DewesoftX® Excel Writer AddOn

DEWESoft®

SOFTWARE USER MANUAL

DewesoftX® Excel Writer AddOn V20-1

1. Table of contents

2. About this document

2.1. Legend

The following symbols and formats will be used throughout the document.

Important
It gives you important information about the subject.
Please read carefully!

Hint
It gives you a hint or provides additional information about a subject.

Example
Gives you an example of a specific subject.

2.2. Links

DewesoftX® homepage
http://www.dewesoft.com
you can download DewesoftX® AddOns when you go to: Support - Downloads – Plugins

2.3. Platform

Since version DewesoftX® X3 you can choose to install DewesoftX® 32-bit or 64-bit. All previous versions (X2, X1, etc.) only supported 32-bit.

Hint
Note that the 64-bit DewesoftX® version also needs 64-bit versions of the AddOns.
At the time of writing this documentation not all AddOns are available as 64-bit version and some older AddOns may never be converted.

If you are not sure which DewesoftX® version you have installed, you can easily see it in the About dialogue:	When the DewesoftX® version ends with (64-bit) then you have the 64-bit version, otherwise it is the 32-bit version.

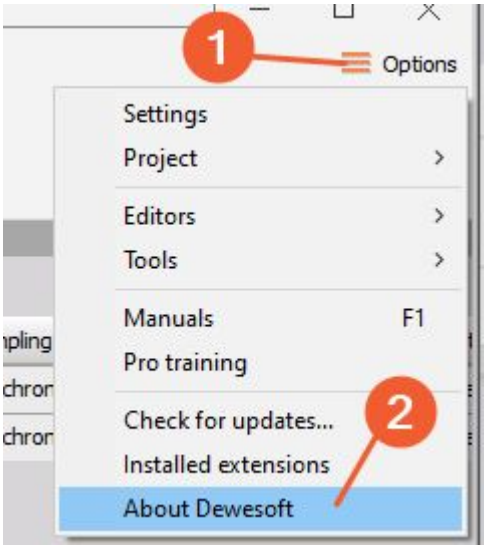


Image 1: Open the About dialogue

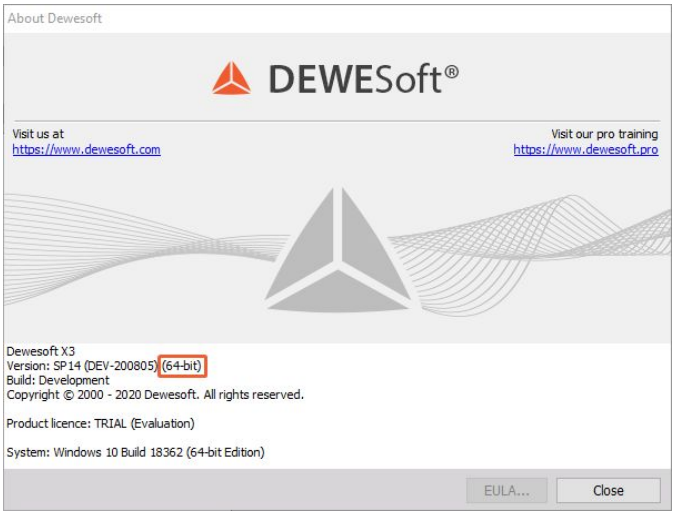


Image 2: About dialogue 64-bit

2.4. Compatibility

The Module requires at least DewesoftX® X2. It is compatible with DewesoftX® X 3 32-bit or 64-bit and Excel® 2007 (or higher).

2.4.1. Update to Version 1.4.0

Due to the multi-worksheet feature the setup structure of the plugin has changed significantly in version 1.4.0 and greater of the plugin.

As soon, as you load an existing DewesoftX® channel setup file with the new Module version 1.4.0 (or higher), the older setup files will be updated automatically. There is usually no manual user-interaction required, but it is strongly recommended that you check if your setup is still okay and that it does not show any warnings or errors.

Important
When you start to use version 1.4.0 of the Module, the old setups will be updated automatically. Keep in mind, that the older Module versions 1.3.x (or lower) will not be able to read the new structure: e.g. in the case when you have multiple PCs running different versions of the Module, you it is highly recommended to update all instances, so that you can share the setups.

2.4.1.2. Trigger Count Channel

If you have used the Trigger Count channel, you will see errors in your setup after upgrading to V1.4.0. You must manually fix these errors (e.g. by reassigning the Trigger Count Channel). This cannot be done automatically because the Trigger Count Channel in the older versions was a single global instance, but since V1.4.0 you can have multiple Trigger Count Channels (one per worksheet).
E.g. when you have used the Trigger Count channel in the Excel® Table Definition you will see an error as illustrated in Image 3. Just edit the Trigger Count (Table row with Id 1) and assign the new Trigger

Count channel, which should be named 'Trigger Count 1'. This will resolve the error and everything should work again as expected.

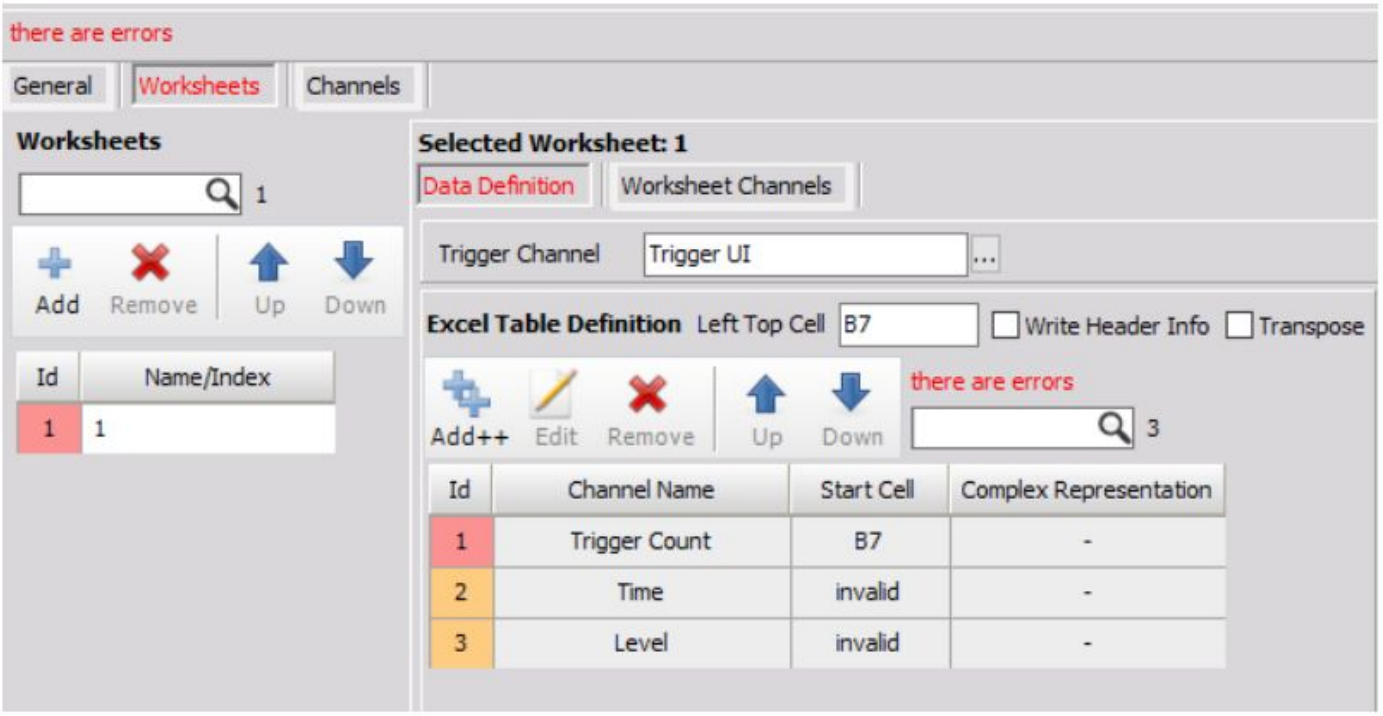


Image 3: Trigger Count Error messages

2.5. Files and Directories

The actual location of the directories on your computer may vary depending on your computer's locale settings and the settings you chose when installing DewesoftX®.

2.5.1. Important DewesoftX® Directories

The following tables show the default paths of your DewesoftX® installation. Note, that the paths may be different, depending on your operating system, DewesoftX® version and language settings.

2.5.1.1. DewesoftX® Measurement Unit [recommended]

Name	Explanation	Platform	Default path
Bin	Contains DEWSoftX.exe	32-bit	D:\Dewesoft\Bin\X3
		64-bit	D:\Dewesoft\Bin64\X3
Addons	The files for Modules (.dll, mth) must be copied into this directory	32-bit	D:\Dewesoft\Bin\X3\Addons
		64-bit	D:\Dewesoft\Bin64\X3\AddOns64
Data	Folder for the measurement data files		D:\Dewesoft\Data

Setups	Folder for the setup files	D:\Dewesoft\Setups
System	Folder for the project files	D:\Dewesoft\System\X3
Log	Folder for the log files	D:\Dewesoft\System\X3\Logs

The paths may be different depending on your DewesoftX® version.

2.5.1.2. Windows Standard

Name	Platform	Default path
Bin	32-bit	C:\Program Files\DewesoftX\Bin
	64-bit	C:\Program Files\DewesoftX\Bin64
AddOns	32-bit	C:\Program Files\DewesoftX\Bin\Addons
	64-bit	C:\Program Files\DewesoftX\Bin64\Addons64
Data		C:\Users\Public\Documents\Dewesoft\Data
Setups		C:\Users\Public\Documents\Dewesoft\Setups
System		C:\Users\Public\Documents\Dewesoft\System
Log		C:\Users\Public\Documents\Dewesoft\System\Logs

The paths may be different depending on your DewesoftX® version and the language of your operating system.

2.6. Licensing

The Module requires a valid DewesoftX® license.
To test the Module you can use an *Evaluation license*.

2.6.1. Requesting an Evaluation license

You can request an Evaluation license from our homepage:
http://www.dewesoft.com/registration

1. Click on Evaluation license
2. Fill out all the required fields
3. Click the **Request** license button

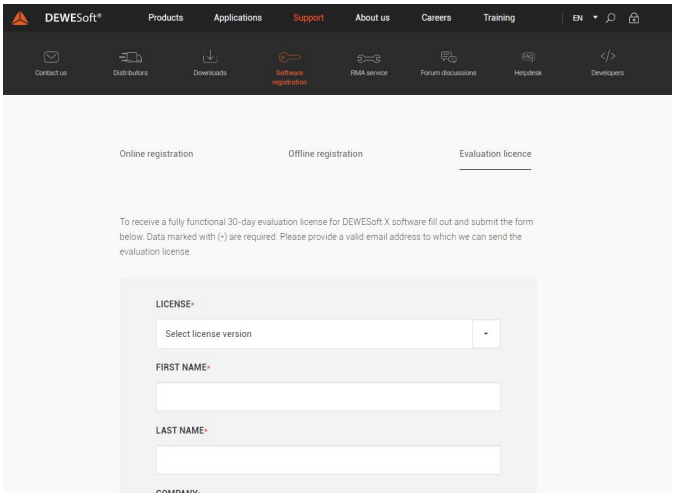


Image 4: Request Evaluation License

2.6.2. Activating the Evaluation license

When you have received your trial licence key, open DewesoftX®, go to *Options- Settings*, select Licensing from the list. Click on *Create new license* and enter the *License number*.

Then click the small arrow for *ONLINE license registration*.

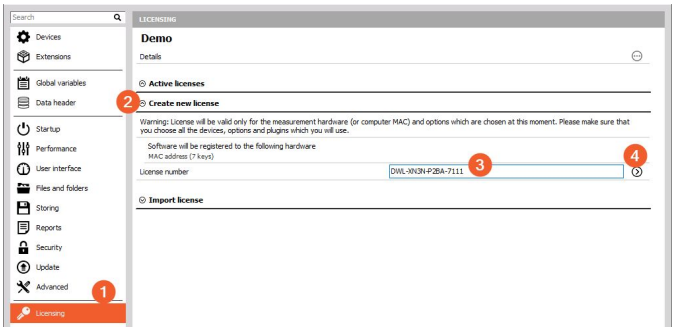


Image 5: Enter license key

After your license has been validated by our servers, the new license will show up in the list of *Active licenses*.

