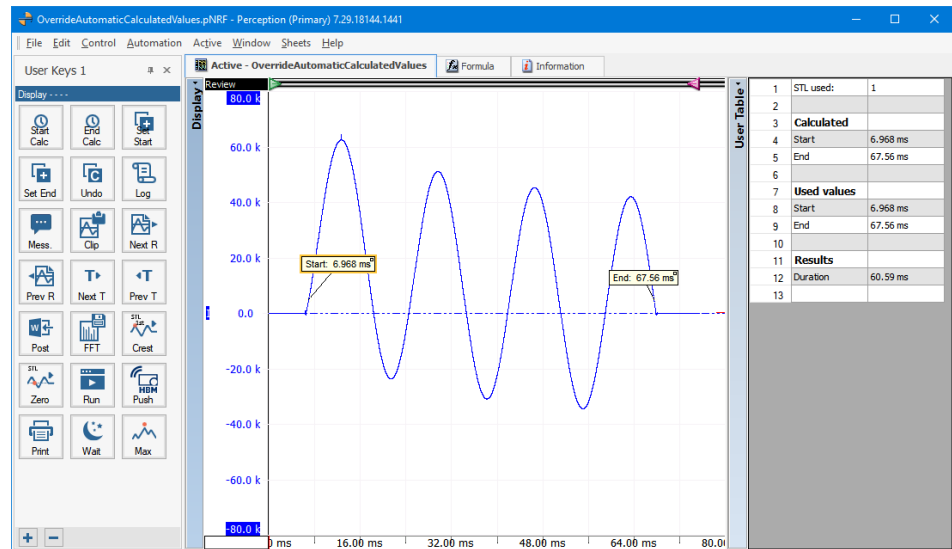


User manual

English



Perception User Keys and Macros

Document version 1.2 – April 2019

For Perception 7.40 or higher

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1 Introduction

Welcome to the **Perception User Keys** user manual. This document describes how to use user keys and macros in Perception.

User Keys are introduced into Perception since version 6.72. User Keys can be used to customize your user interface. You can define the functionality behind a user key. This manual will show you how to do this. There are various so called **Key Actions** available in Perception; those key actions are predefined basic functions. An example of such a basic function is an action which sets the display cursor to a predefined X position. At this very moment there are around 70 actions available, but this list will grow in time. It is also possible to extend this list via CSI (Custom Software Interface) programming, however this is beyond the scope of this manual; you can ask your HBM sales contact or consult the HBM website for more information on this topic.

Since Perception 7.12 the concept of Macro's is introduced, a Macro has a user definable name and contains a list of Key Actions. These macros can be linked to a user key.

Although the title of this manual is User Keys it will explain how to use **Key Actions** and **Macros** in the Perception automation. Therefore macros can be executed automatically, this can happen for example after a trigger or when a recording has been ended.

This manual starts with the **Getting Started** paragraph; in this paragraph you will learn how to add your first user key and your first macro.

The **User Key Window** paragraph explains the ins and outs of the window containing the user keys while the **Setup of User Keys Window** describes the window or dialog used to create and edit your user keys.

In the Macro Manager paragraph you can find how to create and edit macros.

The **Key Actions** paragraph describes the available key actions, for the moment all available key actions are described, but because the number of available key actions will grow in the future it is possible that not all of them are mentioned in this chapter. The key actions are grouped per category. The other paragraphs will give examples on how to use the user keys in various day to day situations.

This manual refers to existing workbenches, bitmaps, recordings etc. This additional content can be downloaded as a zip file from our website. Look for **Perception User Keys and Macros additional content**.

2 Getting Started

2.1 Requirements

You need the **Perception Enterprise** or **Perception Viewer Enterprise** license to be able to work with Macros.

If you do not have access to the Macros functionality then you can only add one **Key Action** to a User Key.

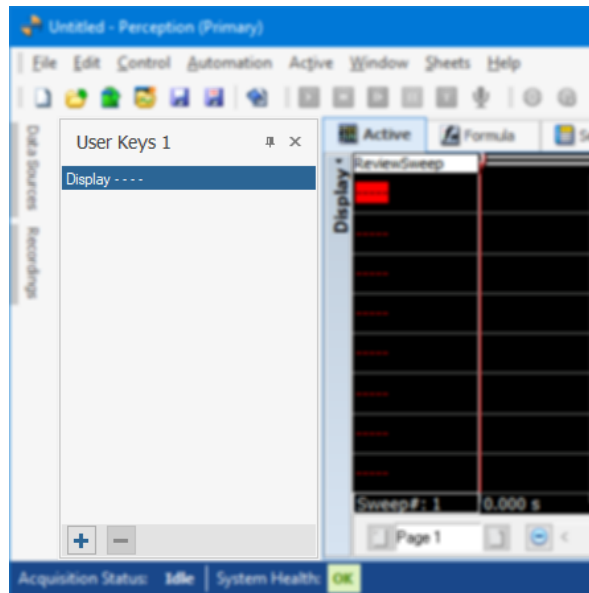
The available **Key Actions** depend on the options you have installed. For example if you have the Sequencer sheet option enabled then you also have access to all user key actions related to this sheet like there are: *Decrease pulse length*, *Increase pulse length* etc.


2.2 Your first User Key

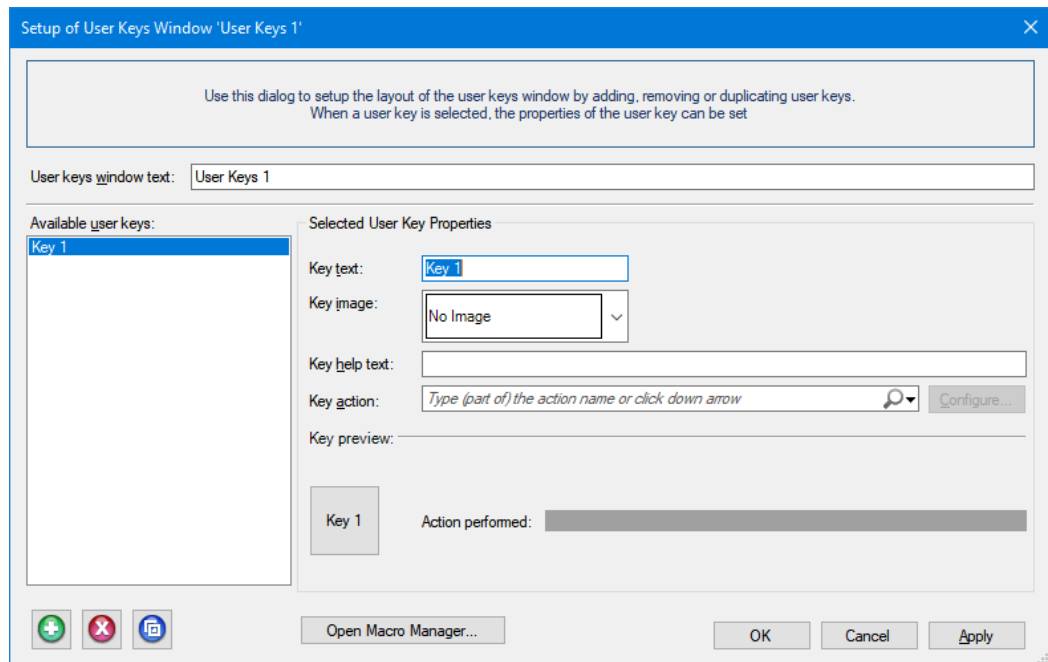
In this chapter you will learn how to add a **User Key** to your Perception configuration.

The new user key will set the cursor to a specific x position. The used Key Action is "**Go to X position**"

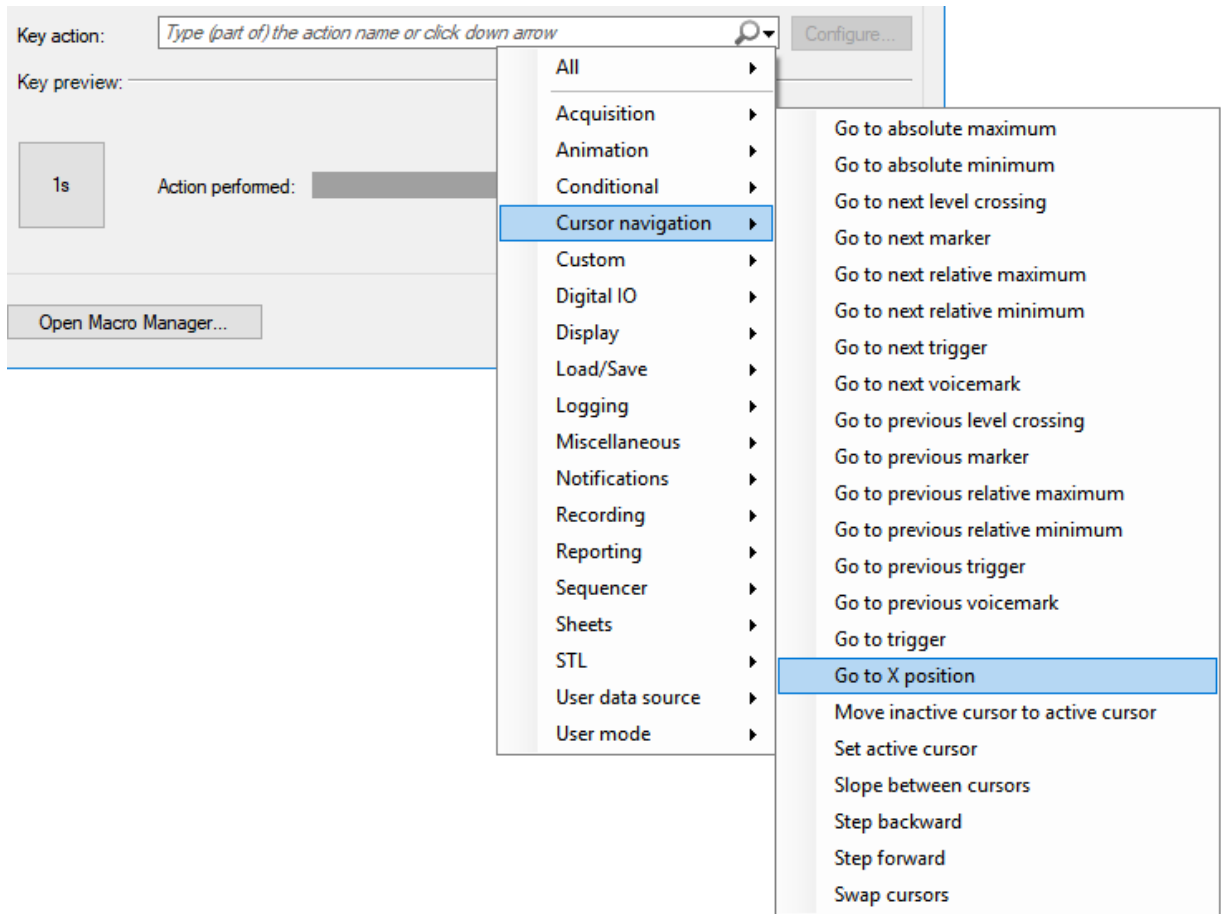
1. Start Perception
2. Set up your environment
3. On the **Window** menu click **User Keys**
4. Click Add **New User Keys Window**
5. A new empty User key window has been added having the title "User Keys 1"



6. Click at the  button at the lower left corner. Now the **Setup of User Keys Window** will be shown.



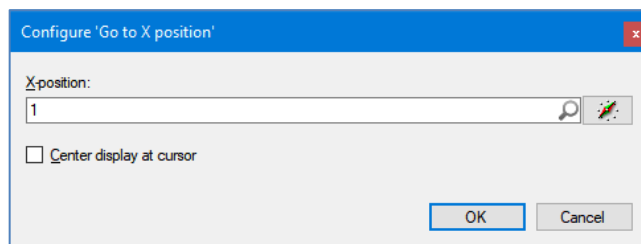
7. The program already created **Key 1**. Now use this dialog for giving this key the correct properties.
8. Set the *Key text* to: **1s**
9. Set the *Key help text* to: **Set cursor to x location of 1 second**
10. Select the *Key action*: **Go to X position** this action can be found in the **Cursor navigation** category.



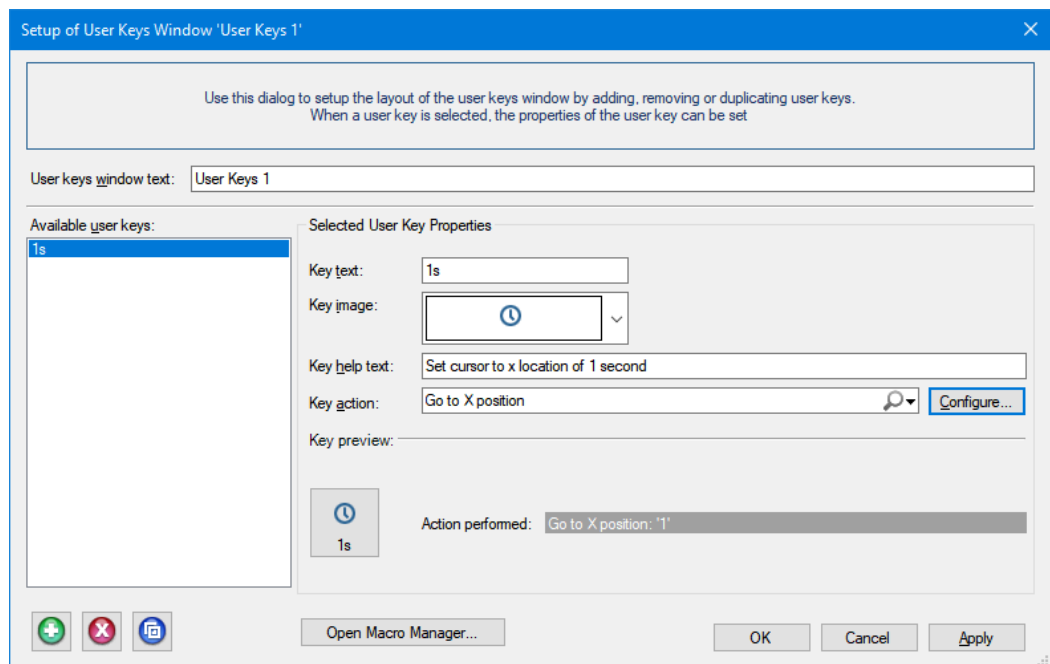
11. The **Configure** button is now enabled:



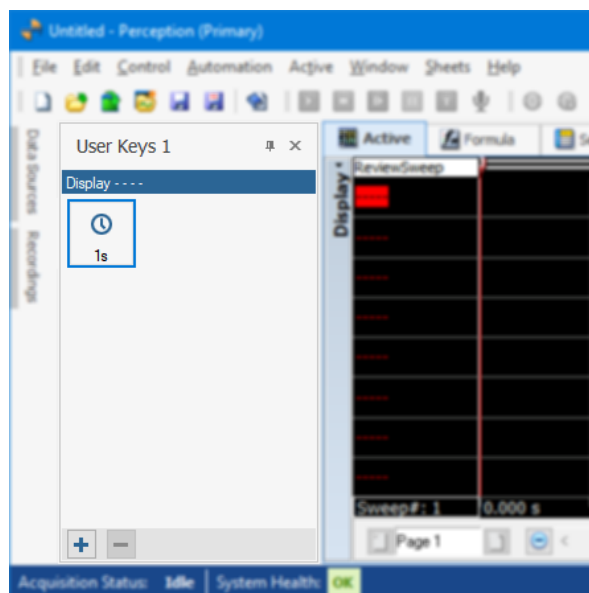
- 12. Click the **Configure...** button to configure the selected key action
- 13. Enter the value **1** for the X-Position:



14. Click **OK**



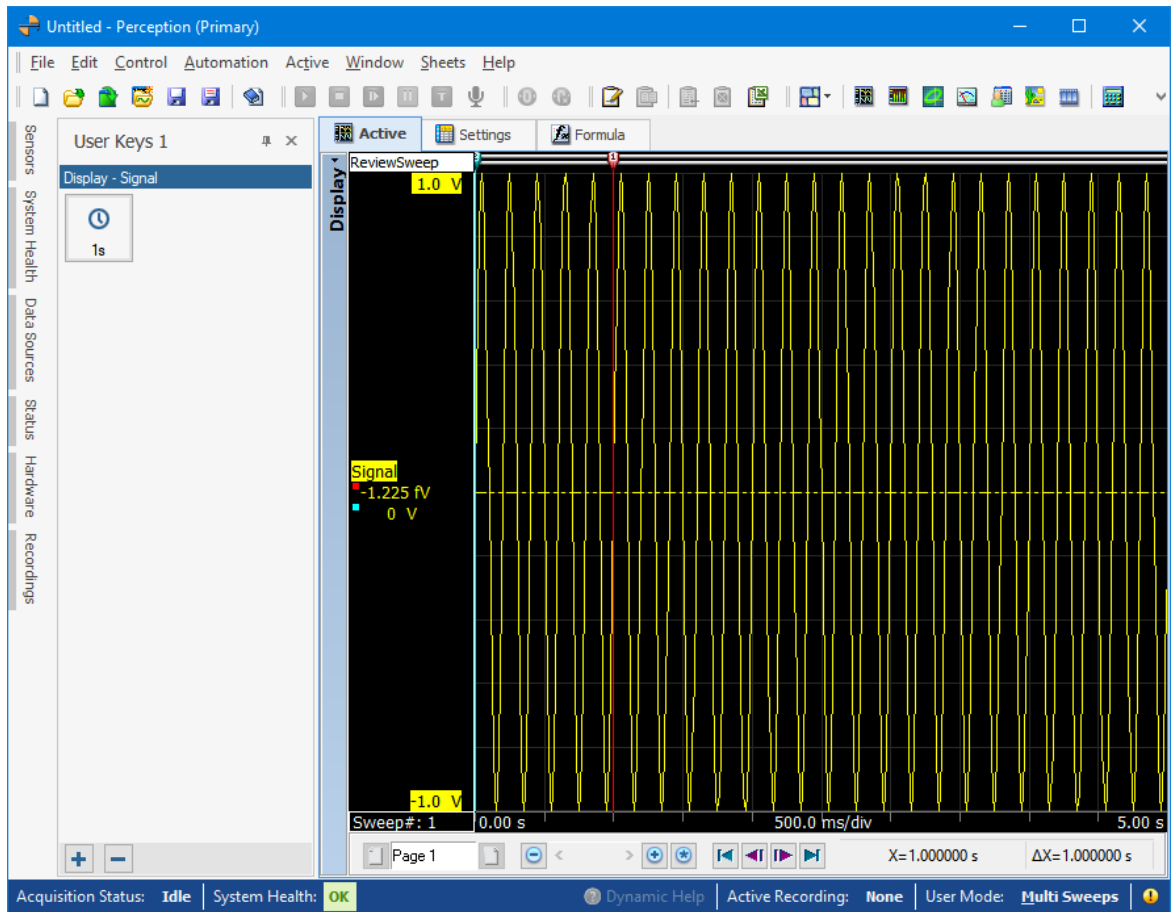
15. Your first user key is now ready and can be used, to continue click **OK**



16. The new user key is now shown in the User Keys 1 window
 17. To be able to see if the key is working you should have a display containing data at the time of 1 second, you can either open one of your own recordings or create a signal via the Formula sheet as shown in the picture below.

| Formula | | | |
|---------|--------|------------------------|------|
| Num | Name | Formula | Unit |
| 1 | Signal | @SineWave(100; 500; 5) | V |

18. If you now click at your new button you will see that the active cursor goes to the 1 second position

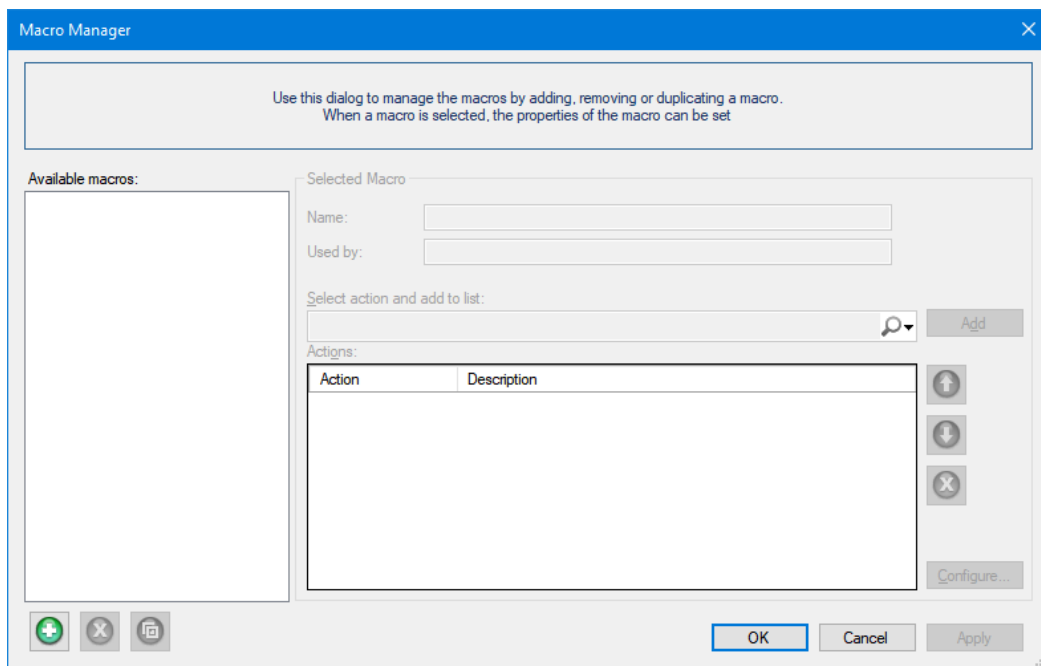



The result can be found in the virtual workbench file: *UserKeys_Manual_1_1.pVWB*

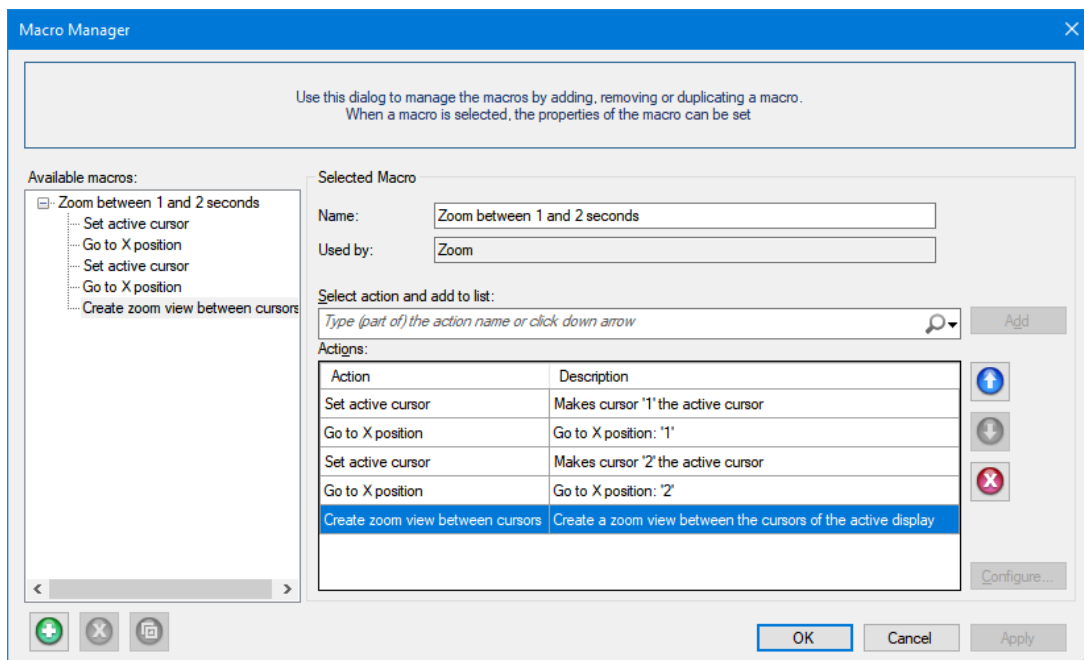
2.3 Create your first Macro

Macros are a list of key actions and can be linked to a user key or to an automation action. In this chapter you will make a macro which sets the first cursor to 1 second and the second cursor to 2 seconds it also will created a zoom display between those cursor positions. We assume that you already have read the previous chapter: **Create your first User Key**

1. On the **Automation** menu click **Macro Manager**
2. The **Macro Manager** dialog will be shown now

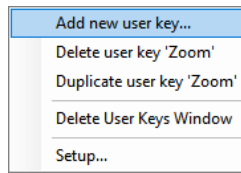


3. Click the green button 
4. Set the *Name* to: **Zoom between 1 and 2 seconds**
5. Add the following actions to the macro list:
 - 5.1. Cursor Navigation - Set active cursor – Cursor 1
 - 5.2. Cursor Navigation - Go to X position – 1
 - 5.3. Cursor Navigation - Set active cursor – Cursor 2
 - 5.4. Cursor Navigation - Go to X position – 2
 - 5.5. Display – Create zoom view between cursors
6. The Macro Manager dialog now should look like:

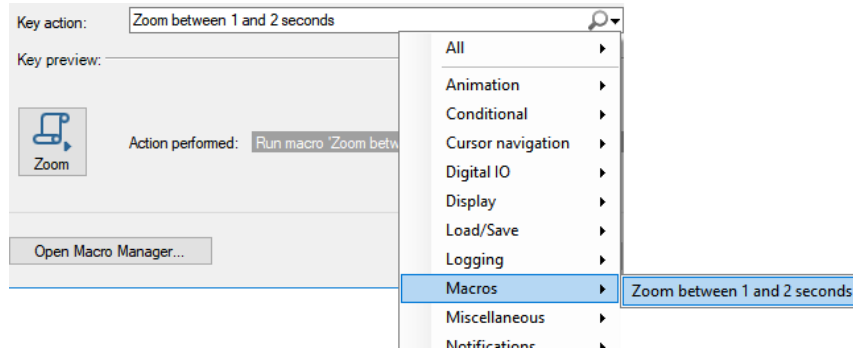


7. Click OK to close the Macro Manager dialog
8. We now want to use the new macro, we will create a new user key which will use the macro

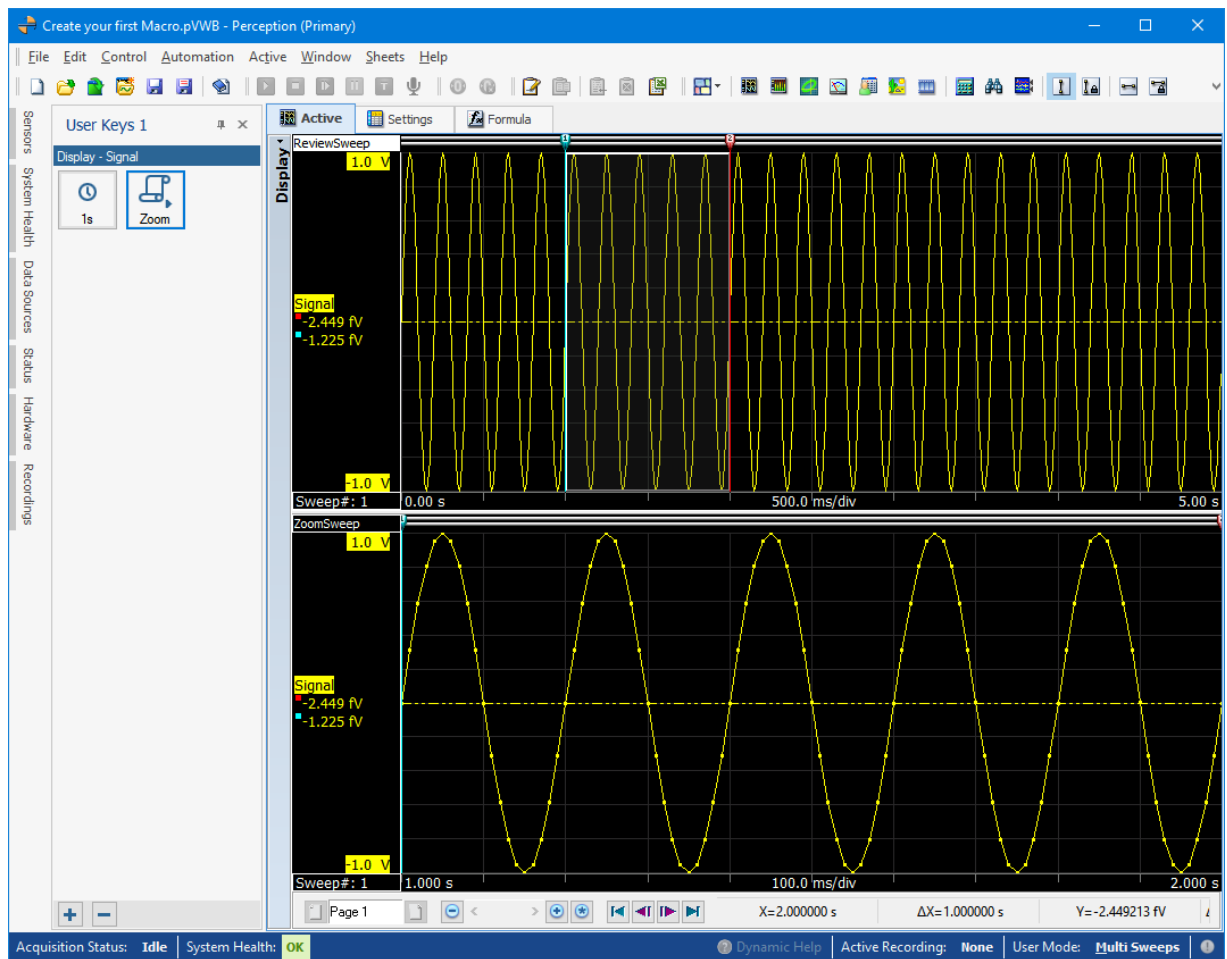
- Add a new user key to the **User Keys 1** window, you can use the **+** button or you can use the right mouse button click on the **User Keys 1** window to use the context menu and select **Add new user key...**



- Set the **Key text** to: **Zoom**
- Set the **Key action** to: **Zoom between 1 and 2 seconds**



- Click OK to close the Setup of User Keys Window.
- Now test the zoom user key button by clicking on this new key:



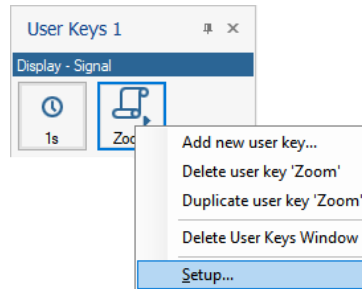
The result can be found in the virtual workbench file: *UserKeys_Manual_1_2.pVWB*

2.4 Modify the image of a user key

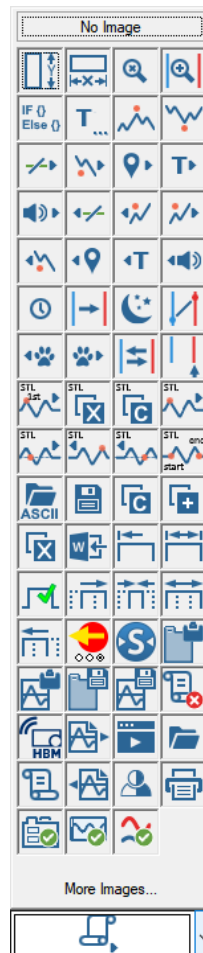
In this chapter you will modify the image of a user key.


