How to import SkyTEM XYZ data

In this document we will show how to create a new workspace and import SkyTEM XYZ data in preparation for SkyTEM XYZ data quality control and data processing.

With SkyTEM XYZ data the import files will usually already have been prepared, so aside from a brief introduction to the different files, we will focus on the actual import.

Import files introduction

Start by organizing your data.

There should be a geometry file. This is a text format (.gex) file that describes the system parameters of the used SkyTEM system. It includes the geometry of the frame, the placement of the instruments, the transmitter waveform, time gate specifications, and so on. Everything needed to allow accurate modelling of the system in the inversion. For more details see the gex format description on the Aarhus Workbench wiki page (http://www.ags-cloud.dk/Wiki/W_GeometryFileFormat).

Then there should be a data file. This is space delimited column file in text format (.xyz) with columns describing the data. It includes the utm coordinates, the time and date, the current, the voltage gates, and so on.

Lastly there should be a xyz format file. This is a text format (.alc) file with two columns. It is used to map the different columns of the data file into the corresponding database fields used by Aarhus Workbench. The first column is the largely fixed list of database fields such as utmx and utmy, the second column holds the column numbers of the columns that will be read from the data file into those database fields.

Create a new workspace and import the SkyTEM XYZ data

Now we can open the Aarhus Workbench and select New to create a new workspace. Select a folder for the workspace, add names and select the map coordinate system (EPSG).

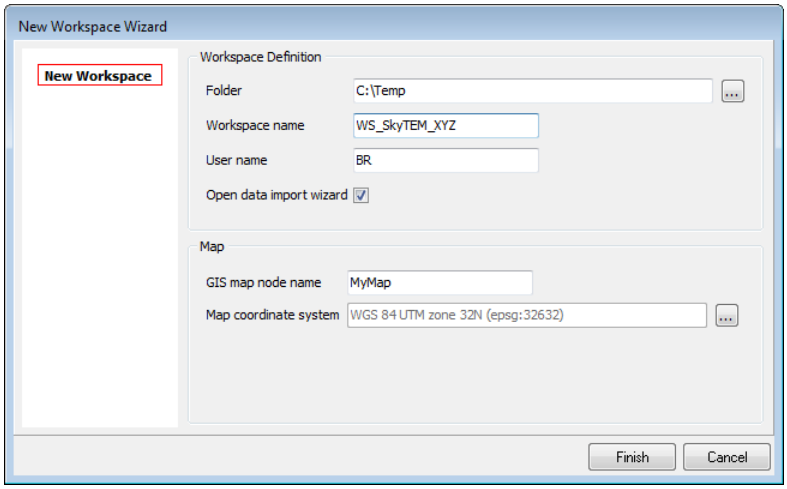

Figure 1. Create the Workspace.

When the workspace has been created, go to the database explorer and select Import on the database ribbon to start the import. If the open data import wizard checkbox was checked before, this wizard will

open automatically. Now set the importer to import to a new database and fill out a name. Then go to the Airborne Data tab and select Airborne TEM Processing (SkyTEM XYZ).

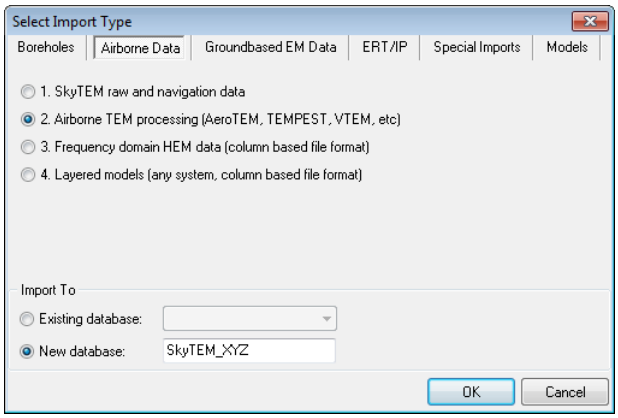

Figure 2. Select the Airborne TEM importer.

This launches the Airborne TEM importer. Select the SkyTEM XYZ importer.