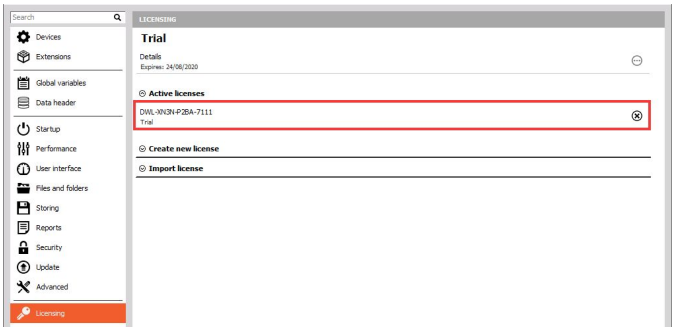


Image 6: Valid trial license

2.7. Module Installation

Make sure to use the correct file for your platform (see chapter Platform):

Platform		Module file	Example of Modules Folder
32-bit	Copy the file:	ExcelWriter.dll	to D:\Dewesoft\Bin\X3\AddOns
64-bit		ExcelWriter64.dll	to D:\Dewesoft\Bin64\X3\AddOns64

Then you can start DewesoftX® and register the Module (aka. Extension). Click *Settings - Settings...*, select Extensions and click the plus sign ❶. Then find the *Excel Writer Module* in the list and activate it ❷ (i.e. click the check-box in Image 7) - when the Module does not show up in the list, you may need to register it first (see chapter Registering the Plug-In)

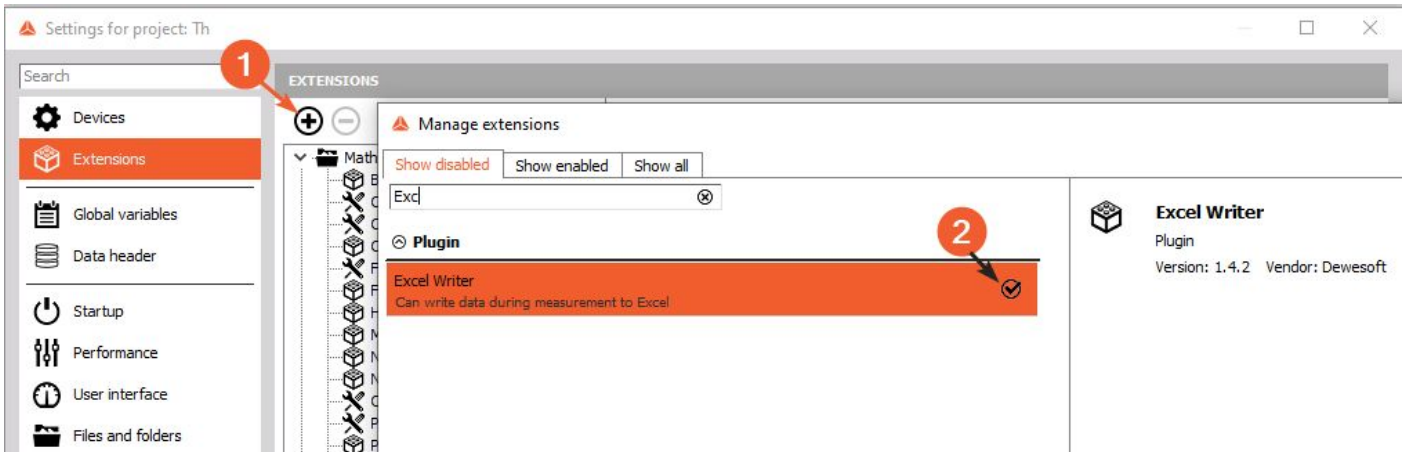


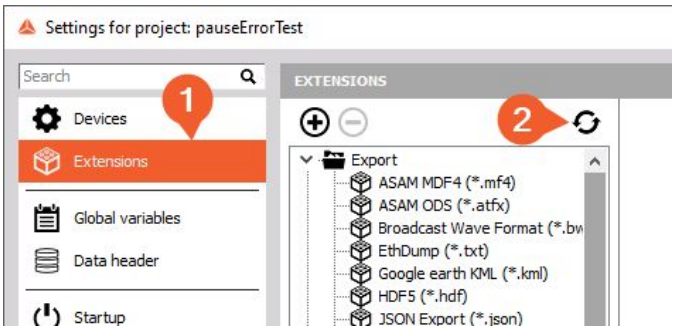
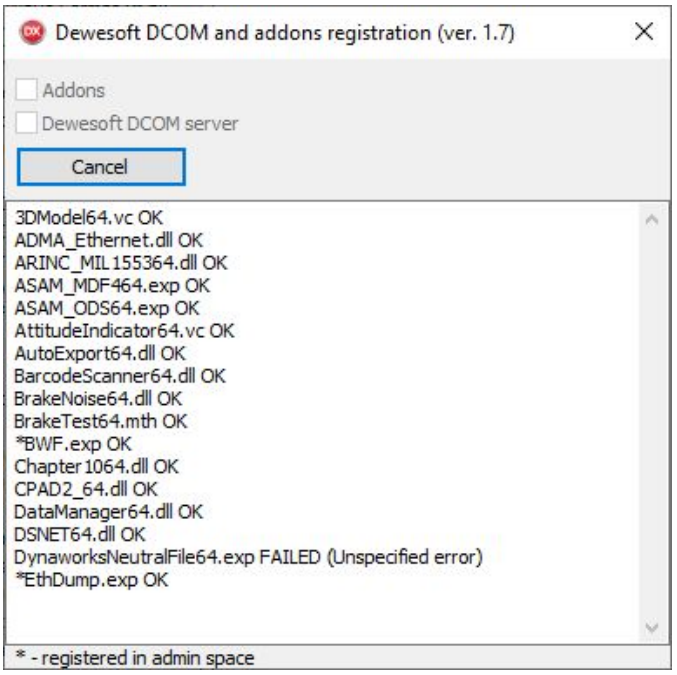
Image 7: Enable Plug-In

2.7.1. Registering the Plug-In

Before you can use Modules in DewesoftX®, the Modules must be registered once.

When DewesoftX® is started it will try to register all Modules (dll files) that it finds in the Addons folder. But in order to do that, DewesoftX® requires administrator permissions (because it must write to the Windows® registry). When DewesoftX® is not started with administrator permissions, the registration cannot be done automatically.

When the Module does not show up in the *Extensions list*, you must press the Refresh button (see in Image 8). Note: you may need to start DewesoftX® as administrator (depending on the UAC settings of your Windows user/installation).	When you have pressed the **Refresh** button, then you will see the registration Window in Image 9 for a short time. After that, you must restart DewesoftX®.

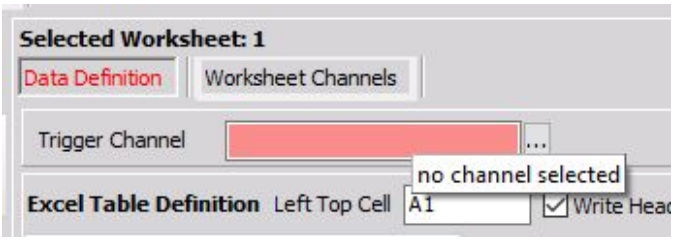
Also make sure that you use the correct dll file for your platform (32-bit or 64-bit): see chapter Platform	
 *Image 8: Extensions: Refresh button*	 *Image 9: Registration Window*

2.8. Input Fields

2.8.1. Input Confirmation

When you change the value of an input field, the background colour of the input field will turn yellow to indicate that you have changed something and that this change has not been confirmed yet. Your input will automatically be confirmed when you set the focus to another input field (i.e. by clicking with the mouse or by pressing the key). You can also press to manually confirm your change.	NewValue
After the input has been confirmed the background colour of the input field will be white again (or red/orange, when there are errors/warnings).	NewValue

2.8.2. Input Warnings/Errors

An invalid input may cause a warning and error. Warnings will be highlighted in orange, errors in red. When you hover over the input field you will see a hint with a detailed description of what is wrong:	

3. Module Settings

After you have installed the Module (see chapter Module Installation), start DewesoftX® and go to *Options – Settings...*:

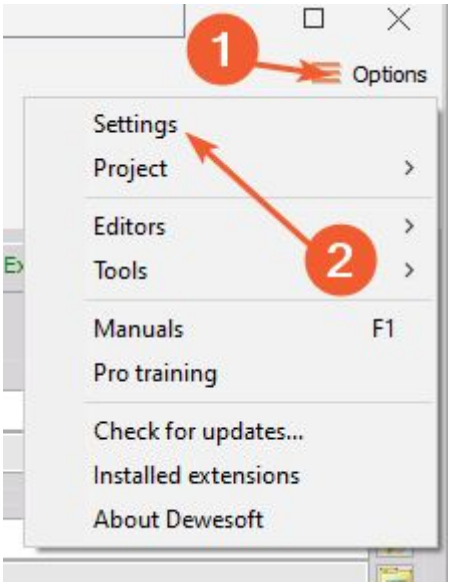
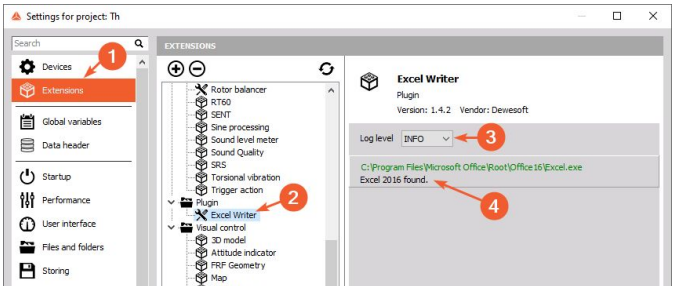


Image 10: Settings Image

To open the *Module Settings* click on *Options – Settings....*

Note: *Options* will be disabled during the measurement.



11: Enable Plug-In

❶ Go to the Extensions section and press plus button

❷In the Extensions section look for the node named Excel Writer. You will see the settings of the Module at the right of the screen:

❸ see chapter Log files

❹ see chapter Excel® Version Info

3.1. Log Settings

These are the log-settings for the current device.

The log-level defines how much log-information will be written (it is recommended to use the default INFO) – see also Log levels.

The log-files have a feature to limit the maximum amount of disk space that will be used. Whenever the log file grows larger than *Max. file size [MB]*, it will be closed and a new log-file will be created. When the maximum number of log files (defined by *No of log files*) is reached, the oldest file will be deleted.

3.1.1. Log files

The Module will write log files during operation. The amount of log messages is configurable via the *Log level* drop down box in the Hardware setup. The name of the logfile is ExcelWriter.log.

When the Module is started, it will immediately start to log to the windows temporary directory.
As soon as the DewesoftX® application is available to the Module, all subsequent logs will be written to the standard DewesoftX® log directory (e.g. D:\Dewesoft\System\X3\Logs).

Note: There is also a log file called ExcelWriter.dll.log in the Modules directory (see chapter Files and Directories). This will normally be empty. It will only contain messages when there is a bug very early in the Module initialization.

3.1.1.1. Log levels

With the *log level* drop down box you can set the detail level of the logging function.

If you set a high log level (e.g. TRACE, ALL) a lot of log messages will be written and the logfiles will roll over quite often. This is also dependent on the sample rate – the higher the sample rate is, the more often data will be fetched and thus more log messages will be written.

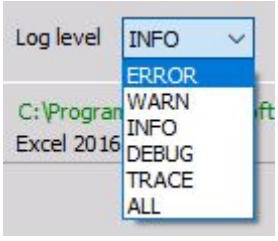


Image 12: Log level

For production-use the log level *INFO* is recommended.

Log level	Description
Error	Will only log error messages
Warn	Will also log warning messages
Info	Will also log info messages – this is **recommended** for production use
Debug	Will also log debug messages

Trace	Will also log trace messages
All	Will log all messages

3.2. Excel® Version Info

The first line shows the location of the Excel® executable and the 2nd line shows the version of the Excel® installation.

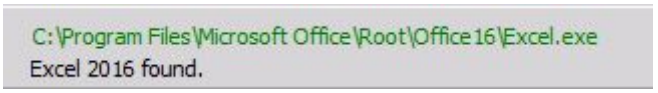


Image 13: Excel version

Hint

The font will turn red when the Excel® installation cannot be found. In this case, make sure that Excel® 2007 or higher is installed. You may try to repair your Excel® installation or even completely uninstall and then reinstall Excel®

4. Channel Setup

The following screenshot shows the Channel Setup of the *Excel Writer Module*:

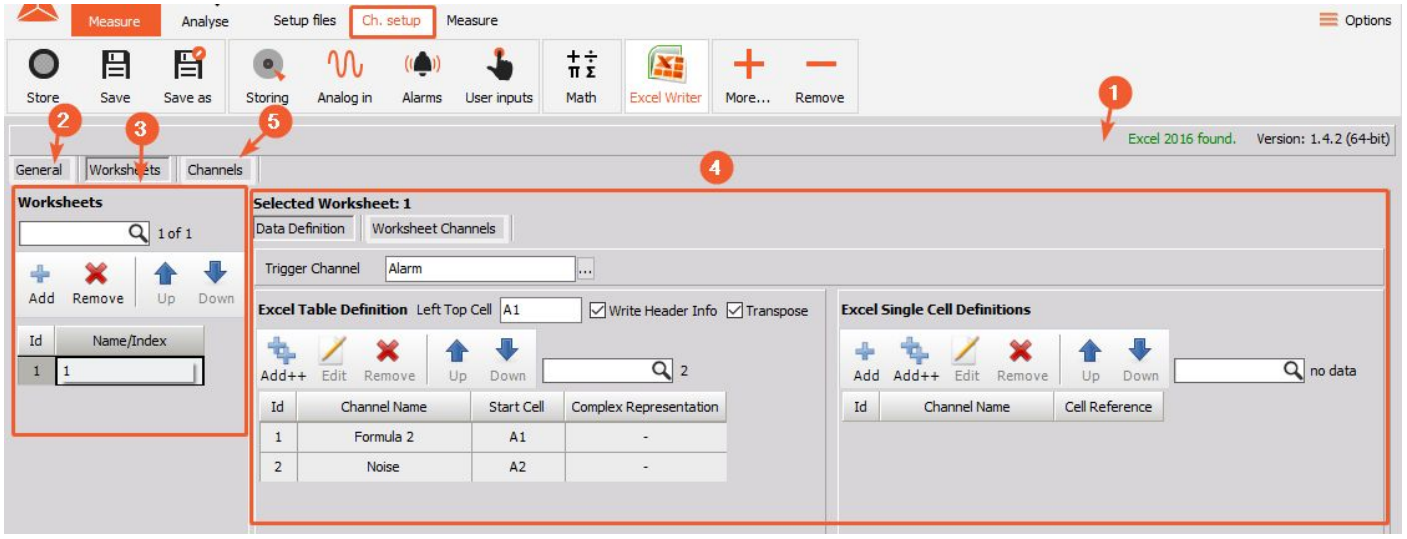


Image 14: Channel Setup Overview

Channel Setup elements:

1. see chapter Top Panel
2. see chapter General Settings
3. see chapter Worksheets
4. see chapter Data Definition
5. see chapter Module Channels

4.1. Top Panel

The top panel shows some information about the current status:

Image 15: Top Panel Elements

Top panel elements:

❶ This text will only be visible when there is some warning or error in the setup. For example if we do not selected any Trigger Channels the Trigger Channel edit box is red to indicate the error (hover the mouse over the edit-field to see a detailed error message) and also the font of the Data Definition tab-sheet is red to indicate that there is an error somewhere on this sheet.