We assume that you already have read the previous chapters: **Create your first User Key** and **Create your first Macro**

1. Do a right mouse click on the User Keys 1 window and select **Setup...**



2. Click at the arrow key of the **Key image**



3. Select the 4th image at the top: 
4. Click OK and the image of the button has been changed.

If you want however your own image you can select the **More Images...** in the image selection; the **Select image file...** dialog comes up and via this dialog you can select your own image file. It is recommended to use a 32x32 bitmap.

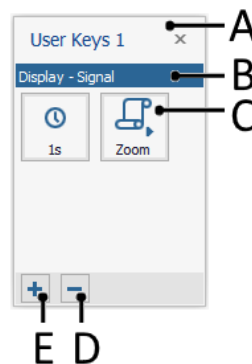
The result can be found in the virtual workbench file: *UserKeys_Manual_1_3.pVWB*

3 User Key Window

The user key window is a window containing the user keys. You can create as many user key windows as you want. A User key window contains your user keys; the user keys are automatically positioned depending on the size of the User key window. However it is always possible to change the position of a key via drag and drop, keep the left mouse button pressed when the mouse cursor is pointing at the user key you want to move, than move the mouse and a vertical blue line shows the possible new position for the user key.

In the chapter **Your first User Key** you can find extensively how to create a new **User Key Window**. Briefly you should go to the Perception **Window** menu and select **User Keys** and from there select **Add New User Keys Window**.

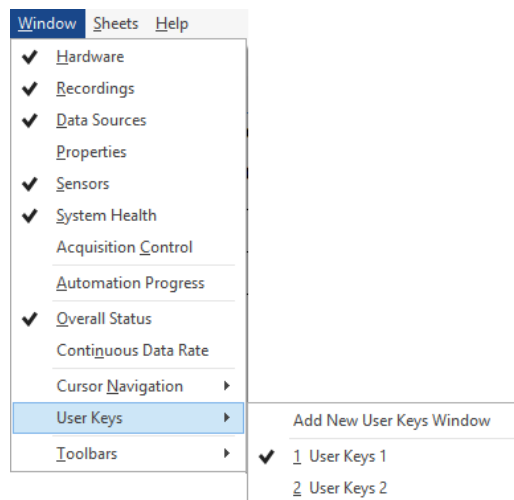
The User Key Window can look like:



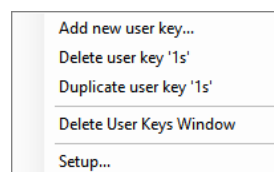
Where:

- A. User keys window text**
This text is the title text of the user key window
- B. Information on the active display and active trace**
This text informs you about the user name of the active display and the active trace in this display. Often user keys are working on this active trace. For example the **Go to absolute maximum** key action sets the cursor of the active display at the maximum position of the active trace.
If there is no active display then this information show dashes.
- C. User Key Area**
This area will contain your user keys. You can add as many user keys as you want.
- D. Remove User Key**
Removes the selected user key
- E. Add new User Key**
Add a new user key

You can close a user key window by clicking at the cross **X** at the upper right corner. If you want to re-open the window again you should go to the Window -> User Keys menu. Here you will see all the user key windows you created as sub menu items, a **✓** marks if the user key window is open. In the example below you see that *User Keys1* window is open and *User Keys 2* window is closed. When you click on the *User Keys 1* menu item then the *User Keys 1* window will be closed; if you click on the *User Keys 2* menu item the *User Keys 2* window will be re-opened.



A user keys window has also a context menu; this menu will be shown after a right mouse click on the window. The menu looks like:



The menu items explained:

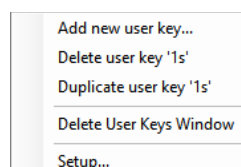
- **Add new user key...**
Add a new user key to the User Key Window
- **Delete user key '1s'**
Delete the selected user key in this case the key with text 1s
- **Duplicate user key '1s'**
Duplicate the selected user key
- **Delete User Keys Window**
Delete this user key window
- **Setup...**
Call the Setup of User Keys Window

User keys, User Keys windows and macros are part of a workbench and can therefore be saved and restored from workbench and experiment files.

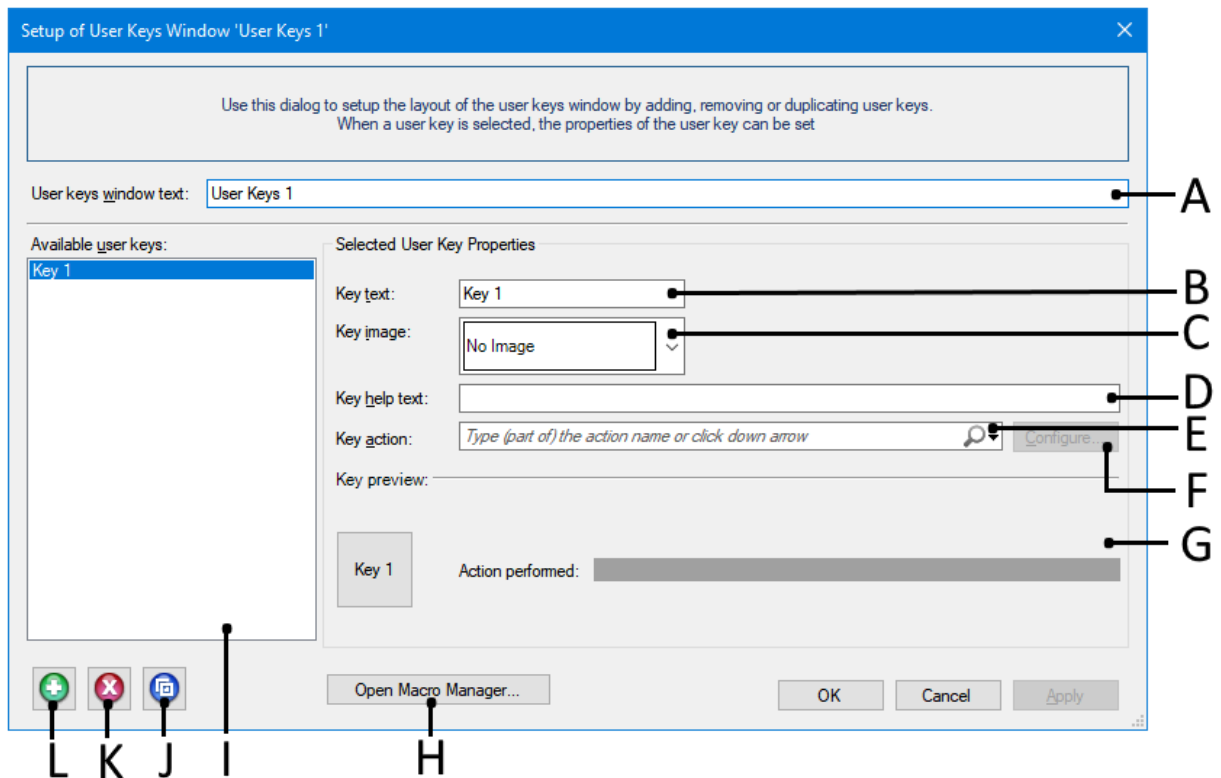
4 Setup of User Keys Window

In this chapter we will explain the working of the **Setup of User Keys Window**.

This window appears when you add a new user key to a user keys window or when you select the **Setup...** menu item from the context menu of the user key window.

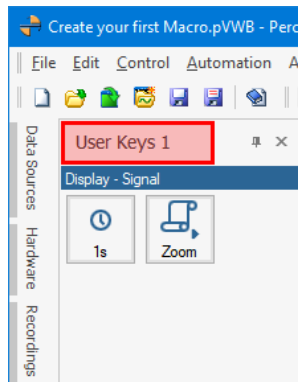


The Setup window looks like:



F. User keys window text

This text is the title text of the user key window:



But will also be used in the menu's:



G. Key text

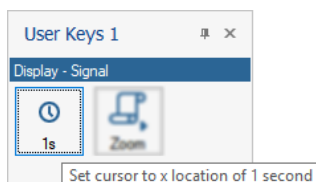
The text shown on a user key. This text should be short because there is not much room for long texts. If you however remove the image you can use longer texts

H. Key image

The image shown on a user key, preferable 32x32 bits. Each key action comes with its own image, however you can select another image from the drop down list or add your own image. In this last case you should select **More Images...** from the dropdown menu. You can also select **No Image** if you do not want an image and use all space for a descriptive text.

I. Key help text

This text is shown as tool tip when hover with your mouse above a user key:



J. Key action

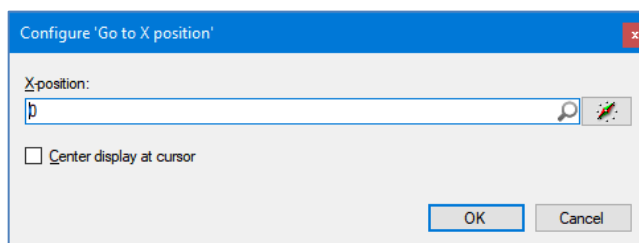
The key action defines what your key will do when you click on it.

There are many key actions available, for more information on the available key action you have to read the Key actions chapter in this manual.

If you want that multiple key actions are executed when clicking at a user key you should create a macro first and then select the macro here.

K. Configure

There are key actions which have properties which can be set by you, the **Configure...** button gives access to the action key configuration dialog. The configuration dialogs depend on the selected key action. For example the configuration dialog for the key action **Go to X position** looks like:



NOT ALL key actions have a configuration dialog, the configure button will be disabled automatically if there are no properties to be set. For example the key action **Go to absolute maximum** has no properties.

L. Key preview

This area shows a preview of your key and also gives information on the selected action and it's configuration

M. Open Macro Manager...

Opens the Macro Manager dialog. See the Macro Manager paragraph for more information.

N. Available user keys area

This area shows all user keys which are contained by the selected user key window. User keys from other user key windows are not shown over here!

O. Duplicate the current user key

Duplicates the selected user key, the new name is constructed from the old name

P. Delete the current user key

Deletes the selected user key

Q. Add a new user key

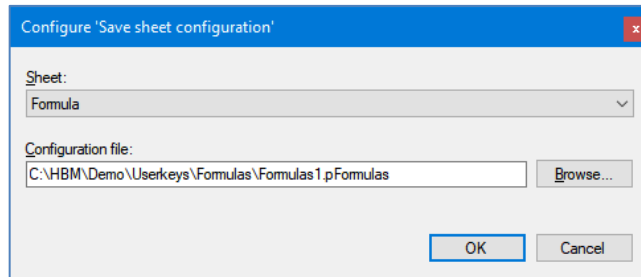
Add a new user key to the user key window

4.1 Creating Multiple User key windows

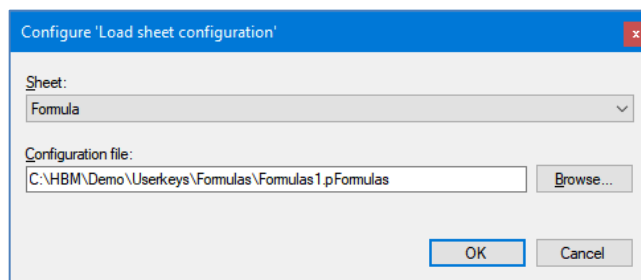
It is possible to create multiple user key windows; this can be useful when you want to group your user keys. In this chapter you will create a new user key window and add two user keys to it for saving and loading formulas, the title of this new user key window will be **Save Load**.

1. Continue with configuration from previous chapter (*UserKeys_Manual_1_3.pVWB*)

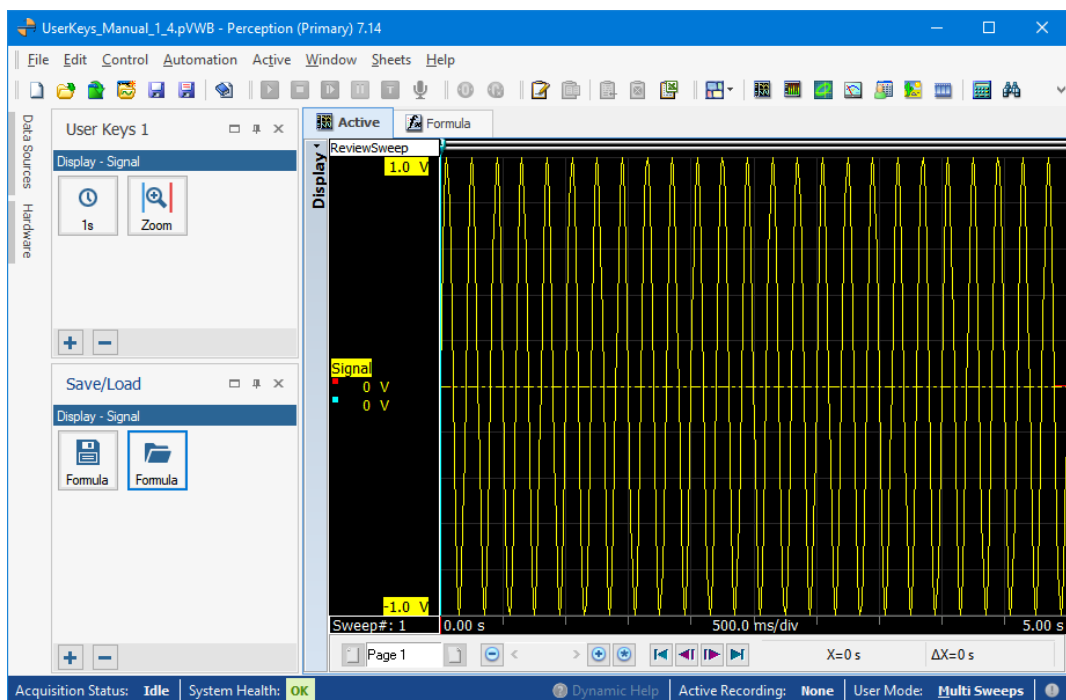
2. On the **Window** menu click **User Keys**
3. Click Add **New User Keys Window**
4. Set the User keys window text to **Save/Load**
5. Add the key action **Save sheet configuration** from the category **Load/Save**
6. Set the Key text to: **Formula**
7. Set the Key help text to: **Save formulas to the file Formulas1.pFormulas**
8. Configure the key action like:





9. Add a second user key by pressing at the green button
10. Add the key action **Load sheet configuration** from the category **Load/Save**
11. Set the Key text to: **Formula**
12. Set the Key help text to: **Load formulas from the file Formulas1.pFormulas**
13. Configure the key action like:



14. Close the Setup of User Keys Window by clicking the OK button.
15. Perception now looks like:




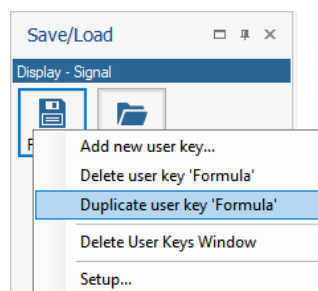
16. Test if the keys are working by first clicking at the new user key Formula 
17. Modify the formula manually, for example change the frequency of the sine wave:
@SineWave(100;500;10).
18. Check if your sine wave in the display has changed
19. Now reload the save formula by clicking at the second user key Formula 
20. Check again if the original formula has been restored.

The result can be found in the virtual workbench file: *UserKeys_Manual_1_4.pVWB*

Now we want you to use the duplicate function to duplicate an existing user key. This can be done in two different ways, you can use the context menu of the user key window or you can use the duplicate button in the Setup of User Keys window. Both methods will be shown.

We will copy the save and load formula keys.

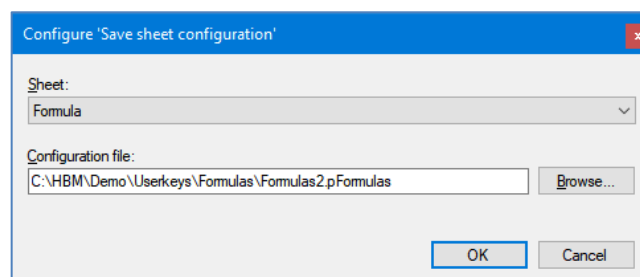
1. Right mouse click at the Formula  user key
2. The following context menu will be shown:



3. Select **Duplicate user key 'Formula'**
4. A duplicate of the user key will now be created.



5. Open the Setup of User Keys Window and select the Formula_1 user key
6. Set the Key text to: **Save 2 Formula**
7. Set the Key help text to: **Save formulas to the file Formulas2.pFormulas**
8. Modify the configuration to:

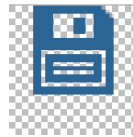


What we see is that the key text does not fit and is using two lines:

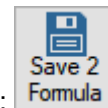
The only way to solve this is using another bitmap. You can use various programs to do this (Microsoft Paint, or Paint.NET, Photoshop etc..) For this example we have provided some adjusted bitmaps. We have modified the original 32x32 bitmap:



To:




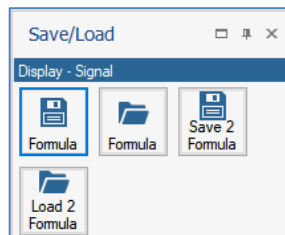
This new bitmap can be found in the bitmaps provided by this manual and having the file name: **My_Formula_2_save_icon_32x32.png**





9. Select new Key Image and check if the text does fit now:



Now we will use the second duplicate method to duplicate the load formulas user key.

10. Select the load Formula user key in the *Available user keys* selection at the left hand side of the *Setup of User Keys Window*.
11. Click at the blue  duplicate button at the bottom
12. Set the key text of the duplicated user key to **Load 2 Formula**
13. The help text to: **Load formulas from the file Formulas2.pFormulas**
14. Change the configuration file to **Formulas2.pFormulas** in the configuration dialog
15. Select the bitmap file **My_Formula_2_Load_icon_32x32.png** from the example bitmaps.
16. Close the Setup of User Keys Window by using the OK button
17. The Save/Load user key window looks now like:



18. Click the load **Formula**  button.
19. Modify the formula manually again to: **@SineWave(100;500;10)**.

20. Now click at the **Save 2 Formula**  button, the current formulas are now saved in the file **Formulas2.pFormulas**

21. Now reload the formula files by clicking at the buttons  and 

22. You will see that you can now change the formulas pretty fast.

The result can be found in the virtual workbench file: *UserKeys_Manual_1_5.pVWB*

4.2 Moving Keys by drag and drop


The way the keys are now organized can be confusing and can result in mistakes, if you press one of the save buttons at a wrong moment you can override the saved formula file. To prevent this it is better to create a user key window for saving and one for loading.

1. Create a new user key window

2. Drag and drop the save buttons from the existing Save/Load window to the new user key window. To do this right mouse click (keep right mouse button pressed) at the **Formula** save



Formula

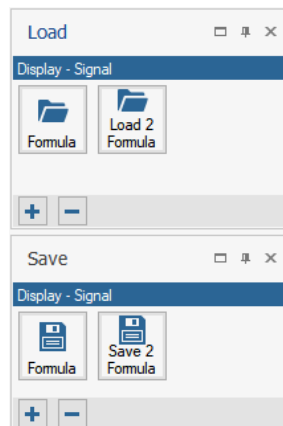
user key. When you now move the mouse the cursor changes in ; Also a blue vertical bar will be shown which moves depending on the position of your mouse. Move the mouse to the new user key window and drop it there by releasing the left mouse button.



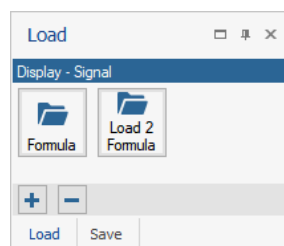
Save 2

Formula

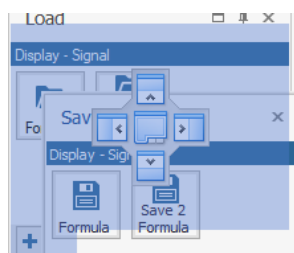
3. Repeat this for the other save button
4. Rename both user key windows, to **Save** and the other to **Load**
5. This can now look like:



6. It is also possible to make a tab for the load and save user key windows, this can result in the following configuration: (where the texts at the bottom are the tabs)



7. You can accomplish this by using the drag and drop features of the (docking) windows. Press at the header of the window and keep again the left mouse button pressed, a help picture will help you by selecting the configuration you want.

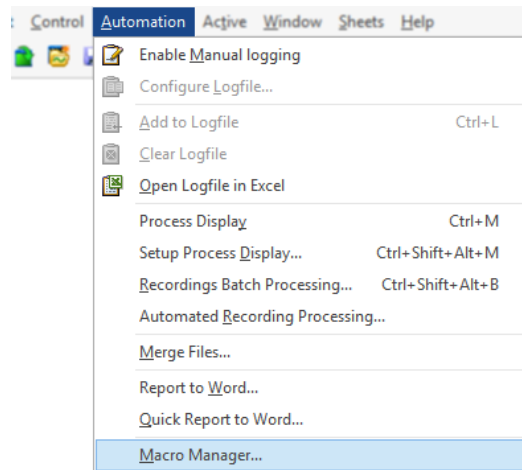


The result can be found in the virtual workbench file: *UserKeys_Manual_1_6.pVWB*

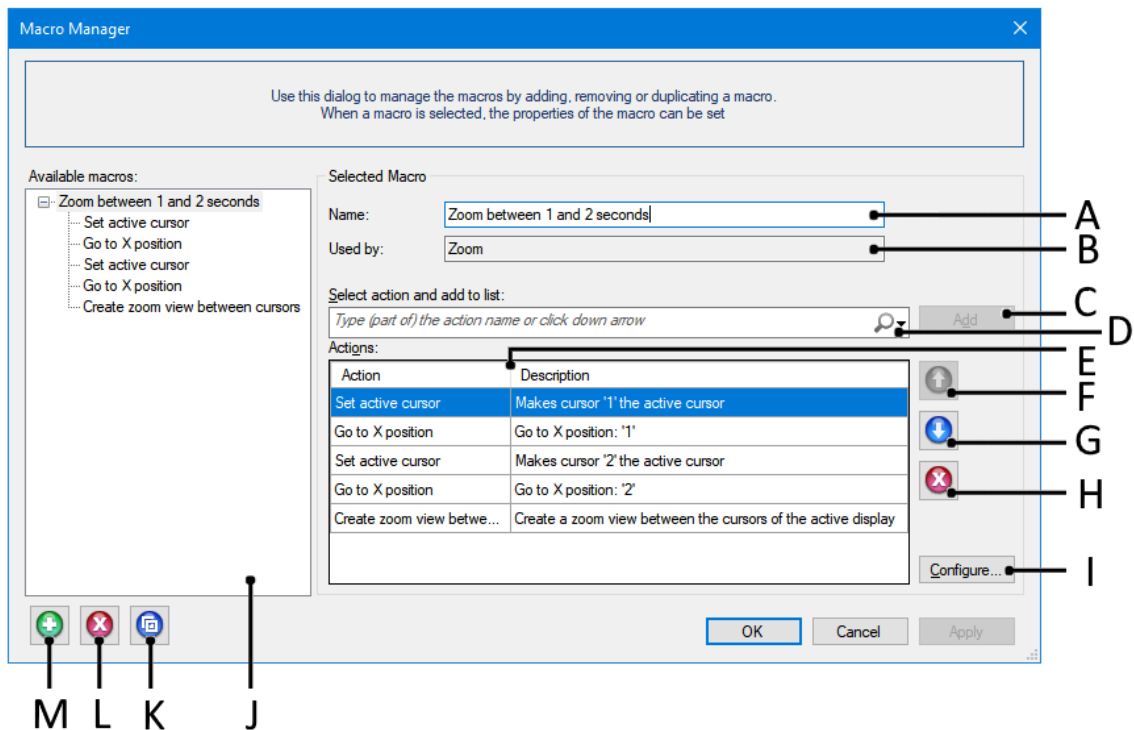
5 Macro Manager

In this chapter we will explain the working of the **Macro Manager**.

This window appears when select **Macro Manager** in the **Automation** menu.



The Macro Manager window looks like:



A. Name of the selected Macro

This is the name of the selected Macro.

B. Used by

This is an information field and is therefore not editable. It shows which user keys or other macros are using this macro.

Remark: If a macro is used by the automation then this is not shown in the **Used by** field!

C. Add

Add the selected action or selected existing macro to the actions list of the macro

D. Select action and add to list

Select an action from the list and use the **Add** button to add it to the list below (**E**)

The actions define what your macro will do when you execute it.

There are many user key actions available, for more information on the available actions you have to read the Key actions chapter in this manual.

E. Action List

The **Action List** is a list of all actions used by this macro. During execution the action at the top of the list will be executed first.

F. Move selected action Up

Move the selected action up in the action selection list

G. Move selected action Down

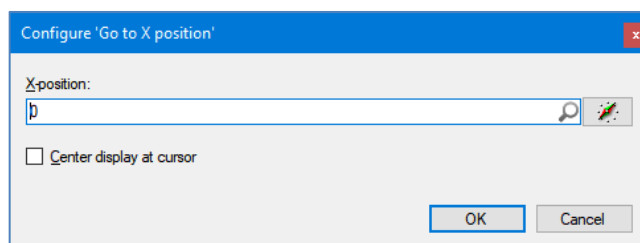
Move the selected action down in the action selection list

H. Remove selected action from list

Remove the selected action from the action selection list

I. Configure the selected action

There are key actions which have properties which can be set by you, the **Configure...** button gives access to the action key configuration dialog. The configuration dialogs depend on the selected key action. For example the configuration dialog for the key action **Go to X position** looks like:



NOT ALL key actions have a configuration dialog, the configure button will be disabled automatically if there are no properties to be set. For example the key action **Go to absolute maximum** has no properties.

J. Available macros

In this section you can see all the macro's you have defined. The main entry in the list is the macro name, the sub trees are the individual actions of the macro. You can select the macro you want to change by clicking at the macro's name or one of its actions. The information at the right site of the screen (**Selected Macro**) will be updated.

K. Duplicate an existing macro

Duplicate the selected macro

L. Delete an existing macro

Delete the selected macro

M. Add a new macro

Use this button if you want to create a new macro.

6 Key Actions

The available key actions are categorized in various groups. The number of available categories depends on your Perception options. For example you do not have the category **Sequencer** if you do not have the Sequencer option enabled.

In this chapter we will list all current available actions per category in alphabetic order.

6.1 Acquisition

All the actions in this category have the same functionality as the equivalent buttons at the acquisition control. However there will be no visual feedback to the user keys like you are used to in the acquisition control. User key bitmaps are selected once and can not be automatically replaced.

6.1.1 *Preview*



Starts preview mode or pause

6.1.2 *Start*



Starts the acquisition of data

6.1.3 *Stop*



To stop an acquisition

6.1.4 *Trigger*



The button is used to send a “manual” trigger command to the recorder(s) under control

6.2 *Animation*

6.2.1 *Wait*



The wait key action waits for a specified amount of time. This time is the delay time and is entered as seconds in the configuration dialog.

6.3 *Conditional*

6.3.1 *Conditional action*



The conditional action is used to execute one of two predefined actions depending on the evaluation of the condition. If several actions after a true or false evaluation have to be done, then you should use macros. You define a macro for the true condition and a macro for the false condition. In these macros you can use multiple single user key actions.

The configuration dialog:

Configure 'Conditional action'
✕

The conditional action is used to execute one of two predefined actions depending on the evaluation of the condition

The condition is a comparison between a string/scalar data source (left hand) and a fixed value or a string/scalar data source (right hand)

"False" and "True" are both accepted values where "False" means equal to zero and "True" means not equal to zero

This looks in pseudo code like:

```

IF ( Condition is TRUE)
{
    Execute Action 1
}
ELSE
{
    Execute Action 2
}
                    
```

Condition

Comparison source:

Comparison operator:

Comparison value:

Action 1 to be executed when TRUE:

Action 2 to be executed when FALSE:

Enter a **Comparison source**; this is a data source (string or numeric) which will be evaluated using the selected **Condition** against the **Comparison value**.

The **Condition** can be:

- equals
- does not equal
- is greater than
- is greater than or equal to
- is less than
- is less than or equal to

If the evaluation results in a **TRUE** then the action selected in the TRUE field will be executed else the selected action in the FALSE field will be executed.

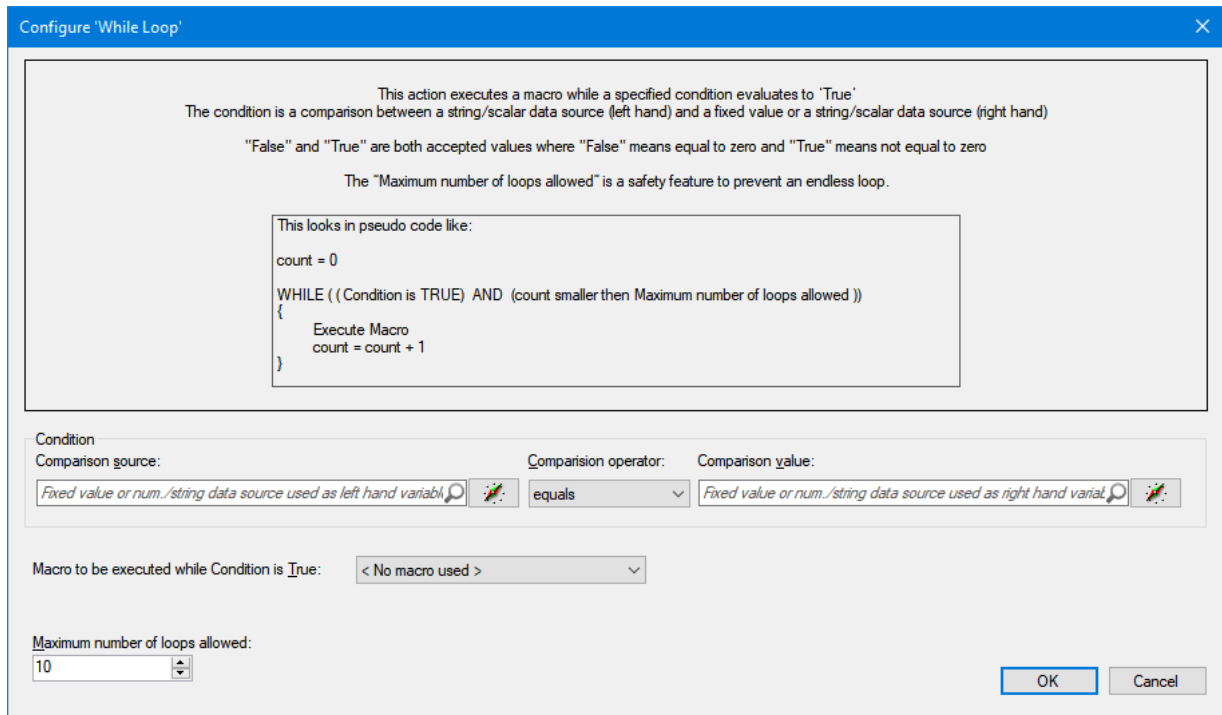
For the comparison value you are also allowed to enter the text **True** or **False**; where **False** means equal to zero and **True** means not equal to zero.

