The Talimer

As described above, the evaluation limits in the measurement program are a combination of learned values and settings from the database. The learned values represent the statistic of each measurement value. The settings from the database are also specified individually for each measurement value.

The user interface for the parameter database – TasForms – allows to edit the limit settings. But since TasForms is Access-based, its graphical abilities are limited. Nevertheless, it is useful for displaying/ editing tables.

Consequently, for the editing of polygons, necessary to give bounds to learned limit curves, TasForms only gives a table view of the anchor points of such polygons. A graphical display is not available.

For this task, you use Talimer. Talimer has a user interface that allows to edit polygons in the database graphically. Moreover, Talimer can read result data and allows you to shape a polygon well to the real need. With Talimer you can edit every polygon, disregarding whether it is a spectrum, a tracking curve or a parameter polygon for shift force evaluation.

Therefore, Talimer is not an alternative for TasForms, but a specialized additional tool for editing limit *curves*.

Starting Talimer

Talimer works – as TasForms does – on the parameter data base file (which you usually will find in the folder `ParamDb` of your project directory – see "The Project Directory" on page 37). Please note that only one of the tools may operate on the database at the same time. Talimer will not open a parameter database which is open in TasForms at the same time.

There are two possibilities to start Talimer (except from starting it directly from the discom-program folder): Open a parameter database or open a Talimer project file.

The Talimer project files ("*.talip") mainly contain a link to the parameter database file and some additional information. Usually, you will not create Talimer project files, since they are mainly used to transport information from e.g. Web.Pal to Talimer. Sometimes you find such a file in the "Rotas For Experts" folder to give you something to click on.

The other way is to right-click on the parameter database file in Windows file explorer and select Open With… from the context menu. Please select **Talimer** to edit the parameter database with Talimer. (If Talimer does not occur in the list, you can add it with the last entry in the menu. You find the

Talimer program in the Discom program folder (C:\Program Files (x86)\Discom\bin).

The Talimer settings are stored in the parameter database file, not in the project file.

Overview

When you start Talimer, you see a main window with a "Scope", where you edit polygons and show reference data. On the left and on the bottom, you find some docking windows which control which polygon you edit, and which reference curves you see.
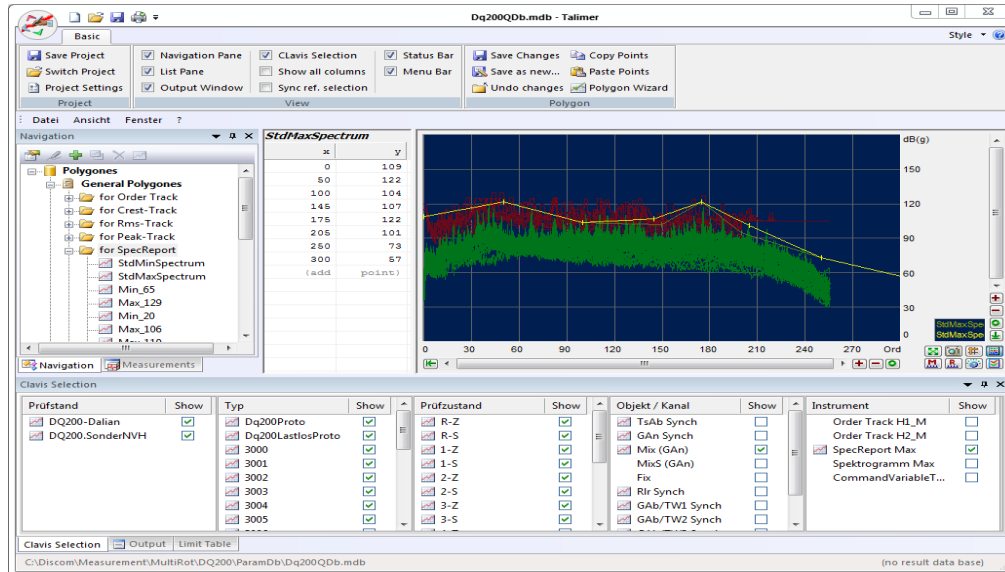
In the multi function bar ("Ribbon") you find the section View. There you find the multiple docking windows, in case you have closed one and want to re-open it.