❷ The Excel® Version Info label shows the same information as the hardware setup: see chapter Excel® Version Info

❸ This is the version of the Module (a red font indicates, that this is a debug version which should not be used in production)

4.2. General Settings

The general settings include Excel® file settings and Excel® application settings:

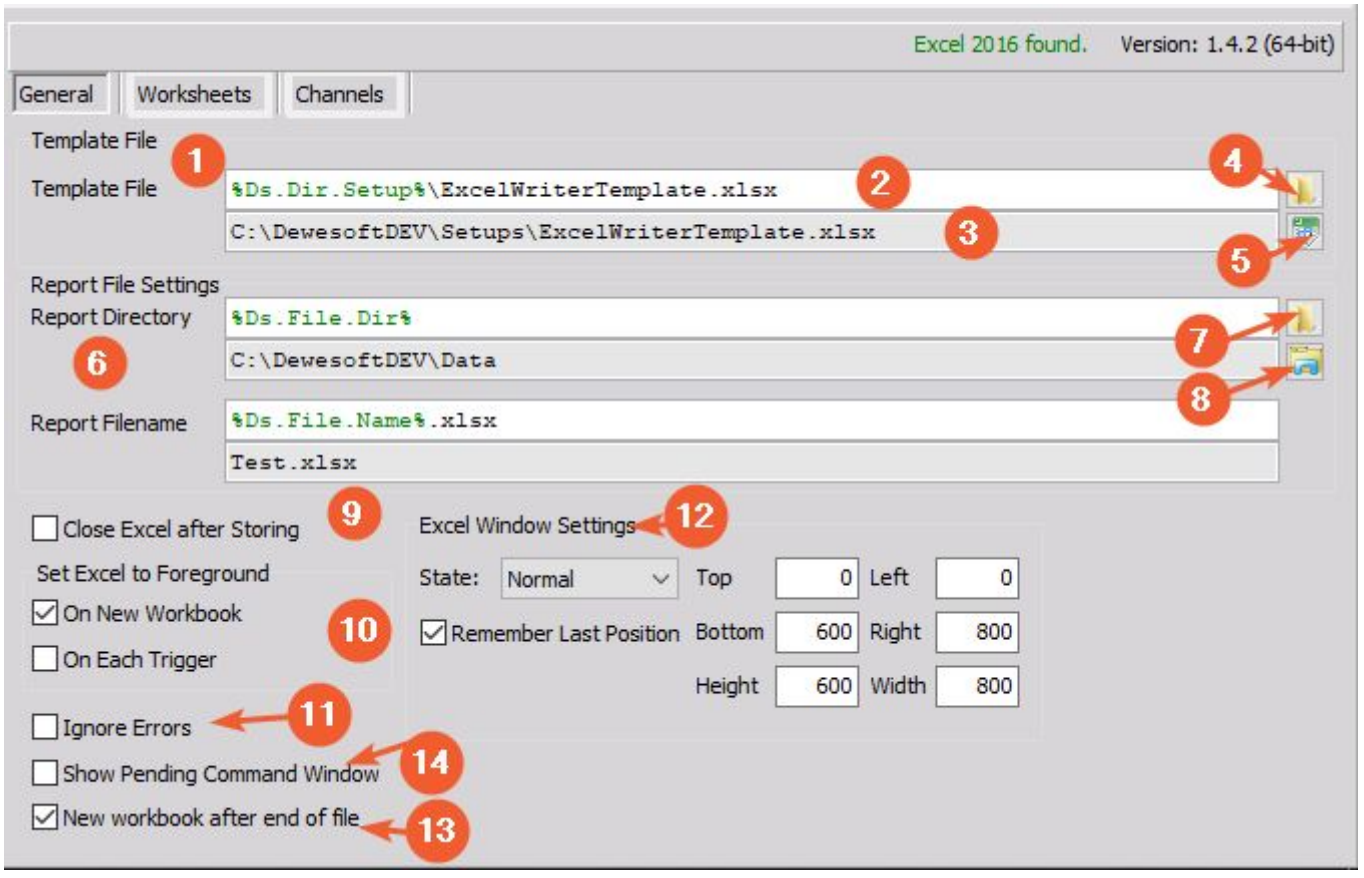


Image 16: General Settings

4.2.1. Template File

The template file ❶ must be an existing Excel® workbook file. In the Template File edit field ❷ you can enter an absolute path to the file or use variables (see chapter Variables) to specify a relative path or name for the template). The result field ❸ is read-only and will show the final resulting file path where the variables are replaced with the current values.

You can click on the button ❹ to open a file input dialogue to select a file directly (the Module will try to replace known directories with matching variables: see chapter Variables). You can also click the Open Template button ❺ to open the specified template file directly in Excel®.

Hint
When the specified Excel® template does not exist yet, and you click the Open Template button ❺, it will ask you if you want to create the file. If you accept, a new empty Excel® file will be created and opened right away.

4.2.2. Report File Settings

Here ❻ you can specify the directory and file-name of the generated Excel® Report file. When you start storing your measurement data, the *Template File* will be copied to the Report Directory and renamed to the *Report filename*. Note: when you close the *Report Directory* selection dialogue, the Module will try to replace known directories with matching variables: see chapter Variables).

You can click on the button ❼ to open a file input dialogue to select a directory directly (the Module will try to replace known directories with matching variables: see chapter Variables). You can also click the *Open Explorer* button ❽ to open the directory in Windows® Explorer.

Important
When the Report file already exists, the Module will try to overwrite it. When the Report file cannot be created (e.g. because the file already exists and is currently opened in Excel®), a message will be written to the Status Reporting.

Hint
When the specified Report Directory does not exist, it will be created.

4.2.2.1. Multifile Storing:

With the 1.4.2 version of Excel writer plugin there is an additional option “New workbook after end of file” ⓭ which facilitates the process of settings. If you want to create a report for each Multifile enable this option, if you want to have only one report for all multifiles, disable this option.

If a lower version of Excel writer is used the following instructions can be used when Multifile storing option is used:

One Excel® Report for each Multifile
To get one Excel® Report for each multi-file, just make sure that the Report filename changes whenever DewesoftX® creates a new multi-file. To do this, just include any of the following variables in the Report Filename (or Report Directory): *Ds.File.MultiFilePostfix*, *Ds.File.Name*.

One Excel® Report for all Multifiles
When you want to create only one report for many multifiles, then you must take care, not to accidentally overwrite an existing report. It is recommended that you use the variable *Ds.File.FirstMultiFilePostfix* (see page 41), because this will make sure that you don't overwrite the previous report when you go to Measure and store several multi-files after each other.

Examples
Let's say, we have activated the Multifile feature. The DewesoftX's base-filename is Test and stores each Multifile for 10 seconds. In the following table you will see all the procedures of the measurement.

Note: some parts of the report filename have been removed for better readability.

Action	Dewesoft Filename	Report-Filename		
		%FirstMultiFilePostfix%	%Ds.File.Name%	%BaseName%
Go to *Measure*				
Press **Store**	Test_0000.dxd	0000	Test_0000	Test
After 10 sec	Test_0001.dxd	0000	Test_0001	Test
After 20 sec	Test_0002.dxd	0000	Test_0002	Test
Press **Stop** : No of stored files	**3**	**1**	**3**	**1**
Press **Store**	Test_0003.dxd	0003	Test_0003	Test
After 10 sec	Test_0004.dxd	0003	Test_0004	Test
After 20 sec	Test_0005.dxd	0003	Test_0005	Test
Press **Stop** : No of stored files	**6**	**2**	**6**	**1**

Note, that the Test file in the %BaseName% case) has been overwritten -and you get only one Excel® file that only includes the data of the DewesoftX® data-files Test_0003.dxd, Test_0004.dxd and Test_0005.dxd.

4.2.3. Misc Excel® Settings

When the *Close Excel® after Storing* checkbox ❾ is activated, then the Excel® Report file will automatically be closed when all data has been written. Otherwise the Report file will only be saved, but remains opened by Excel®.

Important
Note, that a Report file that is currently opened by Excel® cannot be overwritten. Thus it is usually a good idea to automatically close Excel® after storing.

The Set Excel® to Foreground settings ❿ can be used to automatically make Excel® the foreground window:

- *On New Workbook*: Whenever a new workbook is created: i.e. when you have activated the mulit-file feature, this may occur multiple times.
- *On Each Trigger*: This happens whenever the Module has written some data to Excel®. Be careful with this setting: when the trigger fires very often, it may be difficult to work with the windows.

When you start the measurement, the Module will first check if the setup is valid. If not (e.g. because you did not select a trigger channel, ...), then the Module cannot work.
When the I*gnore Errors* ⓫ checkbox is unchecked , the Module will show a warning dialogue, so that you will immediately notice the problem, otherwise the measurement will start anyway, but the Module will not work.

If you are transferring a lot of data to the Excel sheet the Excel program will need some time to process all the data. If you enable the ⓮ “Show Pending Command Window” checkbox, a pop-out warning will appear that indicates Excel is still processing the data.

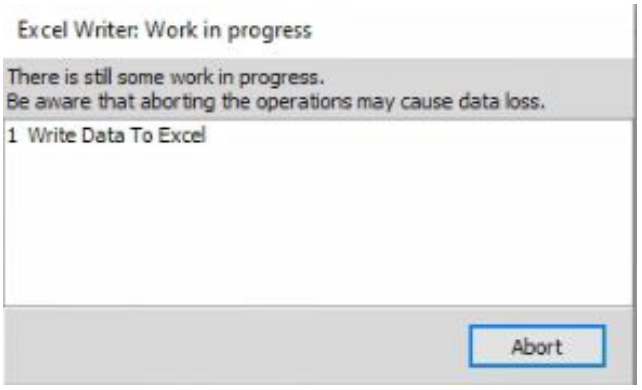


Image 17: Work in progress pop-out window

4.2.4. Excel Window Settings

You can use the *Excel Window Settings* ⑫ to define the state and position of the Excel® window that will be opened:

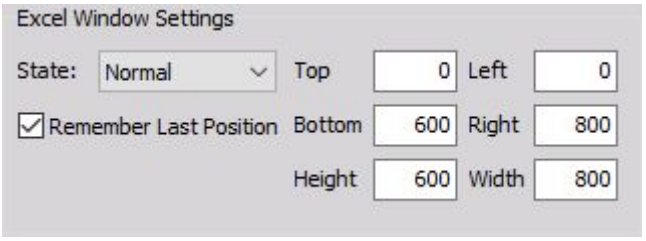


Image 18: Excel® Window Settings

State
The Window state defines if the Excel® Window will appear Minimized, Maximized or Normal.

Position
The values for Top, Left, Height and Width define the Excel® Window position. You can also change Bottom/Right and then Height/Width will be recalculated automatically. Usually you don't set these values manually, but simply activate the Remember Last Position checkbox.

Remember Last Position
When this checkbox is activated, the Excel Writer Module will automatically update the State and Position values from the Excel® window before it is closed (i.e. when you click the **Stop** store button). When you then store the next file, the State and Position will be restored to the previous values.

Hint
When you save the channel setup, then the values will also be written to the DewesoftX® setup-file: i.e. when you reload the setup, the Excel® window State and Position will be restored.

4.3. Worksheets

Since version 1.4.0 the plugin supports multiple worksheets. For each worksheet you can define what data to write to the worksheet (see chapter Data Definition), and when to write the data (see chapter Trigger Channel).

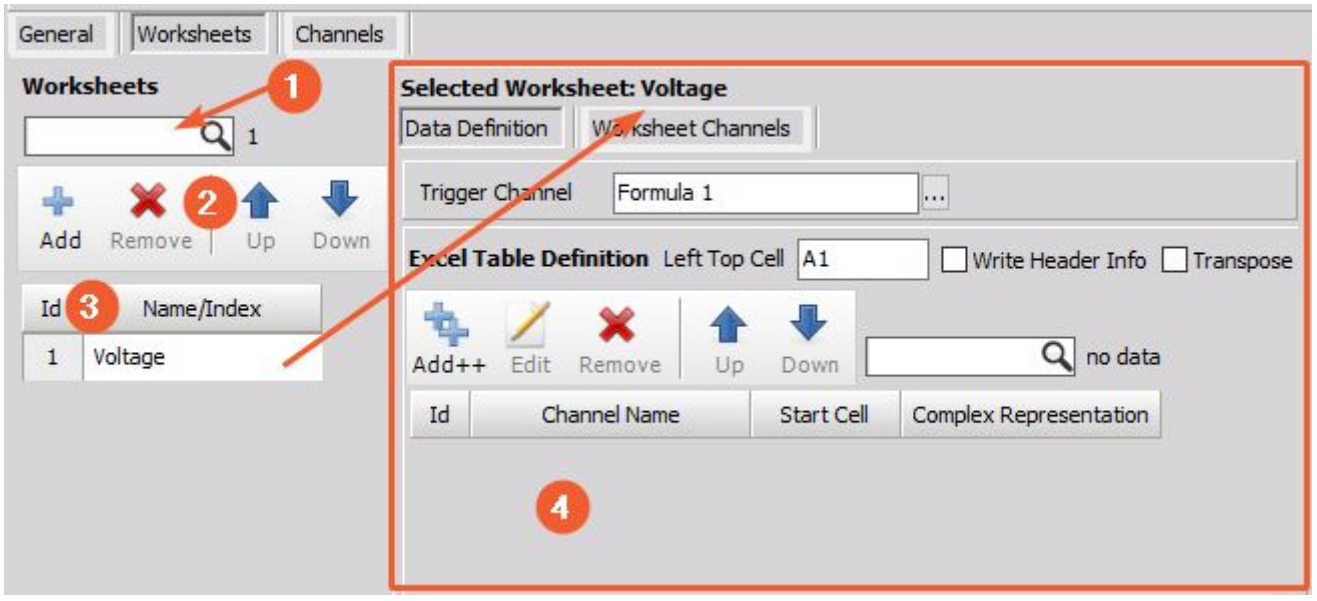


Image 19: Worksheet

❶ see chapter Search-Box & Count-label

❷ Toolbar to Add/Remove/Reorder worksheets.

Note. The order is not really important, it is just a convenience feature.

❸ See chapter Worksheet Grid

❹ This pane will show the details of the worksheet that you have selected in the worksheets grid: ❸

4.3.1. Worksheet Grid

This grid shows all worksheets that the Module might write data to.

4.3.1.1. Id

The ID starts at 1 and is increased for every worksheet.

4.3.1.2. Name/Index

The *Name/Index column* is used to find the worksheet in your template. You can use the name of the worksheet or the index of the worksheet (starting at 1).

Note: also hidden sheets are counted: so when you have one hidden sheet at the start the hidden sheet will have index 1 and the first visible sheet has index 2.

The example in Image 16 above will write data to the first worksheet in the template and to a worksheet called *Voltage*.