We refer to the push notification action for an example on the Conditional action.

6.3.2 While Loop

WHILE

0 This action executes a macro while a specified condition evaluates to 'True'. The condition is a comparison between a fixed value or string/scalar data source at the left and right hand site. This comparison yields a 'True' or a 'False'. As long as the result is 'True' the indicated Macro will be executed and will be followed by the next condition evaluation. When the result is 'False' the while loop ends. The macro being executed typically updates the data source that is being evaluated – thereby controlling if the loop should continue or end. For safety a (user selectable) maximum loop counter is applied. Example use might be to process a certain time slice, 'Export display between cursors', move the cursors to next time slice...etc. where the condition evaluates if the cursor has passed beyond 'end of recording'.



"False" and "True" are both accepted values where "False" means equal to zero and "True" means not equal to zero.

If you just want to execute a Macro a fixed number of times you can enter "True" for both the Comparison source and value and enter the number of repetitions in the Maximum number of loops allowed entry.

6.4 Cursor Navigation

6.4.1 Go to absolute maximum

Set the active cursor at the absolute maximum of the active trace.

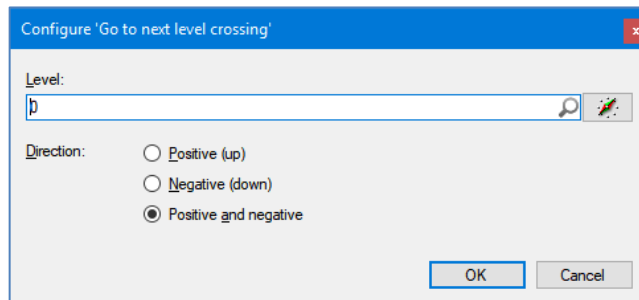
6.4.2 Go to absolute minimum

Set the active cursor at the absolute minimum of the active trace.

6.4.3 Go to next level crossing

The active cursor steps to the next level crossing on the active trace.


The configuration dialog:



Where:

- **Level:** the amplitude level to search for; this level can be a fixed numerical value, but can also be a numerical data source.
- **Direction:** The type of level crossing
 - Positive (up): Positive level crossing (from below level to above level)
 - Negative (down): Negative level crossing (from above level to below level)
 - Positive and negative: Any crossing (either positive or negative)

6.4.4 Go to next marker

 The active cursor goes to the next marker mark position.


6.4.5 Go to next relative maximum

 The active cursor steps to the next relative (or local) maximum on the active trace.


6.4.6 Go to next relative minimum

 The active cursor steps to the next relative (or local) minimum on the active trace.


6.4.7 Go to next trigger

 The active cursor goes to the next trigger position.


6.4.8 Go to next voicemark

 The active cursor goes to the next voice mark position.

6.4.9 Go to previous level crossing

 The active cursor steps to the previous level crossing on the active trace, see also go to next level crossing


6.4.10 Go to previous marker

 The active cursor goes to the previous marker mark position.


6.4.11 Go to previous relative maximum

 The active cursor steps to the previous relative (or local) maximum on the active trace.


6.4.12 Go to previous relative minimum

 The active cursor steps to the previous relative (or local) minimum on the active trace.


6.4.13 Go to previous trigger

 The active cursor goes to the previous trigger position.


6.4.14 Go to previous voicemark

 The active cursor goes to the previous voice mark position.

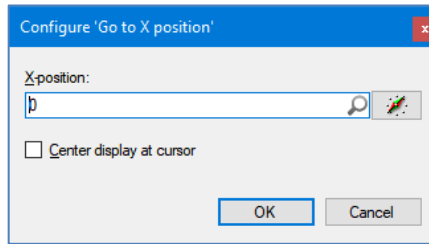
6.4.15 Go to trigger

 The active cursor goes to the specified trigger position.


6.4.16 Go to X position

 Sets the active cursor at a specified X position
This key action is often used to set the active cursor to a location calculated with a formula.


The configuration dialog:

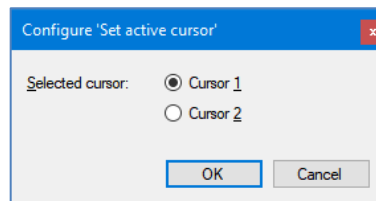


6.4.17 Move inactive cursor to active cursor


 Move the inactive cursor at the position of the active cursor

6.4.18 Set active cursor


 Sets either Cursor 1 or Cursor 2 as the active cursor
The configuration dialog:



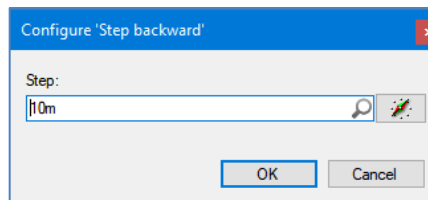
6.4.19 Slope between cursors

 Set a slope cursor on the active trace between the two vertical cursors.

6.4.20 Step backward


 The active cursor steps back by the specified step value.

The configuration dialog:




The step can be a numerical value or a numerical data source and is expressed in seconds.

6.4.21 Step forward



 The active cursor steps ahead by the specified step value; see **Step backward**

6.4.22 Swap cursors

 Exchange the positions of the two cursors. This has the effect of making the inactive cursor the active one.

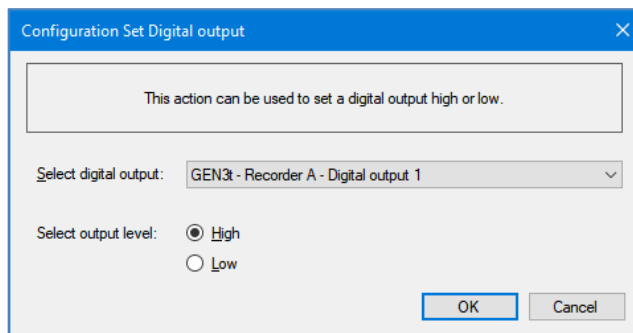
6.5 Digital IO

6.6 Set Digital IO

  Set one of the digital outputs at the digital IO connector high or low.

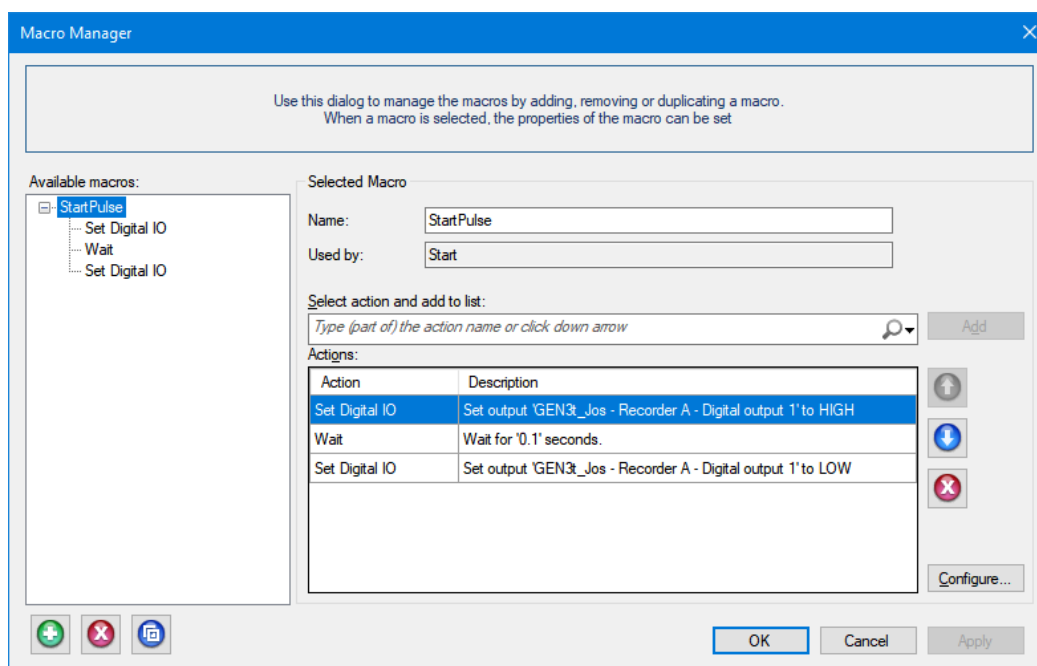
You can only use this key action if you have a digital IO connector available. This action gives you the possibility to interact with other devices/controllers like PLC's. You can also use it for generating a hardware start pulse for the BE3200 Sequencer or generate a hardware pulse which can be used for testing the external trigger of your DAQ system.

The configuration dialog:



In the selection digital output you can select the digital output to be used.

To generate a hardware pulse you should create a macro containing three actions see picture below

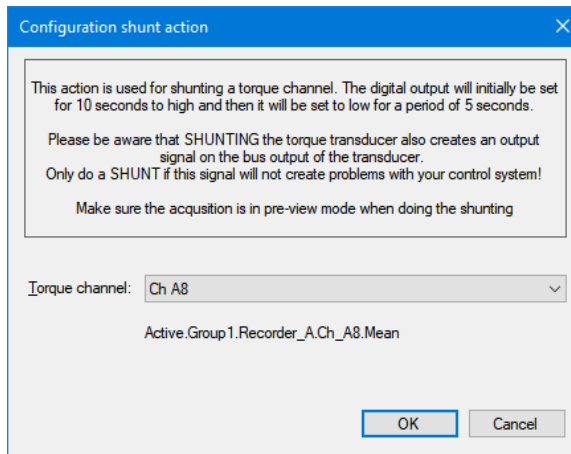


6.6.1 Torque Shunting



This action is used for shunting a torque channel. The digital output will initially be set for 10 seconds to high and then it will be set to low for a period of 5 seconds.

The configuration dialog:



6.7 Display

6.7.1 Copy display picture to clipboard



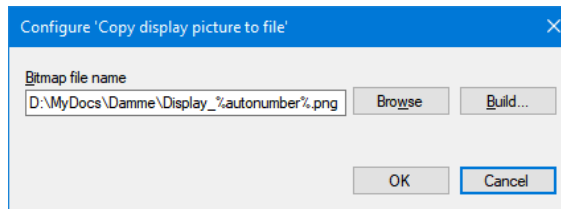
Copies the active display page as bitmap to the clipboard

6.7.2 Copy display picture to file

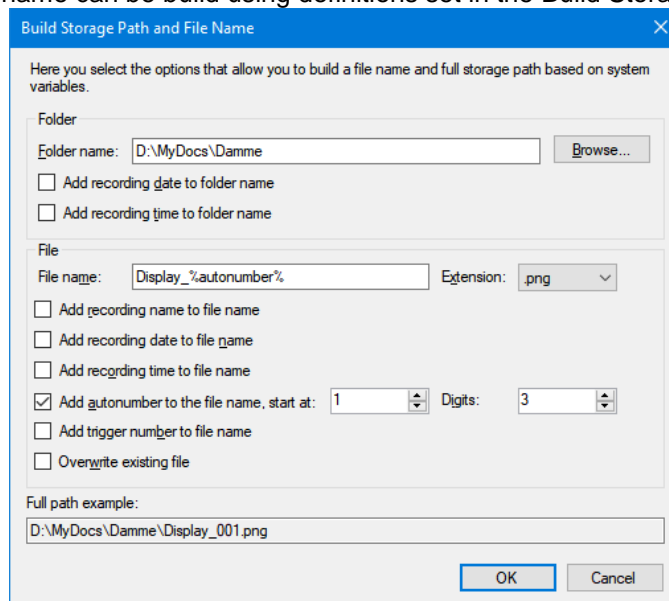


Copies the active display page to a bitmap file
The name of the file will be defined in the configuration file.

The configuration dialog:



The output bitmap file name can be build using definitions set in the Build Storage Path dialog.




6.7.3 Create alternate zoom view between cursors

 Creates an alternate zoom view between the cursors

6.7.4 Create zoom view between cursors

 Creates a zoom view between the cursors

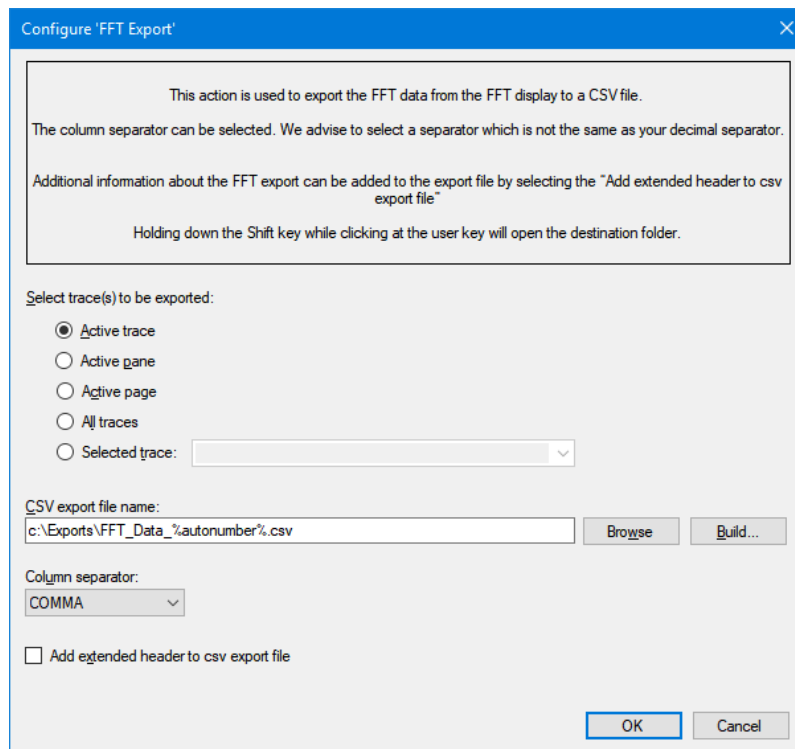
6.7.5 FFT Export

 Exports FFT data from the FFT display into a CSV file

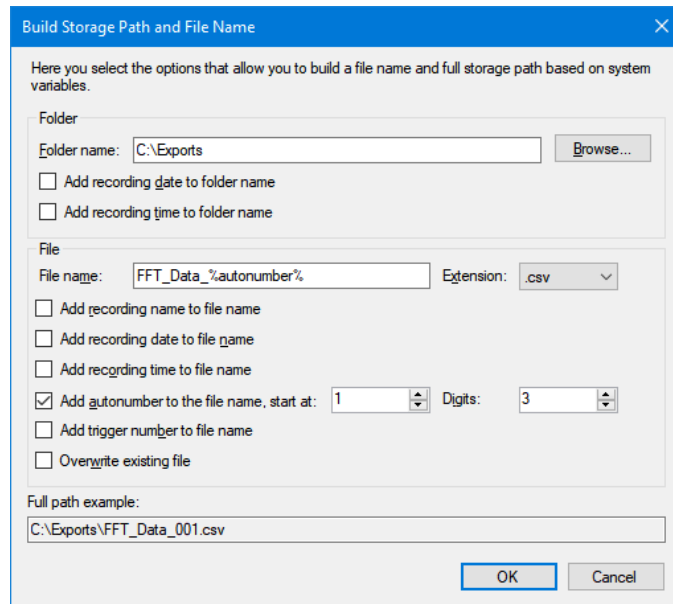
When executing this user key action a CSV file will be created, the data will be a "snapshot" of the FFT display. The layout of the csv file can be modified via the configuration dialog.

The action key always works on the active FFT display; this is the FFT display which is linked to the active time display.

The configuration dialog:



- The trace or traces to be exported can be set as shown in above dialog.
- The existing build dialog will be used to assemble an output name for the CSV file:



- The separator can be selected, default this will be a comma, however if your decimal separator is also a comma than a semicolon will be set as the default separator. If you open the file in Excel by double clicking at the filename in windows explorer then depending on the used separator in the csv file and your local selected decimal separator Excel will create columns for the frequency and the saved FFT data per channel.
- Add extended header to the csv export file
Extra information can be added to the header lines of the csv output file. Those extra lines contain information about the FFT, like what kind of spectrum is used.

Example of an extended header:

Spectrum: FFT Spectrum (Peak)
Time window: Hanning
Separator: COMMA
Time from: 0.530661073267327s to 0.571621073267327s
Maximum spectrum value: -2.77983150513561db V at Frequency: 48.828125Hz
Number of points: 4096

- The first line (or first line after the extended header) contains a description of the exported data fields and their units and is always starting with the Frequency [Hz]; the other columns are the FFT values of the selected traces. The Spectral Settings Analysis property of the FFT display defines what FFT value is exported (FFT Spectrum (Peak), Linear Spectrum (RMS), Auto power spectrum, Power spectral density, Power spectral density or Root Hertz spectrum)
- An example of a CSV file with the export of only one channel:

```

FFT_Data_031.csv
1 Frequency [Hz],Ch A1 [db V]
2 24.4140625,-31.2509493697135
3 48.828125,-16.3602366848284
4 73.2421875,-2.77983150513561
5 97.65625,-3.33255693476739
6 122.0703125,-18.1523954642467
7 146.484375,-34.1760347979865
8 170.8984375,-43.6287229076605
9 195.3125,-48.1510060255063
10 219.7265625,-57.8705435295644
11 244.140625,-58.2435623886846
12 268.5546875,-62.7257986890115
13 292.96875,-65.8384997750892
14 317.3828125,-64.7162550911985
15 341.796875,-78.1418499404747
16 366.2109375,-62.5520762093146
17 390.625,-62.9446328786596
18 415.0390625,-68.7523993101055
19 439.453125,-79.9757896663809
20 463.8671875,-75.8606030092811
21 488.28125,-78.6921970294241
    
```

- An example of a CSV file with export of all channels:

```

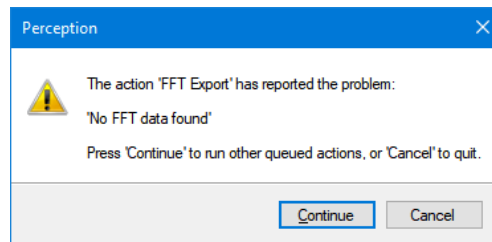
FFT_Data_033.csv
1 Frequency [Hz],Ch A1 [db V],Ch A2 [db V],Ch A3 [db V],Ch A4 [db V],Ch A5 [db V],Ch A6 [db V],Ch B1 [db V],Ch B2 [db V]
2 24.4140625,-31.2509493697135,-25.8556186841905,-64.3923268383947,-57.5359506302407,-31.2570626312761,-101.0011700902
3 48.828125,-16.3602366848284,-8.57329861434484,-40.8881565370738,-65.3925234458527,-16.355943047013,-80.9508219262733
4 73.2421875,-2.77983150513561,-1.52566174584596,-34.1253223996281,-47.496739129917,-2.77723611932265,-73.199989151697
5 97.65625,-3.33255693476739,-6.92868217339449,-39.624118023404,-47.7600232725354,-3.32976005999773,-77.3268097056317,
6 122.0703125,-18.1523954642467,-44.4537033795992,-72.1541086878106,-49.1755212275898,-18.1464092575225,-90.7473950040
7 146.484375,-34.1760347979865,-53.4453048577412,-62.5881156430966,-46.6112756825081,-34.2018796018723,-87.52169284828
8 170.8984375,-43.6287229076605,-60.3249034416705,-58.8220577069099,-49.6072818933436,-43.5713324371045,-93.8994073672
9 195.3125,-48.1510060255063,-86.5924633563692,-61.5807752108751,-47.1853120194914,-48.0931566243374,-84.2904279236661
10 219.7265625,-57.8705435295644,-73.7388883950411,-72.1860680357327,-48.0803205440346,-58.3903483213376,-88.2342869285
11 244.140625,-58.2435623886846,-80.1614297316467,-77.2990151475159,-48.9199703475004,-57.7615954831343,-110.6679387273
12 268.5546875,-62.7257986890115,-80.4112515747006,-79.776245069658,-46.7737662524438,-63.0329093959932,-96.28109554347
13 292.96875,-65.8384997750892,-85.6362393556665,-89.5186982269706,-49.8239992122892,-65.6018824662849,-99.059970324773
14 317.3828125,-64.7162550911985,-64.147480367265,-74.9250689390591,-47.0170545776376,-64.2241725254124,-91.88746771736
15 341.796875,-78.1418499404747,-68.2756931302008,-76.4954998435746,-48.4980572276171,-78.5084518379576,-92.02838861127
16 366.2109375,-62.5520762093146,-87.3698648609744,-77.0132058253703,-48.6303541884845,-63.108331472736,-99.23221813301
17 390.625,-62.9446328786596,-73.5931059068592,-76.4069652040857,-46.956449631959,-63.3825207067046,-86.1010922509283,-
18 415.0390625,-68.7523993101055,-66.9047293348718,-82.6489639529511,-49.8157522219613,-68.0257612303711,-88.2428502503
19 439.453125,-79.9757896663809,-68.5086168670646,-77.617722078605,-46.7688699472872,-82.1514090053331,-100.00356783144
20 463.8671875,-75.8606030092811,-98.5185407257675,-76.332144451639,-48.7367516557515,-76.1241319308229,-91.11973851059
21 488.28125,-78.6921970294241,-84.2784891433027,-74.9943120888615,-48.2230873736177,-79.5783860398298,-94.532447905991
22 512.6953125,-73.0741559495415,-85.4362735153036,-74.6499707678448,-47.1459195772297,-74.2151633933588,-98.8865889552
23 537.109375,-81.2165461336999,-87.225641936915,-77.0639864553381,-49.7349905305884,-82.0643636299907,-94.936344006671
    
```

- An example of a CSV file with the export of only one channel having an extended header:

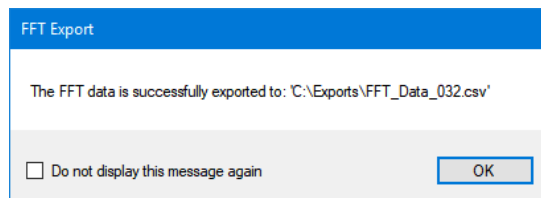
```

FFT_Data_031.csv
1 Spectrum: FFT Spectrum (Peak)
2 Time window: Hanning
3 Separator: COMMA
4 Time from: 0.530661073267327s to 0.571621073267327s
5 Maximum spectrum value: -2.77983150513561db V at Frequency: 48.828125Hz
6 Number of points: 4096
7 Frequency [Hz],Ch A1 [db V]
8 24.4140625,-31.2509493697135
9 48.828125,-16.3602366848284
10 73.2421875,-2.77983150513561
11 97.65625,-3.33255693476739
12 122.0703125,-18.1523954642467
13 146.484375,-34.1760347979865
14 170.8984375,-43.6287229076605
15 195.3125,-48.1510060255063
16 219.7265625,-57.8705435295644
17 244.140625,-58.2435623886846
18 268.5546875,-62.7257986890115
19 292.96875,-65.8384997750892
20 317.3828125,-64.7162550911985
21 341.796875,-78.1418499404747
22 366.2109375,-62.5520762093146
23 390.625,-62.9446328786596
24 415.0390625,-68.7523993101055
25 439.453125,-79.9757896663809
26 463.8671875,-75.8606030092811
27 488.28125,-78.6921970294241
    
```

- If the export fails than this will be shown in the notification dialog:



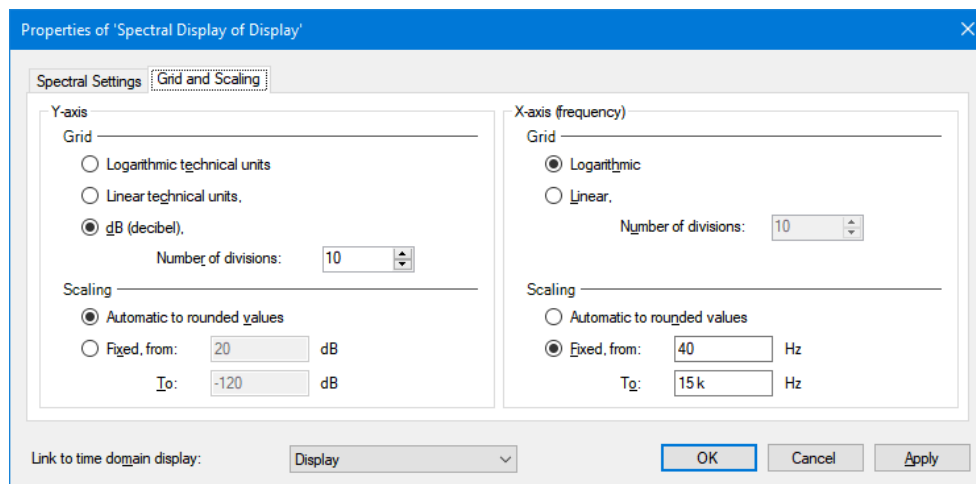
- When the export has been finished successfully than the following dialog will be shown:



The dialog will not be shown next time if you enable the checkbox at the bottom of the dialog. This flag will be reset when restarting Perception or after editing in the configuration dialog.

- **Remark:**
This FFT Export User key action will not work when used in automation while recording for each trigger. This is caused by the behavior of the FFT display which does not update the preview part when a new trigger comes in.

If you do not want to export the complete frequency range you should open the properties dialog of the FFT display and select the Grid and Scaling tabular.



Here you set the X-axis (frequency) scaling to fixed and set the frequency **from** and **to** values. These values are also used for the export.

6.7.6 Process Display

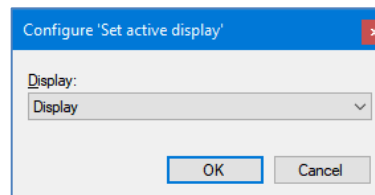


Use the Process Display user key action to start a pre-configured automation process of the active display.



Sets the active display

The configuration dialog:

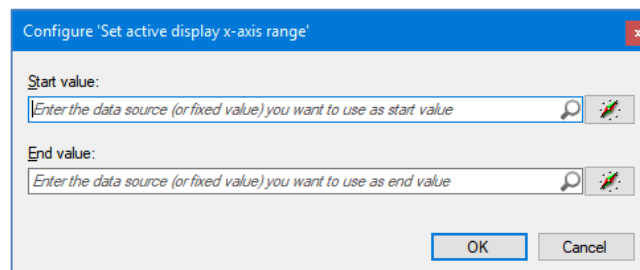


6.7.7 Set active display x-axis range



Set the active display x-axis range

The configuration dialog:



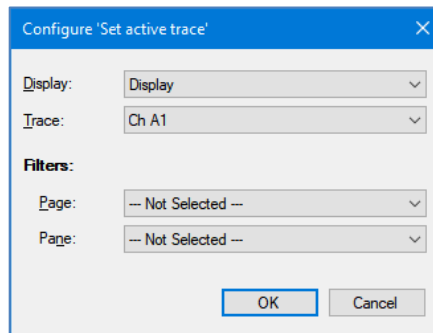
The start and end values can be fixed numerical values, but can also be defined by numerical data sources.

6.7.8 Set active trace




Sets the active trace

The configuration dialog:



Select the Display and the Trace. If you have many traces it might be helpful to use the filters in the configuration dialog to limit the selections in the Display and Trace selection fields.

6.7.9 Unzoom display

 Unzoom the active window if zoomed

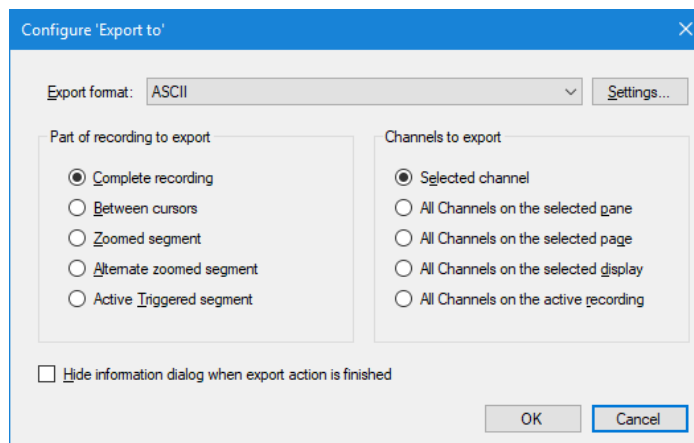
6.1 Exporting

6.1.1 Export to

 Exports data directly in a variety of popular formats like ASCII.

Via the configuration dialog you define which data should be exported, how it will be exported and to which location.

The configuration dialog:

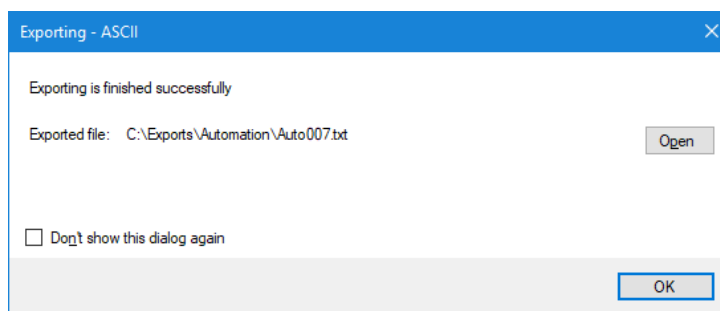


The configuration dialog is almost similar to the dialog you get when you select the Perception *Export Recording...* from the Perception Main *File* menu. You can find information about the various selections in the Perception User Manual section *Export Recording...*

The Export format list box allows you to select one of the available formats. Each format has an individual set of settings pertinent to that format.

The selection at the bottom: *Hide information dialog when export is finished* is used to hide or show a message dialog after an export has been finished.

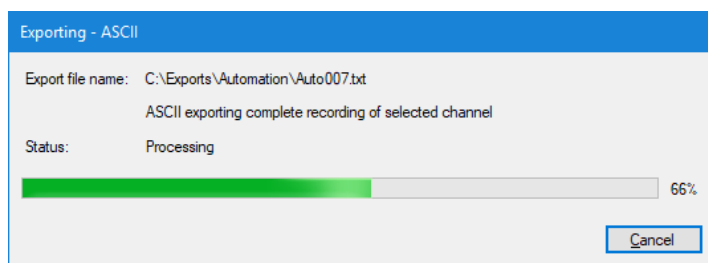
This dialog looks like:



Via the selection *Don't show this dialog again* (at the lower left side) you also can prevent that this dialog is shown next time when an export finishes.