The different docking windows are described in the following sections, except one: At the very bottom, you find a window "Output": This window is usually hidden but you can make it visible by clicking its tab. The output windows contains status and error messages. If you have for example problems accessing the database or problems loading reference measurements, the output window usually contains details to the circumstances or problems.

Navigation

In the docking window **Navigation** (on the left border) you select the polygon you want to edit.

Polygons are sorted into three categories: Polygons which can be used as learn boundaries, polygons which set fixed limits and polygons which are used as parameter for measure values.

The polygons for learn boundaries are called *general polygons*, since they can be genrally used for all fitting measured values. In other words, these form a polygon collection from which you can choose for specific measured values. Nevertheless, the collection is separated for each instrument. That means, if you want to set a limit for a spectrum, you can only choose from polygons that were designed for a spectrum. You cannot set a polygon which was designed for a track. (Usually, the polygons for tracks and spectra will have totally different values and areas. This restriction tries to make polygon settings easier.)

Such a general polygon can be used for many measured values. In contrast to that, a fixed limit is specific for just that measured value (and that test step, candidate, test stand, etc.). Therefore, these polygons are called *individual polygons*. If your database contains fixed limits, you will see that the corresponding branch of the navigation tree shows each measured value with its full key.

The *parameter polygons* are not used to form a limit curve. Instead, they are used to calculate a value. For example, they are used for gear shift force evaluation. There you calculate a value that describes the area between a polygon and the gear shift force curve. (To be more exact: The area where the shift force curve is *above* the polygon.) The result of this calculation is a *single value*.

The **navigation** window lists all polygons. Its counterpart is the window **clavis selection** which is usually docked at the bottom side. In this window, you see which measured value uses which polygon. (This selection also controls the content of the docking window **limit table**. See more below.)

Editing a polygon

Open a parameter database with talimer. In the navigation window, select the instrument below general polygons for which you want to edit a polygon and open the corresponding branch in the navigation tree. Double-click the corrensponding entry for that polygon.

Now, the scope displays that polygon and the anchor points of that polygon are listed on the right beside the scope. (In case, you do not see anything in the scope, please try the autoscale button ⊞.)

The polygon is plotted as yellow line in the scope, the anchor points are marked using vertical lines.

(Please note: The figures in this manual show the scope with a different background color than the default to get a better printout.)

Move the mouse to one of the anchor points and "grab" it by clicking and holding the left mouse button. Now you can move the polygon point with the mouse. A crosshair shows the current position, a dark yellow line shows the original course of the polygon. If you hold the shift key when moving the mouse you move the complete polygon up or down.

You can also enter the positions of the anchor points directly in the table left of the scope display. Only click in a table field and enter a number.

Adding points, removing points

To add a new point to the polygon, move the mouse to the position in the current polygon where you want to add the new point. Click with the right mouse button to open the context menu and select either **Enter new point here** or **Place new point**. Then you can move the point as described above. With **Place new point** you can add points which are far out of the current polygon area.

If you want to remove a point click with the right mouse button on that point and select **Delete this point**.

In the table you can add a point by entering it in the bottom row (**add point**). Click in the left field (showing the text **add**) and enter the x-value of the new point. After pressing enter, the new point is created and immediately placed
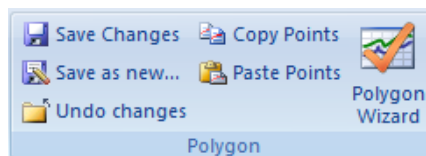
in the list at its correct position. Now you can enter the y-value for the new point.

To delete a point via the table, click on the x-value and erase it (by entering an empty text). After pressing enter the point is being removed.

Saving changes

In the multi-function bar ("Ribbon") you find the section **Polygon**.

When you edit a polygon, the functions **Save Changes** and **Undo changes** are being unlocked. Click **Save Changes** to get the changed entries written into the database or click **Undo changes** to revert the polygon to its original form.

If you change the polygon selection after editing a polygon without having saved or undone the changes, Talimer ask whether the changes shall be saved or undone.