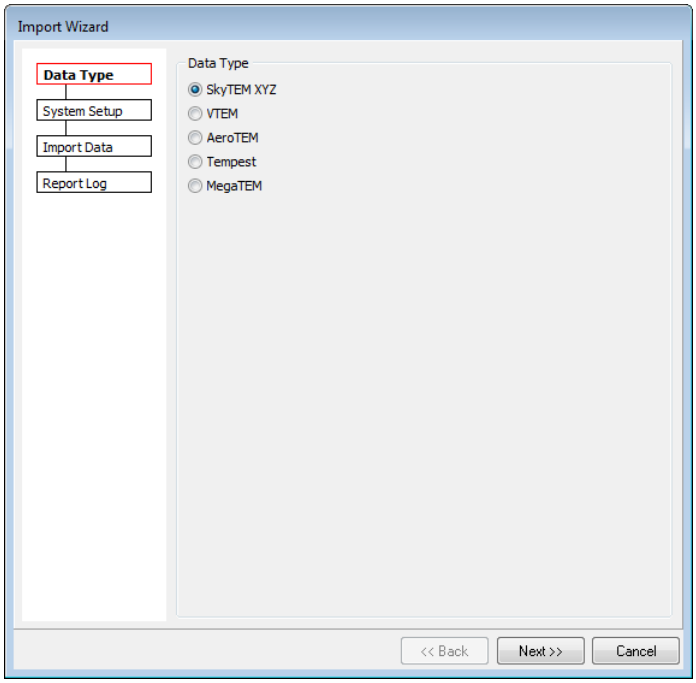

Figure 3. Selecting the SKYTEM XYZ importer.

Here we need to create the new dataset and import the geometry file with the system setup. First name the dataset, then make sure that the right coordinate system has been set, and finally point the geometry file.

In addition to this, it is possible to set several labels related the data processing and the used height system and reference model. None of this affects the inversion of the data, it is just labels in the database.

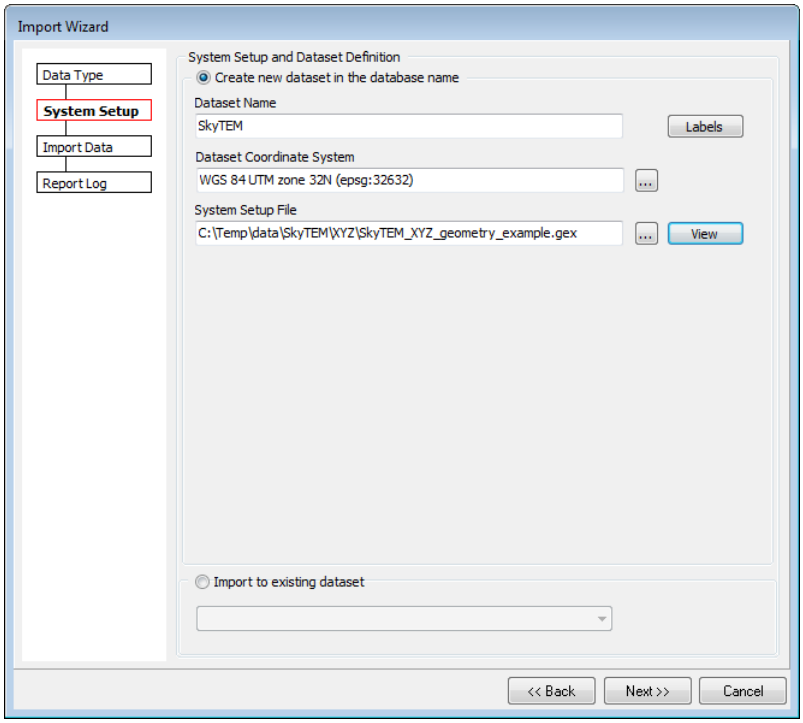

Figure 4. Create the dataset and import the geometry file.

Now we can import the data to the dataset. Point to the xyz file with the data. Then point to the xyz format file with the information about how the data from xyz file should be imported. There should normally not be any need to edit the xyz format files here, so the editor mostly serves as an easy way to confirm that the different columns have been assigned to the right fields. The editor is great for changing the columns of the gates, but for other minor edits we can also easily update the column numbers directly in the file.

It is possible, but in general not recommended, to skip the log form and go directly to automatic processing by pointing to a processing settings file here.

Finally, we have the option of doing decimation on the data and skip some of the data during the import. Start the import by clicking Finish.