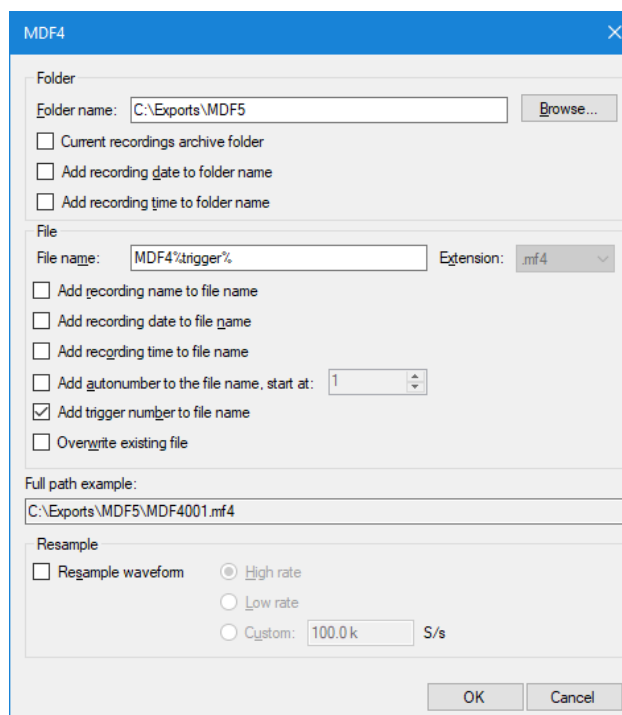
If you click the *Open* button then windows explorer will be used to open the used folder for the just finished export action.

During exporting the following progress dialog is shown, however if the action was called from the automation then this dialog is not shown; in this case the export finish dialog is also suppressed.

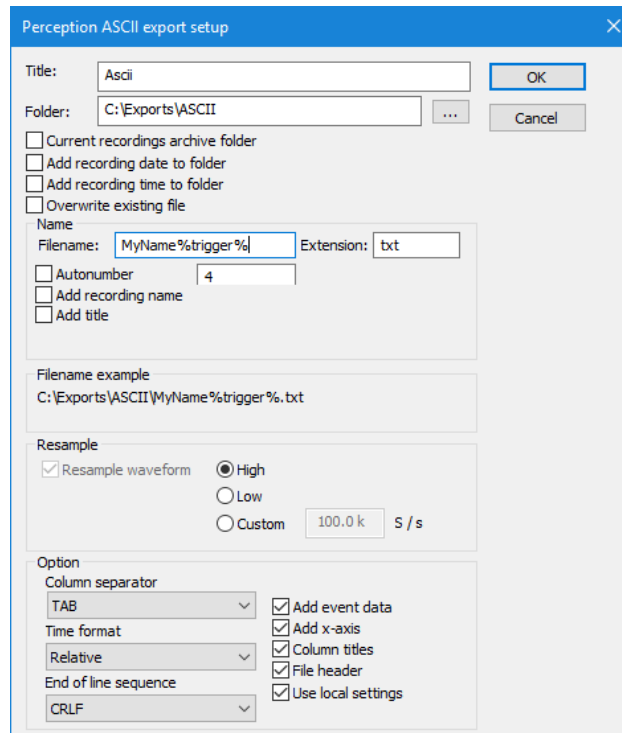


Remark:

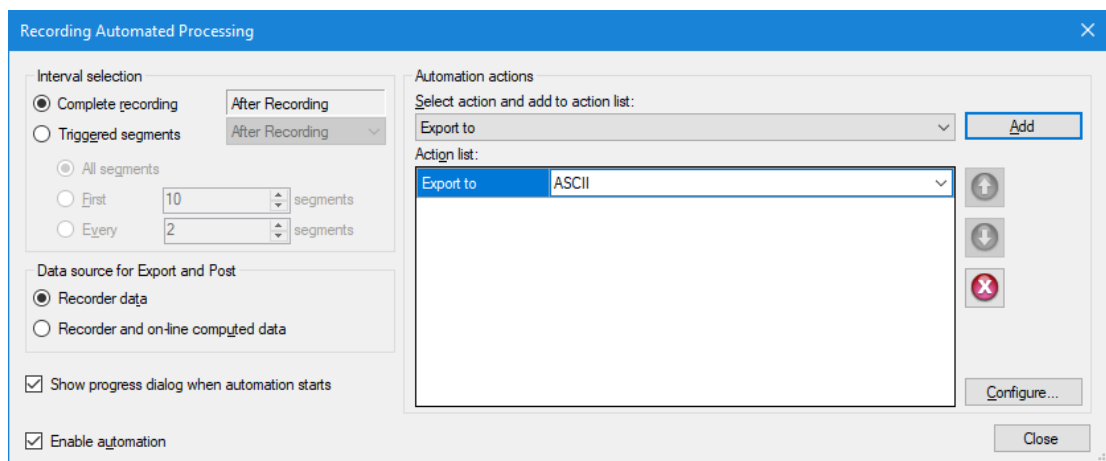
- 1 Each export has it's own configuration dialog. For some formats you will find the option *Add trigger number to file name*. See the MDF4 configuration dialog here below as example:



Although this option is not visible in some other configuration dialogs it can still be used, in those cases you have to type the text `%trigger%` manually into the file name field. You can see this as an example in the ASCII configuration dialog below:



This option does only work when you export with the user key action as described above, when you use the automation action “Export to” then the `%trigger%` is only supported by those export formats which has this option in their configuration dialog. Example of using the Export to automation action:



- 2 If you export via the user key action then the user key action will only finish after the export has been done or you canceled the export. This is not the case when using the export actions from the automation, in that case the export will be started and the Perception can continue doing other automation actions even before an export has been finished. In some cases this is preferable, in other cases it can cause problems.

6.2 File

6.2.1 File copy



Copies one or more files from a source location to a destination folder. For more information read the **FILE COPY AND MOVE ACTIONS** chapter.

6.2.2 File move



Moves one or more files from a source location to a destination folder. For more information read the **FILE COPY AND MOVE ACTIONS** chapter.

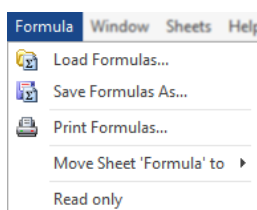
6.3 Load/Save

6.3.1 Load sheet configuration



Load a sheet configuration from a file.

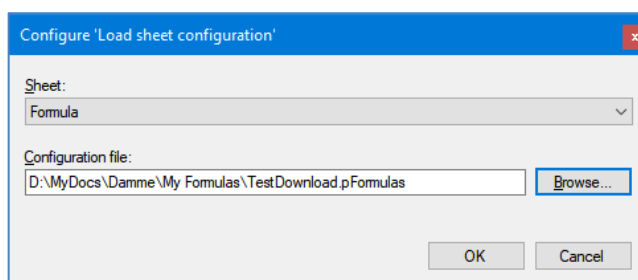
There are various sheets in Perception supporting the ability to save or load their configuration to a separate file; you can find this back in the main menu of a sheet, for example the main menu of the formula sheet looks like:



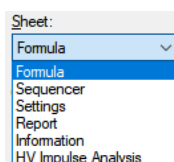
The **Load Formulas...** is used to reload an earlier saved set of formulas. This menu action can also be done by the **Load sheet configuration** key action. The file to be loaded can be defined in the configuration dialog. You can use this key action for example when you have different formula sets or reports and want to load them quickly.

Remark: Not every sheet has the ability to load and save its configuration.

The configuration dialog:



Where the selection for the sheets can look like:



The selection can be different depending on the available sheets in your configuration.

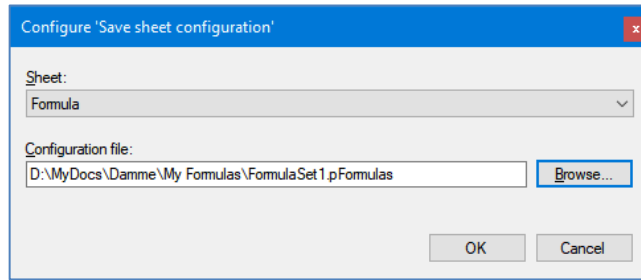
6.3.2 Save sheet configuration



Save a sheet configuration into a file

See Load sheet configuration key action for more information.

The configuration dialog:



6.3.3 Save user data sources into active experiment



Save user data sources into active experiment.

If you have just finished a recording and during the evaluation you have created or updated user data sources then you can use this key action to make sure that the user data will be saved into the active experiment.

6.3.4 Save workbench into active experiment



Save a workbench into active experiment

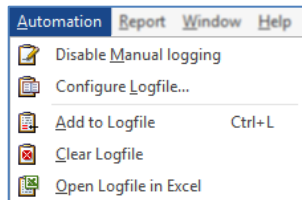
6.4 Logging

6.4.1 Add a manual log entry



Add a manual log entry to the log file

This action is doing exactly the same as the menu item **Add to Logfile** in the **Automation** menu.



6.4.2 Clear Logfile



Completely empty the logfile

This is identical to the **Clear Logfile** menu item in the **Automation** menu.

6.5 Macros

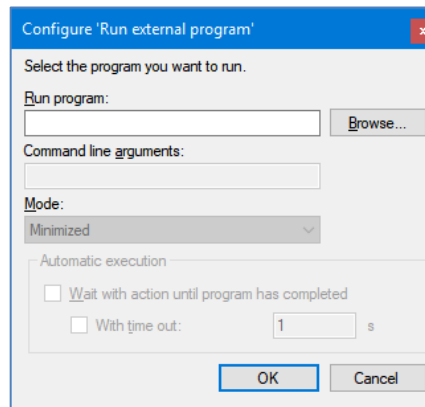
6.6 Miscellaneous

6.6.1 Run external program



Runs an external program

The configuration dialog:



Select the external program you want to be executed.
 Type the command line arguments to input to the program, if applicable
 Select the Mode you want the program's window to run in (Minimized, Normal, Maximized, or Hidden).
 Under Automatic execution, you can set the automation action to wait until the program has completed.
 If this option is not selected, the next automation task will run, without waiting for the external program.
 In addition, if you select the **With time out** option, the automation will only wait for the specified amount of seconds before continuing with the next action.

6.7 Notifications

6.7.1 Send push notification

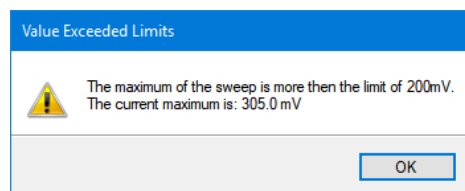


Send a push notification. There is a separate chapter explaining how to work with push notifications.

6.7.2 Message Dialog

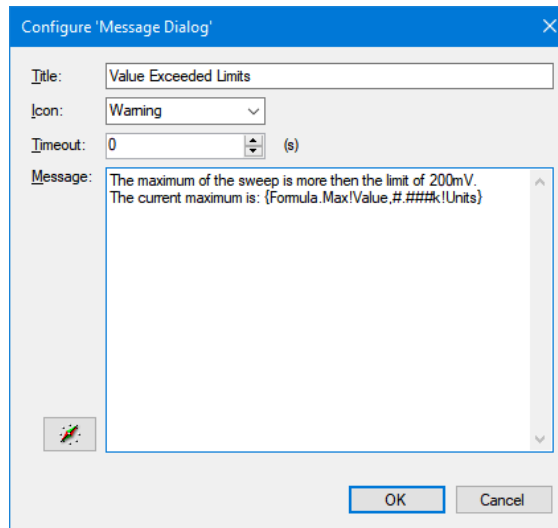


This action shows a message dialog. Below you can see an example of this.



This dialog can be used in combination with the **conditional action** to show information to the operator when for example a value is too high.

The configuration dialog:



The **Title** entry defines the title of the message box.
 You can select one of the predefined icons to show the type of your message.
 A **Timeout** can be used to let the message automatically be closed after the entered timeout. However when the Timeout is set to 0 seconds the message dialog will not close automatically. In cases where the message dialog is called from within an automation action it expects a timeout, if this timeout is however be set to 0 seconds it will be overruled and set to 5 seconds. This is done because during automation it can happen that no operator is available to close the message dialog this can cause unwanted behavior.
 In the **Message** field you enter the body of the message. It is possible to add the actual value of available numerical or string data sources; therefore you can use the data source selection button at the left site of the message box entry. If you want to add a new line into the message you can use the keyboard combination **Ctrl-Enter**.

6.8 Recording

6.8.1 Load next recording file

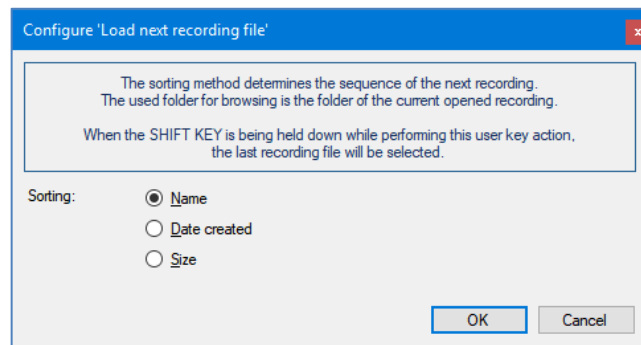


Load next recording file

This action checks the folder of the current open active recording and loads the next recording found at this folder. The sorting method used will be defined in the configuration dialog.

Remark: It is not possible to use this for loading next recording when the files are on a GEN mainframe disk.

The configuration dialog:



6.8.2 Load previous recording file



Load previous recording file

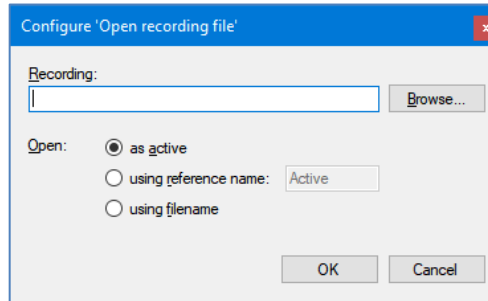
See for more information the Load next recording file.

6.8.3 Open recording file



Open recording file

The configuration dialog:



6.9 Reporting

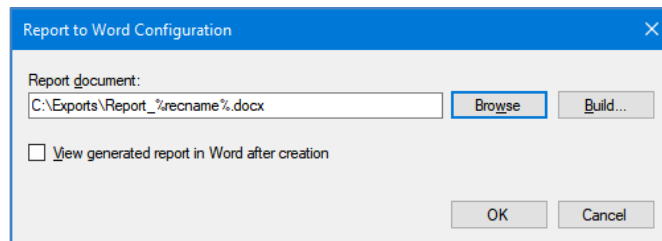
6.9.1 Post Report to Word



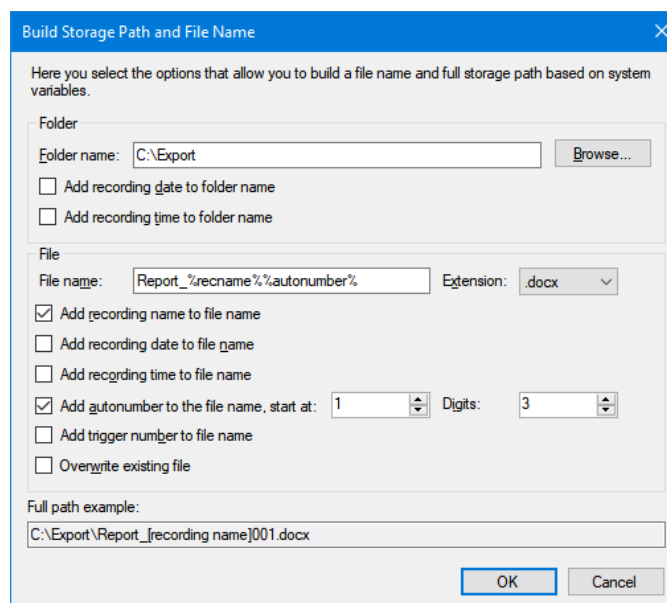
Post report to Word

The current report as you can find at the report sheet will be posted to Microsoft® Word document. The name of the document can be defined via the **Configuration** dialog **Build** option.

The configuration dialog:



The report Word document name can be constructed via the **Build...** option



6.10 Sheets

6.10.1 Copy sheet picture to clipboard



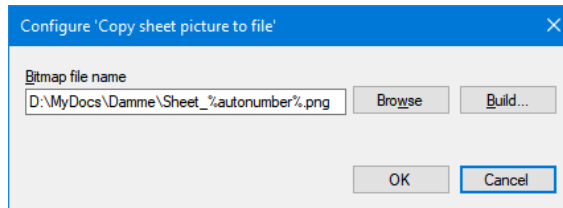
Copy the sheet picture to the clipboard

6.10.2 Copy sheet picture to file



Copy the sheet picture to a bitmap file
The name of the file will be defined in the configuration file.

The configuration dialog:



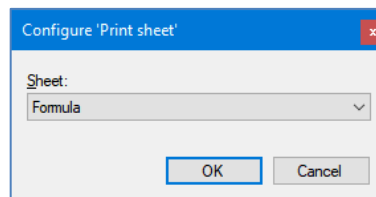
The output bitmap file name can be build using definitions set in the Build Storage Path dialog.

6.10.3 Print sheet



Print an individual sheet. Only sheets having a Print option in their menu can be printed. If you select a user sheet then the print action will only be done if the sheet contains a printable component like a display.

The configuration dialog:



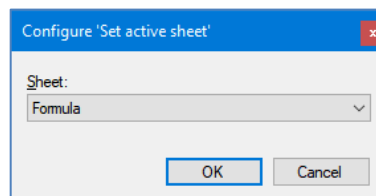
Via the configuration dialog you can select the sheet to be printed.

6.10.4 Set active sheet



Sets the active sheet

The configuration dialog:



Via the configuration dialog you can select the sheet to be set as the active sheet.

6.11 User data source

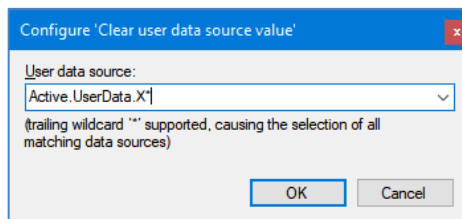
6.11.1 Clear user data source value



Clear user data source value

For more information see **Copy to user data source**

Configuration dialog:



The user data source or data sources you want to clear.

You can use a trailing wildcard to clear a complete data source tree.

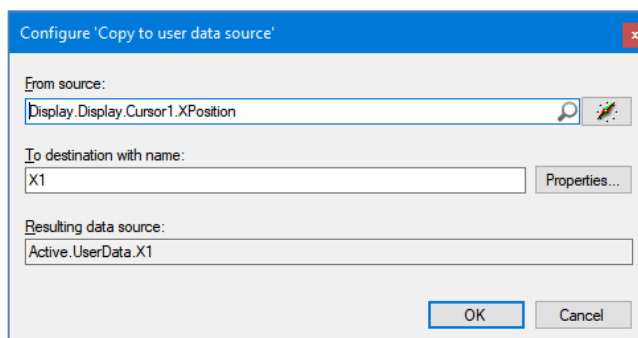
6.11.2 Copy to user data source



Copy to user data source

Via this user key action you can copy the value or content of any numerical or string data source to a new user data source. The user data sources are part of the **Active.UserData.** data sources tree.

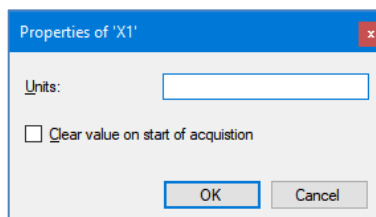
Configuration dialog:



In the configuration dialog you define:


- From source**
 This is the source data source; the numerical or string value of this data source will be copied to a destination data source.
- To destination with name**
 This is part of the name of the destination data source; the resulting name will always start with **Active.UserData.** followed by the name entered in the destination field. In the Resulting data source field you always can see the complete used data source name.

If you click the **Properties...** button then the following dialog comes up:

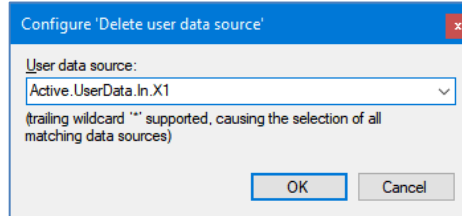


In this dialog you can define the **units** of the destination data source and you can enable/disable the **Clear value on start of acquisition** flag. When this option is enabled then the destination data source value will be cleared each time a recording is started.

6.11.3 Delete user data source

 Delete one or more user data source(s)


Configuration dialog:



The user data source to be deleted can be selected from the selection box or can be entered directly. You can use a trailing wildcard to delete a complete data source tree.

For example when using **Active.UserData.In.*** then all user data sources starting with **Active.UserData.In.** will be deleted.

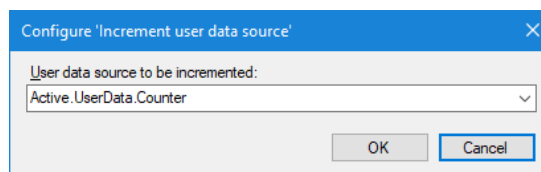
6.11.4 Increment user data source

 Increments a user data source

The increment action depends on the type of the input data source.

- **Numerical**
 If the user data source is a numerical value then this action increments this value by one.
 Example: If the numerical value is **10** the new incremented value is **11**.
- **Letter**
 If the user data source value is a single letter then the “increment” action will take the next letter in the alphabet.
 Example: If the value is **B** the new “incremented” value is **C**
 Remark: When at the end of the alphabet the increment starts back at the beginning: Incrementing **Z** will give **a** as the new value.
- **String**
 If the user data source is a string then the increment adds a 1 behind it, if however if the string ends with a number then this number will be increased.
 Example: If the value is **Counter** then the new “incremented” value is **Counter1**
 If the value is **Counter001** then the new “incremented” value is **Counter002**

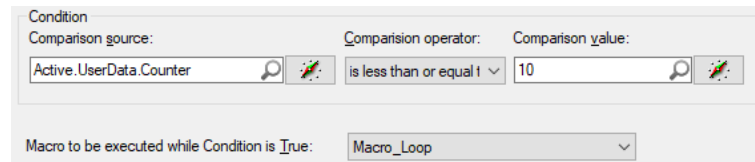
Configuration dialog:



In the configuration dialog you enter the user data source to be incremented. Existing user data sources can be selected from the drop-down list.

Remark.

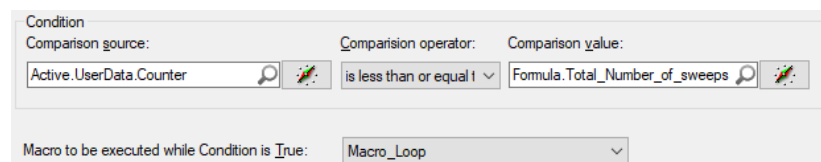
This increment action can be used very easily with the **While Loop** action. In the **Condition** you use a numerical user data source and in the **Macro to be executed while Condition is True** you use the increment action to increment this numerical user data source. The while loop will stop when the numerical user data source is larger than the **Comparison value** (10 in the example below).



TIP:

Use the result of the function *NumberOfSweeps()* as comparison value to loop through all your sweeps. The *NumberOfSweeps()* functions should be used in the formula sheet to get the number of sweeps of the used signal. In the macro loop you can use the *SweepStartTime()* and *SweepEndTime()* functions to get the start and end time of the sweep.

| Num | Name | Formula |
|-----|------------------------|-------------------------------------------------------|
| 1 | Input_Signal | Active.Group1.Recorder_A.Ch_A1 |
| 2 | | |
| 3 | Total_Number_of_sweeps | @NumberOfSweeps(Formula.Input_Signal) |
| 4 | nSweep | Active.UserData.Counter |
| 5 | t1 | @SweepStartTime(Formula.Input_Signal; Formula.nSweep) |
| 6 | t2 | @SweepEndTime(Formula.Input_Signal; Formula.nSweep) |



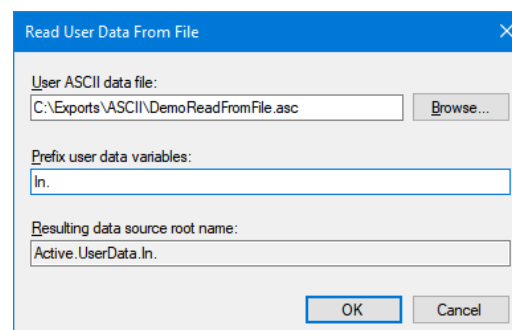
6.11.5 Read user data from file



ASCII Read user data from file.

Remark: This action can only be used when the information sheet has been loaded

Configuration dialog:



In the configuration dialog you will define the ASCII file from which the data will be imported. Per line in the data file a user data source is defined. The definition contains two or three fields:

Imported line fields:

- 1: The name of the variable
- 2: The value of the variable
- 3: (Optional) Units, will only be used when variable is numerical

The fields are separated by a ‘;’

An example of an ASCII file is shown below:

```
DemoReadFromFile.asc
1 X1;3.4;s
2 Y1;23;A
3 Serial;ID34x
```

This file defines three user variables after importing this file and using “In.” as prefix this results in the following data sources:

| User Table | | | |
|------------|--------|-------|-----|
| 1 | Serial | ID34x | --- |
| 2 | X1 | 3.400 | s |
| 3 | Y1 | 23.00 | A |
| 4 | | | |

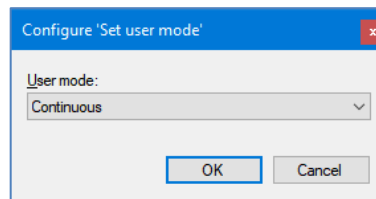
As you can see there are two numerical data sources and one string data source.

6.12 User mode

6.12.1 Set user mode

Set a data acquisition user mode.

The configuration dialog:



The user mode selections are:

- Review
- Single Sweep
- Multi Sweeps
- Slow Fast Sweep
- Continuous**
- Dual

7 Automation using Key Actions, Macros, automation, logging and formulas

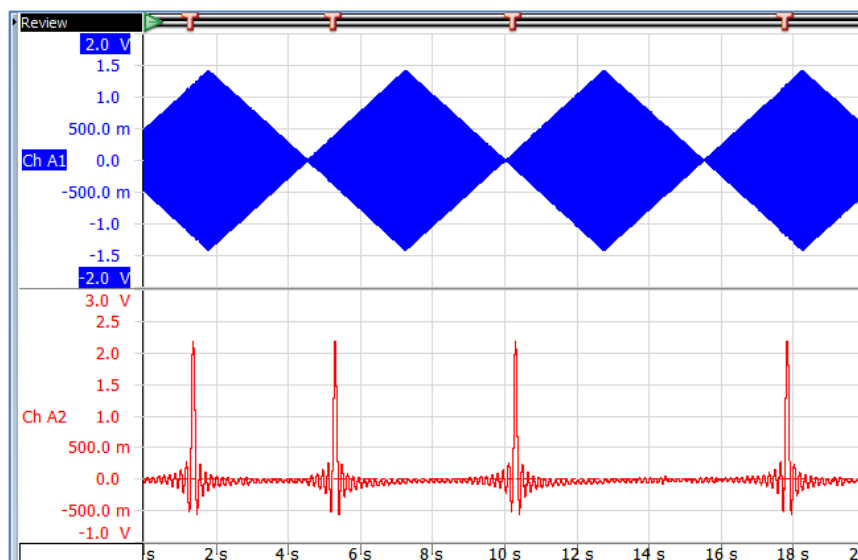
This chapter shows an example on how you can use **Key actions** and **Macros** from within Perception automation.

The demo will run in multi-sweep mode, per sweep the maximum value will be found via the formula **@Max()**, when this maximum is above a predefined level a message will be shown. Later we also show how you can log these events in a Perception Log file which can be opened in Microsoft Excel.

We will define step by step what is needed to accomplish this.

7.1 Signals

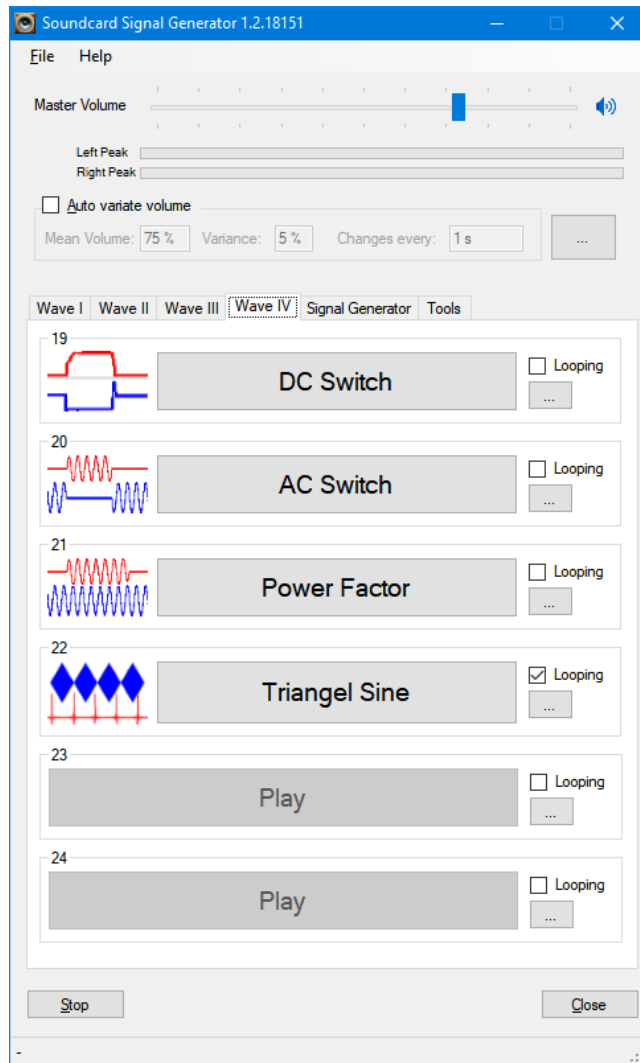
In this demo we use two test signals they look like:



- The first signal is a saw tooth modulated sine wave 1.5 volt top to top and a period of 4 seconds
- The second signal is a repetitive signal used for triggering; the time between the triggers has to be at least 3 seconds. In the example the trigger level is set to 0.5 Volt, but this depends on your signal.
- We will use Perception in **Multi Sweeps** mode
- The sweep length is set to 1 second
- The sweep count is set to 10
- The trigger position is set to 5%
- Sample rate is 100kS/s

Remark

This signal can be created using the free downloadable application: [SoundcardSignalGenerator 1.2.18151.exe](#). This program uses the soundcard for producing test signals. One of the predefined test signals is the signal as described above and is called the **Triangle Sine**



7.2 Formulas

This example uses formulas for calculating the sweep maximum value and maximum position.


