MALÅ Vision Web

User Guide

Our Thanks...

Thank you for choosing Guideline Geo and MALÅ as your Ground Penetrating Radar solution provider. The very core of our corporate philosophy is to provide our users with the very best products, support and services. Our development team is committed to providing you with the most technologically advanced and easy-to-use GPR products with the capability to meet your needs for efficiency and productivity now, and into the future.

Whether this is your first MALÅ product, or addition to the MALÅ collection, we believe that small investment of your time to familiarize yourself with the product by reading this manual will be rewarded with a significant increase in productivity and satisfaction.

At Guideline Geo, we welcome comments concerning the use and experience with our products, as well as the contents and usefulness of this manual.

Guideline Geo team

Guideline Geo AB

www.guidelinegeo.com

MALÅ

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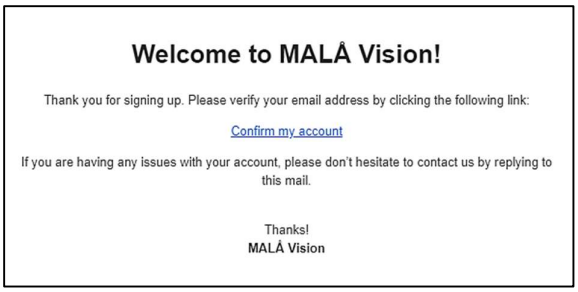
Sign up

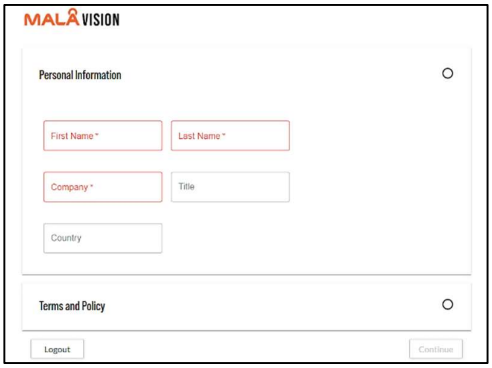
Visit malavision.guidelinegeo.com for both Sign Up and Log In.

To Sign up, you need to enter a valid e-mail address and choose a password.

When you have signed up, you will receive a verification e-mail. Click on "Confirm my account" and your account will immediately be active.



You are re-directed to a page for personal settings and confirmation of Terms and Policy. When this is done, MALÅ Vision is up and running.



GUIDELINEGEO

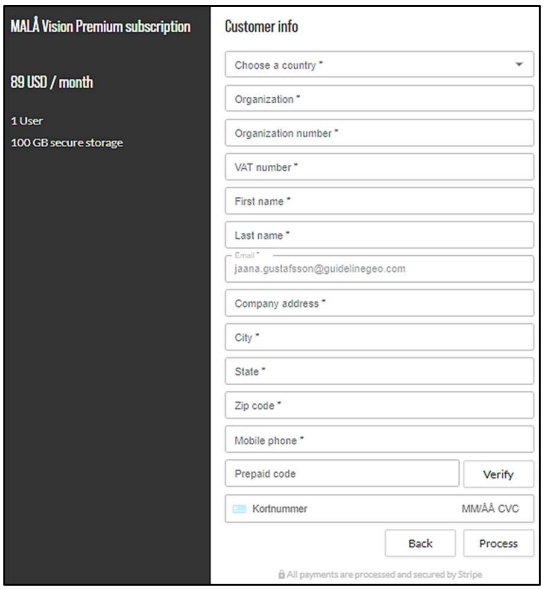
Subscription

You can easily upgrade your MALÅ Vision Community license to a Premium license in the main menu option Subscription.

Fill in all the personal details marked with an asterisk (required filed).

For a monthly payment by card, fill in the card details on the last row and press *Process*.

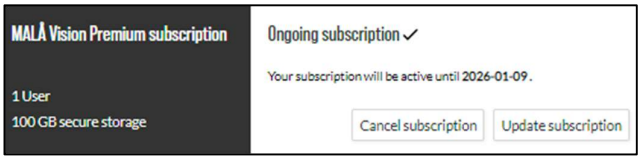
If you have purchased a prepaid code, fill in the code number, press *Verify* and then *Process* (please note that the required fields in the rest of the form need to be filled in as well). In this case the card details can be left empty.



If card details are added when a pre-paid code subscription comes to an end, the monthly billing will be resumed (by card). Please remove the card details if you want to avoid this.

Note: You cannot activate more than one pre-paid code at a time. If you have several pre-paid codes, activate the next code when the first one has expired.

On the subscription page you also cancel or update your subscription and find the receipt history.

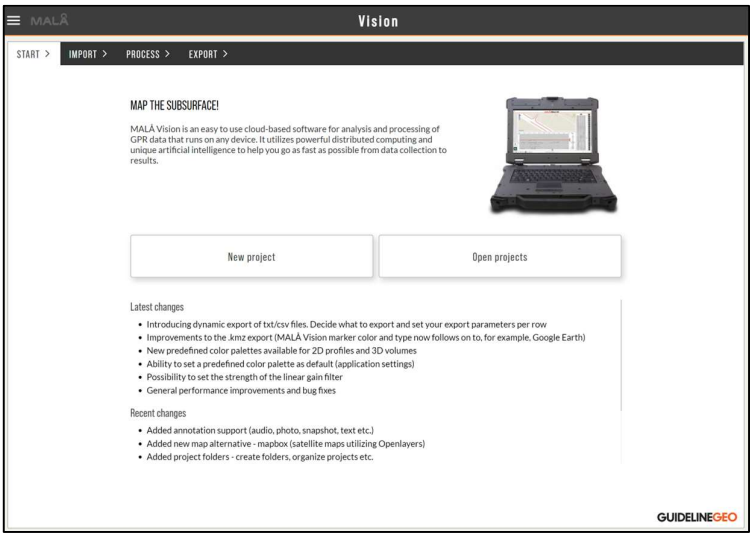


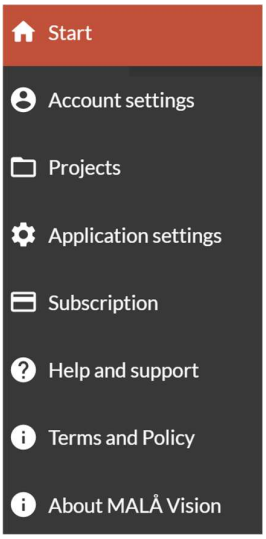
Note: It is the responsibility of the customer to cancel the subscription and to remove the card details if you don't wish to continue your subscription.

Getting started

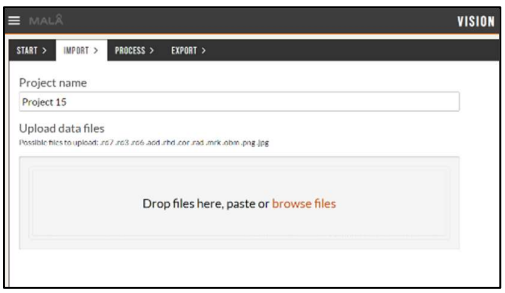
When you have logged in you can create a new project or open an existing project. In this view, all recently released new features are listed.