The Reference Polygon

When you right-click on a polygon item in the navigation tree, you have access to the command **Use as reference**. The reference polygon is shown in the curve plot in addition to the normal polygon (and the reference measurements, see below). If you are for example editing the minimum learn boundary polygon for spectra, you may want to display the maximum learn boundary as a reference.

Exchange with Excel

You can transfer the table of polygon points into an excel table or make a polygon from an excel table quite easily.

To transfer the points, simply press **Copy Points** in the **Polygon** ribbon panel. Now, go to your Excel spreadsheet, select a cell and use the standard **Paste** command (keyboard shortcut **Ctrl+V**).

The other way round, you can get your polygon points from any Excel table: If your spreadsheed only consists of a single table with two columns, you directly can call the standard **Copy** command in Excel (keyboard **Ctrl-C**). If your spreadsheet contains more data, select the two column cell range containing your polygon points and **Copy** these. Now switch to Talimer, open the polygon you want to change for editing (as in the previous section) or create a new one using the Navigation window tool bar button, and press **Paste Points** in the **Polygon** ribbon panel.

The points copied and pasted from Excel completely replace the existing polygon points. You will get a preview of the points and will be asked for confirmation before the points are actually replaced. And you still can use the **Undo Changes** button.

Store the database

If you start editing a polygon with Talimer (or change the contents of the parameter database by other means), Talimer automaically makes a copy of the original database. (This copy is located in the same folder like the original with the addition "`.talimer-bak`").

All changes are being made in the current database. If the measurement program access the database during your work, the changes will get active at once.

When you close Talimer or when you call the command **Save database**, you have two options:

- **Keep changes.** In this case, the copy of the database is being moved to the subfolder Backup and renamed according to the internal version number. In case you notice that you have to revert a change only after closing the database, the backup folder always contains previous versions.

- **Revert changes.** The database with the changes is being erased and the copy renamed back to the original name.

If you want to keep changes, you can enter a short commetary about the changes being made. This is the same thing as you know from TasForms.

Since the settings of Talimer (e.g. Scope settings or connection to a result database) are being stored in the parameter database itself, reverting changes has also influence on these settings. By reverting a previous database the Talimer settings are also reverted to its original state.

Polygon Management

If you want to delete a polygon, search for it in the navigation tree, right-click and select the command **Delete** from the context menu. Alternatively, you can use the button in the tool bar of the navigation window (see below).

If you want tp create a new polygon (general or parameter polygon), go to a branch in the navigation tree which is as close to your desired polygon as possible. This can be the branch "for spectrum", if you want to create a new polygon for spectral limits or it can be the main branch "parameter polygons" if you want to create the first parameter polygon for a certain instrument.

Right-click the branch and select **new polygon** from the context menu or use the corresponding button from the tool bar of the navigation window.

You are now prompted to give a name for the new polygon and for which instrument you want to create the new polygon (if necessary). The polygon names must be unique within their scope.

At first, the new polygon does not have any points. Use the methods described above to give points to the polygon. The measurement program does not accept polygons with less than two points.

With the corresponding command of the context menu or the tool bar you can also copy an existing polygon. Give a name for the copy as described above and adapt the points of the new polygon according to your needs.

Via the context menu command **Properties** or with the corresponding tool bar button you can rename a polygon. More about polygon properties below.

The Navigation Toolbar

The docking window **Navigation** has its own tool bar:

The function of the buttons correspond to the commands of the context menu. Most of the commands are available only if a polygon has been selected. The buttons of the tool bar have the following functions (from left to right):
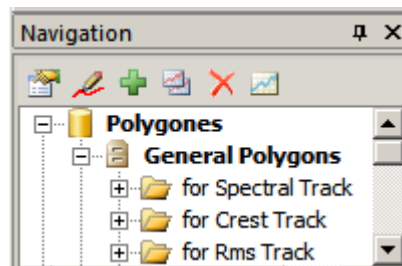
Properties: Display the properties of the selected polygon. This includes especially the display of measured values for which the polygon is currently used. Moreover, you can rename the polygon here.

Edit: Selects the polygon for editing. This function corresponds to the double-click in the navigation tree. The polygon is being displayed in the scope and you can edit the polygon points.