- Enter the formulas as shown in the picture below:

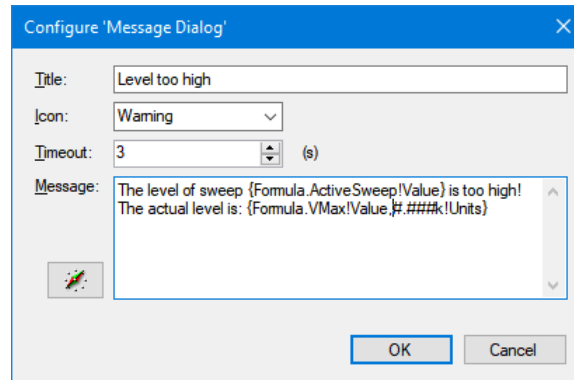
| Name | Formula |
|-------------|------------------------------------------------------------|
| | Sweep index |
| ActiveSweep | Display.Display.ActiveSweep.Index |
| V | @Sweep(Active.Group1.Recorder_A.Ch_A1;Formula.ActiveSweep) |
| | Get the start and end time of the active sweep |
| Sweep_Start | @XFirst(Formula.V) |
| Sweep_End | @XLast(Formula.V) |
| VMax | @Max(Formula.V;Formula.Sweep_Start;Formula.Sweep_End) |
| VMaxPos | @MaxPos(Formula.V;Formula.Sweep_Start;Formula.Sweep_End) |

7.3 Macros

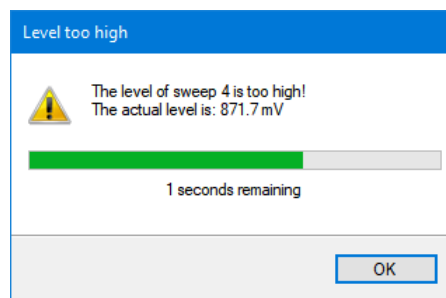
The example will use various macros

First macro is called **LevelTooHighMacro** and will be executed when the maximum level exceeds a specified value.


- Open the **Macro Manager** (Automation menu)
- Create new Macro by clicking at  button
- Enter the name: **LevelTooHighMacro**
- Select the **Message Dialog** action from the **Notifications** category
- Set the following configuration:

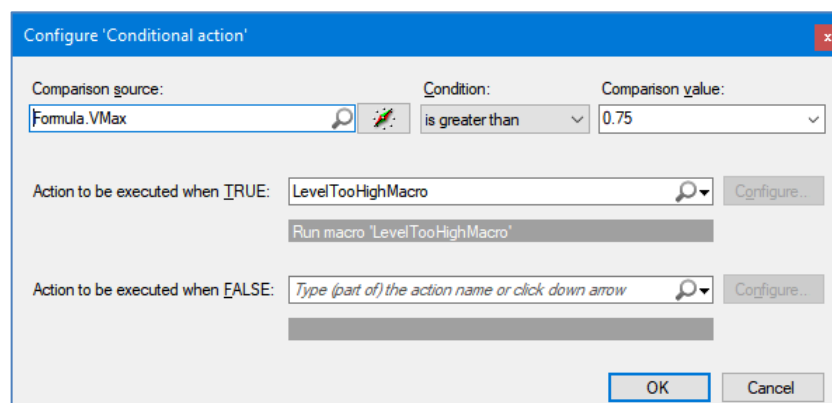


When this macro is called the dialog looks like:



The next macro is called **Sweep_Level_Check**; this macro is doing the maximum level check. If the maximum is above 0.75 Volt the **LevelTooHighMacro** is called.

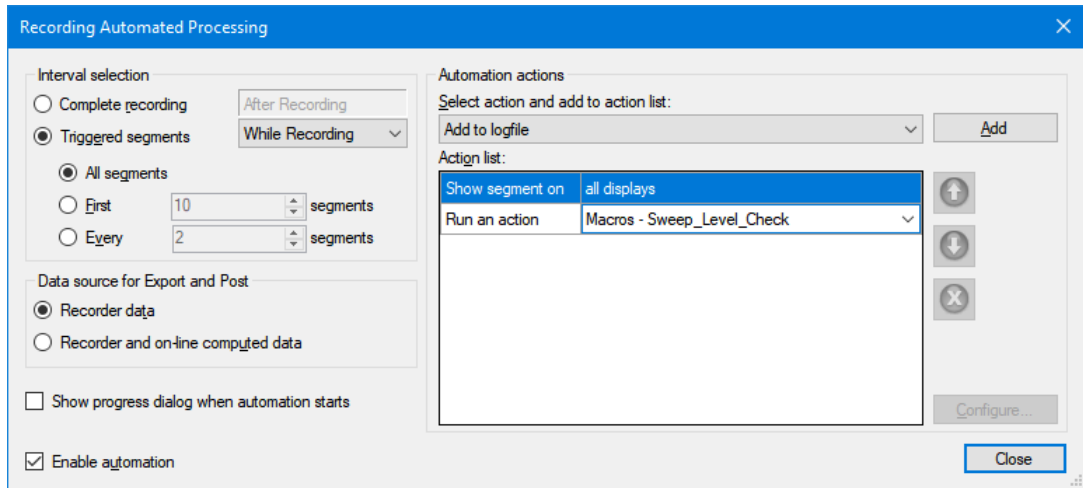
- Create new Macro by clicking at  button in the Macro Manager dialog
- Enter the name: **Sweep_Level_Check**
- Select the **Conditional action** from the **Conditional** category
- Set the following configuration:



7.4 Recording Automated Processing

The **Sweep_Level_Check** macro will be called during a recording per sweep.

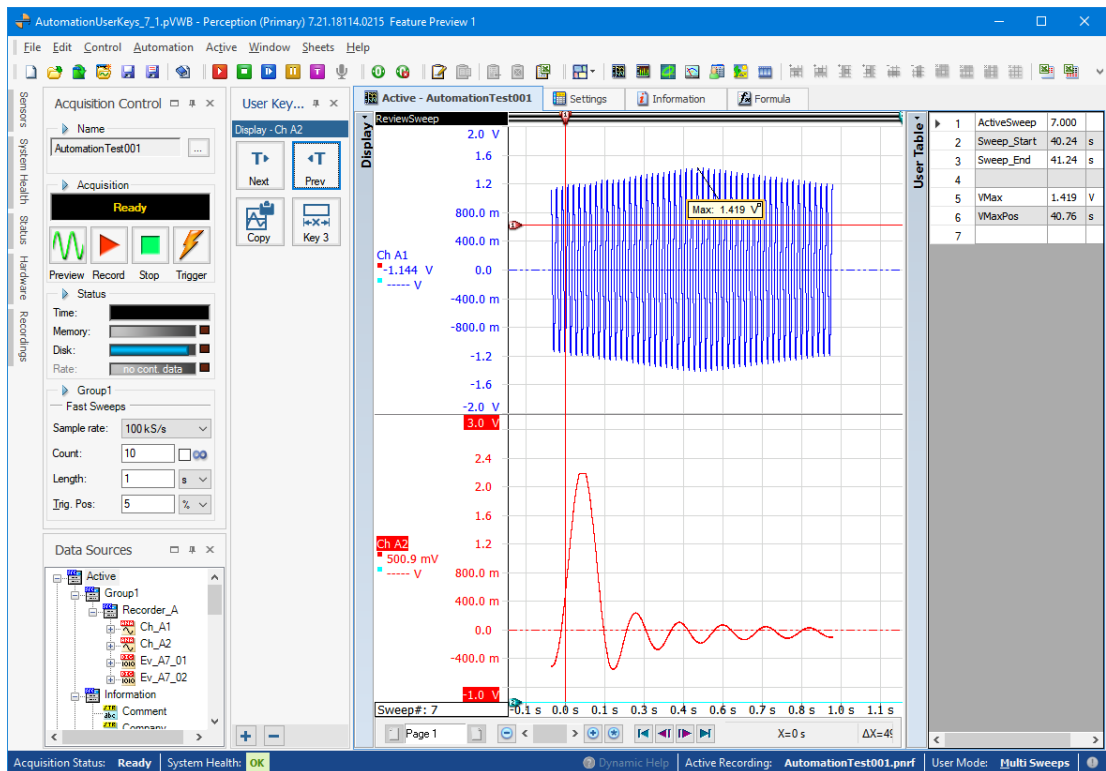
- Open the **Automated Recording Processing** in the **Automation** menu
- Make the following configuration:



7.5 Recording

Now the system is set and ready for doing a recording and check if everything is working as expected. The result can be found in the virtual workbench file: *AutomationUserKeys_7_1.pVWB*

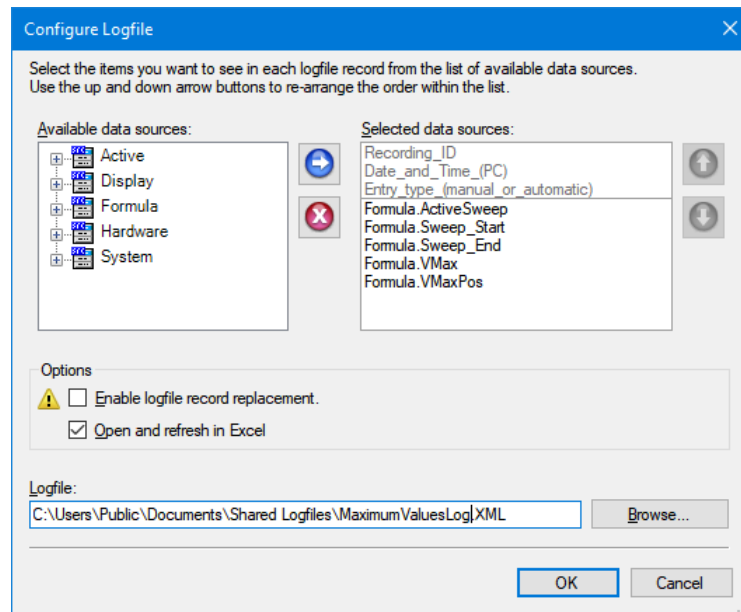
- Start a recording and notice the message dialogues when the maximum is too high.



7.6 Add logging

Now we will add logging to this example. Each time the maximum value is too high this should be logged in a Perception log file (csv file). This log file can be opened in Perception. To accomplish this do the following steps:

- Go to the Automation menu and enable manual logging
- Configure the log file as shown in the picture below:



- Open the Macro Manager and add the action **Add a manual log entry** (category **Logging**) to the existing macro called: LevelTooHighMacro
- Make a new recording and notice that Excel shows the results.

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|-------------------|----------------|------------|-------------|--------------|--------------|--------------|--------------|---|------------|---|---|
| 1 | Recording_ID | Date_and_Time | Entry_type | ActiveSweep | .Sweep_Start | .Sweep_End | | Formula.VMax | F | VMaxPos | F | |
| 2 | AutomationTest003 | 6/11/2018 9:45 | Manual | | 1 | 5.4049255 s | 6.4049155 s | 1.418624738 | V | 5.9442855 | s | |
| 3 | AutomationTest003 | 6/11/2018 9:45 | Manual | | 2 | 9.3395355 s | 10.3395255 s | 0.871047835 | V | 10.3322755 | s | |
| 4 | AutomationTest003 | 6/11/2018 9:45 | Manual | | 4 | 21.8748355 s | 22.8748255 s | 1.418827996 | V | 22.4141955 | s | |
| 5 | AutomationTest003 | 6/11/2018 9:45 | Manual | | 5 | 25.8094455 s | 26.8094355 s | 0.871725362 | V | 26.8021855 | s | |
| 6 | AutomationTest003 | 6/11/2018 9:46 | Manual | | 7 | 38.3447455 s | 39.3447355 s | 1.418760243 | V | 38.8641055 | s | |
| 7 | AutomationTest003 | 6/11/2018 9:46 | Manual | | 8 | 42.2793555 s | 43.2793455 s | 0.871725362 | V | 43.2721055 | s | |
| 8 | AutomationTest003 | 6/11/2018 9:46 | Manual | | 10 | 54.8146655 s | 55.8146555 s | 1.418963501 | V | 55.3340155 | s | |

The result can be found in the virtual workbench file: *AutomationUserKeys_7_2.pVWB*

Remark:

It is also possible to set a digital output to High if the maximum exceeds the entered level. On the HBM website you can find a Tech note describing this, you can however also open the virtual workbench file:

8 Push notifications

This chapter explains how you can use HBM Push notifications in Perception.

The HBM Push app ensures that you never miss an important event again.

It notifies you about specific events occurring on the monitored object – by sending a push message to your smart phone, no matter where you are.

You can use the key action **Send push notification** for this. The Push ID can also be shared to notify others about the events.

Security is guaranteed: All messages are encrypted during transmission.

The HBM Push app for your smart phone is available for free.

8.1 Simple user key sending a Push notification

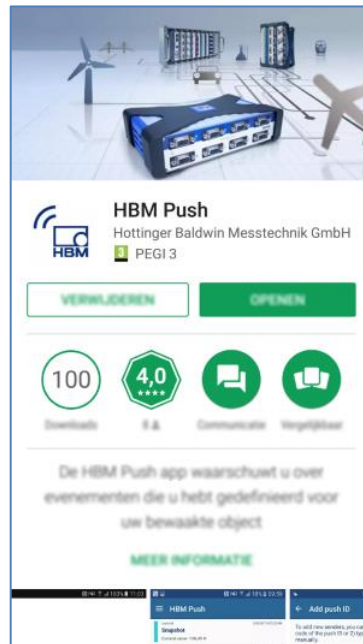
In this chapter we start with an example where we use a user key to send a push notification. Later we show you how you can send a push notification depending on a condition.

You can only send push notifications from Perception if you have an internet connection.

For the push function you need a sender ID which is generated on the HBM server reserved for this.

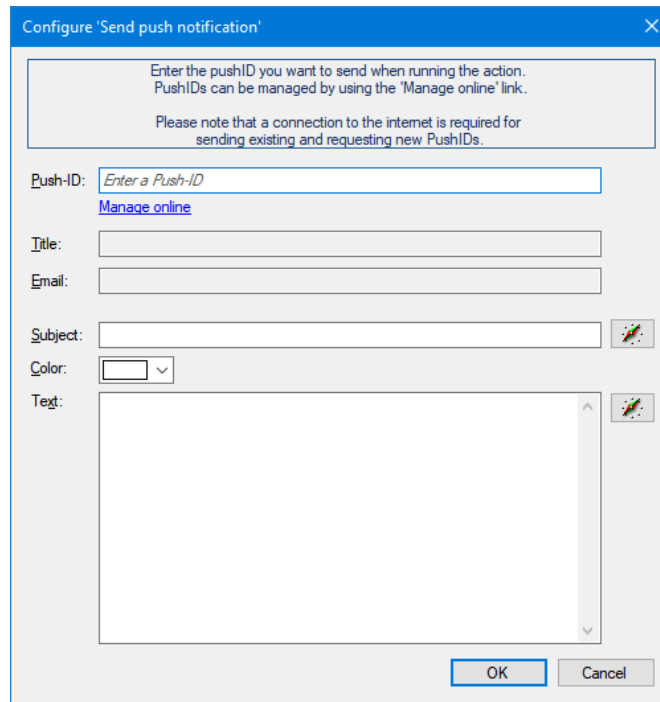
You can request several different IDs for various events.

You can download the app from the Google Play Store:



Now open Perception and add a new user key for sending a push notification.

- Add a new user key
- *Key text:* **Send**
- *Key help text:* **Send a push notification**
- *Key action:* **Send push notification** this action can be found in the **Notifications** category.
- Click at **Configure...**



Configure 'Send push notification'

Enter the pushID you want to send when running the action.
PushIDs can be managed by using the 'Manage online' link.

Please note that a connection to the internet is required for sending existing and requesting new PushIDs.

Push-ID:

[Manage online](#)

Title:

Email:

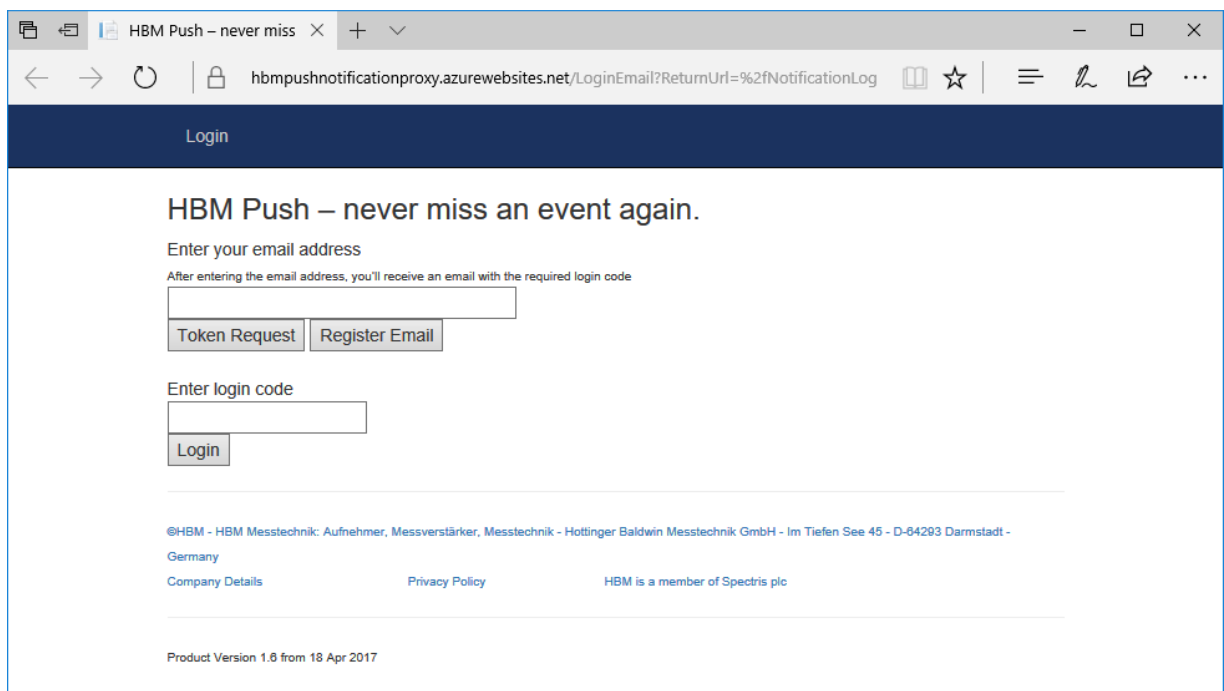
Subject:

Color:

Text:

OK Cancel

- If you already have a Push-ID then enter it here, if you don't have one do the following steps.
- Click the hyperlink called [Manage online](#) in the above shown configuration dialog
- This brings up the following web page:



HBM Push – never miss an event again.

Enter your email address

After entering the email address, you'll receive an email with the required login code

Token Request Register Email

Enter login code

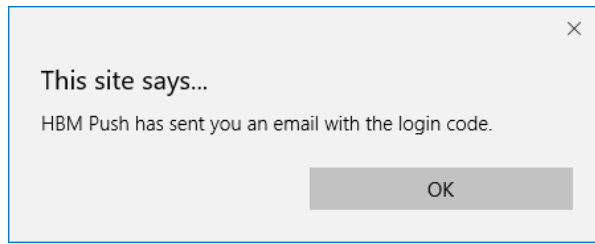
Login

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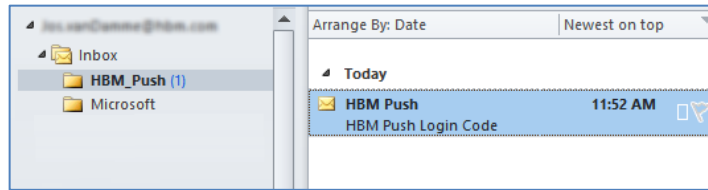
Company Details Privacy Policy HBM is a member of Spectris plc

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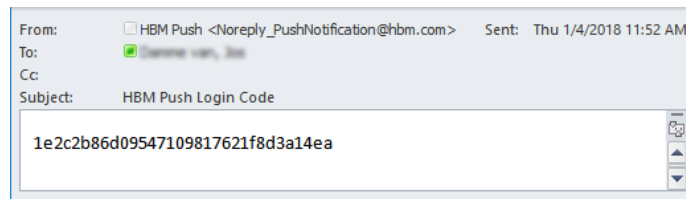
- Enter your Email address
- Register Email
- Click Token Request



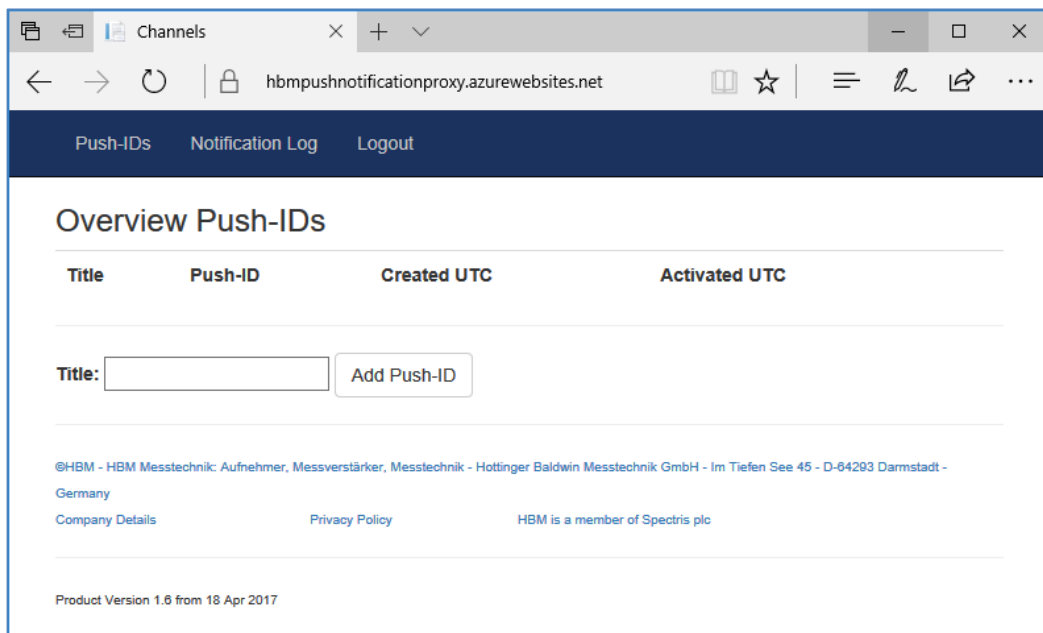
- Check your Email Inbox



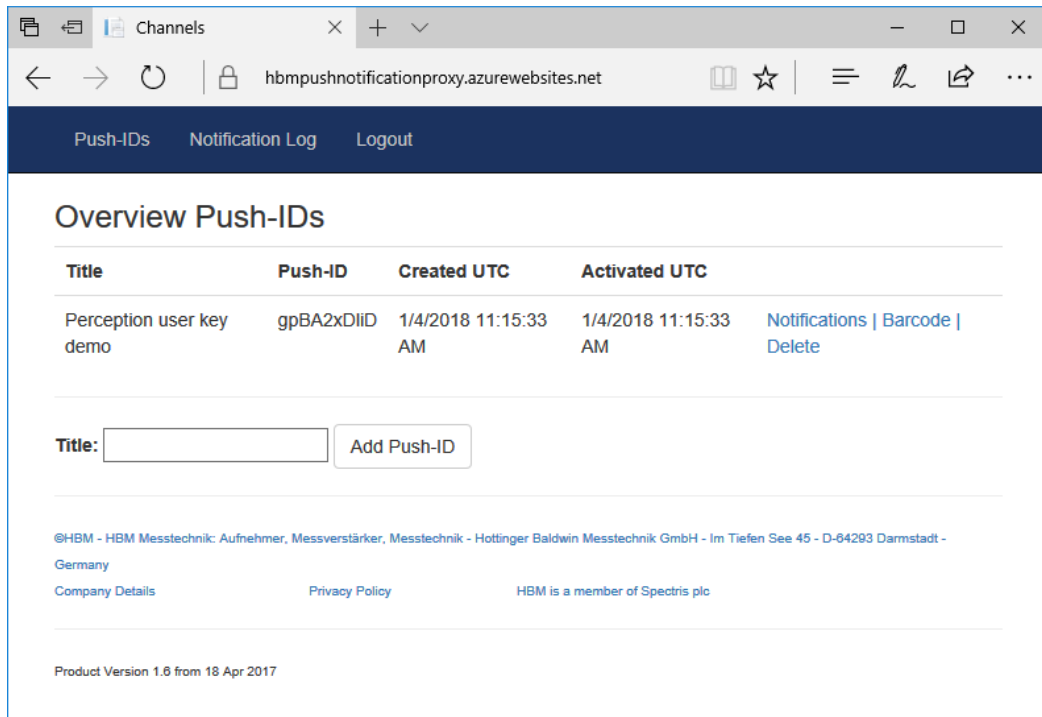
- Open the Email:



- Copy the login code into the clipboard (Ctrl-c)
- Paste the code into the **Enter login code** in the web page as shown above and click **Login**. This can take some time!



- Enter the new title for the Push-ID: **Perception user key demo** in the field behind **Title**:
- Click at: **Add Push-ID**
- The HBM web service will generate a new Push-ID for you. In the example below this is gpBA2xDIiD



| Title | Push-ID | Created UTC | Activated UTC |
|--------------------------|-------------|----------------------|----------------------|
| Perception user key demo | gpBA2xDliID | 1/4/2018 11:15:33 AM | 1/4/2018 11:15:33 AM |

- Now click at the blue text Barcode at the end of the Push-ID's information



The PushNotification Push-ID was already activated on: 1/4/2018 11:15:33 AM UTC

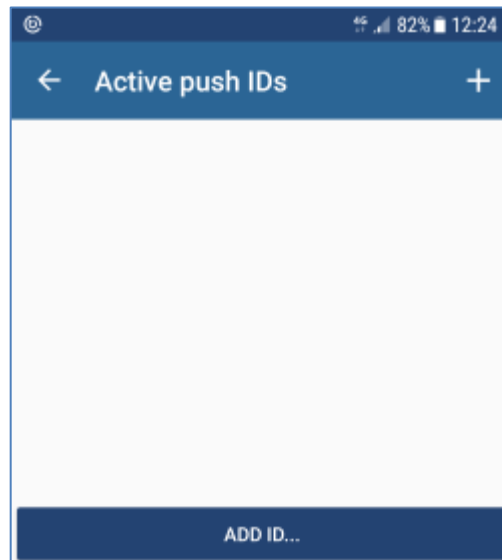
Email Registration: j.m.vandamme@hbm.com

Push-ID: gpBA2xDliID

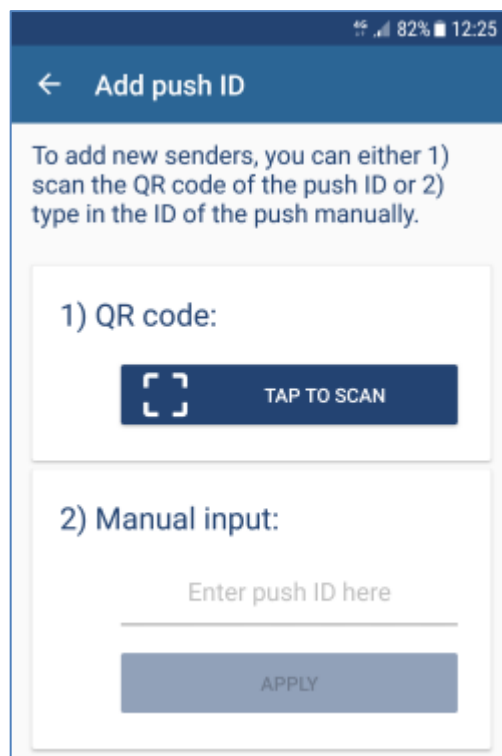
- Take your smart phone and open the HBM app



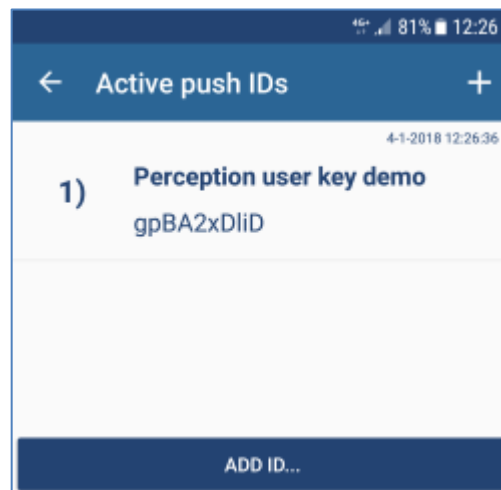
- Click at the menu of the app and select Active push IDs



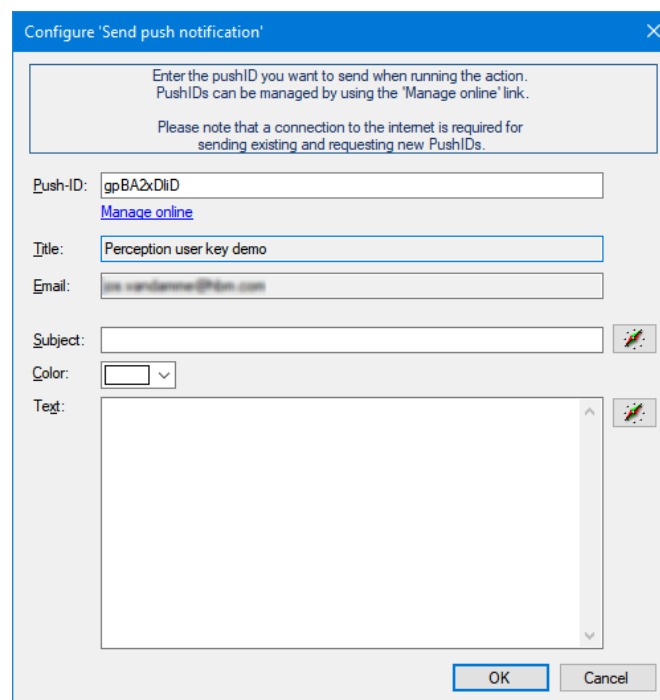
- Click **Add ID....**




- Click at **TAP TO SCAN** and scan the barcode from the web site as shown above

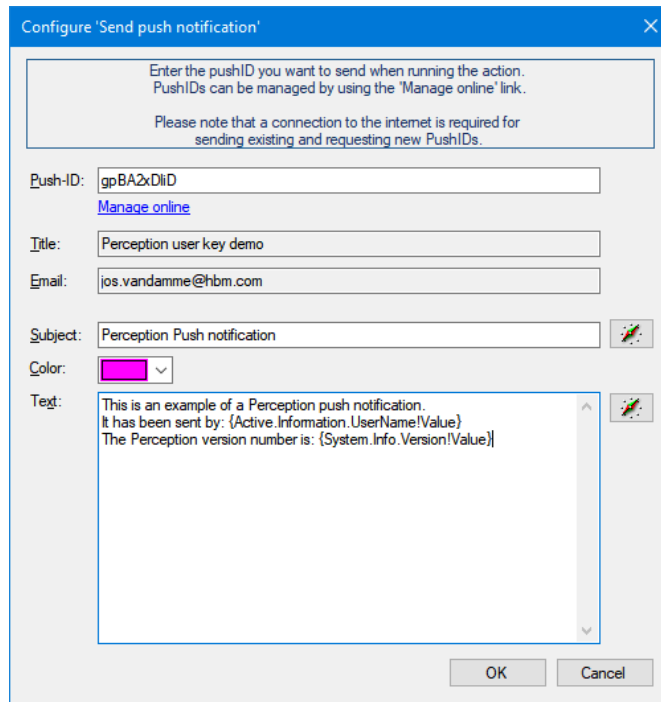


- Now your phone is ready to receive push messages from Perception
- We go back to the Configure dialog of the 'Send push notification'
- Enter your new **Push-ID** here
- If you do this and leave the **Push-ID** field then the **Title** and **Email** fields are automatically filled, Perception asks the HBM web service for this information.