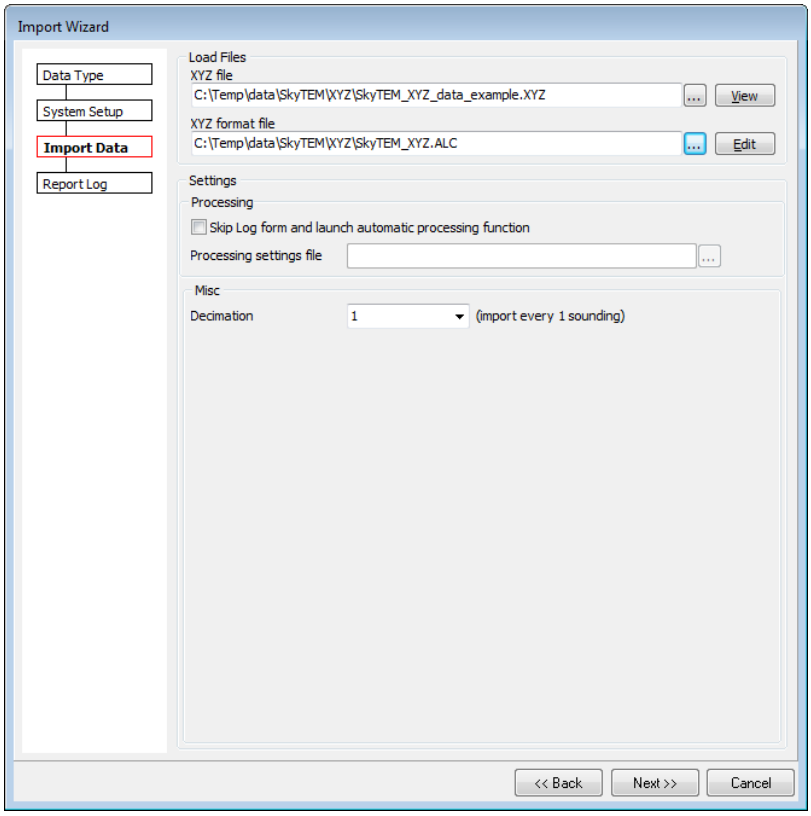

Figure 5. Import the data.

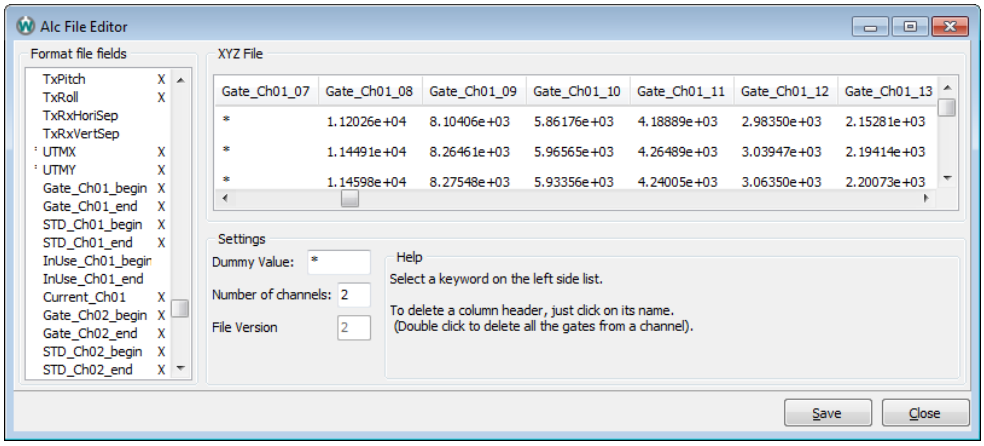

Figure 6. The alc file editor. For gates there is an option to click on the first gate and then the last gate, it can then fill out the gate column numbers of the gates in-between. To adjust an already existing gate setup, first click on begin and then any of the already assigned gates to reset the selection.

When everything has been imported check the log. If everything looks fine, it is time to create the data node. For that go to Data Processing and select Data (create new processing) and then select the database in the dropdown and processing type Airborne TEM. Then there is a dataset selector where we just need to say ok and a name for the processing node that needs to be filled out, before the data node will be created.

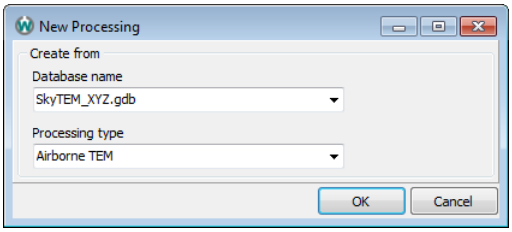

Figure 7. Create new data processing.

We will then be asked to also create a processing node. Here just click ones on each side of the data we want to include. If needed, click the button in the upper right corner of the form to reset. Larger nodes will be slower to work with in the processing, so it is suggested to limit the size of the processing nodes. For SkyTEM XYZ a processing node is normally made for 1 flight or in the case of larger datasets, for 1 day consisting of 1-3 flights. When doing so it can be advantageous to enter the from and to times manually to get more exactly defined processing nodes that doesn't leave out any data.