New Polygon: Add a new polygon to this section of the navigation tree as described above.

Duplicate: Makes a copy of the selected polygon as described above.

Delete: Deletes the selected polygon as described above.

Reference: You can display a second polygon as reference in the scope display. For example: If you edit a maximum polygon you can show the corresponding minimum polygon.

Tidy up the polygon collection

When you have been working with the parameter database for a while, it can easily be that your database contains polygons which you do not longer use. Reason for that can be that base types have been deleted which used certain polygons or measured values have changed which used certain parameter polygons.

For this purpose there exists a tidy up function. You find it in the multi-function tool bar **Maintenance**.

Reference Measurements

You can display reference measurements from measurement archives in the Talimer. Talimer can then automatically load the measurements curves of those measurements which use this polygon. That way you can easily see whether the polygon fits to the data. Moreover, you can use the measure curves as basis for the creation of a polygon using the polygon wizard.
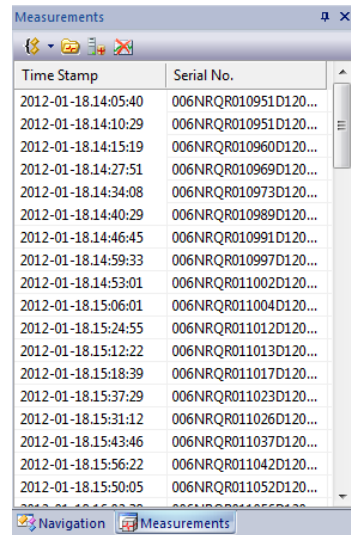
Loading reference measurements

Reference measurements can be loaded from archive files directly or via the result database.

If you want to use an archive file directly, you only need to move it from the windows explorer into the talimer window. Talimer reads out the contents and displays it in the docking window **Measurements**. (You find this window at the same place as the **Navigation** window. You can switch between both windows with the tab at the bottom.)

The tool bar of the **Measurements** window contains also a button which lets you open an archive file. Another button lets you query the result database for measurements or "forget" all loaded measuremnts.

The **Measurements** window lists all measurements of all loaded archive files. Use the **Archive Content** window to see which measurements are in these archives or to manually select one for displaying it.
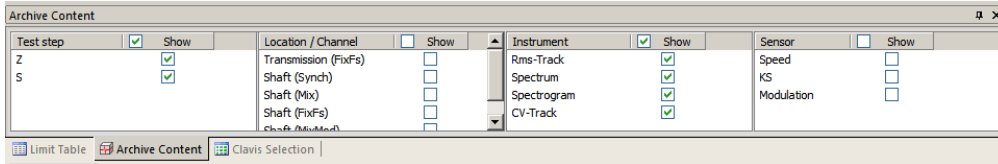
Archive Content

The docking window **Archive Content** is usually loacated at the bottom of the main window together with the windows **Clavis Selection** and **Limit Table**. (If your monitor is large enough you can also place the docking windows above each other. You do not need to switch between the windows, then.)

The Archive Content window lists in the corresponding columns for which test steps, types, sensors, instruments, etc. data is available:


If you select a polygon in the navigation tree (couble-click), the corresponding entries in the Archive content window which use this polygon are being marked with the symbol ![icon]. Moreover, the corresponding measured curves are being loaded from the archives and displayed in the scope window together with the polygons.

Auto-Sync and Display of Various Data

This auto mechanism is not always desired. Sometimes, you see much more measurement curves than you want to see. (For example: It can be that you only want to see spectra from the mix channel and not also those of the synch channels even if they also use the same polygons). On the other hand, it may be that you want to see data which does not seem to have anything to do with the selected polygon (e.g. spectral track polygon compared with a RMS track).

Therefore, the automatic sync between polygon selection and reference measurement can be turned off. You find the corresponding function in the section **Control** of the multi function bar.