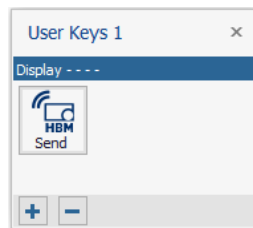


- Now we will add a subject to the push notification, therefore enter **Perception Push notification**
- Change the color to cyan
- Add the following text and use the button at the right  for adding dynamic data sources to the message text.

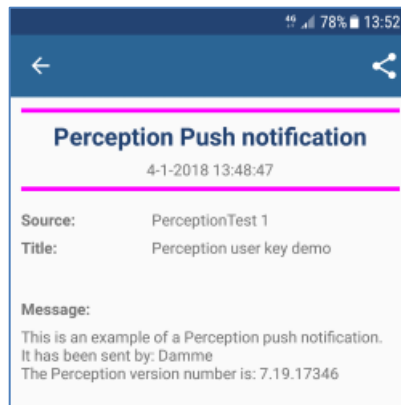
This is an example of a Perception push notification.
It has been sent by: {Active.Information.UserName!Value}
The Perception version number is: {System.Info.Version!Value}



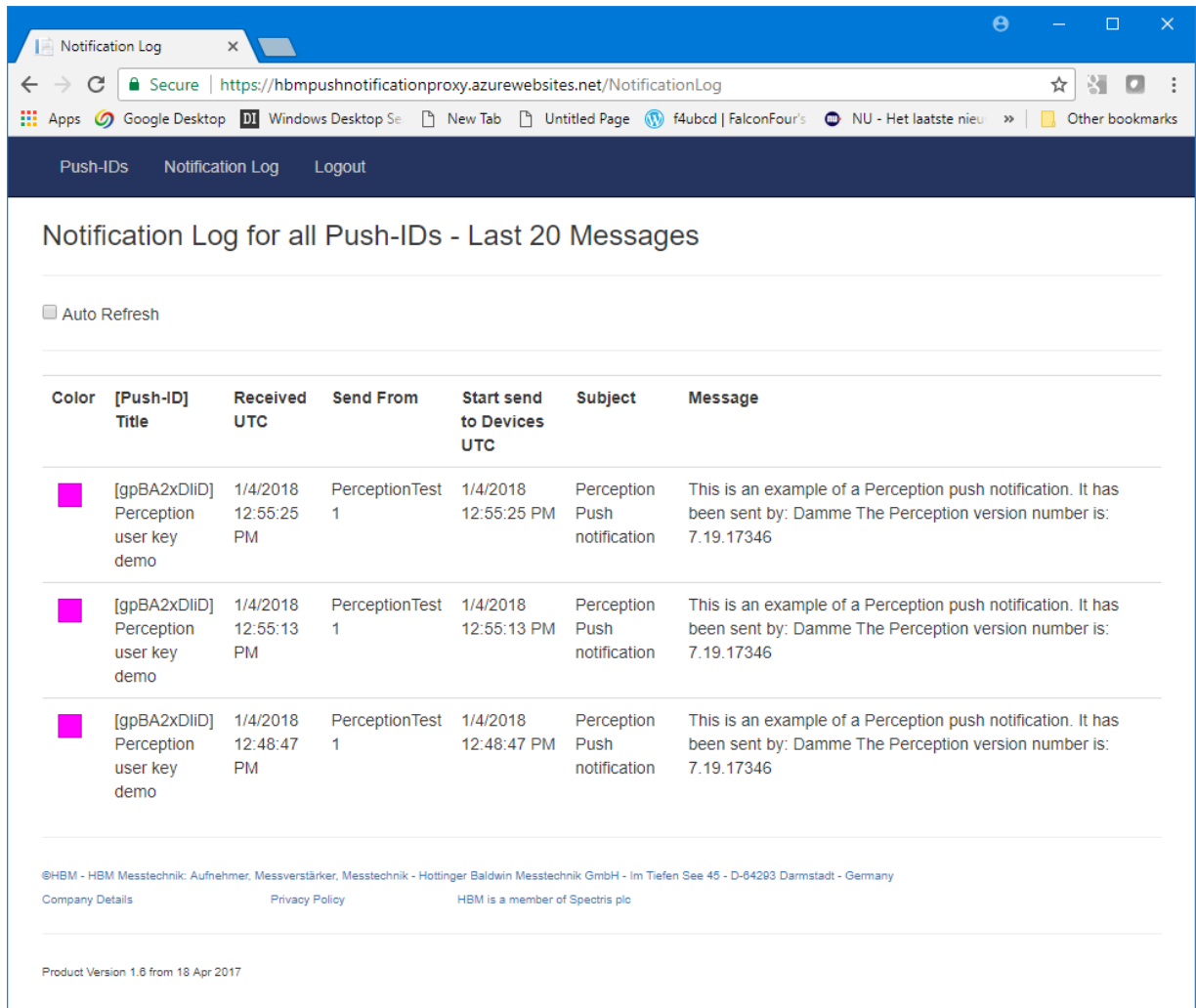
- Close the configuration window
- Close the Setup of User Keys window by clicking at OK



- The new user key is now ready to be used, click at this new user key button.
- The push notification is now send to your smart phone, you should see something like:



- Press several times at the user key to send some more push messages and see what happens
- On the web site you can also see the Notification Log:



Notification Log for all Push-IDs - Last 20 Messages

Auto Refresh

| Color | [Push-ID] Title | Received UTC | Send From | Start send to Devices UTC | Subject | Message |
|-------|---------------------------------------|----------------------|------------------|---------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| ■ | [gpBA2xDIID] Perception user key demo | 1/4/2018 12:55:25 PM | PerceptionTest 1 | 1/4/2018 12:55:25 PM | Perception Push notification | This is an example of a Perception push notification. It has been sent by: Damme The Perception version number is: 7.19.17346 |
| ■ | [gpBA2xDIID] Perception user key demo | 1/4/2018 12:55:13 PM | PerceptionTest 1 | 1/4/2018 12:55:13 PM | Perception Push notification | This is an example of a Perception push notification. It has been sent by: Damme The Perception version number is: 7.19.17346 |
| ■ | [gpBA2xDIID] Perception user key demo | 1/4/2018 12:48:47 PM | PerceptionTest 1 | 1/4/2018 12:48:47 PM | Perception Push notification | This is an example of a Perception push notification. It has been sent by: Damme The Perception version number is: 7.19.17346 |

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If you also want that somebody else should also receive the notifications, you just send him an Email containing the Push-ID or barcode picture and explain him how to install the HBM app on his smart phone. Once he has the app up and running he should add the new Push-ID. You can read in the text above how to do this.

8.1 Sending a push notification during recording when a value is too high

The previous example was only a simple example to learn you how the push mechanism works there is not much practical use for a user key sending a notification. It is much more interesting to send a push notification automatically when something of interest happens; for example when a calculated value is too high.

9 File copy and move actions

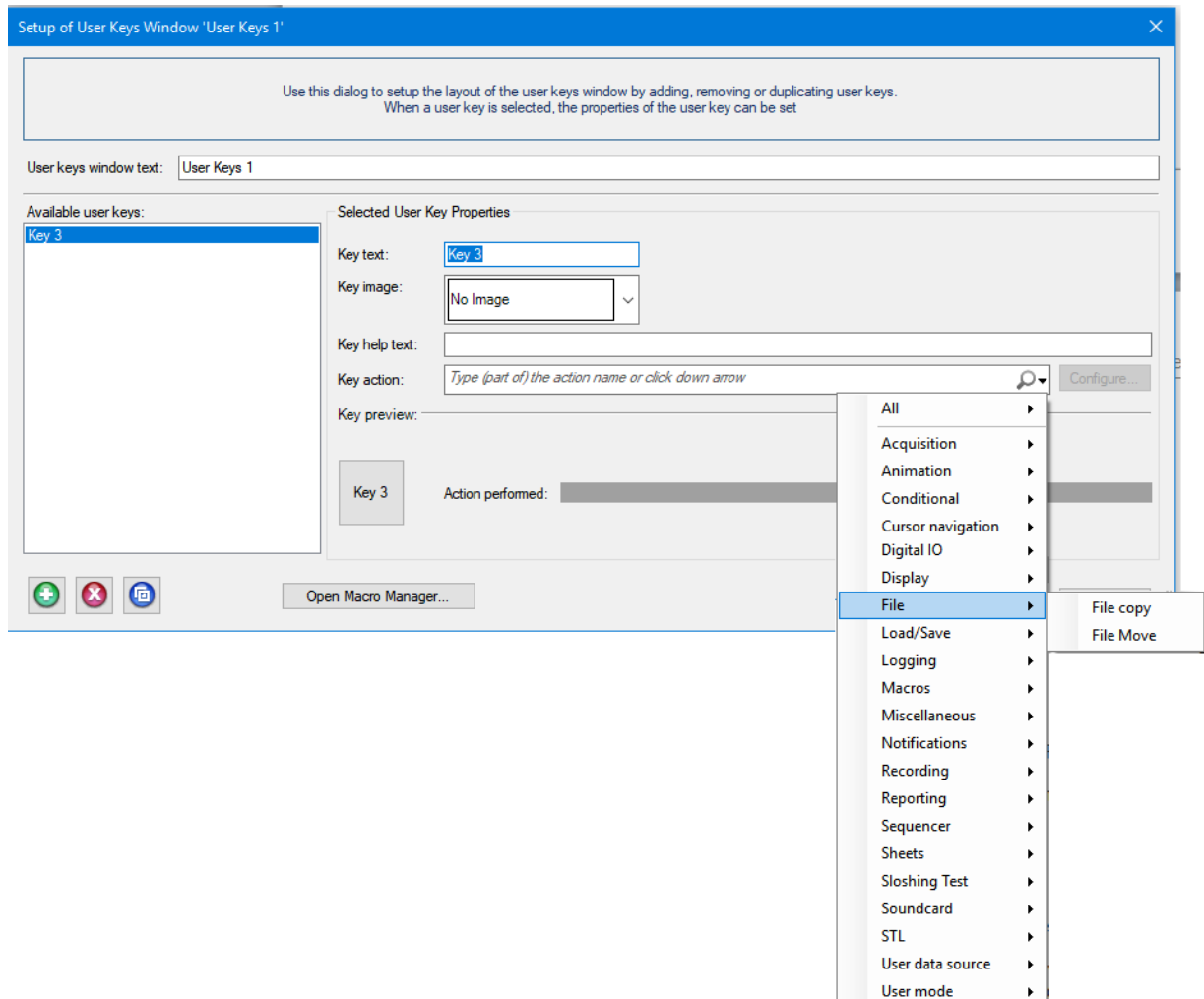
9.1 Introduction

The file copy or move actions can be used to copy or move files from within Perception. This can be done manually or via the Perception build in automation.

The two user key actions are:

- File copy
- File move

These actions can be found in the File category of the key actions list.

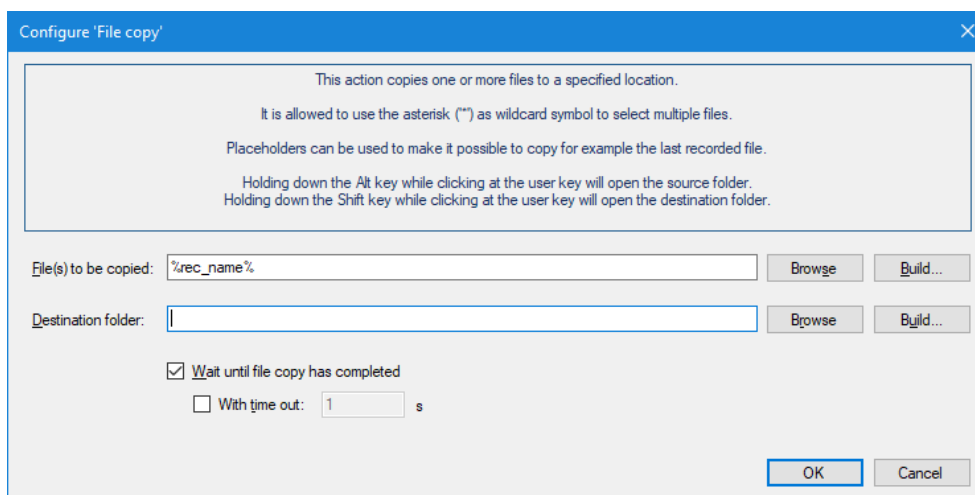


The **File copy** and **File move** actions are not limited to copy or move only recording files, but all kinds of files on your system can be copied or moved. It is for example possible to copy or move the Perception logging files. Also files stored at the internal storage of a mainframe can be copied or moved using these user key actions, this will be described later in this chapter.

9.2 File copy

The File Copy action copies one or more files from a source location to a destination folder. For the selection of the files to be copied the wild card "*" can be used; this way you can select multiple files; for example to select all recording files you can enter *.pnrf files. It is also possible to use place holders when you want to select files where the names are related to the active recording or recording location. This makes it for example possible to copy the active recording after the recording has been finished.

The configuration dialog:



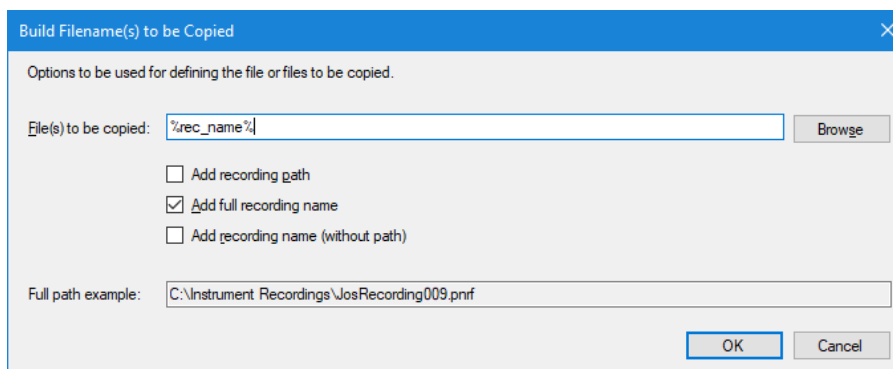
9.2.1 File(s) to be copied:

In the field **File(s) to be copied** you will enter file or files you want to be copied. You can enter here a fixed file name or you can use a wild card to select multiple files.

Examples:

- **C:\MyRecordings\Recording1.pnrf**
Only one file will be copied
- **C:\MyRecordings*.pnrf**
All files in this folder ending with .pnrf will be copied

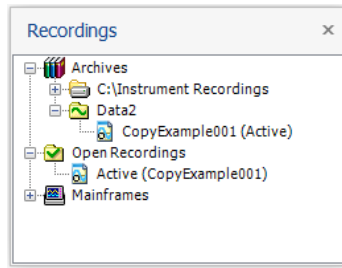
It is also possible to use a place holder, these are predefined texts surrounded by the % character. To make it easy to use the placeholders you can click at the **Build...** button which brings you in the **Build Filename(s) to be Copied** dialog:



There are three place holders available:

%rec_path%
%rec_name%
%base_rename%

These place holders can be used to construct a name using information from the currently active Perception recording. Via the Recordings window you can find information on the currently opened active recording. See picture below



The complete name of the active recording in the example above is:

C:\HBM\Training\Data2\CopyExample001.pnrf

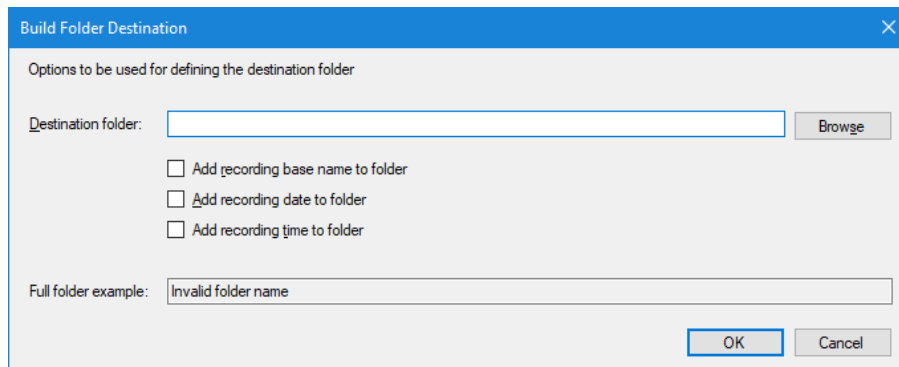
The place holders now will return:

| | | |
|-------------------------|----------------------------|---------------------------------------------|
| Recording path: | <code>%rec_path%</code> | → C:\HBM\Training\Data2\ |
| Recording full name: | <code>%rec_name%</code> | → C:\HBM\Training\Data2\CopyExample001.pnrf |
| Rec. name without path: | <code>%base_rename%</code> | → CopyExample001 |

The **full path example** in the *Build Filename(s) to be Copied* dialog shows an example of the file(s) to be copied using the selected place holders.

9.2.2 Destination folder

In the destination folder the location is defined to where the files have to be copied. You can enter here a fixed folder name or you can use a wild card to select a variable folder name. To make it easy to create a variable destination folder name you have to click the **Build..** button which brings you in the **Build Folder Destination** dialog.



There are three place holders available:

`%base_rename%`
`%date%`
`%time%`

These place holders can be used to construct a name using information from the currently active Perception recording.

We will give an example on how this works using the following name as active recording:

C:\HBM\Training\Data2\CopyExample001.pnrf

The place holders now will return:

| | | |
|------------------------------------|----------------------------|----------------------------|
| Add recording base name to folder: | <code>%base_rename%</code> | → g:\Backup\CopyExample001 |
| Add recording date to folder: | <code>%date%</code> | → g:\Backup\10_30_2018 |
| Add recording time to folder: | <code>%time%</code> | → g:\Backup\1_43_29 PM |

The **full folder example** in the *Build Folder Destination* dialog shows an example of the folder to be used during the copy action using the selected place holders.

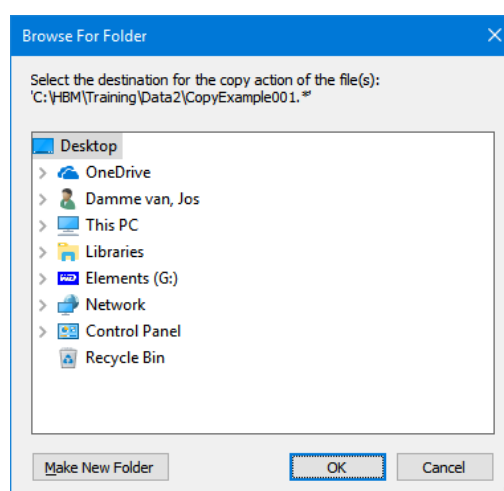
9.2.3 Additional copy parameters

With the additional parameters you can define whether or not Perception will wait until the copy action has been completed.

If you wait for completion of the copy action you can also enter a time out value in seconds, Perception will wait for the copy action, but if it takes too long it continues. The copy action is not aborted!

If the destination folder is left empty then a folder browser dialog will be shown when you press the copy user key. If the user key action is however called from automation then an error will be set.

The folder browser dialog looks like:



9.2.4 Using the copy action

The copy action can be used by a user key, but it can also be used as part of a Macro. In the Macro you can add several copy actions, for example if you have other files to be copied like the log file or possible other files generated during a recording (e.g. video files).

You can also use automation to execute the copy action; this way you can copy the recording file automatically after the recording has been finished.

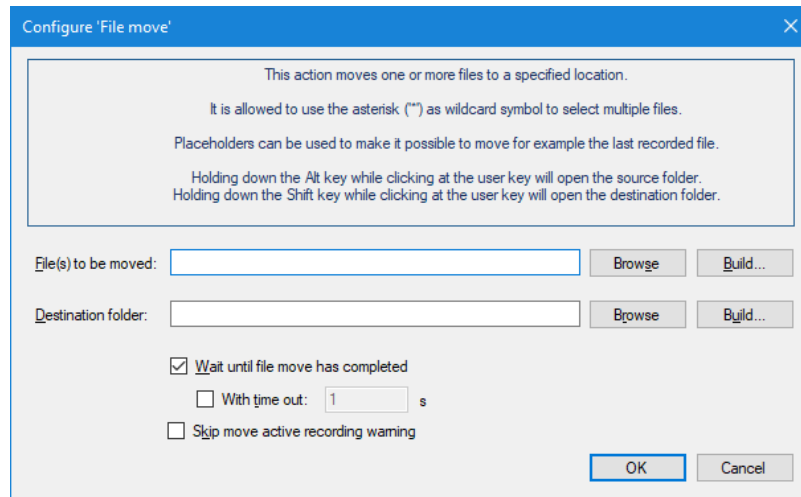
When you hold down the **Alt key** while clicking at the copy user key the windows explorer will open the source folder.

When you hold down the **Shift key** while clicking at the copy user key the windows explorer will open the destination folder.

9.3 File move

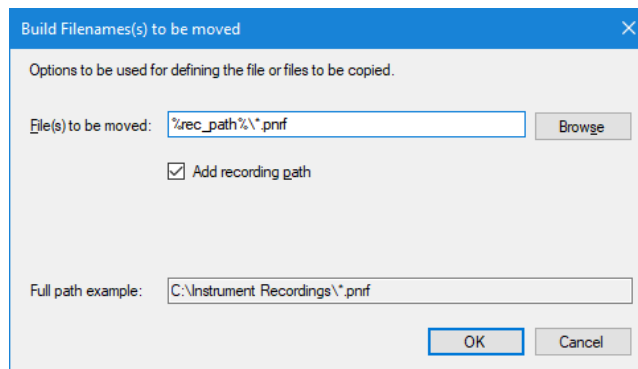
The File move action moves one or more files from a source location to a destination folder. It works almost similar to the copy action; therefore we recommend to read the information above about the File Copy User Key Action paragraph.

The File move configuration dialog looks like:



Only the differences with the copy action are described.

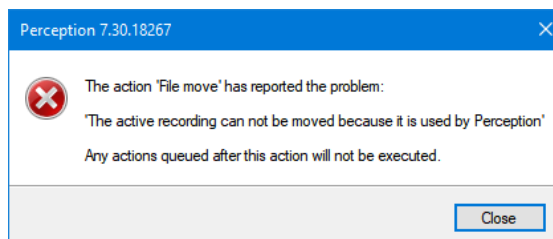
9.3.1 Build Filename(s) to be moved



The build dialog for the move action looks a little bit different, only one placeholder is supported: the **recording path** placeholder. This is done because the current active recording can **NOT** be moved because it is locked by Perception. Only when you close the recording it can be moved, but if you close the recording then the placeholders `%rec_name%` and `%base_recname%` as used by the copy action are empty because there is no active recording any more. This is the reason why they are not supported for the move action.

9.3.2 Skip move active recording warning

The active recording cannot be moved, when you however try to do this a warning will be shown, this looks like:



This warning can be very annoying when you have selected the following as files to be moved:

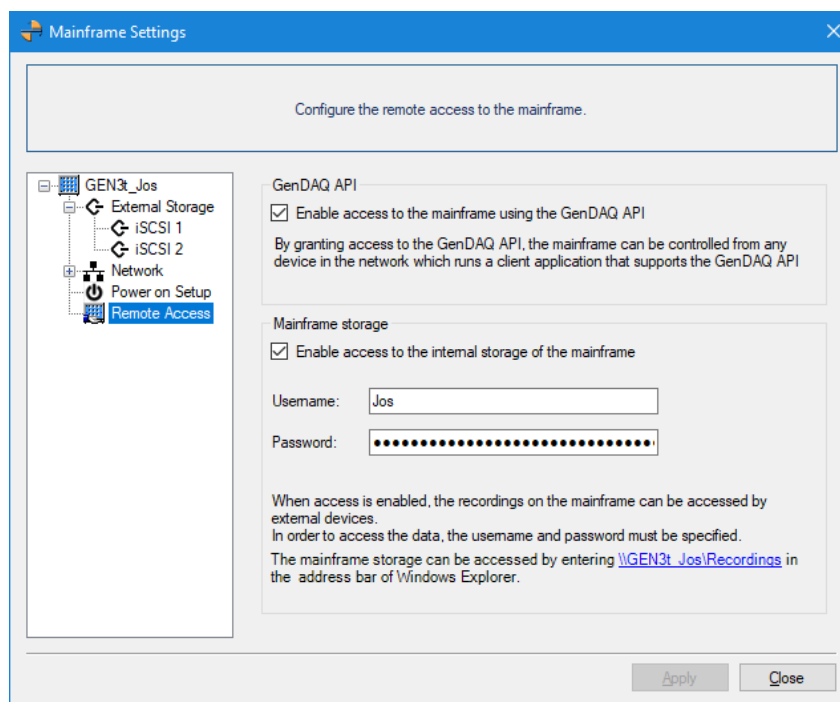
`%rec_path%*.pnrf`

In this case the move action tries to move all recording files from the recording folder, including the active recording, therefore the warning will be shown. By enabling the **Skip move active recording**

warning you can prevent that this warning will be shown. By using `%rec_path%*.pnrf` in a move action called from automation after a recording has ended Perception will move all previous recordings except the active one to a specified location. This way you can manage your recording folder location and prevent that the recording disk will become full.

9.4 Copy move from internal mainframe disk

Files stored at the internal storage of a mainframe can be copied or moved using the File copy or File move user key actions. However before you can do this you have to enable the access to the internal storage of the mainframe. To do this you should go to the Settings sheet and select the Mainframe Setup... menu. In the **Mainframe Settings** dialog you go to the Remote Access branch. Here you enable the access to the internal storage of the mainframe. The picture below shows this dialog. More information can be found in the Perception user manual sub chapter **Remote access** this is part of the chapter **Navigator Panels**.



If you have multiple mainframes and you are working with the internal mainframe storage, then the recorded data is distributed over the mainframes. If the recording name is for example Recording001.pnrf then you will find on each mainframe a recording with this name. If you want to copy this data to your PC automatically after the recording is done you can use a Macro where you add for each mainframe a File copy action and copy those recordings each to a predefined folder per mainframe. If needed you can always merge these individual recordings later with the option **Merge Files...** which can be found in the Perception **Automation** menu.

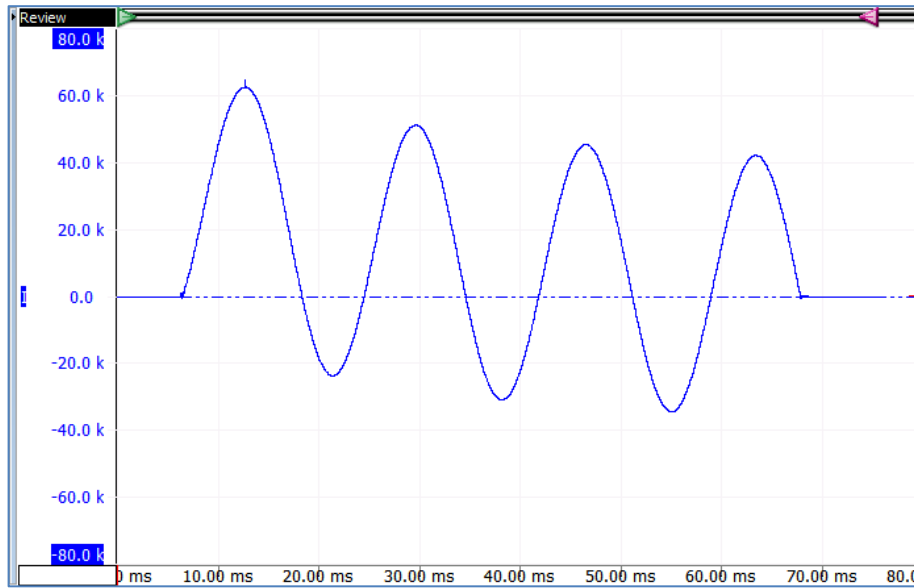
10 Interactively overruling automatic calculations by using user keys

This example shows how you can overrule automatic calculations using user keys. This example is using formulas to find the start and end of a current signal. This is something typically done by switchgear tests. The STL functions `@STLSignalStart()` and `@STLSignalEnd()` will be used to locate the start and end of the current; however sometimes these locations can be set more precisely by using the display cursor. This example shows how to use the cursor position in the formulas.

If you do not have the STL library then the functions `@NextLvlCross()` and `@PrevLvlCross()` are used to find the start and end of the signal.