When the worksheet cannot be found, you will see a warning message (see also chapter Status Reporting). Note this message will be written once when the plugin tries to write some data to the worksheet. For example:

- When you activate Write Header Row, the warning will show up immediately after you start storing
- When Write Header Row is deactivated, the warning will show up when the first trigger fires (Note: when you did not specify any data to write to the worksheet, the error will never show up)

For example, when we specify a worksheet called 'Dummy' in the Worksheet Grid (see chapter 3.3.1 on page 15), but the template does not include a worksheet with this name, you will a warning message like this:

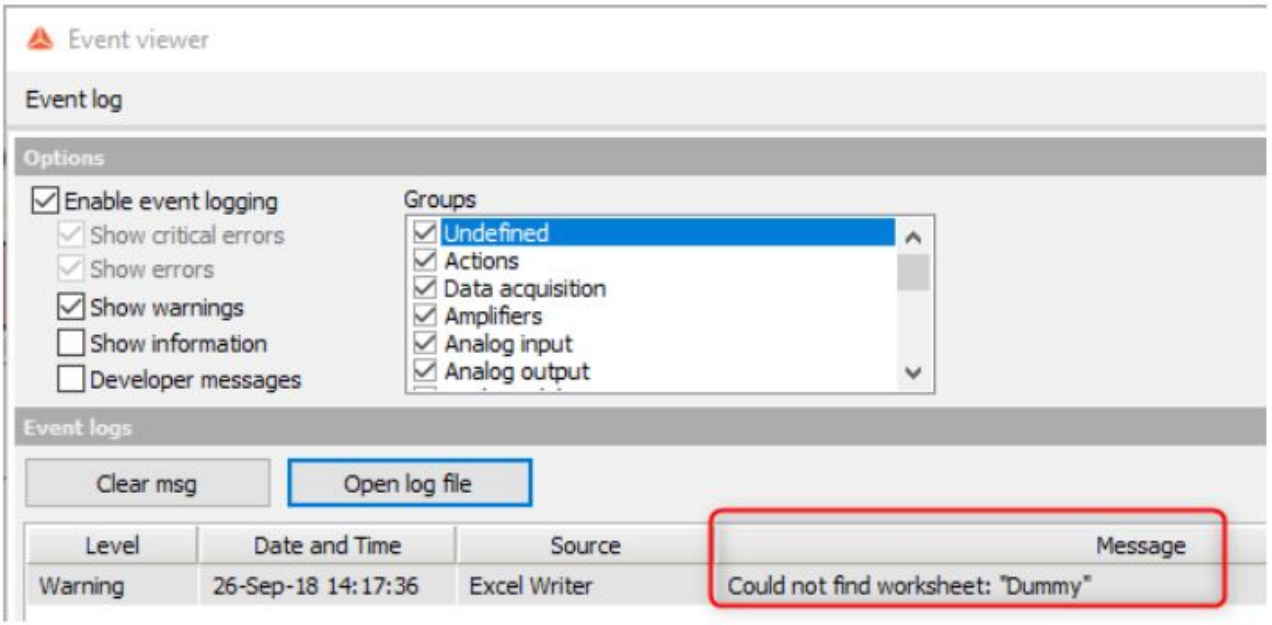


Image 20: Worksheet not found Warning

4.3.2. Data Definition

In the Data Definition tab-sheet you can specify when the data will be written to Excel® and what data will be written to which cells:

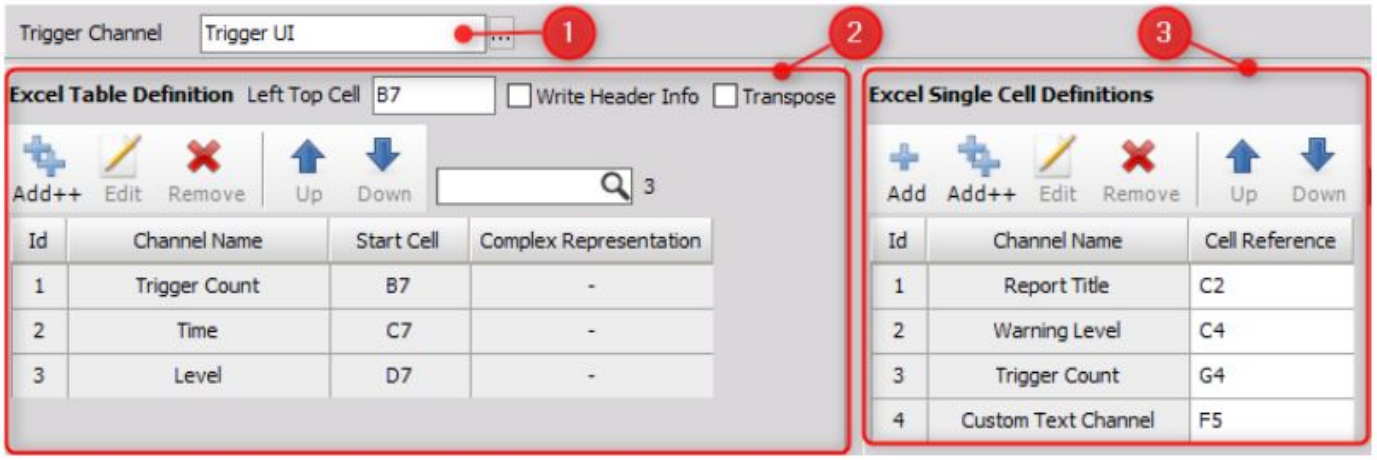


Image 21: Data Definition

Data Definition Elements:

❶ 3.3.2.1 Trigger Channel on page 16
❷ 3.3.2.2 Excel® Table Definition on page 19
❸ 3.3.2.3 Single Cell Definitions on page 24

4.3.2.1. Trigger Channel

The *Trigger Channel* is the most important channel. The data in the selected trigger will continuously be monitored by
the Module and whenever it rises over the value of 0.5, the trigger “fires”. When this happens, the data of all channels specified in the Table or Single Cell definitions will be written to the Excel® Report.

Important
Make sure that the triggers don't fire too often. When you generate way more trigger events, than can be written to Excel®, then the events will be queued and when DewesoftX® runs out of memory it will crash!

The *Trigger Channel* edit box is read-only. You can click on the box to select a channel or click on the ellipsis button to the right: see chapter Channel Selection Dialogue.

Alarms
When you want to model complex trigger conditions, you can use DewesoftX® alarm channels, which offer a very easy and flexible trigger condition setup.

First, we add the *Alarms* and *User Input* section to the *Channel Setup*: just click on the orange plus sign in *Ch. Setup* and select *Alarms*, then do the same again and select *User Inputs*.

Now we have 2 new sections in the Channel Setup. First, we will create a User Input channel. This channel will then be used as Alarm output: i.e. whenever the alarm channel changes (becomes active or is being reset), the alarm will write it's value to the output channel. In the Excel Writer Module, we will use the User input channel as Trigger Channel.

Image 22: Add sections

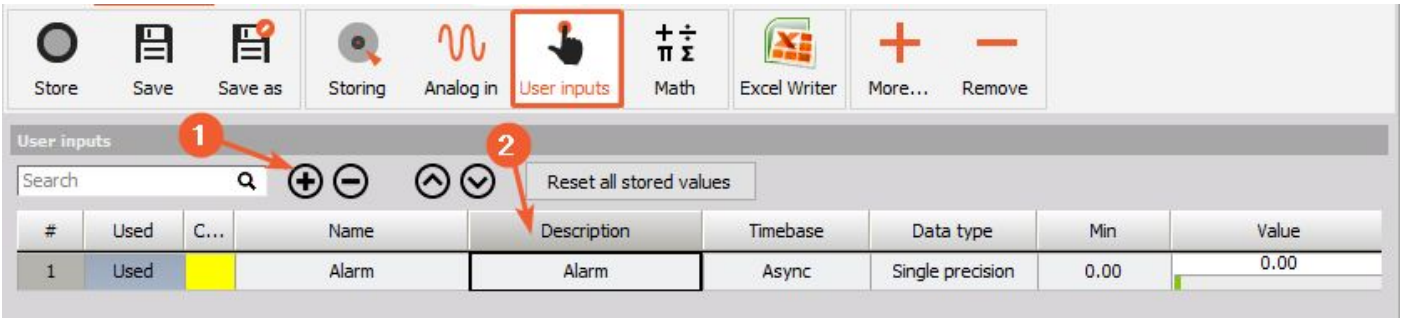


Image 23: User Input Channel

In the *User inputs* section click the add button ❶ and then change the channel values accordingly (i.e. set the colour, a meaningful name/description).

Now let's switch to the Alarms section. Click on the plus button ❶ to add a new alarm. Then give it a meaningful name ❷.You can see our *User input* channel called *Alarm* in the Alarm output selection box ❸ : make sure to activate the checkbox (otherwise the alarm would still work, but the value would not be written to the User input channel and thus the Excel Writer Module would not detect the trigger). Now you can add alarm conditions.

Hint:
you may want to set an alarm-reset condition ❹ , so that the alarm is reset automatically.

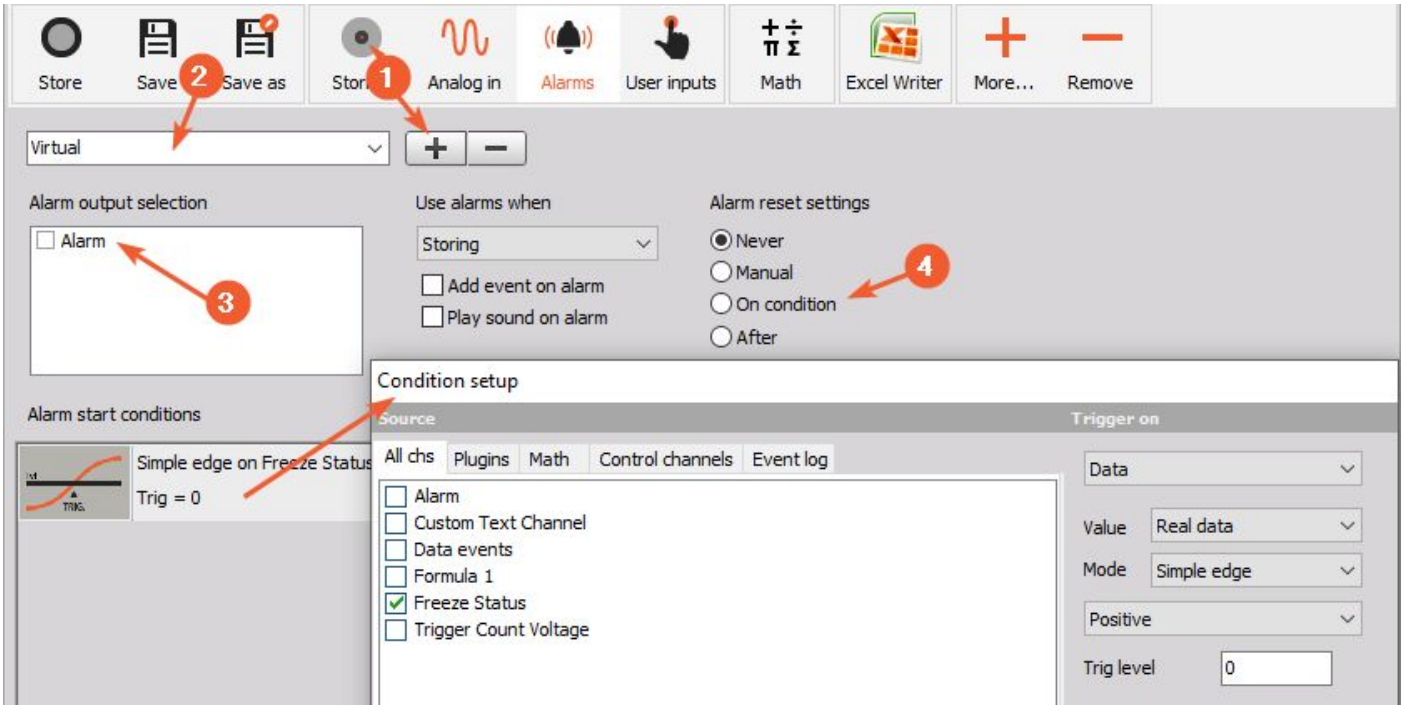


Image 24: Alarm setup

Important

Make sure that you use DewesoftX® X2 SP6 RC20 or higher. Lower versions had a minor bug: when you save the channel setup and reload it, the Alarm output channel is lost.
i.e. you would have to delete the user-input channel, add a new one and then assign it again to the Alarm output!

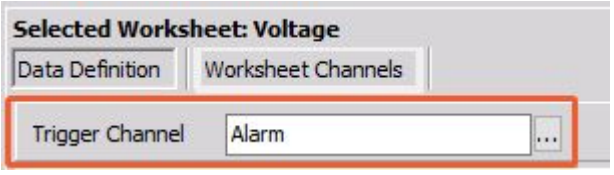
Finally go to the Excel Writer setup and select the User input channel (called Alarm) as Trigger Channel.	

Image 25: Trigger on Alarm

4.3.2.2. Excel® Table Definition

The Excel® Table Definition (see Image 23) allows you to define a tabular area in Excel® where the DewesoftX® measurement data will be written to.
You must specify the left-top cell where the table should start ❶: A3 in our example. And then you can specify a list of channels ❷.
When you are storing the data and the Trigger Channel fires the Module will add the data to Excel®. Image 24 shows what the resulting data in Excel® will look like after 4 triggers.

i.e. When the first trigger occurs the current data for the first channel in the list (Trigger Count) in our case will be written to the left-top cell A3. The current value of the 2nd channel (Time) will be written to the adjacent column B3, so on.

When the next trigger occurs the next data will be written on the row below the last one, in this case row 4.
So the data at the 2nd trigger time for the first channel in the list (*Trigger Count*) will be written to the cell. The data of the 2nd channel (Time) will be written C4, and so on.