The checkox **Auto-sync reference data** turns off the automatic synchronization between polygon selection and loaded reference curves. (The checkbox **Auto-sync clavis selection** does the same between clavis selection and content of the limit table.)
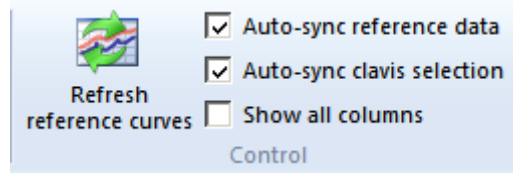
When auto sync reference data is turned off, you can select various measured curves in the docking window archive content (by entering green checks in

the corresponding boxes). Then press the button **Refreh reference curves** as displayed above to see the curves in the scope.

To do this, it is not necessary to select a polygon. That means you can also use Talimer to display the content of various measurement archives in case you want to have a quick glance at the result curves.

The third check box **Show all columns** has effect to the docking windows **Archive content** and **Clavis Selection**. If **Show all columns** is unchecked, columns which have only one entry are hidden in these windows. (In the screen shot above, the columns *test bench* and *type* have been hidden.) This function helps to concetrate on those entries where there you indeed have to select something.
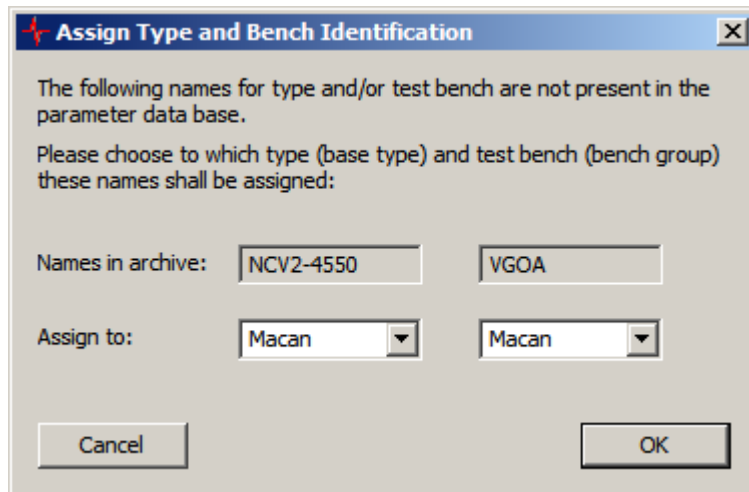
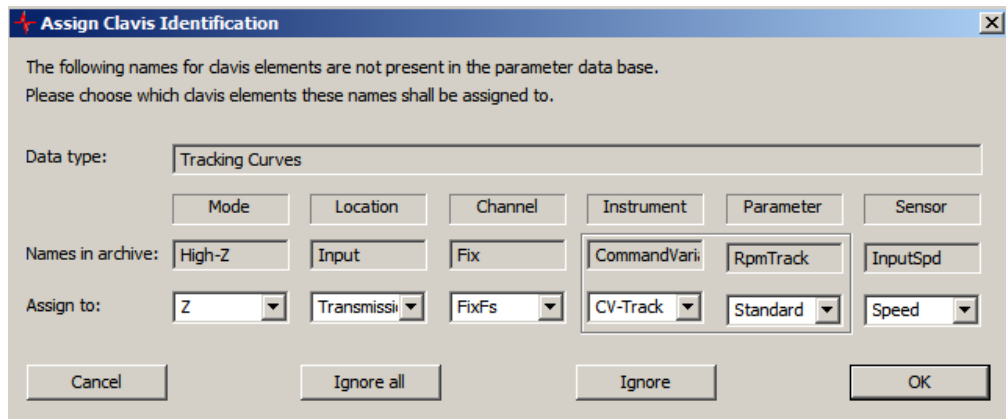## Foreign Archives, Foreign Names

It can happen, that you want to load reference measurements which have not been measured on the same test bench (or test line) as the parameter database is designed for. The reason can be that you want to display data from another factory producing similar aggregates or that the archives have been written by TasAlyser's predecessor.

Talimer generally can only work with measurements belonging to the currently used parameter database. Only the test steps, types, sensors, instruments, etc. can be used to find reference measurements.

When you load an archive that contains different test steps, types or other measurement specifications that are not in the parameter database, Talimer asks what to do with them.

If Talimer finds unknown types or test stand names, it will ask which of the known types/ test stands shall be used instead. The same is true for unknown measured values.