10.1 Signal

The signal used for this example looks like:



10.2 Formulas

- Add the following formulas to the Formula sheet:

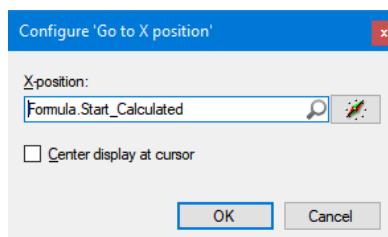
| Name | Formula |
|---------------------|--------------------------------------------------------------------------------------------|
| | Used input signal |
| I | Active.Group1.Recorder_A.I |
| | If you have the STL formulas available you set the next value to 1 else you set it to 0 |
| USE_STL | 1 |
| | If you have STL you can use the following formulas |
| Start_STL | @STLSignalStart(Formula.I; 50) |
| End_STL | @STLSignalEnd(Formula.I; 50; 100) |
| | If you do not have STL use the following formulas |
| Start_LevelCrossing | @NextLvlCross(Formula.I; 0; 0) |
| End_LevelCrossing | @PrevLvlCross(Formula.I; 100; 0) |
| | |
| Start_Calculated | @IIF(Formula.USE_STL; Formula.Start_STL; Formula.Start_LevelCrossing) |
| End_Calculated | @IIF(Formula.USE_STL; Formula.End_STL; Formula.End_LevelCrossing) |
| | |
| | Check if the calculated start and end have to be overruled by the manual entered positions |
| Start | @IIF(Active.UserData.StartManual; Active.UserData.StartManual; Formula.Start_Calculated) |
| End | @IIF(Active.UserData.EndManual; Active.UserData.EndManual; Formula.End_Calculated) |
| | |
| | Calculate the duration |
| Duration | Formula.End - Formula.Start |
| | |

10.3 User Keys

Add the following 5 user keys to Perception:

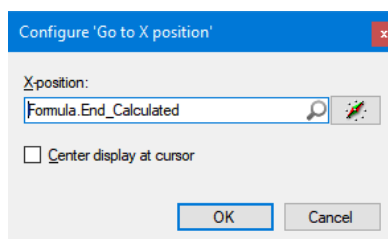
User key for setting the active cursor to the calculated start value of the cursor

- Add the following user key:
 Key text: *Start Calc*
 Key Help text: *Automatically calculated start of current*
 Key action: *Go to X position category Cursor navigation*



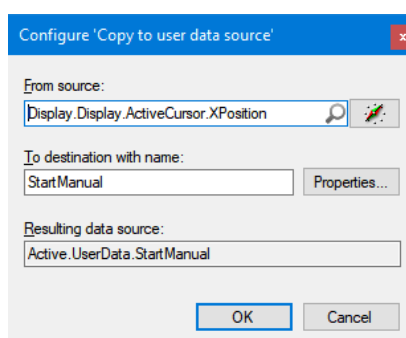
User key for setting the active cursor to the calculated end value of the cursor

- Add the following user key:
 Key text: *End Calc*
 Key Help text: *Automatically calculated end of current*
 Key action: *Go to X position category Cursor navigation*



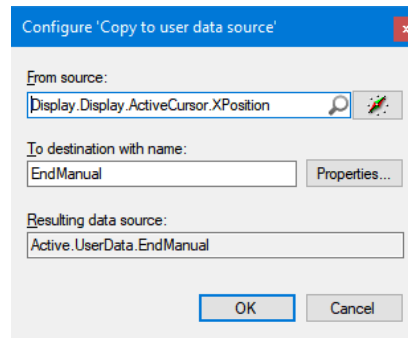
User key for setting the new start location to be used by the formulas

- Add the following user key:
 Key text: *Set Start*
 Key Help text: *Set manual start location*
 Key action: *Copy to user data source category User data source*

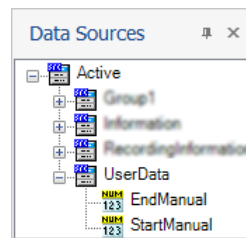


User key for setting the new end location to be used by the formulas

- Add the following user key:
 Key text: *Set End*
 Key Help text: *Set manual end location*
 Key action: *Copy to user data source category User data source*

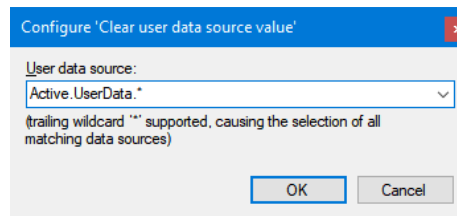


The last two user keys create the following data sources after you have clicked on them:

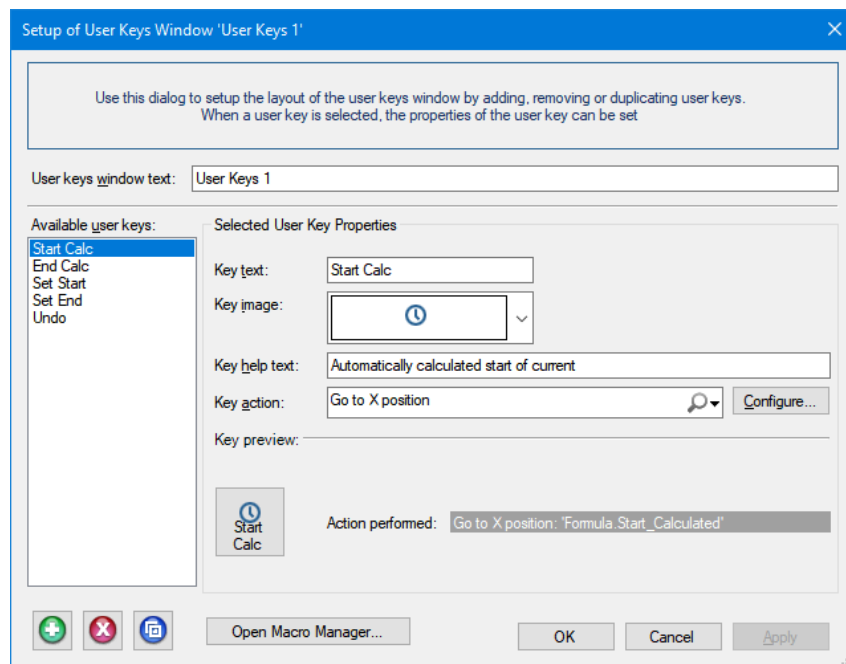


User key for undo the manual added values

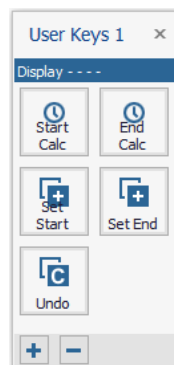
- Add the following user key:
 Key text: *Undo*
 Key Help text: *Undo manual added values*
 Key action: *Clear user data source value category User data source*



The user key configuration looks now like:



And the user key window:



10.4 User Table

Add a user table to your configuration, in this user table the various calculated values will be shown. The table looks like:

| User Table | | |
|------------|--------------------|----------|
| 1 | STL used: | 1 |
| 2 | | |
| 3 | Calculated | |
| 4 | Start | 6.968 ms |
| 5 | End | 67.56 ms |
| 6 | | |
| 7 | Used values | |
| 8 | Start | 6.481 ms |
| 9 | End | 67.56 ms |
| 10 | | |
| 11 | Results | |
| 12 | Duration | 61.08 ms |

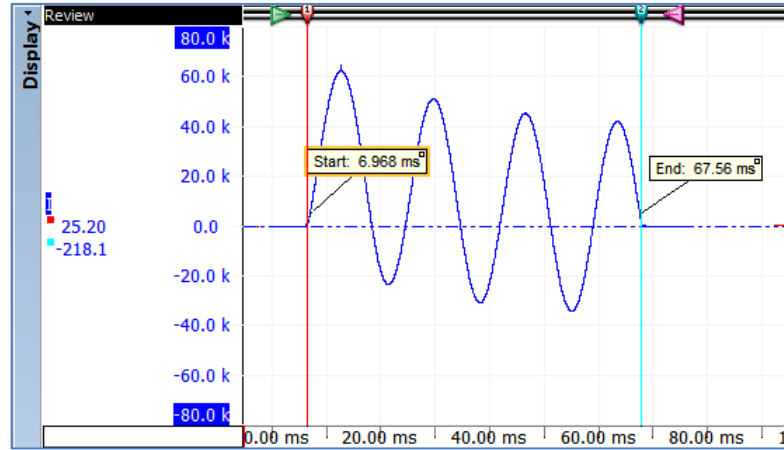
Where:

| Variable | Data source |
|-------------------------|--------------------------|
| STL Used | Formula.USE_STL |
| Calculated Start | Formula.Start_Calculated |

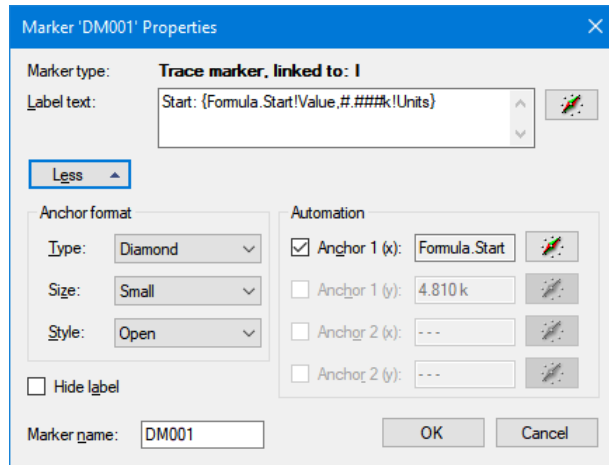
| | |
|-----------------------|------------------------|
| Calculated End | Formula.End_Calculated |
| Used Start | Formula.Start |
| Used End | Formula.End |
| Duration | Formula.Duration |

10.5 Display Trace Markers

Add two trace markers to the display, one for marking the **Start** location and one for the **End** location.

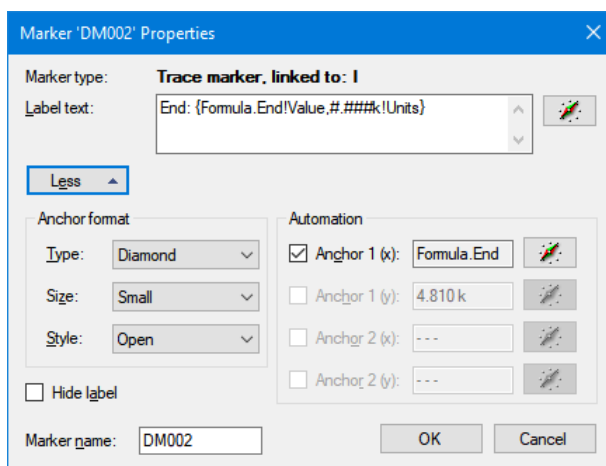


- Position the cursor around the start location of the current and add a trace marker, set the properties of the trace marker like:




The **x-anchor** is set to **Formula.Start** therefore the location will change if the used start location changes.

- Repeat this but now for the end position:




10.6 Testing the user keys

Now the configuration is ready to be used.

- To see the calculated start position of the current press the first user key (Start Calc)
- Zoom in on the start area and try to locate the cursor at a better starting position
- Once you have positioned the cursor correctly you can press the user key , the current time location of the cursor is now copied into the numerical data source: **Active.UserData.StartManual**
- The **Start** formula at line 16 will now see that this data source is valid and therefore the 2nd argument is returned, if the Active.UserData.StartManual is not set then the last (3rd) argument is returned.

| | | |
|----|-------|--------------------------------------------------------------------------------------------|
| 15 | | Check if the calculated start and end have to be overruled by the manual entered positions |
| 16 | Start | @IIF(Active.UserData.StartManual; Active.UserData.StartManual; Formula.Start_Calculated) |

- Notice that the duration is affected and that the display trace markers are repositioned. 
- Now click at the **Undo** user key, the duration resets to the original calculated value and the markers show again the calculated start and end locations.

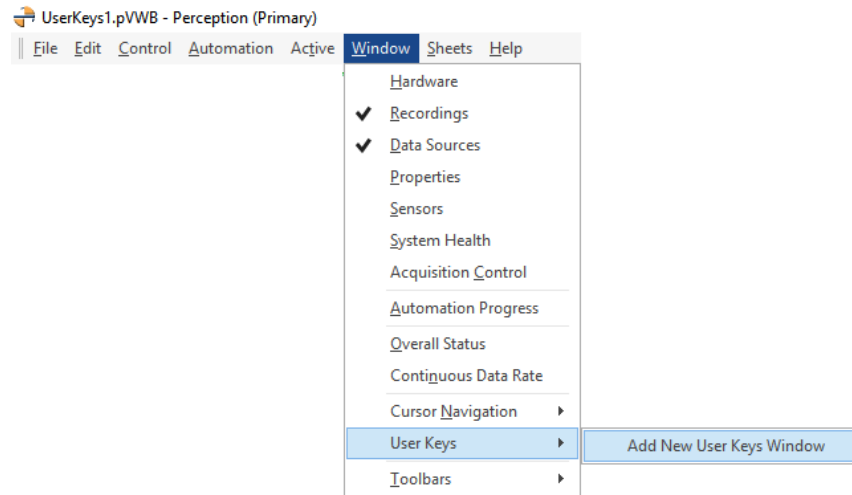
The recording file *OverrideAutomaticCalculatedValues.pNRF* can be opened to see this example working.

11 Example open next and previous recording

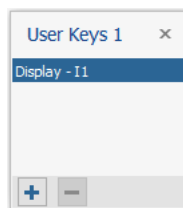
In this example you can quickly open the next or previous recording via user keys. There will be also a key for defining a reference recording which can be used for comparing recorded waveforms.

Do the following steps:

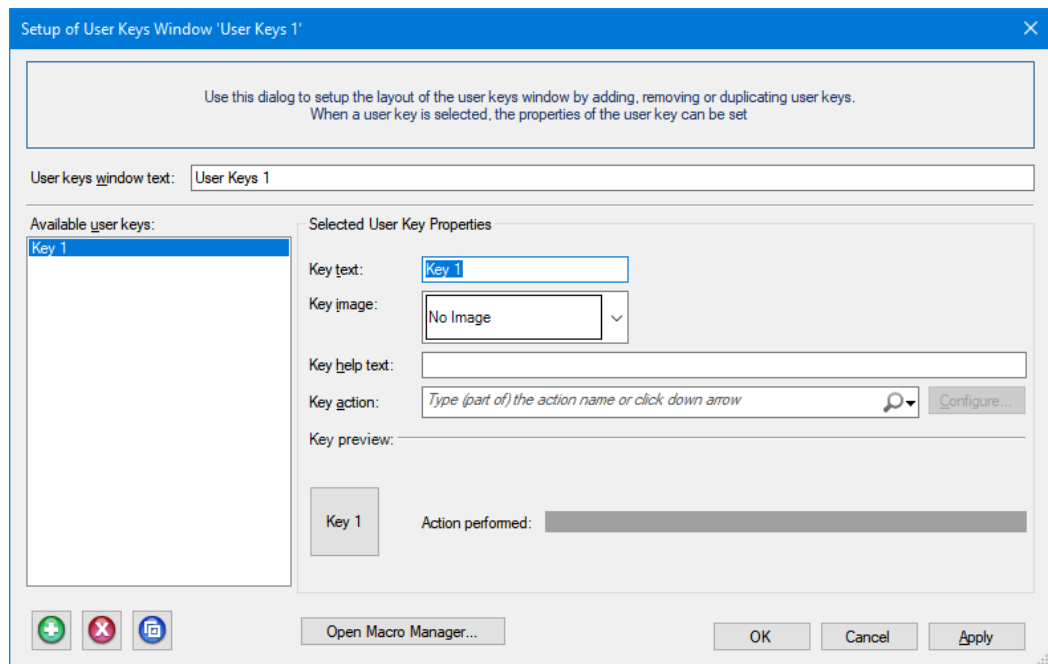
- Add a new User Keys Window



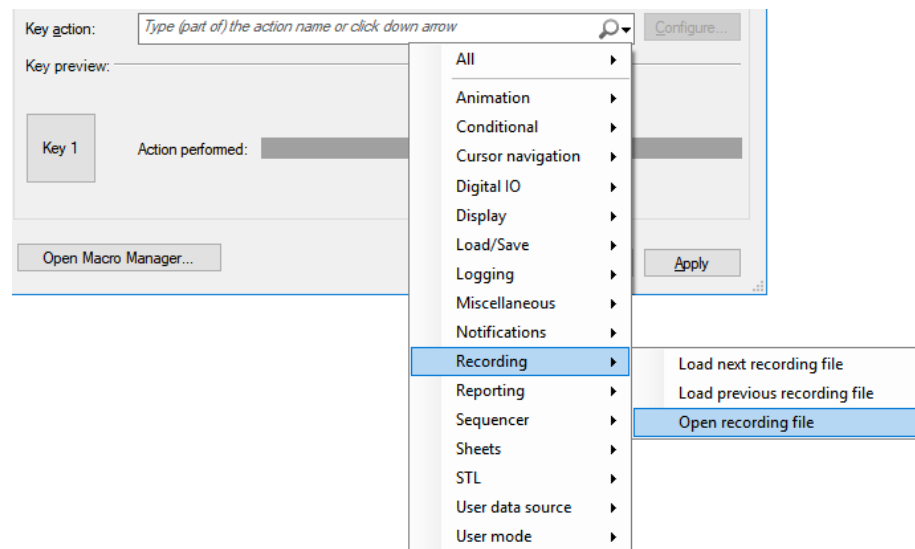
- Add a new button to this User Keys window by clicking at the + button at the bottom



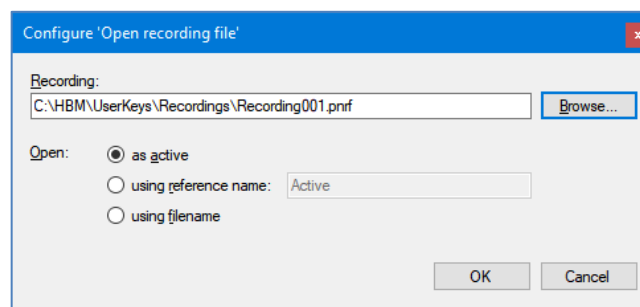
- This brings you up in the Setup dialog of the user keys.



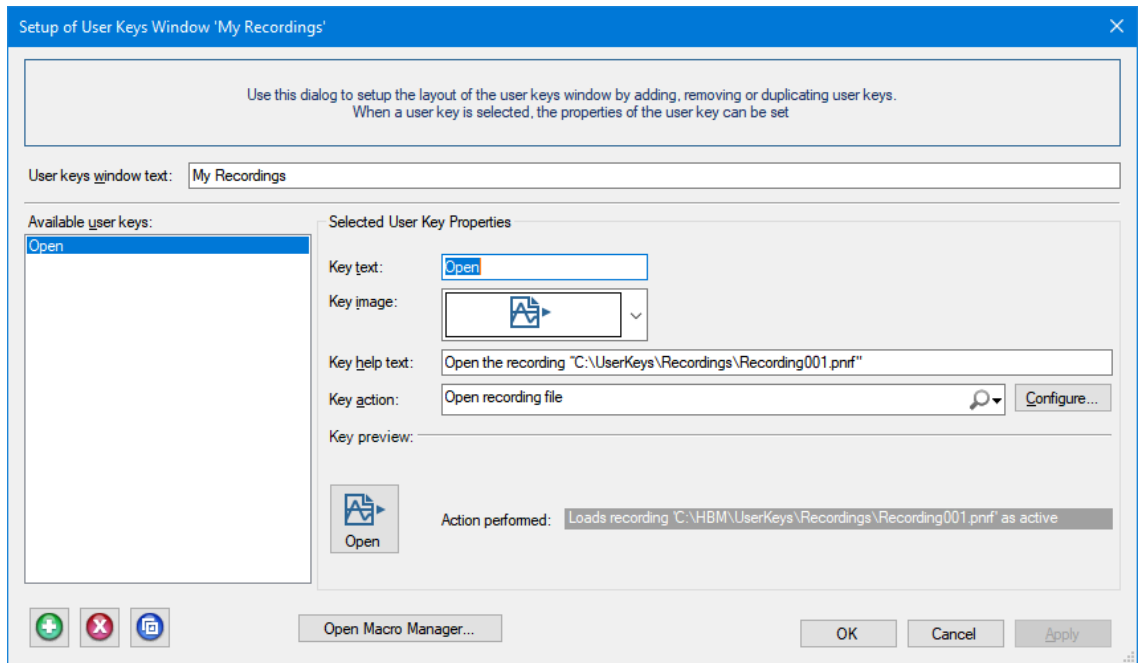
- The first step is to change the *User keys window text* to: **My Recordings**
- Now we will select the **Open recording file** action from the action list and add it to the new user key button.



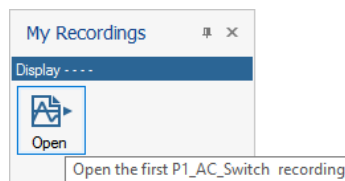
- Do not forget to press the **Add** button after you selected the user key action!
- Now you have to configure this action, you can do this by clicking at the **Configure...** button, or double clicking at the action in the selected list.
- Select the first recording from the recordings you just have created,
c:\HBM\UserKeys\Recordings\Recording001.pnrf



- Close this dialog, and you see that the *Key preview* gives you information on the configuration. If the window is too small you can enlarge it. The action comes with a predefined key image which is automatically used, however you can change this and use your own image, we will do this later.
- Set the *Key text* to: **“Open”**
- Set the *Key help text* to: **“Open the recording
“C:\UserKeys\Recordings\Recording001.pnrf””**



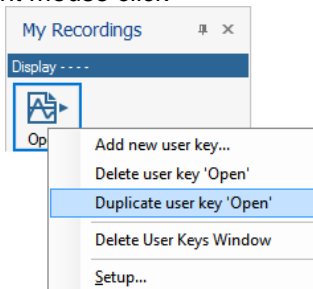
- Now your key has been configured and is ready to be used, therefore close the window (OK)
- Test your new user key button. First hover over it with the cursor to see the tool tip.



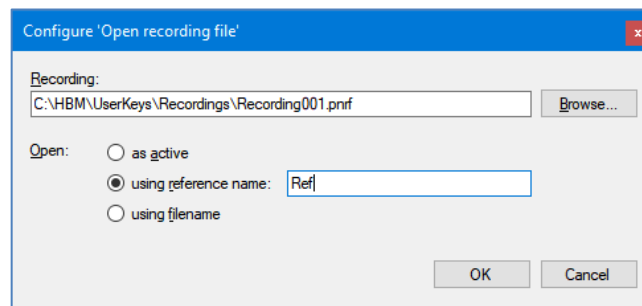
- Click at the button and the recording will be loaded.


In the next steps you will add 3 more buttons to be used for opening a recording as reference recording and two buttons for opening the next or the previous recording.

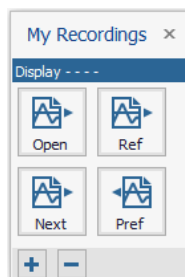
- Duplicate the Open key, use a right mouse click



- Modify the setup of this new button, and set:
 - *Key text:* **Ref**
 - *Key help text:* **Open P1_AC_Switch recording as reference recording**
 - Modify the configuration of the *Open recording file* key action, now select the radio button option *Using reference name* and set it to **Ref**



- Close this window
- Create **New** button for loading next recording, you can use the  button at the lower left corner of the Setup dialog.
 - *Key text:* **Next**
 - *Key help text:* **Load next recording**
 - *Key Action:* (Recording) **Load next recording file**
- Create New button for loading next recording:
 - *Key text:* **Prev**
 - *Key help text:* **Load previous recording**
 - *Key Action:* (Recording) **Load previous recording file**

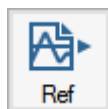


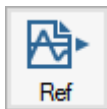
- Test the user-key buttons, to be able to test this nicely you should have already have some recordings in recordings folder.

We now will add some formulas to calculate the maximum value of the voltage and current signals, we will do this for both the active and reference signals. We will use these values to get a ratio between the active and reference waveforms.

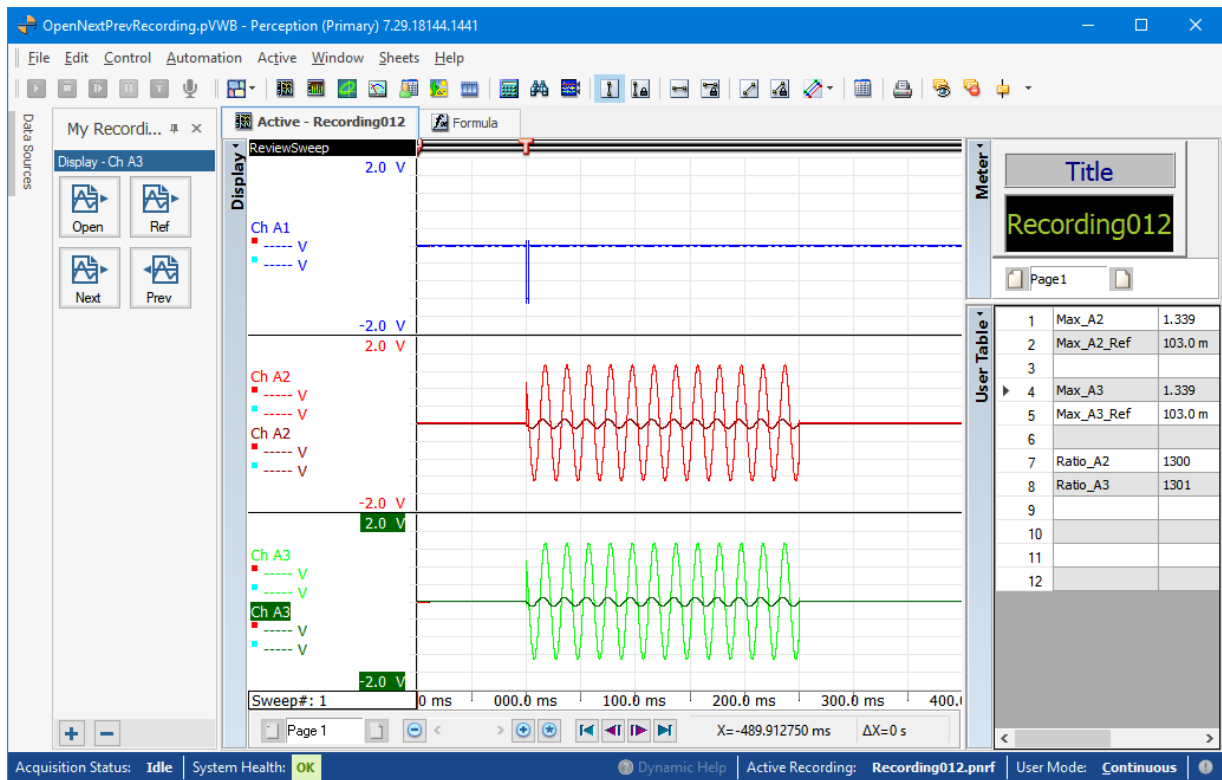
- Enter the following formulas:

| Name | Formula |
|------------|-------------------------------------------|
| Max_A2 | @Max(Active.Group1.Recorder_A.Ch_A2) |
| Max_A3 | @Max(Active.Group1.Recorder_A.Ch_A3) |
| Max_A2_Ref | @Max(Ref.Group1.Recorder_A.Ch_A2) |
| Max_A3_Ref | @Max(Ref.Group1.Recorder_A.Ch_A3) |
| Ratio_A2 | 100 * Formula.Max_A2 / Formula.Max_A2_Ref |
| Ratio_A3 | 100 * Formula.Max_A3 / Formula.Max_A3_Ref |



- Click at the user-key Ref ; this will set the recording Recording001.pnrf as the reference recording

- Add the reference traces Ch A2 and Ch A3 to the display
- Modify their colors ■ ■ and ■ ■
- Add the recording title to the meter
- Add the Max and ratio values to the user table (Drag the data source from the Data Source window and drop it below in the User Table)



- Now use the load next and previous user keys to load the various recordings.

The result can be found in the virtual workbench file: *OpenNextPreviousRecording.pVWB*

12 Importing Info sheet and user-keys

In this example we will read an ASCII file containing user data. This data will be added as string or numerical values into the **Active.UserData** data sources branch. The ASCII file in this demo looks like:

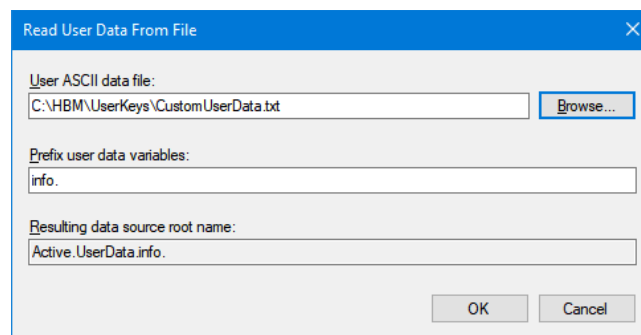
```

CustomUserData.txt - Notepad
File Edit Format View Help
Customer;Clarc
Order;201656112
LengthDevice;24;cm
Weigth;55m;kg
Color;Blue
    
```

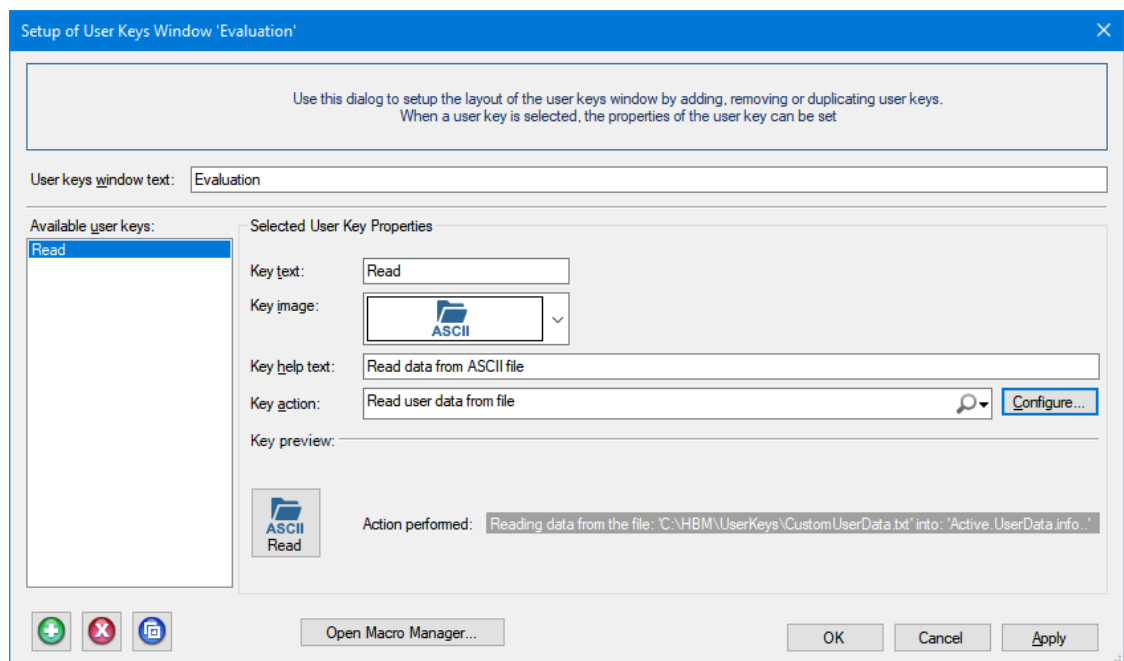
Before you start this demo make sure the Info sheet is loaded and visible in Perception. First you have to add a user key which will read the ASCII file after clicking on it and later on we will add this action to the Perception automation.