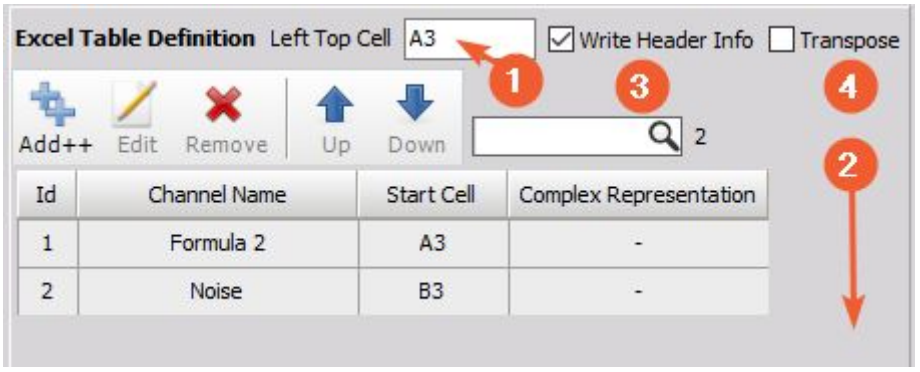


Image 26: Channel Definition

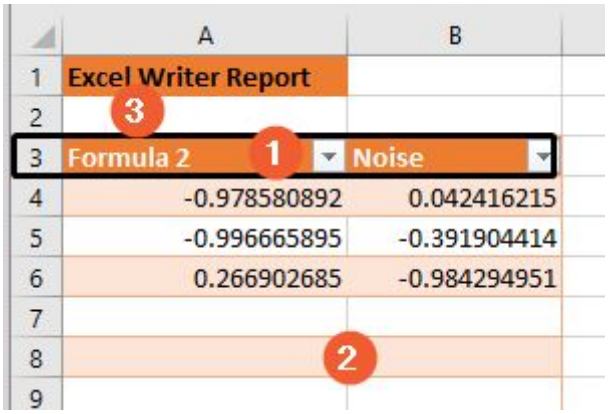


Image 27: Excel® Report

Write Header Row
When Write Header Row ❸ is activated, then the names of the channels will be written into the first row (i.e. A2, B2, C2 in Image 23) and the data start at the next row (i.e. A3, B3, C3 in Image 23).

Transpose
When *Transpose* ❹ is activated, the Rows and Columns in Excel® will be switched: e.g. the channels will be written to separate rows (instead of columns). This feature is supported since version 1.3.0. and greater.
This feature allows you to write even large arrays with 64k items to Excel®. But keep in mind that Excel® will be slow when handling lots of data (see also:chapter Performance). A downside of this approach is that you cannot use the *Excel® Tables* feature: see chapter Excel® Charts & Excel® Tables.

Note that the start-cell references will change when you active *Transpose*:

- Image 23 Transpose is not activated: the first channel starts at the Left Top Cell (A3), channel 2 starts at the next column B3 and the 3rd channel in C3
- Image 25:Transpose is activated: the first channel starts at the Left Top Cell (A3), channel 2 starts at the next row A4 and the 3rd channel in A5

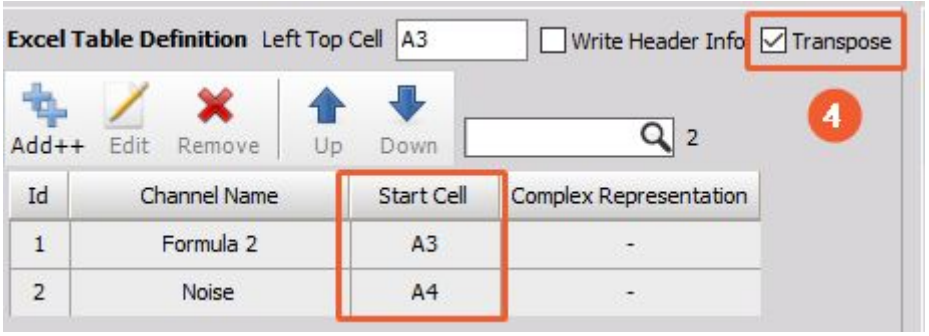


Image 28: Channel Definition

	A	B	C	D
1	**Excel Writter Report**			
2				
3	**Formula 2**	1.743	2.722	3.563
4	**Noise**	0.233899593	0.230061	-0.15648
5				

Image 29: Excel® Report

Complex channels

Since version 1.3.0 complex channels (including array channels) are supported. For complex channels you can select the representation that will be used when writing the data to Excel®:

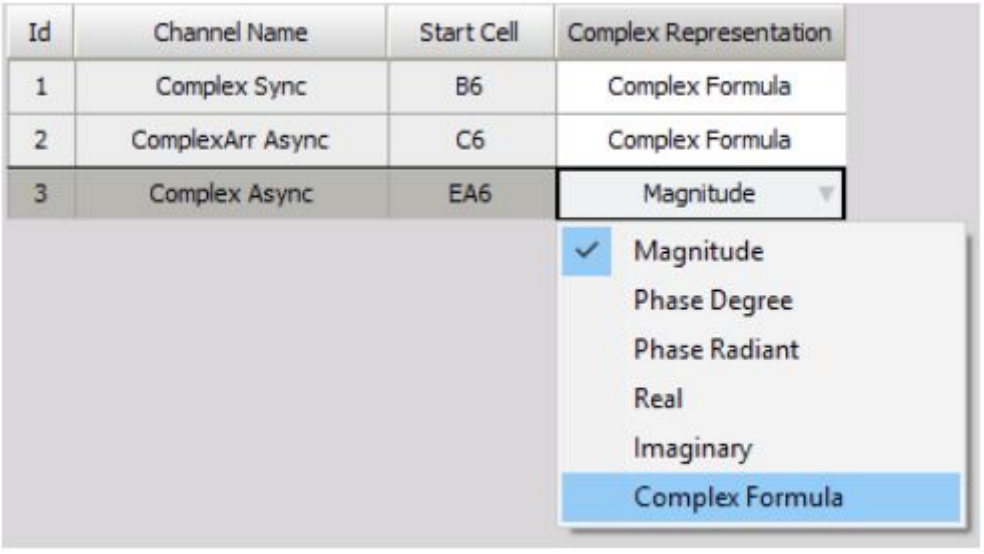


Image 30: Complex Representation

Complex Formula

The Complex Formula representation uses the Excel® complex numbers feature to write the real and imaginary part of the complex number into a single cell: see also Microsoft documentation “COMPLEX function”

When the COMPLEX function is not available, you may need to activate the Analysis ToolPak : see Microsoft documentation: Analysis ToolPak.

Note: the formula is language dependent: e.g. when you use a German Excel® it is called KOMPLEXE.

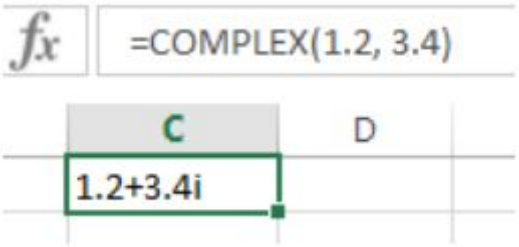


Image 31: Excel® Complex Formula

Take care when using the Complex Formula representation in Excel® tables (see chapter Excel® Table). Per default Excel® will automatically fill down the formulas in tables. But in case of complex numbers, this is not what you want. It is not recommended to use Complex Formula data in Excel® tables. If you still want to use it, you can try to deactivate the Excel® automatic fill feature BEFORE you start storing the data.
See Microsoft Documentation “Use calculated columns in an Excel table” (expand the section “Stop creating calculated columns” at the bottom of the page).

Array channels
Array channels are supported in version 1.1.0 and higher.
The 3rd channel FFT V in Image 29 ❶ is an array channel: a math FFT with 128 lines. Each element in the array channel will be written to a separate column/row in the Excel® report. Thus the next channel Level in the setup will start at cell EB6 ❷ . When you activate Write Header Row, then the name of the array elements will include the array index: see Image 30: the first array-element starts with [0], then [1], and so on.

Id	Channel Name	Top Left Cell
1	Trigger Count	B6
2	Time	C6
3	FFT V	D6
4	Level	EB6

Image 32: Ch. Setup Array Channel

Time	FFT V [0]	FFT V [1]	FFT V [2]
3.9	0.0050	0.01	0.0134

Image 33: Excel®: Array Channel

Keep in mind that an Excel® Worksheet can have a maximum of 16.384 columns and 1.048.576 rows. When you exceed this limit, the remaining items will be skipped. The Excel Writer Module will warn you in this case.
E.g. when we set the line resolution of the FFT V channel to 32k lines, then the channel setup will show you warnings when elements of a channel will be skipped (see ❶ in Image 31) or when a channel will be completely skipped (see ❷ in Image 31)

When you start storing anyway, the Excel Writer Module will warn you again: see Image 32.

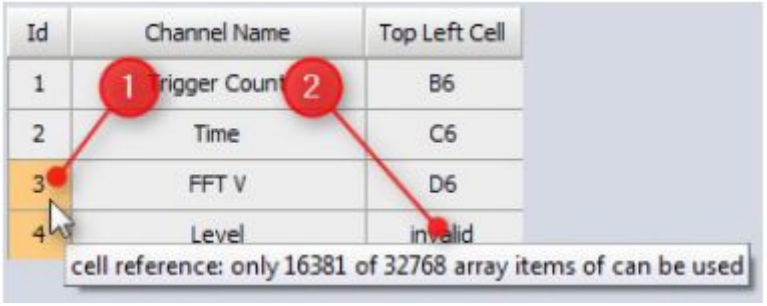


Image 34: Ch. Setup Array Warning

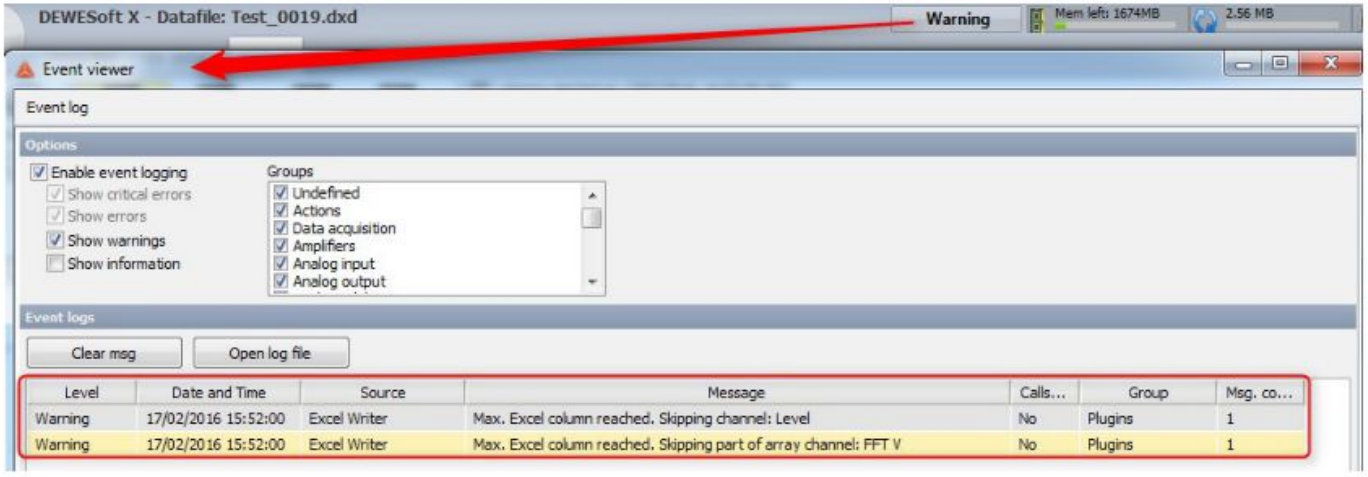


Image 35: Acquisition: Array Warning

Usually you do not want to pass large arrays to Excel® anyway, because Excel® is quite slow and not good at handling them. So you can use DewesoftX® Math to do some computation and only pass the relevant data for your report to Excel®: i.e. only use a slice of the array, only the maximum, minimum, .. see Array Formulas and Array Statistics below

Array Formulas
The DewesoftX® Formulas have very good support for arrays. To get a quick start, switch to the *Arrays* section ❷ to see all available array functions – when you hover the mouse over an item ❸ , you can see a short description in a hint window. To get detailed information, please consult the DewesoftX® user-manual.

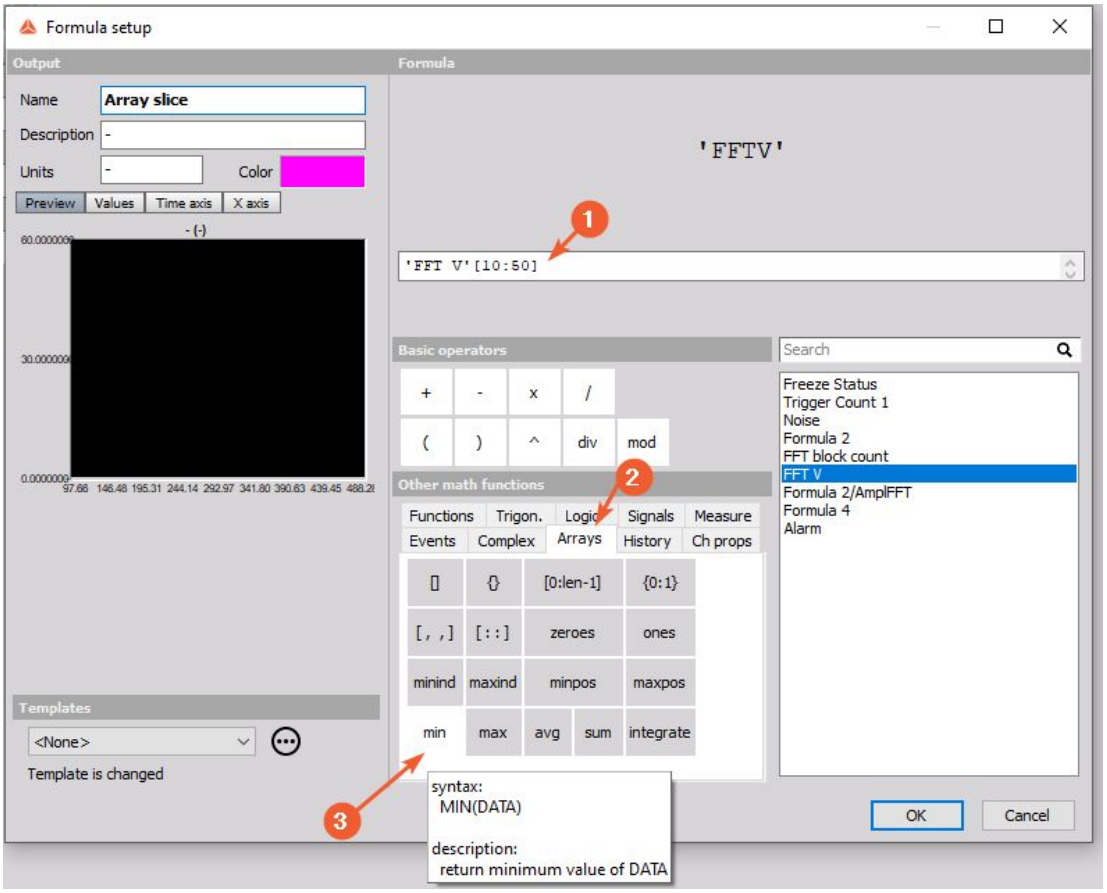


Image 36: Formula: Arrays

Array Statistics

There is also a dedicated *Array statistics* mathematics feature to calculate statistics over the whole array: i.e. to get the Maximum value in the array.