User settings, account settings, subscription details etc. are found in the main menu, which is accessed by clicking the hamburger menu  at the top left corner. The main menu also includes direct access to Guideline Geo Support if needed.



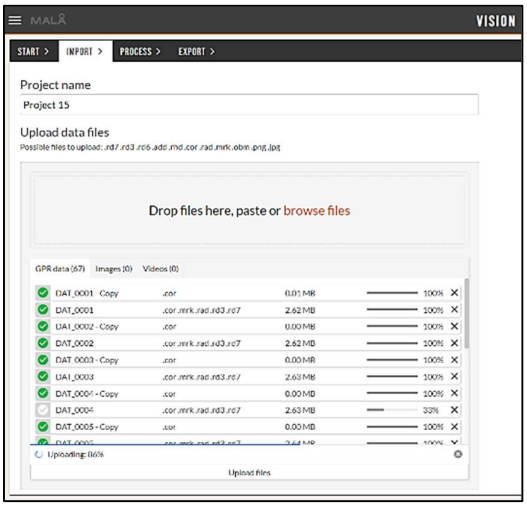


To create a new project, press *New project*. Start by naming your project. Drag and drop your files, complete data folders, even zip-archives, onto the drop zone or use the browse function to upload files.



Note: If you drag and drop a complete project folder, MALÅ Vision will import all recognizable data and meta data formats automatically.

Press the *Upload Files* button to start the process. The upload progress of each file can be viewed in the Import tab. During upload, the progress is clearly seen and when upload is ready the files get a green tick mark.

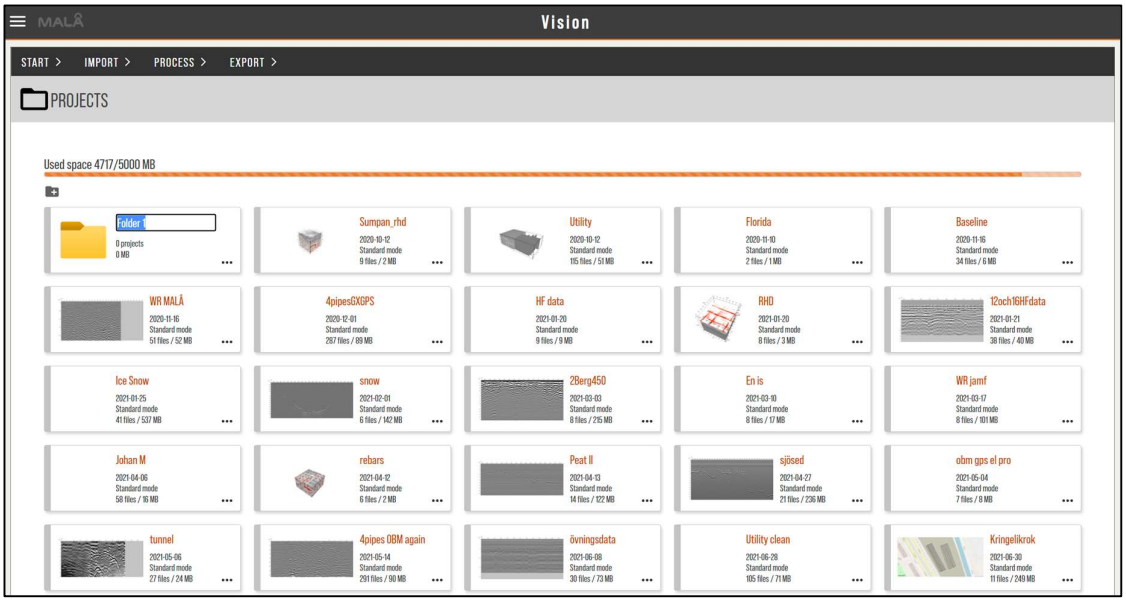


Note: You can also upload images and videos connected to your GPR project.

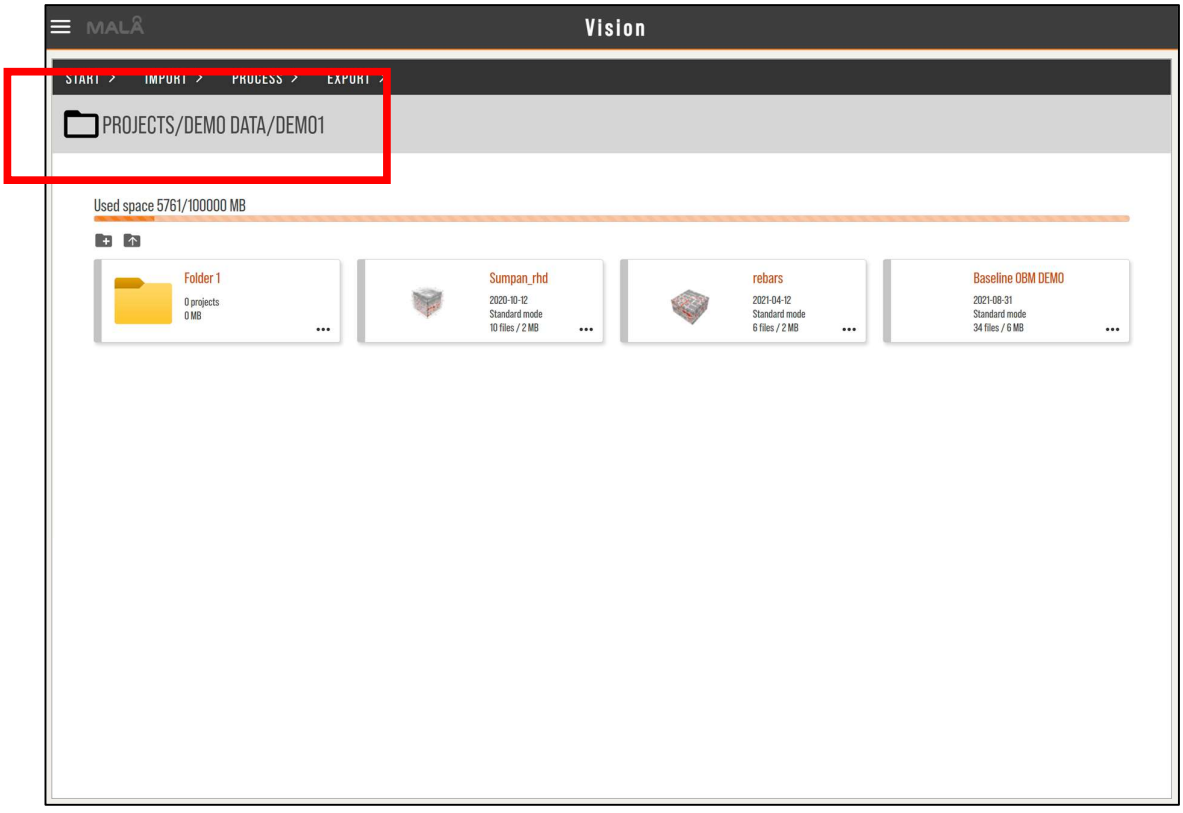
MALÅ Vision imports Object Mapper and 3D Grid projects (acquired with some of MALÅ´s Monitors / Controllers). When uploading an Object Mapper Project, you will get the option to decide if X or Y should increase to the north.