- Add a new user key to the **Evaluation** user key group
- Set the **Key text** to **Read**
- **Key help text:** **Read data from the ASCII file**
- Add user key action: (user data source) **Read user data from file**

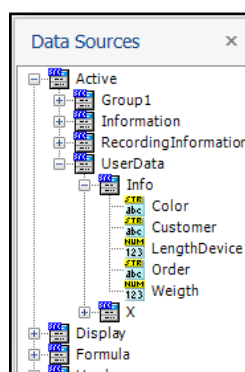
- Configure the action:
 - Set the *User ASCII data file* to: **C:\HBM\UserKeys\CustomUserData.txt**
 - Set the *Prefix user data variables* to: **Info.** (Do not forget the last dot!)



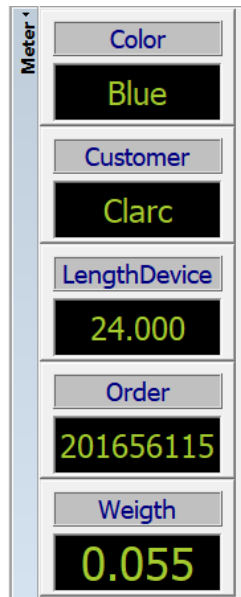
- This results in:



- Test the new key; after pressing the **UserData** is extended see picture below.

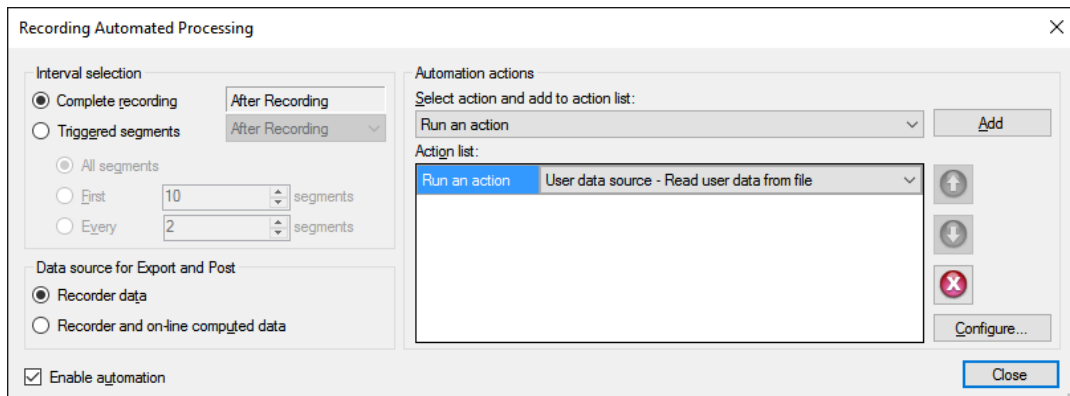


- Add the Order data source to the meter.
- The meter now shows the data from the ASCII file:

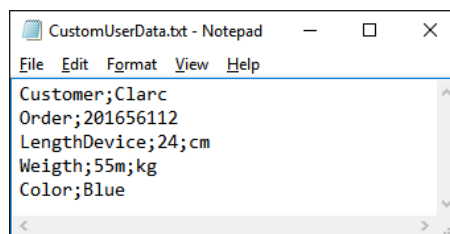


Now we will add this read action into the automated recording processing.

- Open the *Automated Recording Processing*
- Enable automation (selection at left bottom of the dialog)
- Add the automated action **Run an action**
- Select the **User data source – Read user data from file**
- Configure this action exactly like above; *ASCII data file to:* **C:\HBM\Training\Input\CustomUserData.txt** and *Prefix user data variables to:* **Info**.



- Open the text file **C:\HBM\Training\Input\CustomUserData.txt** with notepad



- Modify the order number, save the file and do a recording. Check if the order number in the meter has changed.

The result can be found in the virtual workbench file: *InfoSheetUserData_1.pVWB*

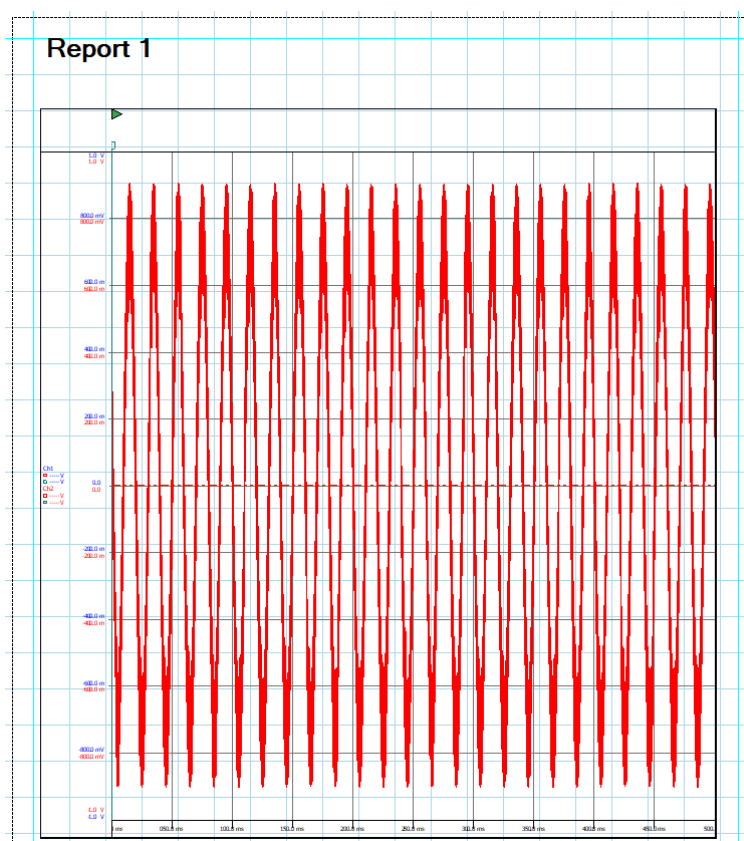
13 Example using multiple reports

This example shows how you can use different reports using user key actions. To be able to do this Perception will be configured with two different displays having different layouts. The first display is used by the first report and the other display for the second report. Perception has only one Report sheet, this means that when working with two different reports the report sheet has to load its configuration from a Perception report file. In this example you will create two report layout files; via a user key one of the two reports will be loaded and then posted to a Word document.

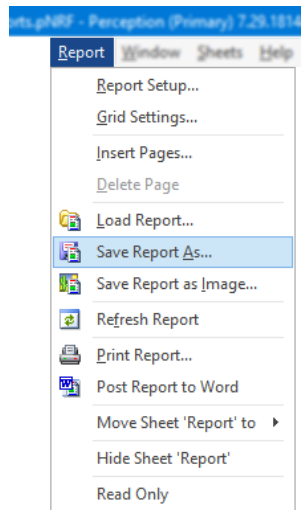
It is assumed that you have at least two displays in your configuration: Display and Display2.

Create two different reports

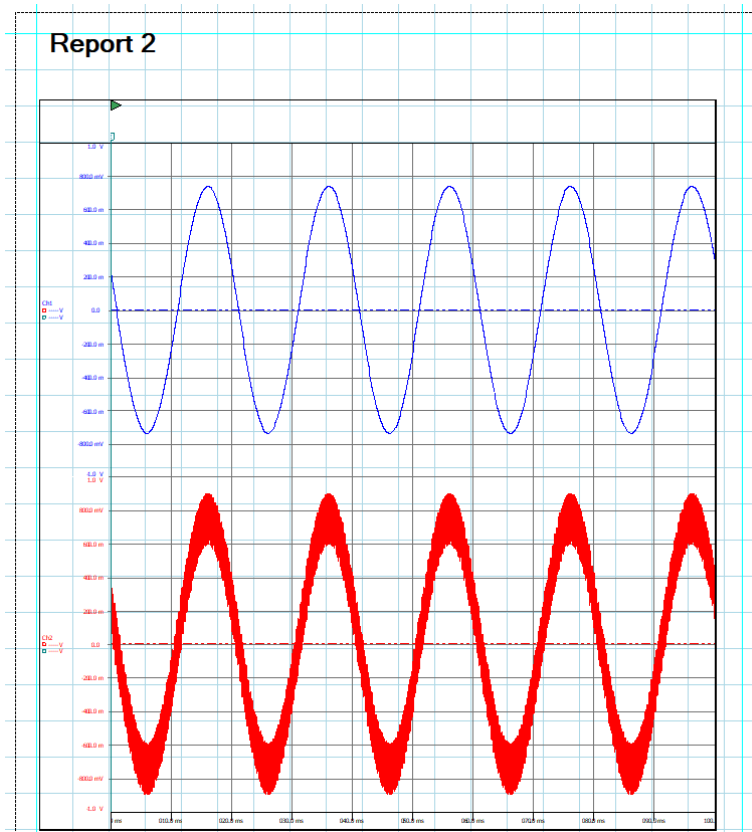
- Open the report sheet and create the following setup:



- Link the display to your first display probably called **Display**
- Save the report layout to **Report1.pReportLayout**



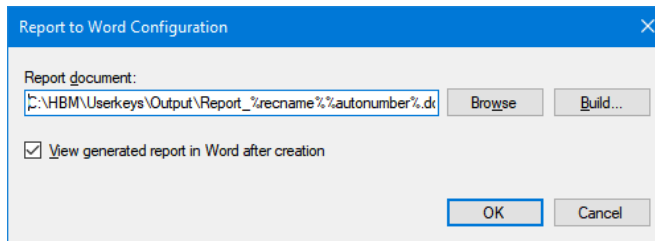
- Modify the report, change the text label and link the display to your second display probably called **Display2**



- Save the report layout to **Report2.pReportLayout**

Create three macros to be used by the two user keys, these macros will load the correct report layout file and post the report to Word.

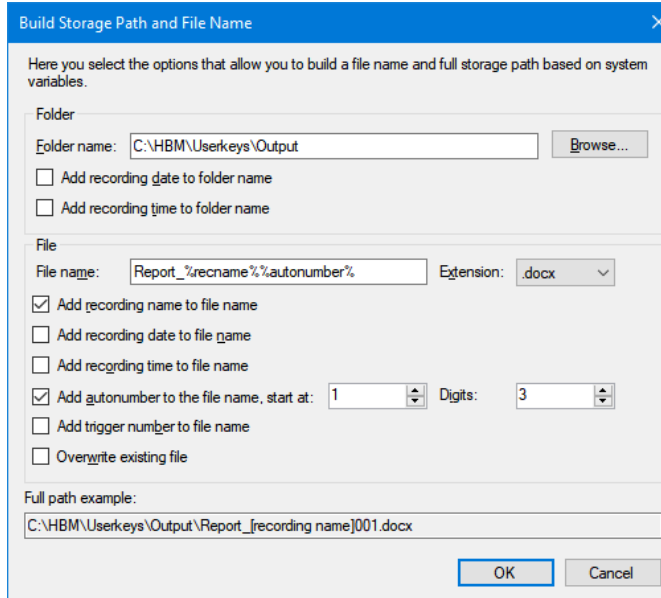
- Open the Macro Manager
- Create new Macro by clicking at button in the Macro Manager dialog
- Enter the name: **Macro_Post_Report_To_Word**
- Select the **Post Report to Word** action from the **Reporting** category
- Set the following configuration:



Report to Word Configuration

Report document:

View generated report in Word after creation



Build Storage Path and File Name

Here you select the options that allow you to build a file name and full storage path based on system variables.


Folder
 Folder name:

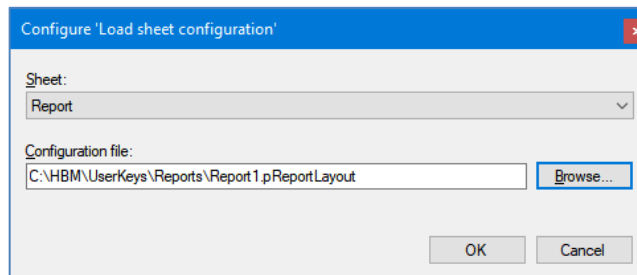
Add recording date to folder name
 Add recording time to folder name

File
 File name: Extension:

Add recording name to file name
 Add recording date to file name
 Add recording time to file name
 Add autonumber to the file name, start at: Digits:
 Add trigger number to file name
 Overwrite existing file

Full path example:

- Create new Macro by clicking at  button in the Macro Manager dialog
- Enter the name: **Macro_Report1**
- Select the **Load sheet configuration** action from the **Load/Save** category
- Set the following configuration:

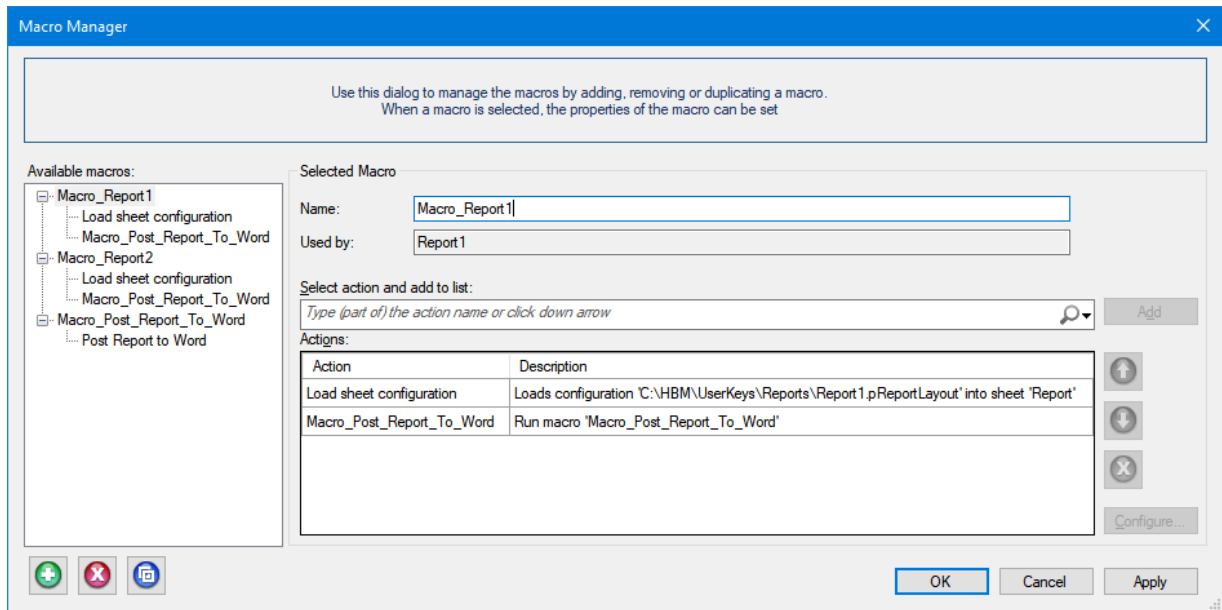


Configure 'Load sheet configuration'


Sheet:


Configuration file:

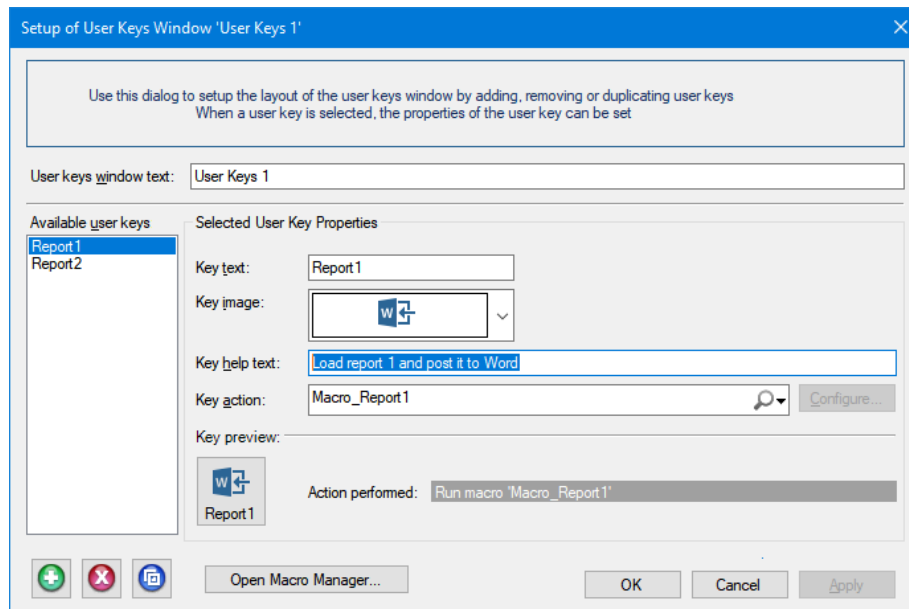
- Add the macro **Macro_Post_Report_To_Word**
- Add another macro called: **Macro_Report2**
- Again add the **Load sheet configuration** action from the **Load/Save** category
- Now select as configuration file: "*C:\HBM\UserKeys\Reports\Report2.pReportLayout*"
- And again add the macro **Macro_Post_Report_To_Word**
- The configuration looks like:



The macros have been set, now you have to create two new user keys which will call the appropriate macro.

- Create a new user key, the key text will be “Report1”
- Assign bitmap  to the Key image
- Key help text: “Load report 1 and post it to Word”
- Key action: *Macro_Report1*

- Create a new user key, the key text will be “Report2”
- Assign bitmap  to the Key image
- Key help text: “Load report 2 and post it to Word”
- Key action: *Macro_Report2*



- Test the two new user keys

The result can be found in the virtual workbench file: *UserKeyDemo_Multiple_Reports.pVWB* or you can open the recording file: *UserKeyDemo_Multiple_Reports.pNRF*

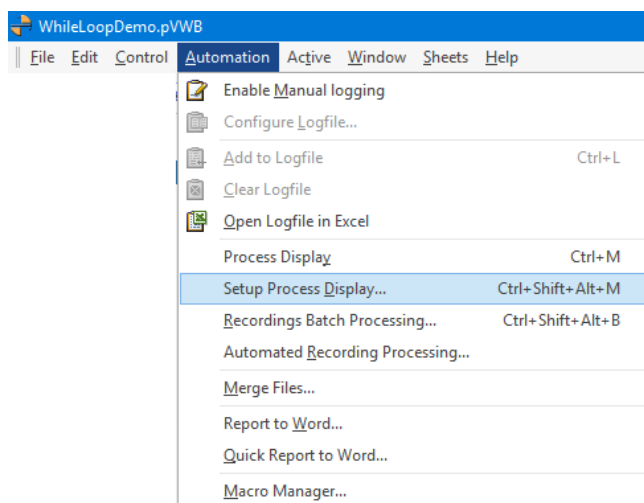
14 Example using the While Loop

This example shows how you can use the **While Loop** key actions for exporting a trace in chunks of 1 second. To be able to do this you need to write two macro's, one macro called when pressing the user key for starting the export procedure and one macro which will be called repeatedly by the While Loop. Automation will be added to a display; the ASCII export between cursors of the current trace will be setup. The export macro will now set the display cursors to the correct positions and calls the Process Display key action. This will be repeated until the cursors have passed the end of the trace. To be able to detect if the cursor has passed the end of the trace formulas will be used.

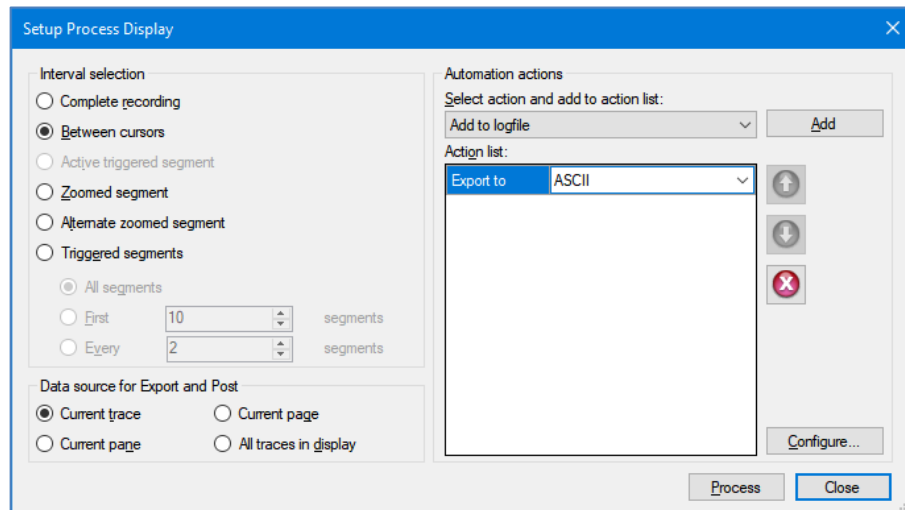
- Create the following formulas:

| Num | Name | Formula | Unit |
|-----|----------|---------------------------------------------------------------------------------------------------|------|
| 1 | | Signal used for the demo | |
| 2 | Signal | @SineWave(1k;10k;50) | V |
| 3 | | | |
| 4 | | The position used to set the cursor to the initial position when starting the exporting procedure | |
| 5 | Start | @XFirst(Formula.Signal) - 10m | |
| 6 | | Get the end location of the signal to be exported in chunks | |
| 7 | End | @XLast(Formula.Signal) | |
| 8 | | | |
| 9 | | "Boolean" variable used to detect if the cursor has reached the end of the data | |
| 10 | HasEnded | @GreaterThan(Display.Display.Cursor2.XPosition; Formula.End) | |

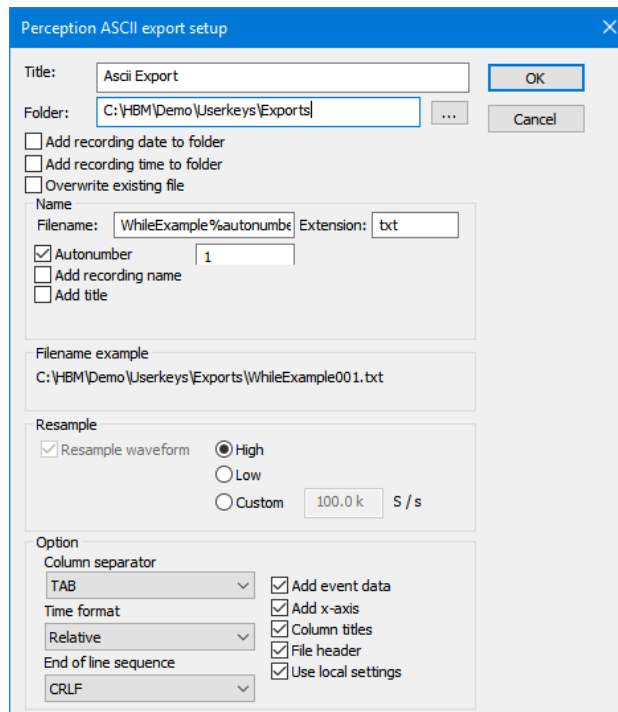
- Add the Signal trace to the active display
- Open the Setup Process Display



- Select Between cursors as interval selection
- Add the **Export to ASCII** automation action.



- Use the following configuration for the export:



Now we will create two Macro's the first Macro is called **Export** and will set the cursors of the display to the correct values and then calls the Process Display action to start the export of the data in ASCII between the cursors. The cursors are set 1 second from each other. The other macro is used to start the complete export action, in this example this will be called from a new user key.

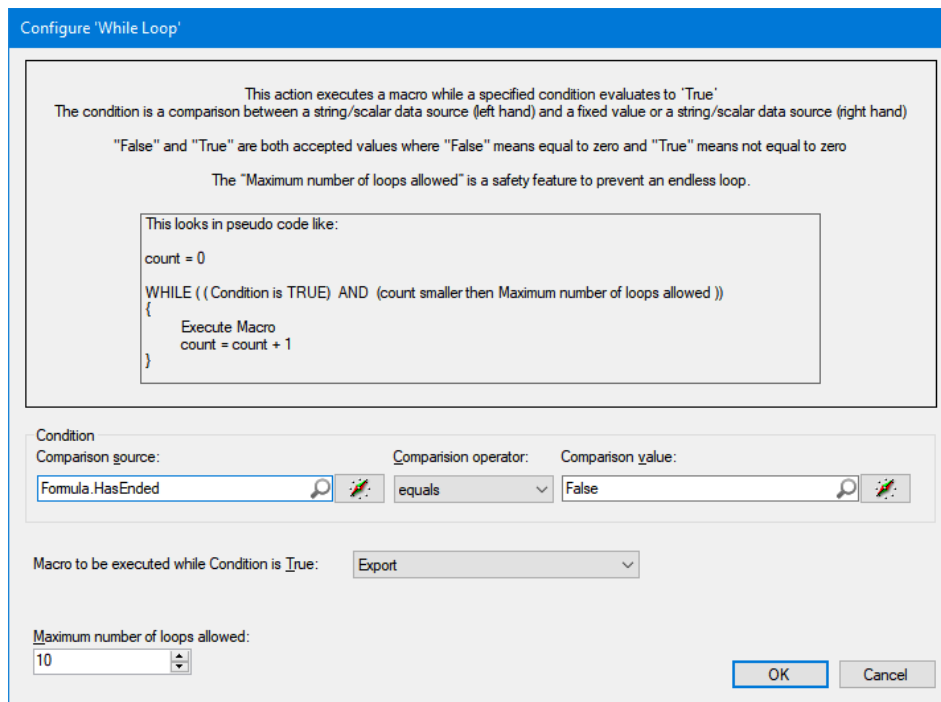
- Create a new macro called **Export**
Add the following actions to this macro:

| Action | Description |
|---------------------------------------|--------------------------------------------------------------|
| Set active cursor | Makes cursor '1' the active cursor |
| Step forward | Step '1' forward |
| Move inactive cursor to active cursor | Set the inactive cursor at the position of the active cursor |
| Set active cursor | Makes cursor '2' the active cursor |
| Step forward | Step '1' forward |
| Wait | Wait for '0.2' seconds. |
| Process Display | Process the automation on a display |

- Create the second macro called **DoExport**

| Action | Description |
|-------------------|--------------------------------------------------|
| Set active cursor | Makes cursor '1' the active cursor |
| Go to X position | Go to X position: 'Formula.Start' |
| Set active cursor | Makes cursor '2' the active cursor |
| Go to X position | Go to X position: 'Formula.Start' |
| Wait | Wait for '0.1' seconds. |
| While Loop | While (Formula.HasEnded Equals False) Do Export |

- The configuration of the **While Loop** looks like:



Configure 'While Loop'

This action executes a macro while a specified condition evaluates to 'True'
 The condition is a comparison between a string/scalar data source (left hand) and a fixed value or a string/scalar data source (right hand)
 "False" and "True" are both accepted values where "False" means equal to zero and "True" means not equal to zero
 The "Maximum number of loops allowed" is a safety feature to prevent an endless loop.

This looks in pseudo code like:

```

count = 0
WHILE (( Condition is TRUE) AND (count smaller then Maximum number of loops allowed ))
{
    Execute Macro
    count = count + 1
}
    
```

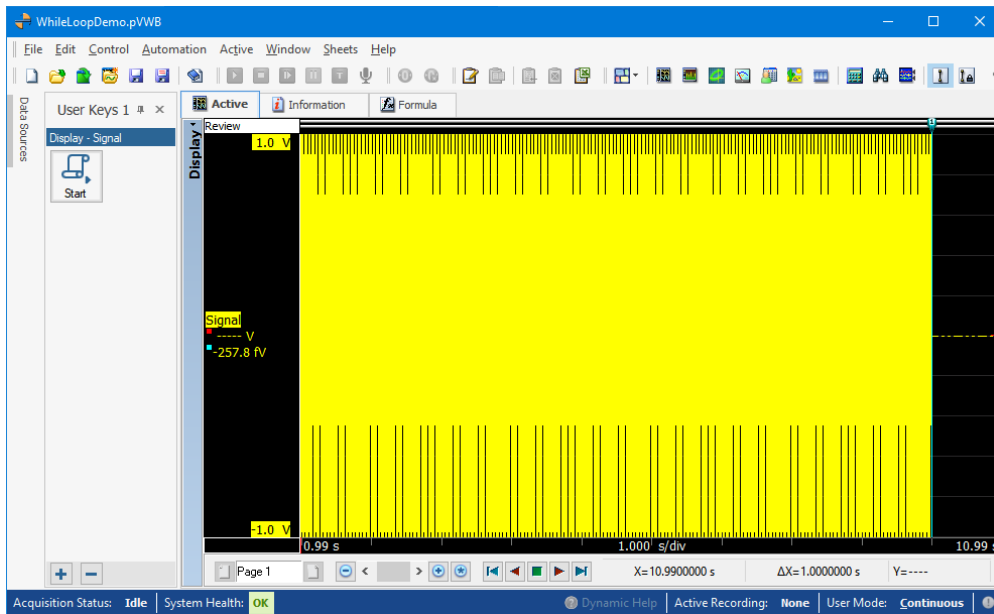
Condition

Comparison source: Comparison operator: Comparison value:

Macro to be executed while Condition is True:

Maximum number of loops allowed:

- The macro's are ready now, you have to add a new user key to run the **DoExport** macro add the text **Start** to this user key.



- You are now ready to test if the export works.

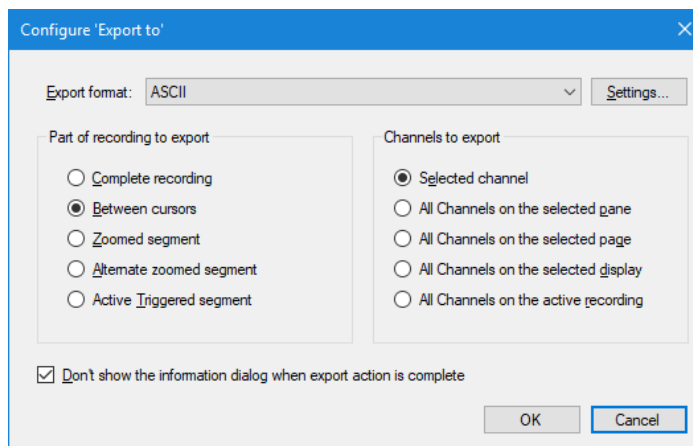
The result can be found in the virtual workbench file: *WhileLoopDemo.pVWB*

Since Perception version 7.40 the **Export to** user key action is available. It is better to use this action in the above example.

You should replace the **Process Display** action by the **Export to** action in the **DoExport** macro.

| Action | Description |
|--------------------------|--------------------------------------------------------------|
| Set active cursor | Makes cursor '1' the active cursor |
| Step forward | Step '1' forward |
| Move inactive cursor ... | Set the inactive cursor at the position of the active cursor |
| Set active cursor | Makes cursor '2' the active cursor |
| Step forward | Step '1' forward |
| Wait | Wait for '0.2' seconds. |
| Export to | ASCII exporting between cursors of selected channel |

The configuration of the **Export to** action should look like:



The ASCII format settings can be the same as used before.

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