When the Array stat. icon ❷ is not shown, press the orange plus button ❶ and add it from the list.

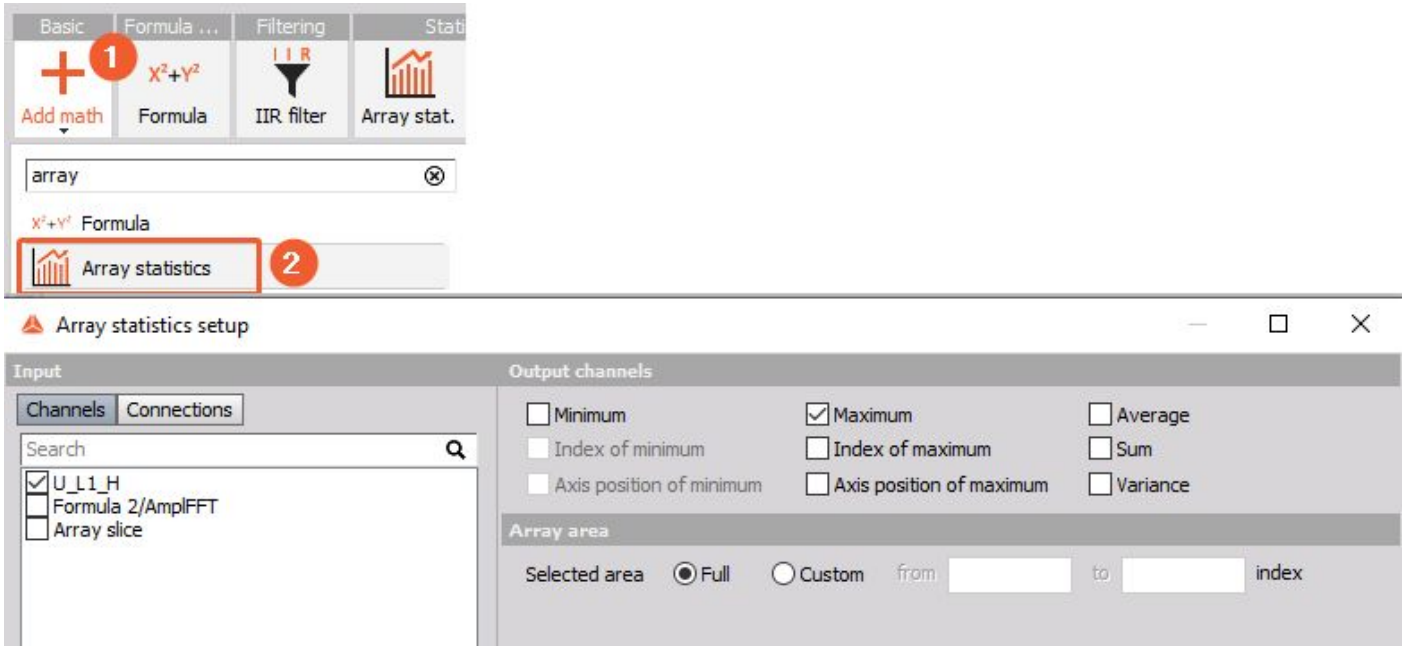


Image 37: Array Statistics

Excel® Table Definition: Grid-Buttons

Column	Information
Add++	Opens the Channel Selection Dialogue (see chapter Channel Selection Dialogue) so that you can select multiple channels.
Edit	Will open the Channel Selection Dialogue (see chapter Channel Selection Dialogue) so that you can change the Channel of the currently selected grid-row. Note: you can also double-click the grid-row. This button is only active, when you select exactly one row.
Remove	Will delete the selected rows.
Up	Will move the selected grid-row up. Note: the order is important. It specifies into which Excel® column the data will be written: i.e. when you change the order, the value of the *Top Left Cell* grid row will also change.
Down	Will move the selected grid-rows down. Note: the order is important. It specifies into which Excel® column the data will be written: i.e. when you change the order, the value of the *Top Left Cell* grid row will also change.

Excel® Table Definition: Grid-Columns

You can use the Header pop-up (see chapter Header pop-up) to show/hide columns of the grid:

- Id: a consecutive number to identify the rows (important when you sort the grid)
- Channel Name: the name of the channel which will be used to read the data that we will write to Excel®
- Synchronism: information if the channel is synchronous, asynchronous or single value

- Single Value channels are shown in a warning colour: since they usually don't change their value, you might not want to use them in the Excel® Table
- Top Left Cell: this is the cell to which the first data value will be written. The cell of the first channel is the same as in the input field Left Top Cell Ref', the others are increased by one column each.

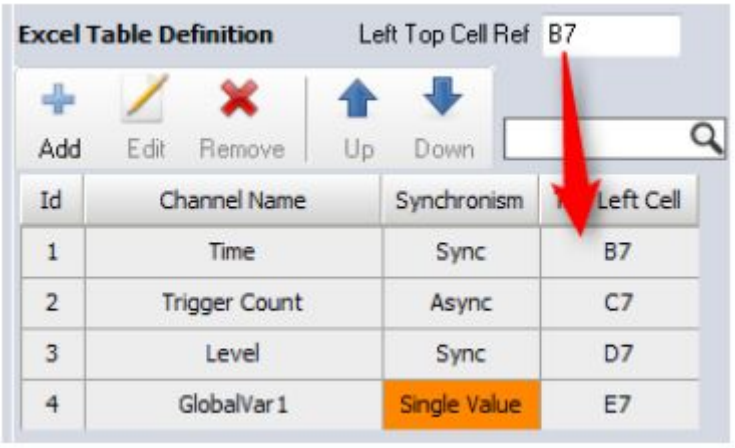


Image 38: Excel Table Definition Columns

4.3.2.3. Single Cell Definitions

The Single Cell Definitions (see Image 36) allows you to define a single Excel® cell where the DewesoftX® data will of the related channel will be written to.
Click the **Add** button and select one or multiple channels. The channels will be added to the grid immediately. Now you must enter a valid cell reference (in Excel® A1 notation) into the *Cell Reference* column.

When you are storing the data and the Trigger Channel fires the Module will write the data of the correspondingDewesoftX® channels to Excel® the specified Excel® cells..
Image 37 shows what the resulting data in Excel® will look like after some triggers:

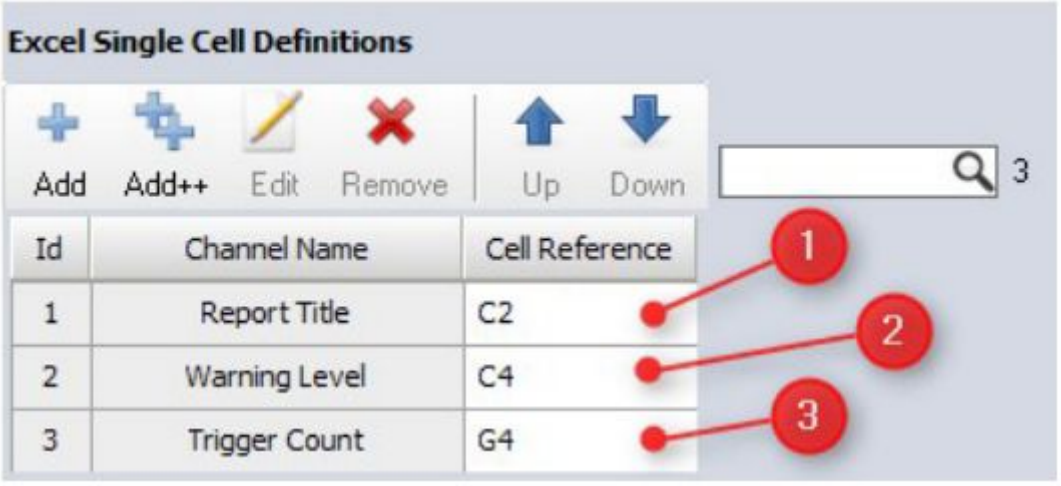


Image 39: Single Channel Definitions

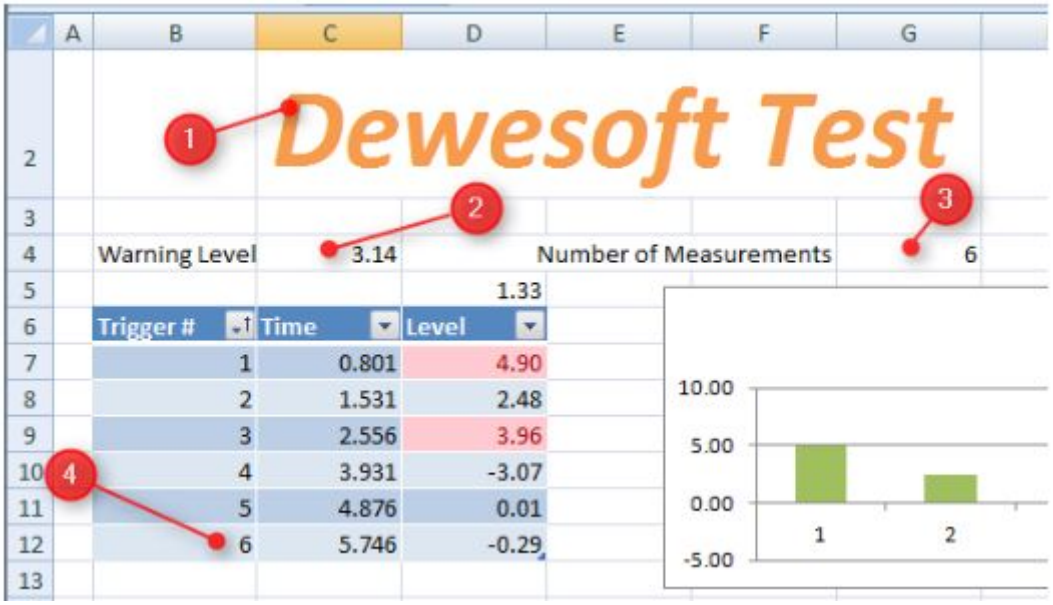


Image 40: Single Channel Result

Single cell definitions are normally used for single value channels: i.e. your Data Header values, that the user must enter at the start of the measurement, like the *Report Title* in our example ❶.

But you can also specify any other channels: i.e. the *Trigger Count* channel in our example (3 and 4).

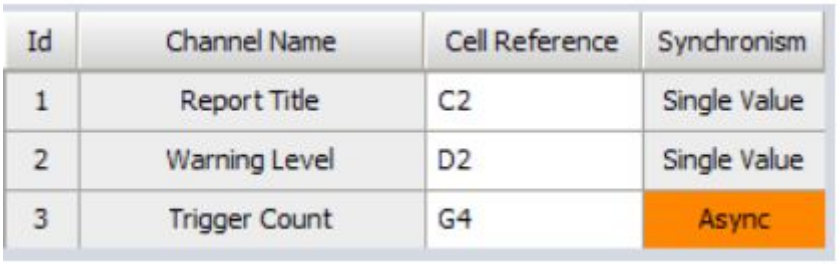
Single Cell Definitions: Grid-Buttons

Column	Information
Add	Opens a dialogue to add a single Excel® Cell Definition (channel including the cell-reference) see Single Cell Definitions: Dialogue on page 25
Add++	Opens the Channel Selection Dialogue (see chapter Channel Selection Dialogue) so that you can select multiple channels. After you close the dialogue, you can enter a Cell Reference for the new items directly in the grid.
Edit	Will open an edit dialogue for the selected Cell Definitions. Note: you can also double-click the grid-row. see Single Cell Definitions: Dialogue
Remove	Will delete the selected Cell Definitions.
Up	Will move the selected grid-rows up. Note: the order of the Cell Definitions does not really matter, you may want to order them as you like.
Down	Will move the selected grid-rows down. Note: the order of the Cell Definitions does not really matter, you may want to order them as you like.

Single Cell Definitions: Grid-Columns

You can use the Header pop-up (see 5.8.2 Header pop-up on page 46) to show/hide column of the grid:

- Id: a consecutive number to identify the rows (important when you sort the grid)
- Channel Name: the name of the channel which will be used to read the data that we will write to Excel®
- Cell Reference: this is the cell to which the data-value will be written.
- Synchronism: information if the channel is synchronous, asynchronous or single value Non Single Value channels are shown in a warning colour: since they usually change their value, you might not want to use them in a Single Cell Definition.