Assign Clavis Identification ✕

The following names for clavis elements are not present in the parameter data base.
Please choose which clavis elements these names shall be assigned to.

Data type: Tracking Curves

Mode	Location	Channel	Instrument	Parameter	Sensor

Names in archive: High-Z | Input | Fix | CommandVari | RpmTrack | InputSpd

Assign to: Z ▼ | Transmissi ▼ | FixFs ▼ | CV-Track ▼ | Standard ▼ | Speed ▼

[Cancel]   [Ignore all]   [Ignore]   [OK]

Clicking Cancel stops reading that archive.

Assigning measurement values has two more options: If you click **Ignore** the current measurement value is being skipped (and will not appear in the archive content list). **Ignore all** skips all measured values of the current data type (which is displayed in the upper part of the window).

Talimer stores the assignments that you selected. If you want to load another archive from the same source, you will not be prompted again. (You will be prompted only for those entries that you **ignored** the previous time.)

These settings are also stored in the parameter database. In case you select not to keep changes when ending Talimer, the assigments done since the last start will also be reverted.

In the multi function bar section **Maintenance** you find a button where you can check, edit or reset these assignments if necessary.

Polygon Wizard

Instead of manually fitting the polygon points to measurement data curves, you can summon the polygon wizard. The wizard creates a polygon from the displayed measurement curves, which you can refine afterwards.

You summon the wizard with the according button in the **Polygon** ribbon panel. The wizard is only available when there are reference measurements loaded – see above on how to load reference measurements.

Polygon wizard knows different methods to create a polygon from your reference data. Just try and press the button **Preview** (bottom center). In the scope, in addition to the current polygon (in yellow) and the reference measurements (dark green) you will see the current wizard proposal (in pink).
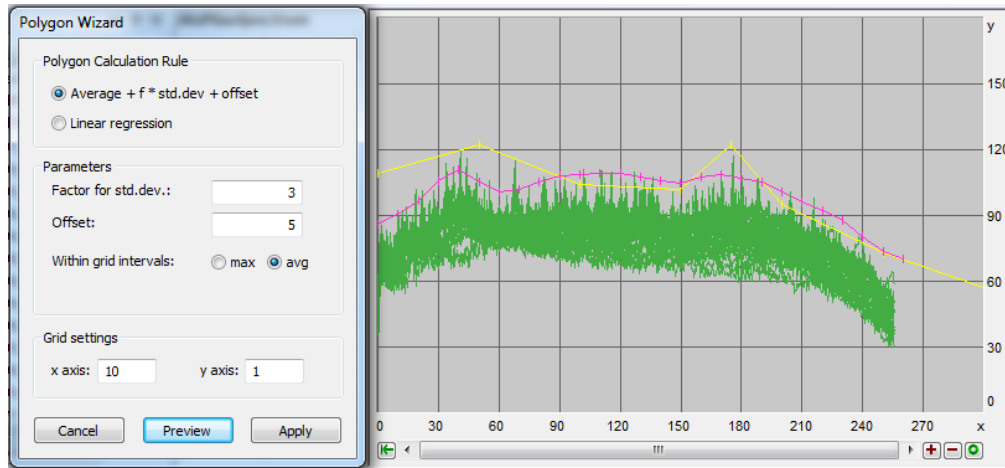
Change the calculation parameters and press Preview again until you are content. Only when you press Apply in the wizard window, the wizard stores the polygon as if you edited the points manually. (That means that you can still cancel the changes with the corresponding button of the multifunction bar.)

Moreover, you can fine tune the points after wizard has done its work.

Calculation methods

Grid Size

A polygon usually shall be designed with less points than the measure curves. For this reason you set a grid size. The grid size in x-direction defines the distance between the polygon anchor points. For example, if you define a x-grid of 100 the polygon has anchor points at 1100, 1200, 1300, etc. depending on the area of your result curve. The y-grid defines how much these values are being rounded. A grid of 2 has the effect that the value will be rounded to multiples of 2. If the calculation results in a point (100, 17.2) and the y-grid is 2, the polygon will get the point (100,18). If you enter the value 0 , the y-values are not being rounded.

The polygon wizard knows three different ways of creating a polygon based on the reference values.