To open an existing project, choose *Open Projects* from the start menu. All available projects are listed with name and size. The amount of available disk space on your account is also displayed at the top of the window.

To organize your projects, you can create folders by clicking  and add projects to these folders by drag-and-drop. To delete and rename projects and folders click the ••• button.



In order to move projects and folders further up in the map structure, drag-and-drop the project or folder to the desired level (marked with red below). You can also click on these folder names (in the red marked area) to move to the desired folder level or use .



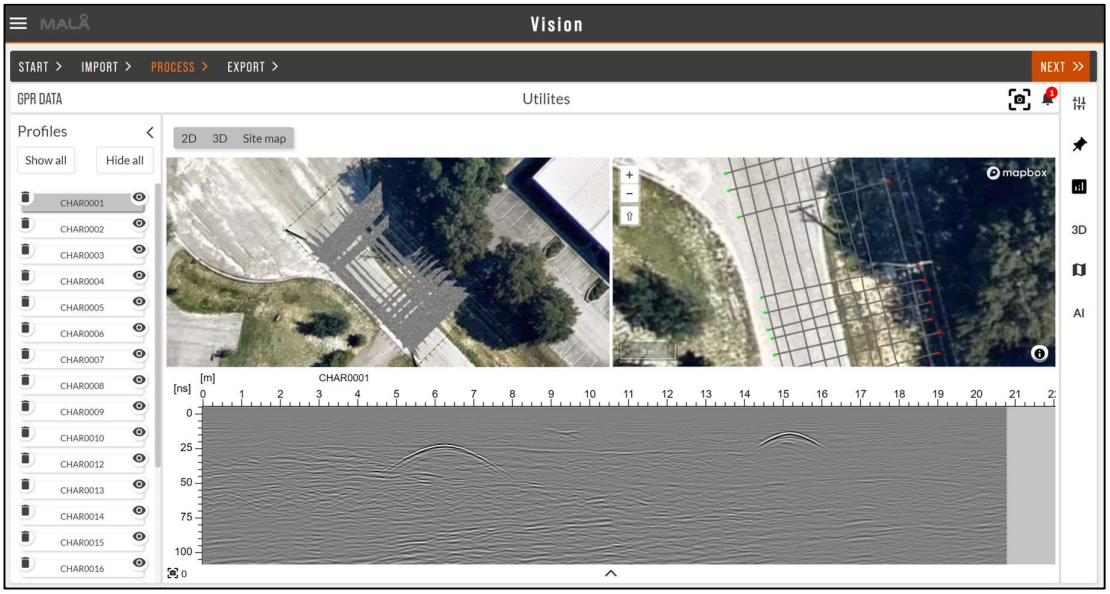
Main view

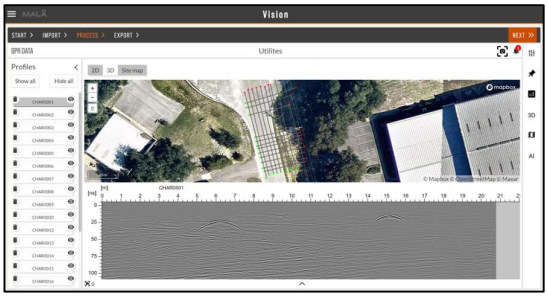
When the project is uploaded, the GPR data file is displayed in the main view window.

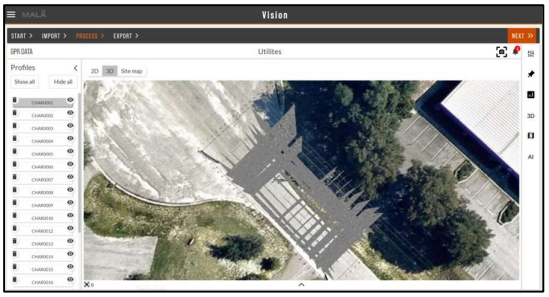
The list of all imported GPR profiles can be found in the left-hand side pane. Press the arrow > on the left-hand side to view and navigate between imported profiles. You can easily switch between profiles using PgUp and PgDn on your keyboard.

In the main view window, you can choose to look at the data in 2D, 3D or in a Site Map view. All three windows can be activated at the same time or just one or two of the views.

The main menu for processing, interpretation and tools related to the different views can be found on the right-hand side. Separate toolboxes are available for Filter settings, Interpretation, Analysis, 3D settings, Site Map and AI. These will be explained in the following sections.



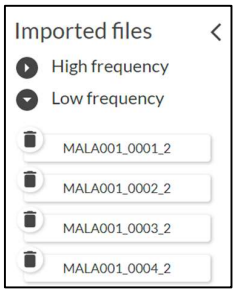




Note: The toolboxes and Profile lists are dynamic and can be minimized or maximized by using the arrow ›.

Note: Notifications from the software give information on upload status, interpolations, error messages etc.

If you have Easy Locator Pro WideRange HDR data, the low and high frequency profiles are displayed separately on the left-hand side.



Filters

In order to add a filter to your data, choose the Filter toolbox and press *Add filter* to add the desired filters.

Filters can be turned off and on or be deleted .

Some filters have additional controls; for example, the velocity for the FK-migration is adjusted by using a slide-bar. The correct velocity is determined by adjusting the slide-bar until the legs of the hyperbola are minimized and only a point response remains in the data. See examples below.

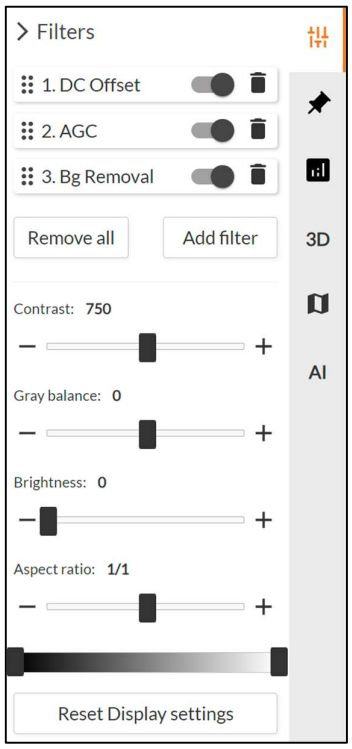
Below the filter list you find display settings, as contrast and grey balance, for both the 2D and 3D views.

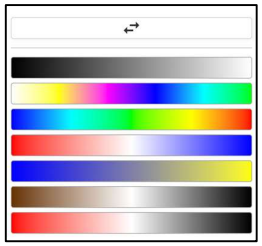
Use the aspect ratio and zoom (mouse wheel/stretch with two fingers on mouse pad/screen) to zoom in and out in the data.

If you keep the left mouse-button down and move, the radargram with the present zoom and aspect ratio level will move.

If you click on the color scale bar you can choose between seven different color schemes. The direction of these can be changed by pressing the arrows. Click somewhere on the screen to close the pop-up and now you can also use the nodes to change the strength of the colors.

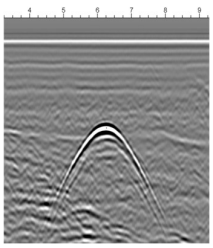
To reset the display settings, press *Clear filters*.



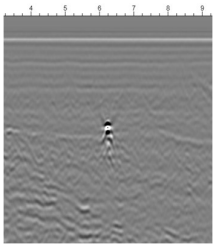


Note: The preferred color scheme can be set as the default color map in the *Application Settings*, found in the main menu .