Id	Channel Name	Cell Reference	Synchronism
1	Report Title	C2	Single Value
2	Warning Level	D2	Single Value
3	Trigger Count	G4	Async

Image 41: Single Cell Definitions: Columns

Single Cell Definitions: Dialogue

When you click **Add** or **Edit** (or double-click) this dialogue will allow you to change the selected Single Cell Definition/s:

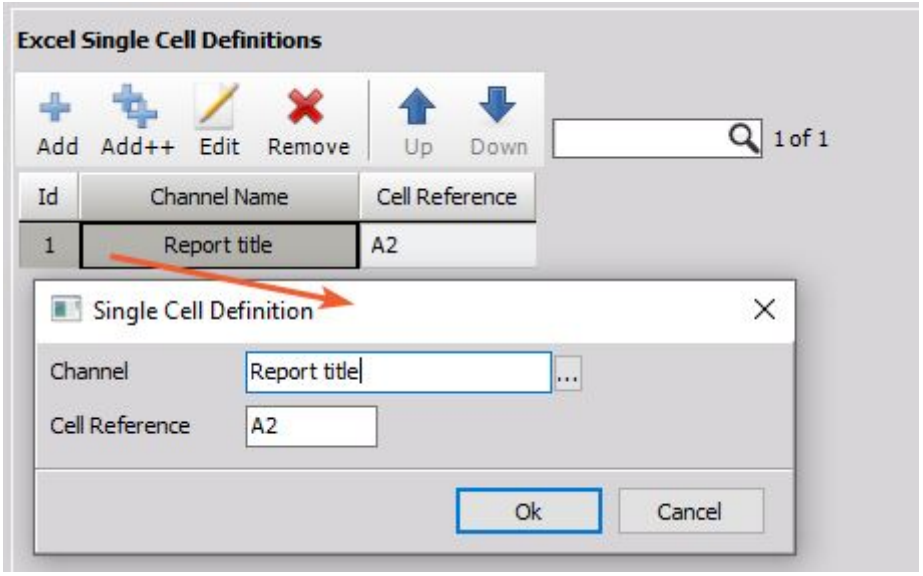


Image 42: Single Cell Definitions: Dialogue

The dialogue is simple: you can select a channel (see chapter Channel Selection Dialogue) and a *Cell Reference*.

4.3.3. Worksheet Channels

Currently there is only one special channel per worksheet: Trigger Count

4.3.3.1. Trigger Count

Whenever the trigger channel fires, the *Trigger Count* channel will be incremented. You can use this channel in DewesoftX® and also write it to the Excel® workbook. This can be useful for debugging to check how many times the Trigger Channel (see chapter 3.3.2.1 on page 16) was triggered.

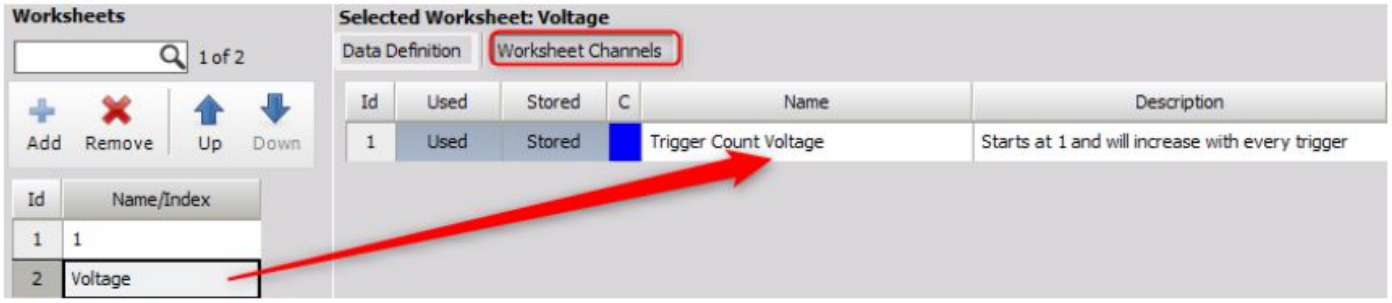


Image 43: Trigger Count Channel

The Trigger Count channel has an automatic naming feature: e.g. when the name of the channel starts with '*Trigger Count* ' and you rename the related worksheet in the worksheets grid (see chapter Worksheets), the name of the trigger count channel will also change.

Note, that the trigger count may only be updated once per OnGetData call – so when the trigger fires multiple times per acquisition cycle (e.g. 20ms), you may see the same trigger count multiple times in the Excel® cells.

4.4. Module Channels

The Channels tab-sheet shows a grid of all global channels of the Excel Writer Module.

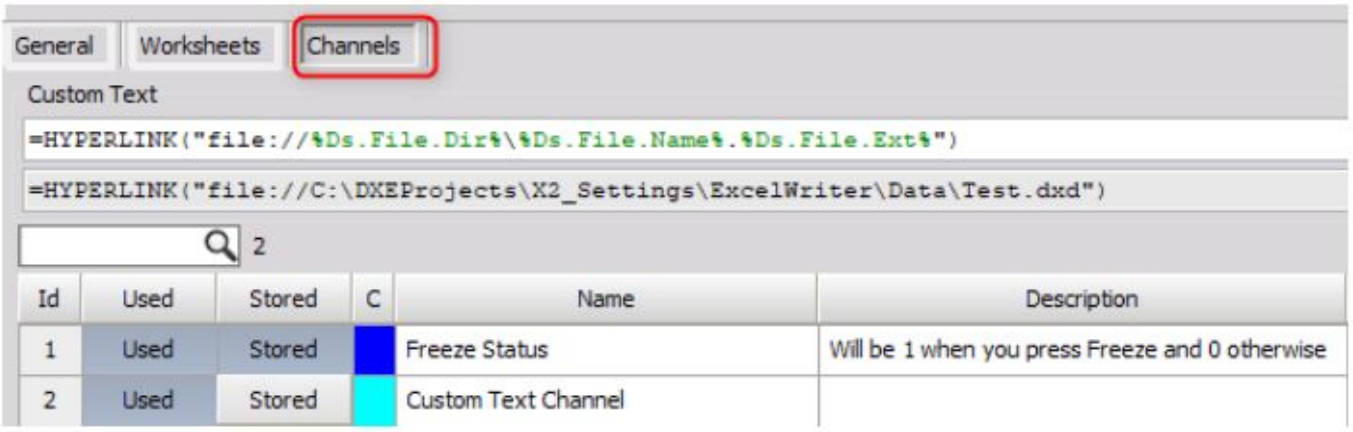


Image 44: Module Channels

4.4.1. Module Channels: Grid Columns

You can use the Header pop-up (see chapter Header pop-up) to show/hide column of the grid:

Column	Information
Id	This is just a unique consecutive number to identify the row/channel of the grid
Used	You can click on the buttons in this row to toggle the **Used** status from **Used** to Unused. Only channels that are set to **Used** will show up in Measure Mode and can be stored in DewesoftX® data files.
Stored	This is only useful if the channel is set to **Used** (see description above). For **Used** channels you may want to deactivate the **Store** button. Then you can see and use the values of this channel in *Measure Mode*, but the channel data will not be stored to the DewesoftX® data file (i.e. the data-file size may become considerably smaller when you don't store data of channels with a high sampling rate). This can be useful if you just want to check the data during measurement, but don't need it after the measurement (i.e. when opening the data-file in *Analyze* mode). Another use-case is to use the data of the channel in other *Math* channels (e.g. to do some statistics) and then only store the *Math* channel to the DewesoftX® data file (but not the original data).
V	This colour will be used by the displays in Measure Mode. You can click on the colour to change it.
Name	This is the name of the channel as it will show up in the channel list of the Measure mode. Make sure to enter a useful name for the channel (it also makes sense to use unique names to avoid confusion). If you enter a blank name, then you will get a warning.
Description	Detailed description of the channel. You can enter any text that you consider helpful.
Unit	This is the unit that will be displayed for the channel. Note: you can change this value, but it is not recommended.

4.4.2. Custom Text

You can use the custom text channel to define a template that will be written to a DewesoftX® text-channel. You can use this channel in DewesoftX® screens or you can use it in the Excel® Table Definitions (see chapter Excel® Table Definition) or in Single Cell Definitions (see chapter Single Cell Definitions), so that it will be written to your Excel® Report.

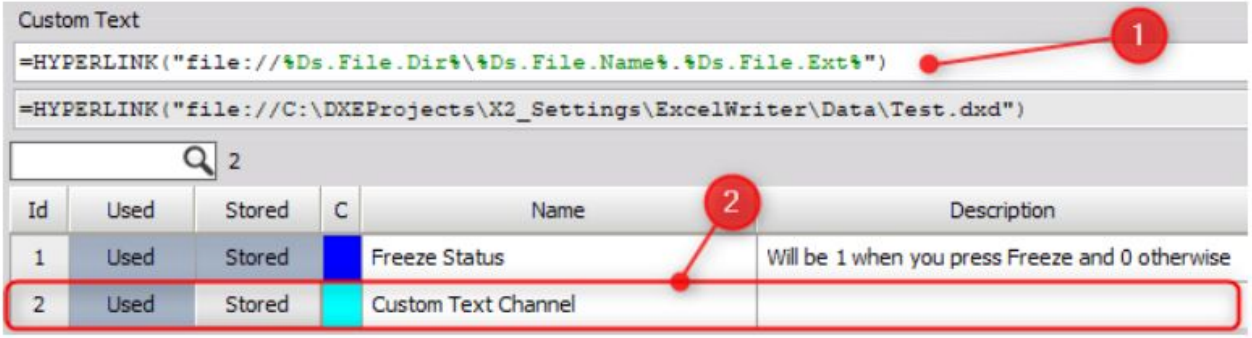


Image 45: Custom Text Channel

Note, that the Custom Text Channel is not Stored in the DewesoftX® data-file per default.
The default value is an Excel® formula that inserts a hyperlink to the DewesoftX® data-file into the Excel® target cell.
This is very convenient, because when you later open the Excel® Report, you can simply click on the file-link and Windows® will start a new DewesoftX® instance and load the data-file in *Analysis* mode.

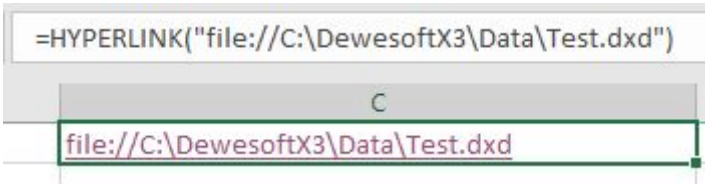


Image 46: Excel® Hyperlink to DewesoftX® File

The file-name hyperlink is just the default – you can change the text to anything you like and you can use all available variables (see chapter Variable)). Just make sure that the text is valid for the Excel® cell (i.e. when you enter an invalid formula then writing the data to Excel® will fail, and the Module will report a warning: see also: chapter Status Reporting.

Hint
Take care, when you write formulas (i.e. like the Hyperlink above) into a column of an Excel® table (see also chapter Excel® Charts & Excel® Tables). Excel® will per default use the same formula for all rows in a column. This feature can be deactivated. Please consult the Excel® help for details.

4.4.2.1. Formulas vs. Text
Make sure to take care of the leading equals sign. This will determine if Excel® treats the data as formula or as text.

Example
Let's consider this input
=%Ds.StartStoringUTC.sec%
DewesoftX® will replace the variable with the current value: e.g.
2016_10_12_10_33_48
so that this text will be written to the Excel® cell:
=2016_10_12_10_33_48
Since the cell-value starts with the equals sign, Excel® will interpret this as a formula and (since this is not a valid Excel® formula) will result in an error.
To fix this, we may use double quotes around the the variable
=“%Ds.StartStoringUTC.sec%”
in this case DewesoftX® will send this text to Excel®:
=”2016_10_12_10_33_48”
and Excel® will evaluate this formula (which only consists of a string literal) and this will work.
We may also simple skip the leading equals sign:
%Ds.StartStoringUTC.sec%
so that DewesoftX® will send this text to Excel®:
2016_10_12_10_33_48
This will also work, because this is just some text-input into an Excel® cell.

4.4.3. Freeze Status

This channel will be set to 1 when you press the Freeze button during measurement and will be reset to 0 when you unfreeze the measurement screens: so you can use this button as trigger channel (see chapter Trigger Channel).

Note: For technical reasons, the Module cannot react at the very same time to the button press as DewesoftX®: so the values that you see in the frozen DewesoftX® measurement screen will be some 100-milliseconds older than the values that you see in the Excel® report.
But since you activate the function via a manual button-press the values will vary anyway and not be exact to the millisecond.

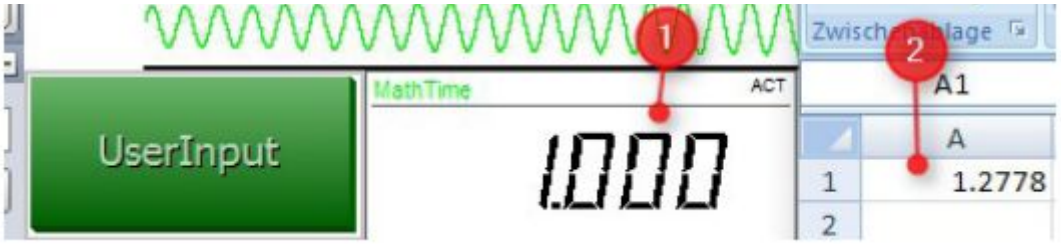


Image 47: Freeze Delay

4.4.3.1. Combined Trigger Channels

When you want to combine multiple async trigger channels, you can do so via a simple Math formula.

Let's assume we want to write the data to Excel®, when the user presses a button (which we assign to a *User Input* channel) or when the user presses the Freeze button.
In this case we can simply add a Math channel that calculates the sum of the 2 channels . ❶ Just take care that you must set the *Timebase* to *Sync* ❷. so that the formula is constantly evaluated. Then you can use this Math channel as a trigger channel (see chapter Trigger Channel).