Polygons from Average and Standard Deviation

The calculation from average and standard deviation works basically the same way it does for learned limits. The wizard also calculates Average and standard deviation for each point from all measurement curves loaded via $p =$ Average + Offset + $f \times$ Standard deviation. Finally, the polygon points are combined according to grid size. The points that are combined correspond to the x-grid. Two methods for this summary are avaliable: Maximize or

Average. Please try yourself the effect of both methods for the polygon and **Preview** the result to get a feeling for which method is best in which situation.

Polygon from Linear Regression

This procedure is also applied within the x grid intervals. For each interval a regression line is drawn and connected at the interval bounds by averaging. Finally, a "general offset" is being added (which can also be negativ to generate a minimum polygon).

If you set the x grid width to 0 or a value higher than the reference data length, you get a polygon with two points. Then you have *the one* regression line built from all data points.

As an option, you can give a gradient for this regression line or a fix point. The wizard will then take care that the result line will either use that gradient or will hit the fix point.

Polygon by maximization

The polygon wizard simply calculates the maximum of all reference curve points within reach x grid interval. This gives the polygon point for this interval. The **overall offset** is applied afterwards. However, there is one distinctive feature in case the reference curves contain less points than the x-grid defines. Polygon points are set only at positions where there are measurement curve points as well. If the reference curve has only two points at 1000 and 4000, the polygon will also have only these two points even if the x-grid is set to 10.

All other calculation methods interpolate values according to the x-grid. Witch averaging in the example above, the polygon would have 301 anchor points a 1000, 1010, 1020,...,3990, 4000

Genral Settings

The multi function bar contains on the left the button **settings**. With this button you open a dialog where you can make some general settings.

- Grid size: Defines grid size for each instrument in x and y direction (see above).
- Reference measurements: The maximum number of measurements (not measurement values but whole test runs) from which reference curves shall be loaded from. Furthermore you can set whether the limits shall be displayed as well which were valid for evaluation at the time of measurement.
- Result database: Connect to a result database and load fitting reference curves from there. The name of the result database is

being displayed in the status bar at the bottom right of the Talimer window

As already mentioned, these settings are stored in the parameter database and are lost when you decide not to keep changes at the end...

Individual Polygons

As described above, individual polygons are used as fixed limits for single measured curves.

Existing individual polygons can be edited like general polygons, including the use of the polygon wizard.

If you create a new individual polygon, this means that you change the setting "learned limit" to "fixed limit" for the corresponding measured curve. Since there can be as many individual polygons as measured curves, Talimer offers to create many individual polygons at one go (as well as deleting them). That means, you can call the function **New Polygon** in the navigation tree at any sub-branch below "Individual Polygons" to create individual polygons for all measured curves below this branch.

Nevertheless, this usually leads to much too many polygons. Therefore, you can limit the list of polygons to create.

1. Select a branch of the navigation tree and call **New Polygon**. For example, you call this function for the branch representing a certain test step of a certain type. Then, at first the list of polygons to create contains of all polygons for this test step.

2. Talimer also uses the settings in the window **Clavis-Selection**. (You have to turn off the function **Auto-Sync.** if you want to limit the list of polygons to create that way.) For example you could turn off all sensors but one in the clavis selection. Then the list contains all polygons from step 1 restricted to those of the selected sensor.

3. All measured curves are removed
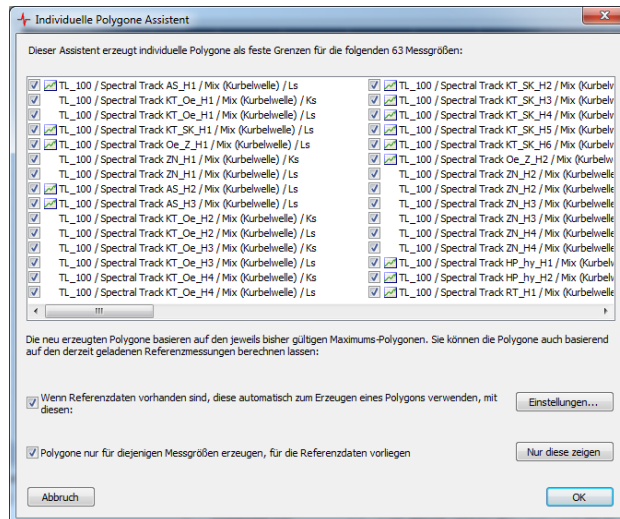
from the list which already have a fixed limit set.