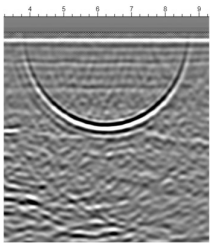
Example of FK-Migration carried out with different velocities are shown below:



Too slow migration velocity



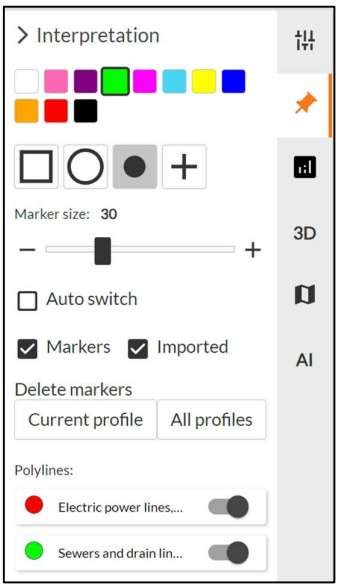
Correct migration velocity



Too fast migration velocity

Interpretation

To add interpretations, use the Interpretation toolbox  .



Select the color, type and size of your marker.

Left-click in the displayed profile to add a marker. To move or delete a marker, right-click on the marker in the profile and select the appropriate action. See picture below. You can also delete all markers in one profile or in all profiles.

When right-clicking on a marker you can also set the depth of the same. The velocity of the radargram will change accordingly. See picture below.

There is also an option to hide all markers (both interpreted or added during import as .mrk files) in the Interpretation tab, by un-ticking  .

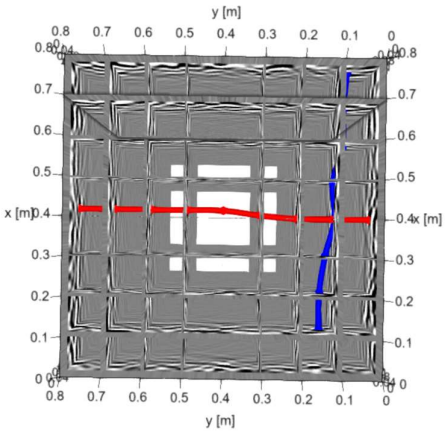
The last set marker can be deleted by Ctrl+Z.

Use the Auto switch option to automatically jump to the next 2D radargram in your list (left-hand pane) when setting markers.

Note: The colors of the markers are defined in the marker template, found in *Applications settings*, in the main menu.

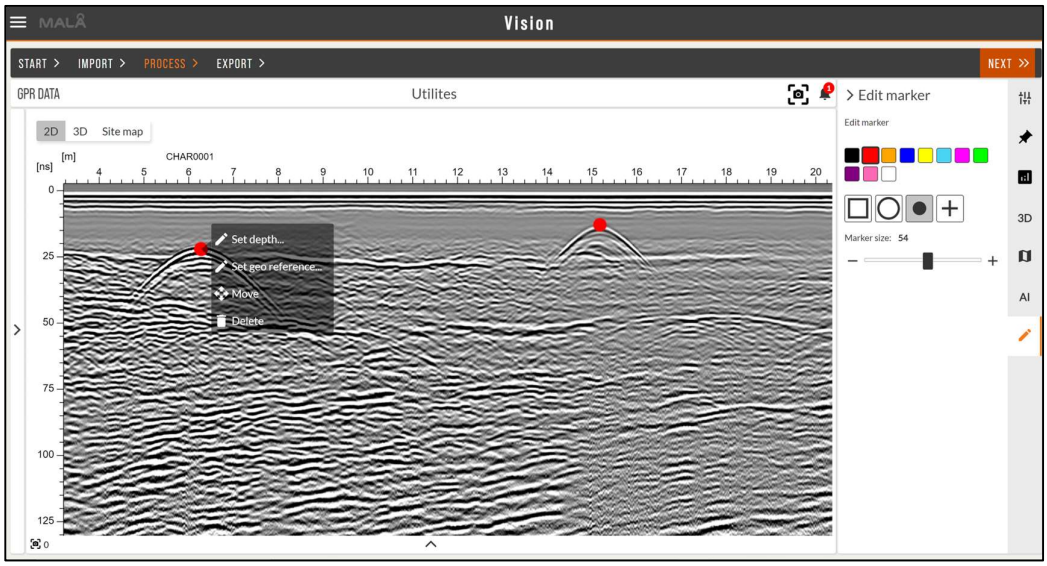
Markers of the same combination of shape and color get linked together in 3D and Sitemap view. These appear automatically once you have more than two of the same combination and are possible to turn off if wished, under Polylines in the Interpretation toolbox.

The combination of a filled circle shape and undefined color (which is the default MALÅ AI combination) is a slight exception to this. This combination has an algorithm applied, which only makes polylines from markers forming straight lines.



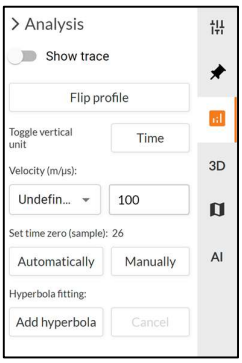
When right-clicking on a marker you get a menu with different actions (set depth, set georeference, move or delete). Left- (or right-clicking) a marker also provides you with an option to edit the marker in form of color, shape and size through the Edit marker toolbox.

Note: When you use the Set Depth option, the velocity of the radargram will change accordingly.



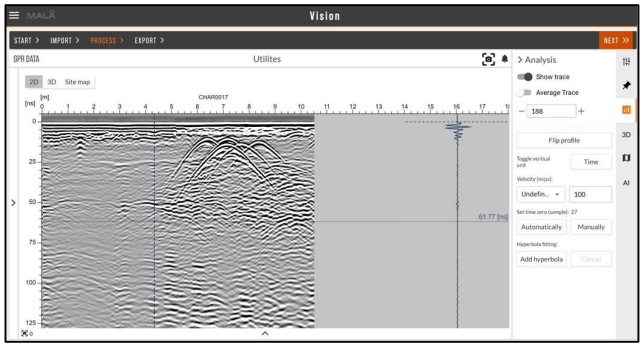
Analysis

In the Analysis toolbox you turn on and off the trace view, flip profiles, toggle between time and depth for the vertical unit, set the velocity (manually or using pre-defined values), adjust the time zero and use hyperbola fitting to check the velocity of your radar data.

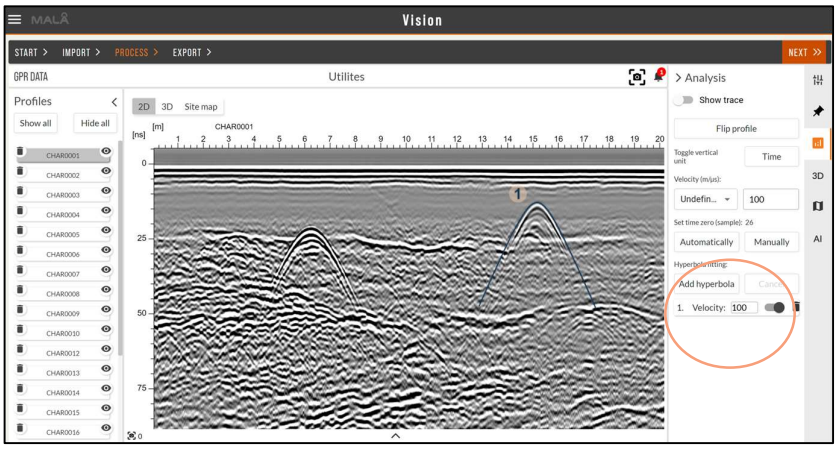


When trace view is on, you display a single trace or an average for the whole profile.