If a lot of data has been imported this approach becomes impractical, but one can then instead use the gab option in the bottom of this form that allows us to create automatic intervals after for instance each 8 hours gab.

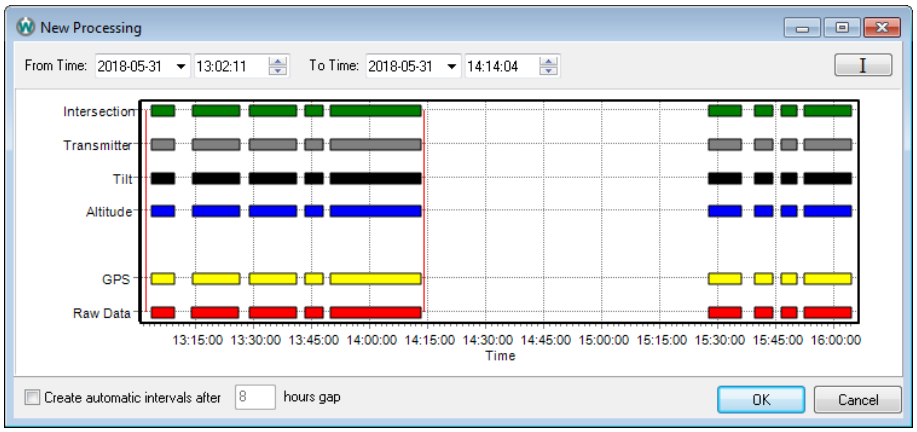

Figure 8. Processing node creation. Select the beginning and end of the data needed.

Lastly, we will be asked to give that node a name (this name must include a letter) and then we get to the processing filters. That will be covered in greater details later, for now just use default values. This was the last part of the import.

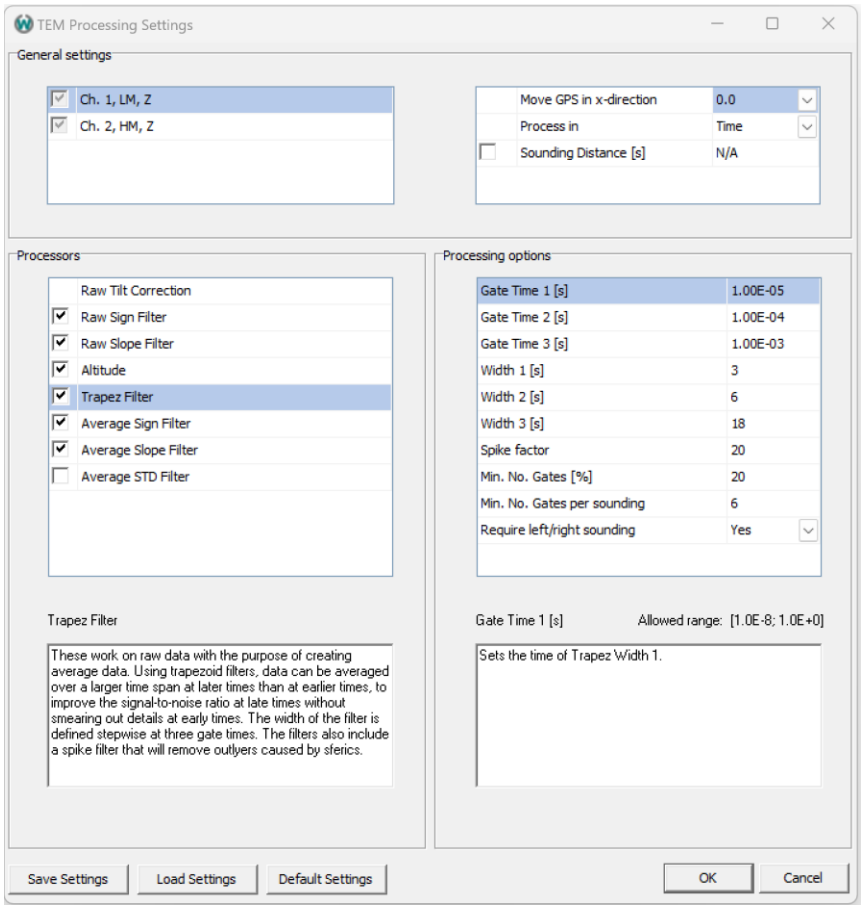

Figure 9. Processing filters with default settings.

If it was necessary to cut the processing into multiple node, additional processing nodes should be made by selecting the data node and then selecting Process Data. This open a window where we can select Create new processing node(s) which will return us to the Processing node creation. This is important as this allows us to create multiple processing nodes under the same data node rather than under a new data node.