4. Now Talimer lists all measured curves that are still in the list. When reference curves are loaded, Talimer marks those which correspond to reference curves. With the additional filter "Show only those" (with reference curves present) you can restrict the list even more.

5. Finally, you can uncheck entries in the list to forbid the creation of individual polygons for those.

If you want to create polygons from reference curves, you should check the **settings**. They correspond to those of the polygon wizard (since this is the tool creating the reference curves).

If you now click **OK**, the wizard starts to work. The following action is carried out for each measured curve:

6. For the measured curve the setting "learned limit" is changed to "fixed limit".

7. If you selected to create the polygons from reference curves, for each measured curve a polygon is being calculated using the reference curves.

8. If no reference curves have been loaded (or you did not select to use them), Talimer checks whether there already exists an individual polygon for this measured curve in the parameter database. If yes, this polygon is being set active again and the wizard is finished with this measured curve.

9. If no former polygon exists, the wizard creates a new individual polygon and copies the points of the maximum polygon which were used before. That means, the new fixed limit as a copy of the former maximum polygon and can be changed afterwards.

If you use the navigation tree function **Show as reference** on a sub tree (e.g the sub tree representing a test step) the marks and check boxes in the clavis selection and archive content window are adapted according to this branch.

Deleting Individual Polygons

The deletion of individual polygons also affects many entries, if you call the function on a sub tree in the individual polygon's section. In the same way as described above, a list of affected polygons is created which you finally can check or uncheck.

Nevertheless, the affected polygons are not really removed from the database. Only the setting "fixed limit" is set back to "learned limit". You can return to fixed limit any time you want (e.g. using the limit table or TasForms).

Limit Table

The window **Limit Table** (sharing space with **Clavis Selection** and **Archive Content**) is similar to the **Curve Value Limts** form in TasForms. In case your database has learn settings or evaluation params integrated into the limit table, the window only shows the limit settings (e.g. "Offset" will be hidden).

Type	Test step	Location / Channel	Instrument	Sensor	Limit type	Min Lim	Max/Fix Lim	
					* ▽	* ▽	* ▽	
Macan	Z	FixFs	Rms-Track	KS	(off) ▽	StdMinRmsTrack	StdMinRmsTrack ▽	
Macan	Z	Shaft Synch	Spectrum	KS	learned ▽	StdMinSpectrum ▽	StdMaxSpectrum ▽	
Macan	Z	Mix (Shaft)	Spectrum	KS	learned ▽	StdMinSpectrum ▽	StdMaxSpectrum ▽	
Macan	Z	FixFs	Spectrum	KS	learned ▽	StdMinSpectrum ▽	StdMaxSpectrum ▽	
Macan	Z	MixMod (Shaft)	Spectrum	Modulation	learned ▽	StdMinSpectrum ▽	StdMaxSpectrum ▽	

Limit Table | Archive Content | Clavis Selection |

The content of the **Limit Table** window is controlled by the **Clavis Selection** window.

If **Auto-sync clavis selection** is checked in the **Control** ribbon panel, the list shows the entries using the currently selected polygon. If **Auto-sync clavis selection** is switched off, you can set the **Clavis Selection Show** check marks manually and press the **Refresh** button above the limit table.

In every line, you can switch between "no evaluation", "learned limit" and "fixed limit". For learned limits you can select the corresponding polygons for min and max, for individual polygons, the name of the polygon is being displayed, but you cannot change it (since it is the individual part of just this measurement).

With the ?-fields in the first row, you can set that entry to a specific value vor *all* measurements in the list. For example, you can set the same minimum polygon for all entries. If you change the setting evaluation to "fixed limit", this operation is being done only for these entries which already have an individual polygon (meaning which once already had a fixed polygon). If you change from "fixed polygon" to "learned" or "no evaluation", the individual polygon remains. It is just not being used anymore.