By using + and - or entering a number, the trace number to be viewed is set.



Hyperbolas can be used and added to displayed data for an easy verification of the velocity. Press *Add hyperbola* and place the hyperbola in the radargram with a left-click. Change the velocity in the Analysis toolbox to change the shape of the hyperbola. Right-clicking on the top of the hyperbola gives you the option to delete or move the same. To move, choose *Move*, and then use your mouse (hold down left button) and move the hyperbola.



3D settings

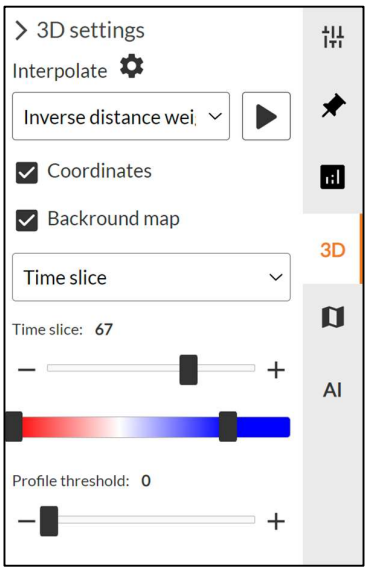
In the 3D tab you can view your data as single 2D files in a 3D volume, interpolate your data, and change the threshold of the 2D profiles.

By right-click on a profile in the 3D view, you can hide it. By left-click on a profile in the 3D view, you will open it in the 2D View (make sure this view is open). Keep the right mouse button down and move will move the 3D volume at the present zoom level.

To create a 3D cube of your 2D lines, select your preferred interpolation method from the drop-down menu and press the play button to start the process. You can continue working as the interpolation is carried out.

The interpolation settings allow the user to customize the process. See more on interpolation below.

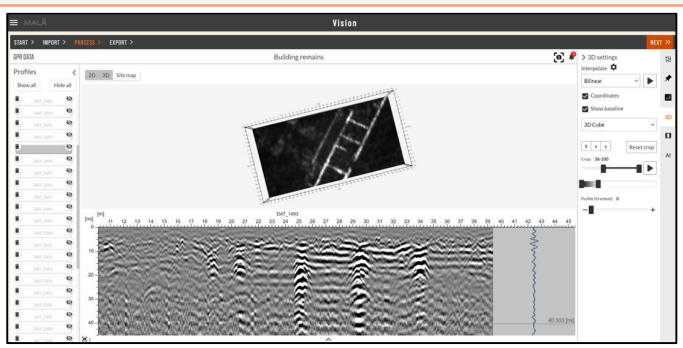
When the interpolation is finished, use the drop-down menu to view the interpolated data as either a 3D Cube, Time slice or as an Iso surface. Alternatively, the interpolated volume can be switched off. Both the 3D cube and the Iso surface can be cropped in three orientations: t (time), x and y.



The colors of the 3D Cube can be changed by clicking on the color scale bar. This will open a selection of seven different color maps. See Section *Filters*.

Profile threshold makes weak reflections in the profiles below the given threshold transparent.

Note: The left-hand pane can be used to view all 2D profiles included in the 3D volume. Individual profiles can be hidden from the 3D view by clicking on the eye icon next to the specific profile.



Interpolation

In MALÅ Vision interpolation of the data volume can be done with the following techniques:

Inverse distance weighting

Inverse distance weighting is primarily suitable for irregularly spaced profiles. The method functions as a heat map and will keep the values of the original data points. It calculates the distance to each point in the vicinity and takes this distance between the points into account. This means that points in closer proximity to each other will affect one another more than points that are separated by a longer distance.

Linear interpolation

Linear interpolation is mostly suitable for parallel profiles with an equal spacing. In other words, linear interpolation works best when utilities or other linear structures are in line with the chosen direction of interpolation. Specify the direction of interpolation and the resolution in the settings ⚙. The interpolation method takes the average value of two points in adjacent profiles.

Bilinear interpolation

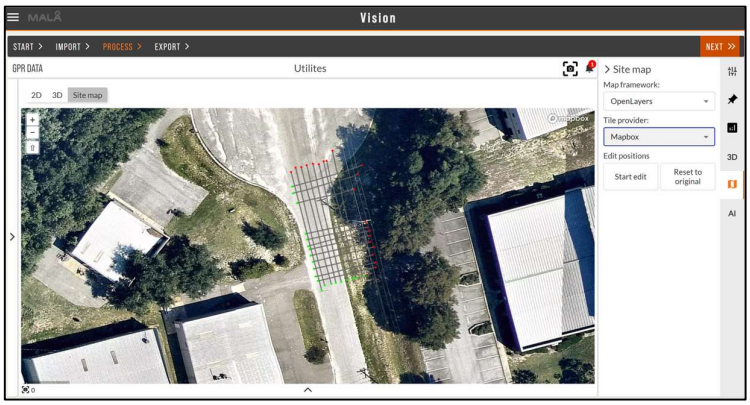
Bilinear interpolation is best for data collected in two directions (such as a 3D grid project collected by one of the MALÅ GPR equipment's). Bilinear interpolation should be avoided if having profiles in an irregular pattern. It performs a linear interpolation in both directions and averages the two results to yield the final result. You could possibly also lower the z value for a better result.

FK Pocs 3D

FK Pocs 3D is the only method to take all three dimensions into account and it creates new points with new values in a more coherent pattern. The FK Pocs 3D method is useful when features are dipping between profiles as it takes the z value into account but can potentially create artifacts in your data if the data is collected in a too irregular fashion. The larger the distance between profiles the longer the interpolation needs to run in order to create a good result.

Site map

If your imported data contains positioning information (as cor-files or obm-files) the Site map will display all GPR profiles onto a map or satellite image for cor-files and a layout for obm-files. The Site map will also display all interpretations, including polylines.



If you have 2D profiles without any positioning (cor- or obm-file) these will be displayed as evenly distributed parallel profiles, where the location can be edited. See section *Edit Geometry* below.

The color of the GPR profile indicates the direction the data was collected. Green dot indicates the start and red the end of the profile.

When you hover above the profiles in the site map the correct profile is highlighted in the left-hand profile list. When right-clicking on one of the nodes (red or green dot) on a profile in the site map, this will provide you with an option to show the profile in the 2D view. Make sure the 2D view is open.

Note: When making changes to markers in the 2D view, these are automatically updated in the Site Map.

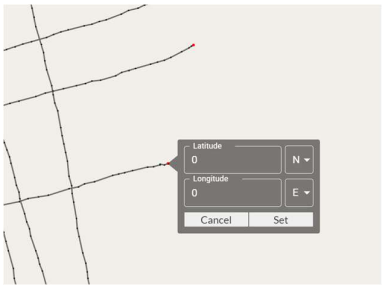
Edit geometry

The geometry can be edited for all types of collected files. Depending on GNSS or non-GNSS data the edit differs. See the following sections below.