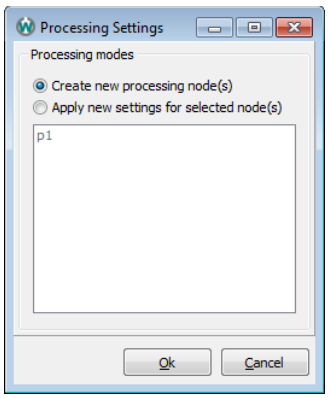

Figure 10. Creating additional processing nodes from the same data node.

All SkyTEM XYZ data from a survey should be imported through a single import, unless different geometry files make it necessary to split the survey into multiple imports.

If additional data from the same survey need to be imported later, it should be imported into the same dataset. The only exception would be if parts of the survey was flown using a different geometry file, then import it into a new database. To import additional data of a different type, simply import it into a new database.

When importing to the same dataset, go into import as before. Since the database already exist we can adjust the Import To setting to points to the existing database.

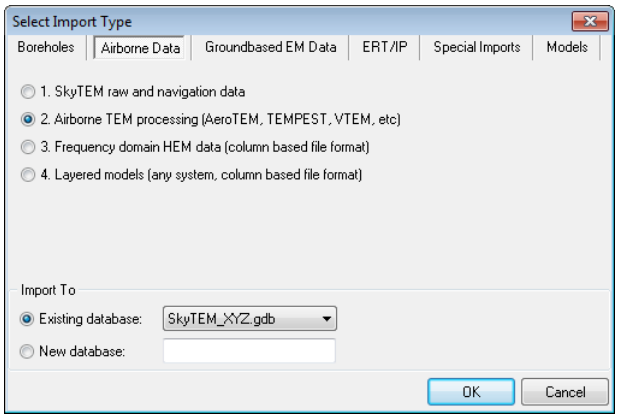

Figure 11. Importing to an existing database.

The dataset has also already been created, so we can select the import to existing dataset option and point the existing dataset. The rest is done just like before, just point to the new xyz file with the data. There is one little thing however that we need to remember here, if we are using an artificial starting point, one should move the date ahead here so that we don't import to the same time. When done additional processing node can be made just as described earlier.

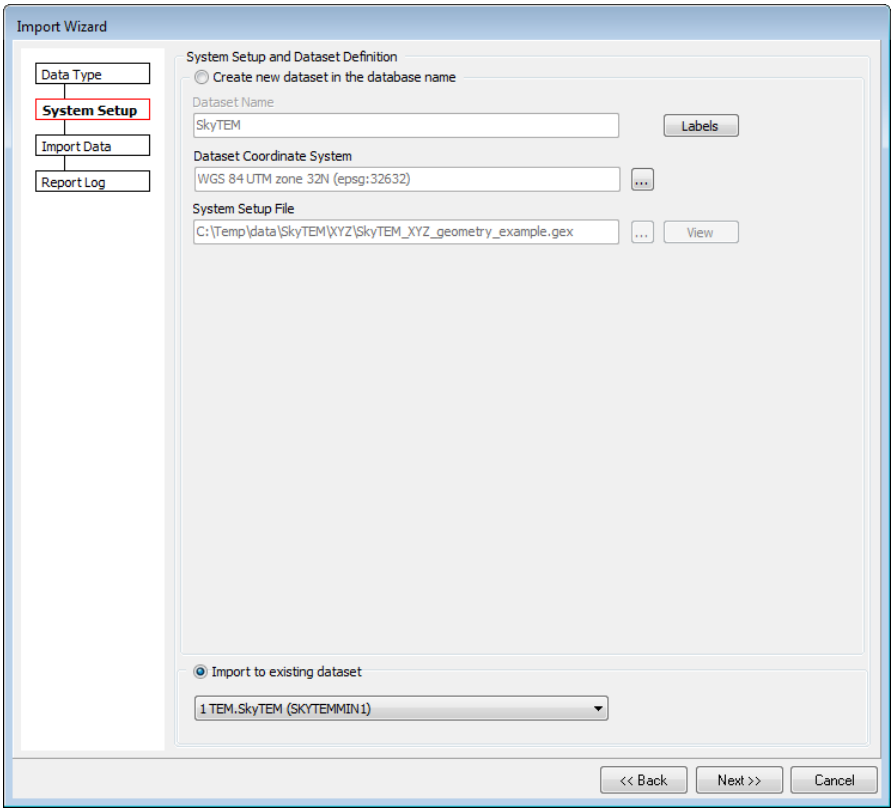

Figure 12. Import additional raw data to existing dataset.