Note: To enable Edit of data acquired with GNSS, choose OpenLayers as map resource.

Data in Site Map can also be georeferenced. Right-click on the node that will be used for georeferencing and enter the corrected Lat and Long positions. Press *Set*.

When georeferencing is done for two points, the data set will move and rotate to the new location. The first point set gives the rotation of the project and the second point the exact location. If setting a georeference point again, it will be point 2 for rotation and point 3 for the exact location.

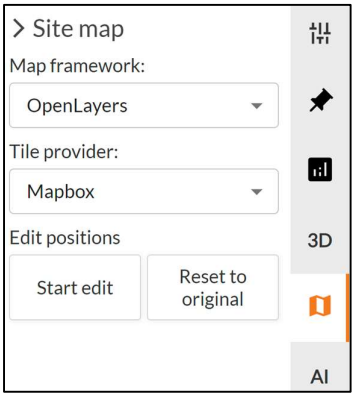


Note: Reset is only applied for edited relative positions of nodes, not for georeferenced points.

Edit geometry – data with GNSS or 3D Grid Projects and OBM

If you have collected data with positioning (cor-files available) the following adjustments can be made, when pressing *Start edit*:

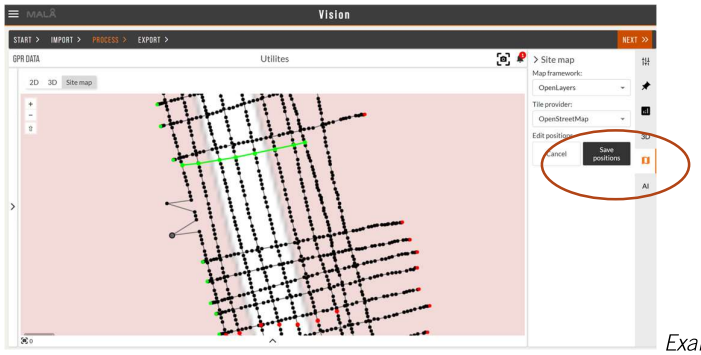
- Change position of single nodes.
- Change position of several nodes.
- Change position of several lines.



Use the following commands to mark and move:

- Mouse-click to mark a single node.
- Control+mouse-click to mark several nodes.
- Shift+mouse-click+hold to draw a square around nodes or profiles be marked.
- When the nodes are marked: Hold down left mouse button and move.

When you are satisfied with your changes, press *Save positions* for saving or *Cancel* to return.



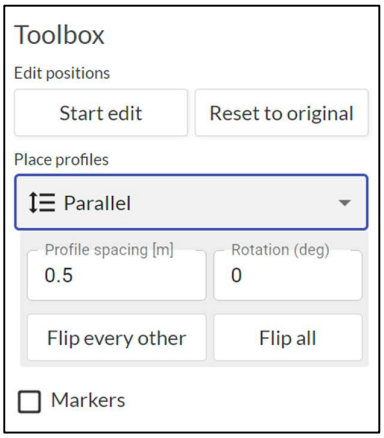
Example of marked and moved nodes

Edit geometry – Non-GNSS data

If you have collected data without positioning as single 2D files, MALÅ Vision will automatically place them in parallel, and you can easily adjust the following:

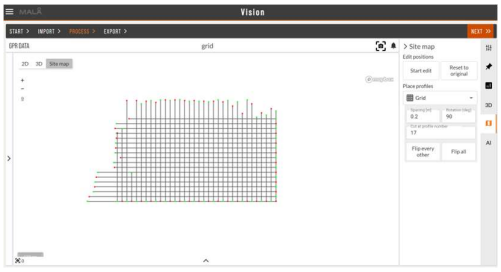
- Place profiles in parallel or in a grid
- Change profile spacing and rotation
- Flip profiles

When right-clicking on a profile point you can view the profile in 2D (make sure the 2D view is open), flip that single profile or georeference the project.



Note: When press *Start Edit* the nodes can be marked and moved as for GNSS and OBM data. See section *Edit Geometry – Data with GNSS or OMB projects*.

Data rotated and flipped.



Data files sorted as a grid.

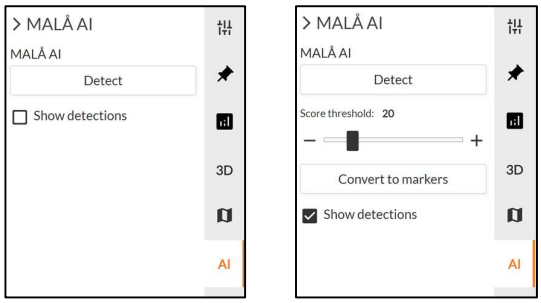
MALÅ AI

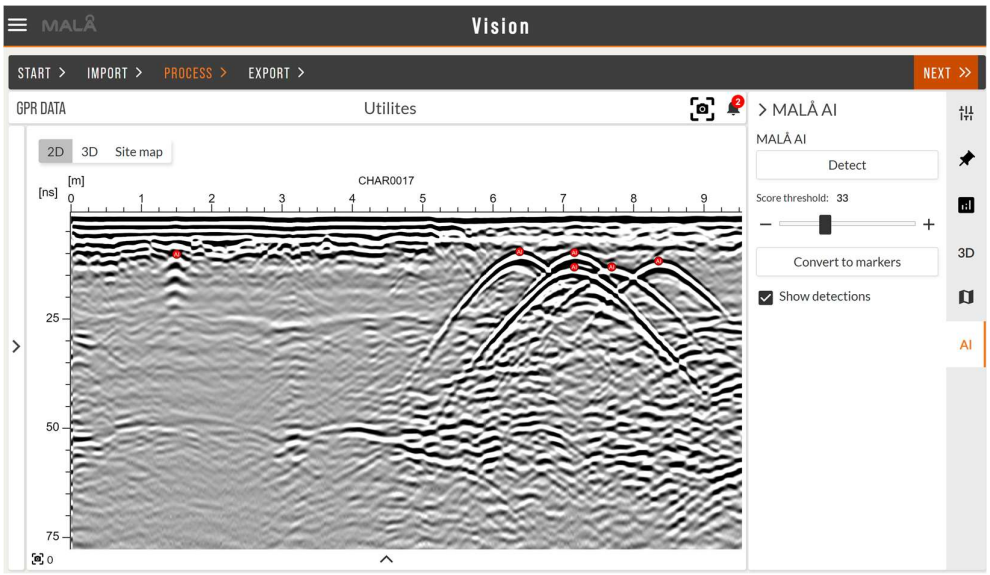
The MALÅ AI can be used as an efficient aid in identifying hyperbolas. Press *Detect* and the identified hyperbolas, in the whole data set, will be marked with red. These are displayed in both the 2D and 3D views.

When one run of detection is made, you can change the score threshold, the sensitivity of the MALÅ AI, and the AI makers will automatically adjust.

The identified objects can be converted into markers and are then also displayed in the 3D and Site Map view, both as markers and as polylines.

For markers set with AI, the polylines created are only created for markers forming straight lines.

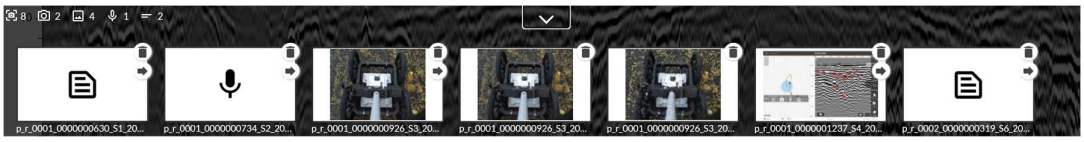


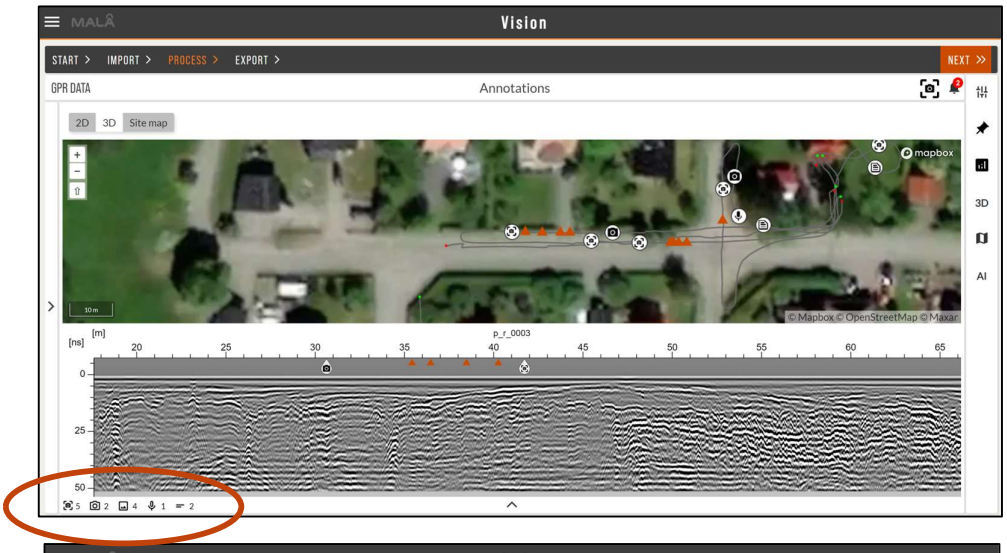


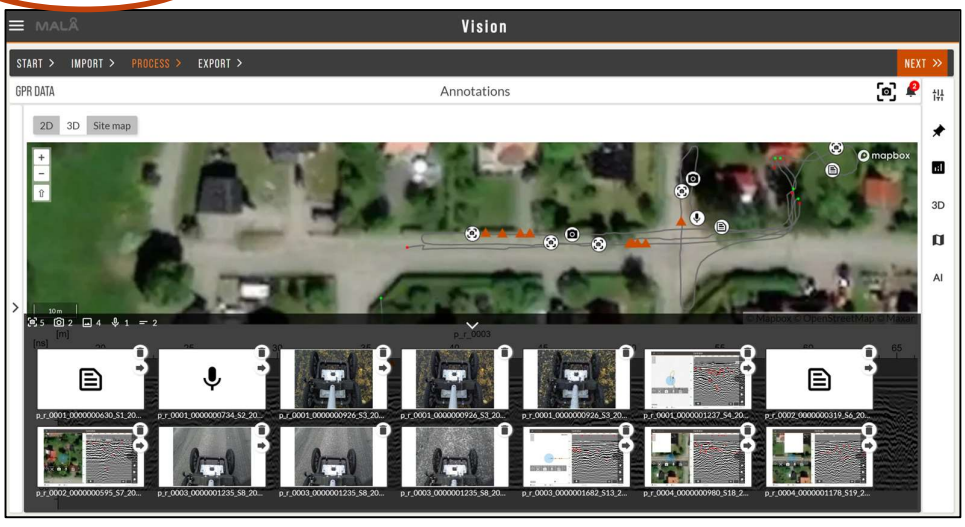
Other features

Annotations

All annotations added during a survey using the MALÅ Controller App (audio, photo, snapshot, text etc.) will be imported together with your project and will be available by clicking the annotations bar below the radargram view (see images below). You can open and view/edit your annotation with a click, or you can press the arrow on top to the annotation thumbnail to move to the location of that specific annotation (in the 2D view or Site map if these are open).







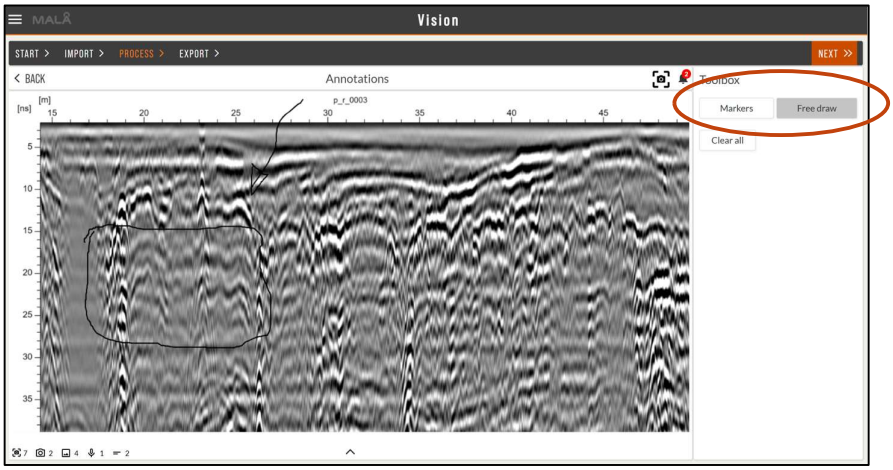
Screenshots

For both 2D, 3D and Site map a snapshot tool is available . When using this tool, the current workspace screen is saved as an image for easy use in a report or for export. All snapshots are viewed and retrieved in the lower part of the screen or in the Export/Report tab.

When changing to Snapshots or Images (in the drop-down menu in the upper-left corner) more markers can be set, and a Free draw option is available, which can be used to enhance and mark features in the data.

Note: When you are ready with adding markers and free drawing, remember to save another screenshot to keep the additions.

Use *Back* (upper left corner) to go back to main view with 2D, 3D and Site Map views of radardata.



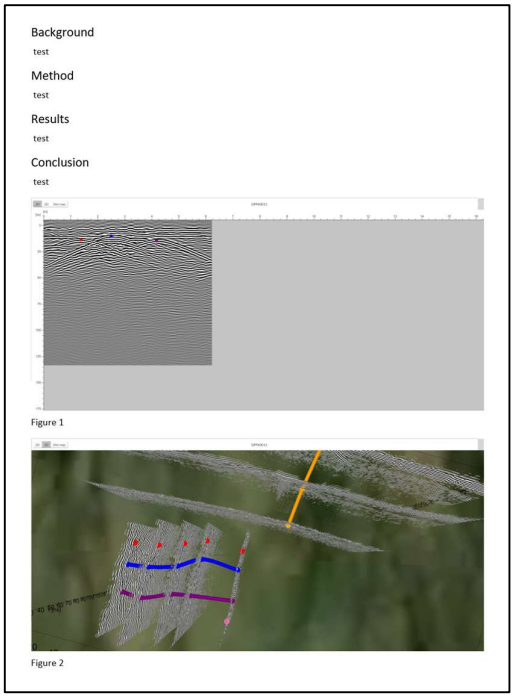
The snapshots are seen together with your annotations in the lower foldable menu.

Report and Export

When you are ready with your interpolation and snapshots of the data, proceed to the Export tab. From this tab you can choose to either create a report, or to export data, interpretations, and images.

Create report

With the Create report tool you can add both snapshots and text to a standardized report template, which are compiled into a document for easy sharing with a contractor or customer. The report can be exported to PDF or Microsoft Word format.

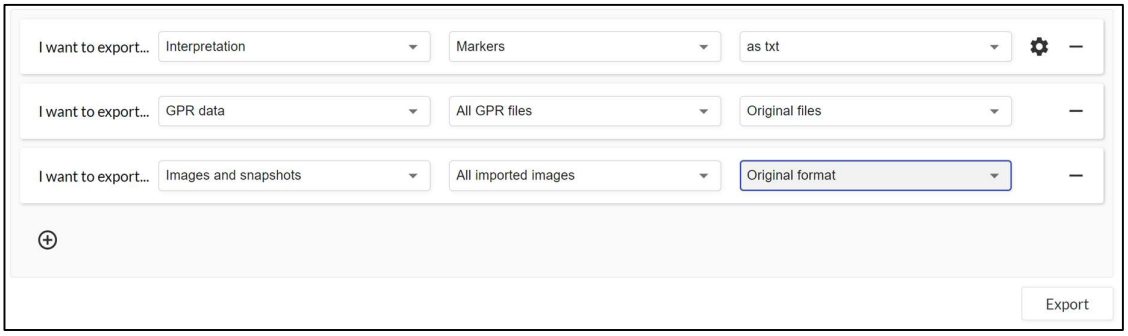


Note: When choosing snapshots for the report, these are included at the bottom of the text.

Export data

The Export data option includes dynamic export of GPR files, Profile location, Markers, Polylines, Snapshots and Images. The markers can be exported as .txt, .csv, .dxf or as .kmz-files (used in e.g., Google Earth).

Use the + button to add additional exports items to the same zipped export folder.

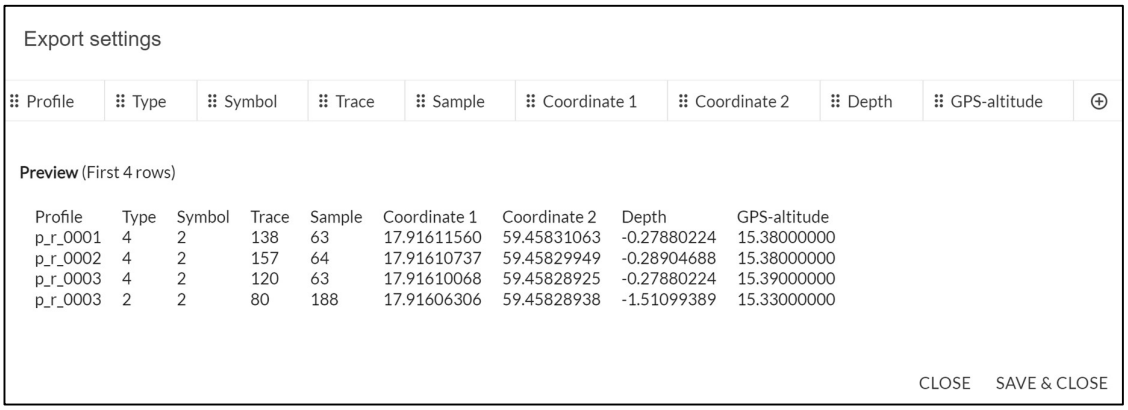


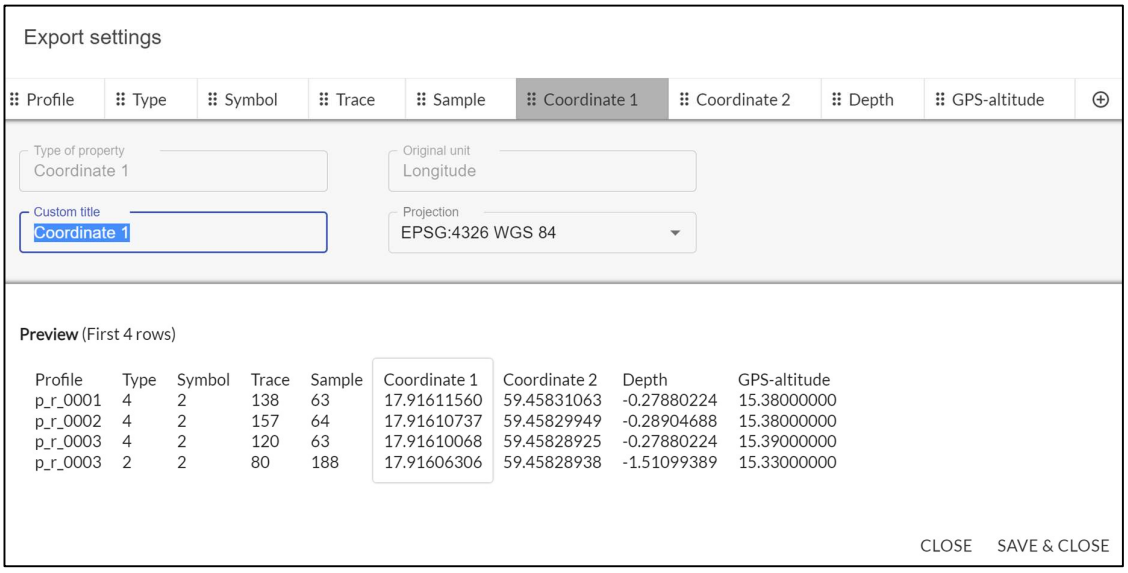
The exported data will be exported to a zip-file with the same name as your project. If you export several different categories, these are stored in different sub-folders in the zip-file.

Txt- and csv-export

The dynamic txt- and csv-export of Interpretation and option Markers, contains information about the set markers. Press ⚙ to open the Export settings pop-up window. With ⊕ you can choose which parameters you wish to export; profile, type, symbol, longitude, latitude, depth (m), GPS-altitude (m), distance from start (m) and color. When clicking on each tab you can set a custom title and depending on the export type change parameters:

- For Coordinates you can choose the map projection to use in the drop-down menu. If you choose MALÅ Vision local, the interpretations will be exported into a local coordinate system (as displayed in the 3D view of MALÅ Vision).
- For Depth, GPS-altitude, and Distance from start you can set an offset.





Dxf-export

When exporting to dxf (choose Interpretation and option Marker or Polyline, Marker & Polyline or Profiles with gps altitude) the different marker types, polylines or profile lines will be exported into a single dxf-file with several different layers.

Note: Press ⚙ to check and change the map projection used for export.

If you do not have any markers or polylines available, the dxf-export will only include the profile line location (without GPS altitude).

If you choose the option Interpretation and option Profiles with GPS altitude, only the location of the profile is exported to a dxf-file, with the altitude (z-level).