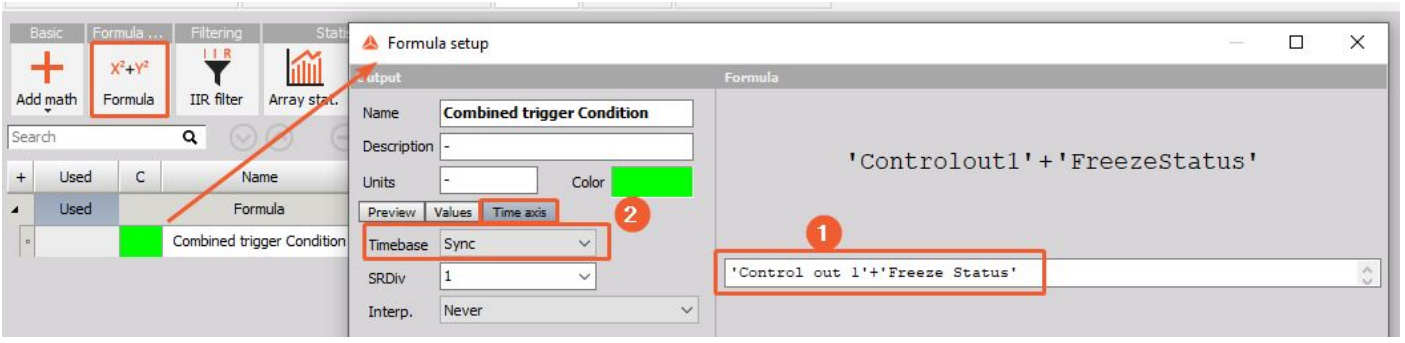


Image 48: Combined Trigger Channel

4.5. Status Reporting

The Module may write error/warning messages during operation. In this case you can use the DewesoftX® status handling:

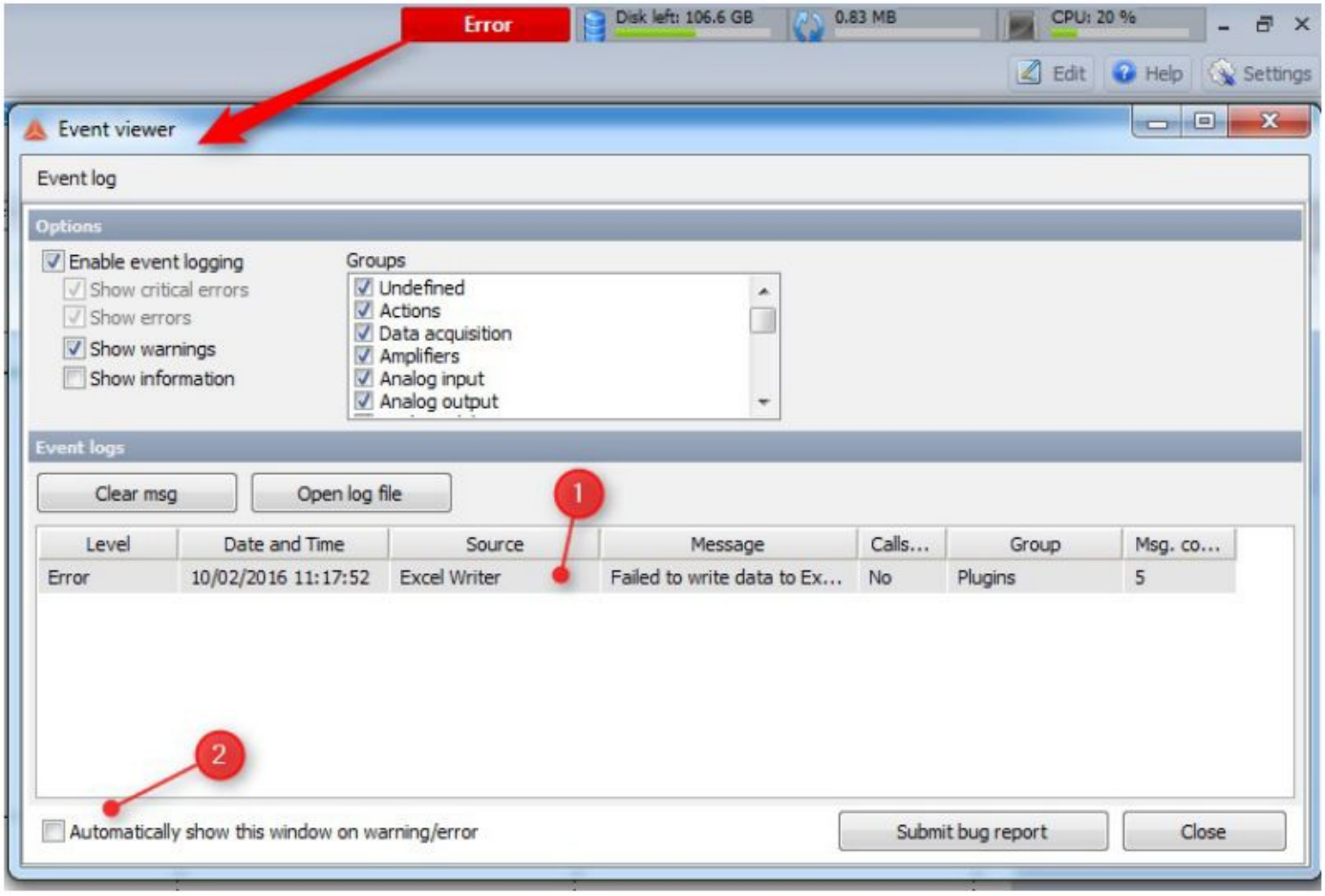


Image 49: Status reporting

When a warning/error occurs, the **Error** button (see top of Image 46) will show it – and depending on the checkbox ❷, the *Event viewer* window will automatically open (if it is deactivated, just click on the **Error** button).
The event viewer will list all errors/warning/information messages. All messages related to the Excel Writer Module will have the Source text ❶ Excel® Writer.

See also: chapter Using Excel® During Storing Name/Index on page 15

4.6. Channel Selection Dialogue

The Channel Selection Dialogue allows you to select one or multiple channels. e.g. when you select a Trigger Channel (see chapter Trigger Channel), you can only select one channel, but when you click the Multi Add button (see chapter Single Cell Definition), you can select multiple channels at once:

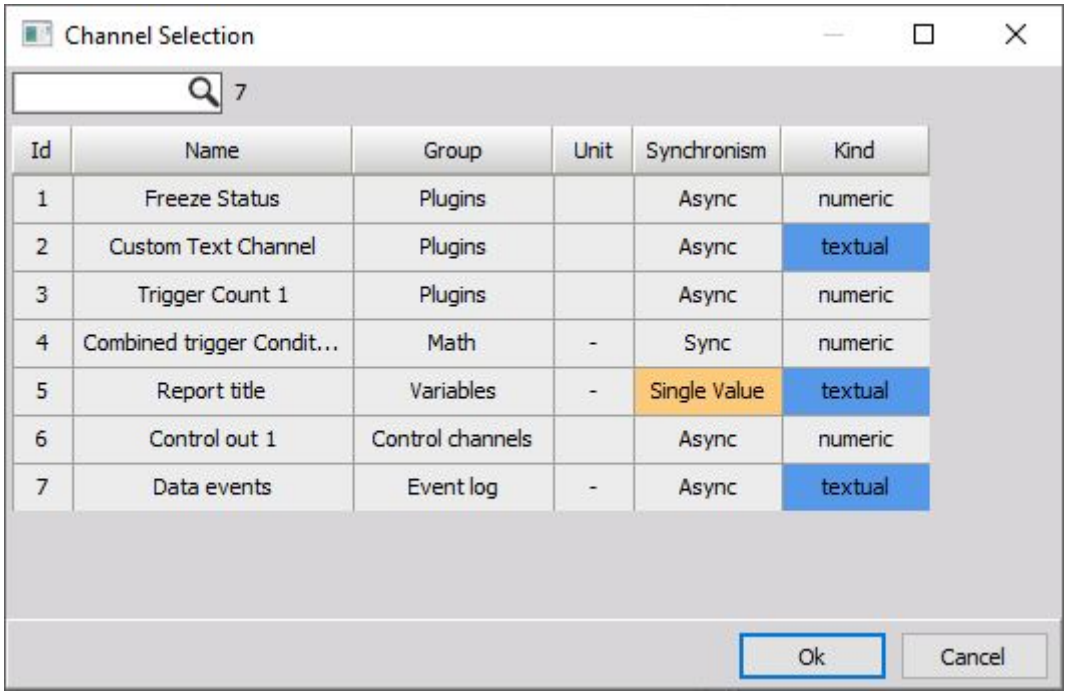


Image 50: Channel Selection Dialogue

Column	Information
Id	This is just a unique consecutive number to identify the row/channel of the grid
Name	The name of the channel
Description	The description of the channel
Group	The DewesoftX®-Group that the channel belongs to: eg. AI (Analogue Input), Math, etc.
Index	The channel index is the unique identifier that DewesoftX® uses (Note: the name is not required to be unique: i.e. you could have multiple channels with the same name). This column is only useful for debugging.
Unit	This is the measurement unit of the channel.
Synchronism	Information if the channel is synchronous, asynchronous or single value.
Kind	Channel can be of kind: textual, numeric, numeric array, complex complex array Textual channels are highlighted in blue, complex channels in yellow see also: Complex channels on page 20, Array channels on page 21

5. General

This chapter contains useful hints to using the AddOn/Excel® and more detailed information to certain subjects (i.e. detailed variable descriptions).

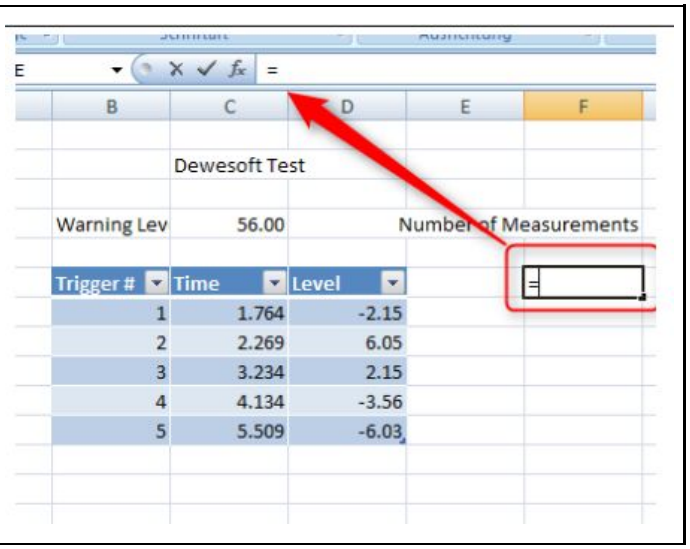
5.1. Using Excel® During Storing

It is not recommended that you use Excel® during Storing (i.e. while the AddOn writes data into the report worksheet).
When you do it anyway DewesoftX® may not be able to write the data.

For example, when you are in formula edit mode in Excel® then DewesoftX® cannot write data to Excel®.

See the Image to the right: you can see that 5 triggers have already been written correctly to Excel®. Now we enter the formula edit mode. The cell is marked in red.

When Excel® is in this mode, it will not allow external application to add any data.



Now we fire the 6th trigger in DewesoftX® (while we are still in the formula edit mode). You will notice that no data will be written to Excel®. Instead the DewesoftX® will show some warning-messages (one for each attempt to write data: see the Msg. Count column). See also Status Reporting.

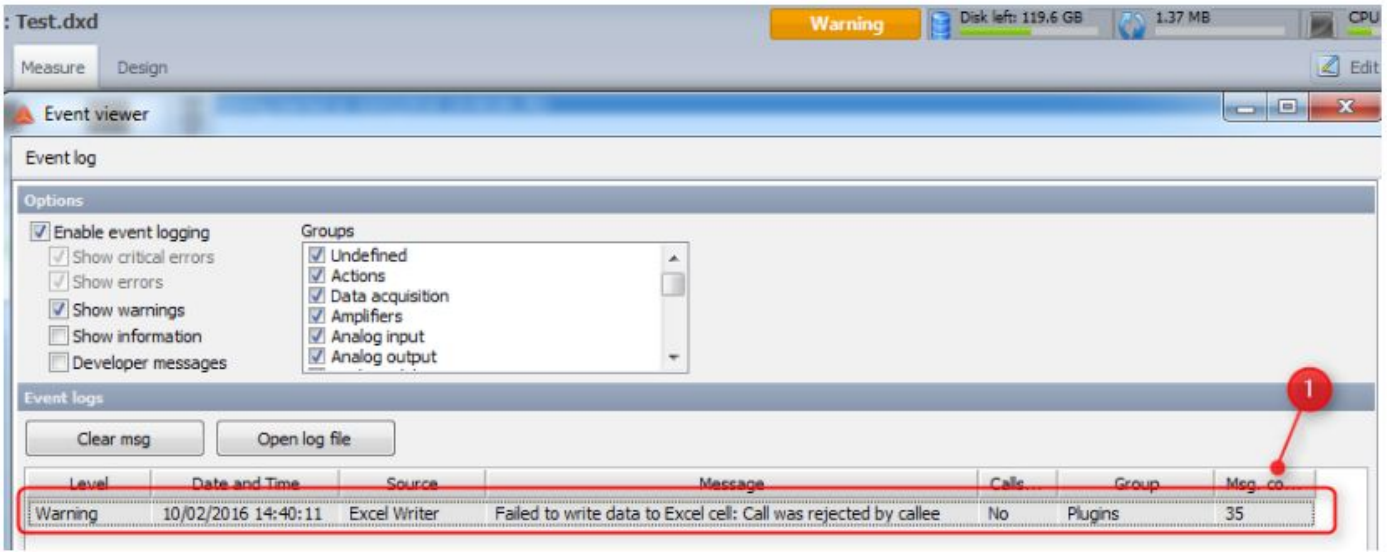


Image 51: Warning: Failed to write data to Excel cell

When we leave the formula edit mode, then writing the next trigger will work again – but the previous data (of trigger 6) is missing. When you use an Excel® Table then the new data will not belong to the table anymore (due to the empty row)!	

Trigger #	Time	Level
1	1.764	-2.15
2	2.269	6.05
3	3.234	2.15
4	4.134	-3.56
5	5.509	-6.03
7	52.582	3.6239624

5.2. Excel® Worksheet

Note, that the AddOn will always write the data directly to the corresponding worksheet: see 3.3 Worksheets on page 15: i.e. the plugin needs not switch to a worksheet before writing some data: so when you use multiple worksheets in your workbook you can switch between them during storing. This also means, that you can hide the sheets and in the remaining visible sheets you can reference the data/cells of the hidden sheets. A use-case for this is when you only want to show a chart to the users, but hide the data-table.

5.3. Excel® Charts & Excel® Tables

When you use Excel® charts to display the DewesoftX® measurement data, you might want to use the Excel® table feature. When you use an Excel® table, it is possible to use the table columns in the chart-series. This has the advantage that the chart will show exactly the number of samples that exist in the table.
The pros of using tables are best explained in an example. We will first take a look at what happens when we use fixed ranges, and then we will introduce a table.

5.3.1. Fixed Ranges

In this chapter we will use fixed cell-references to define the data-area in our template:

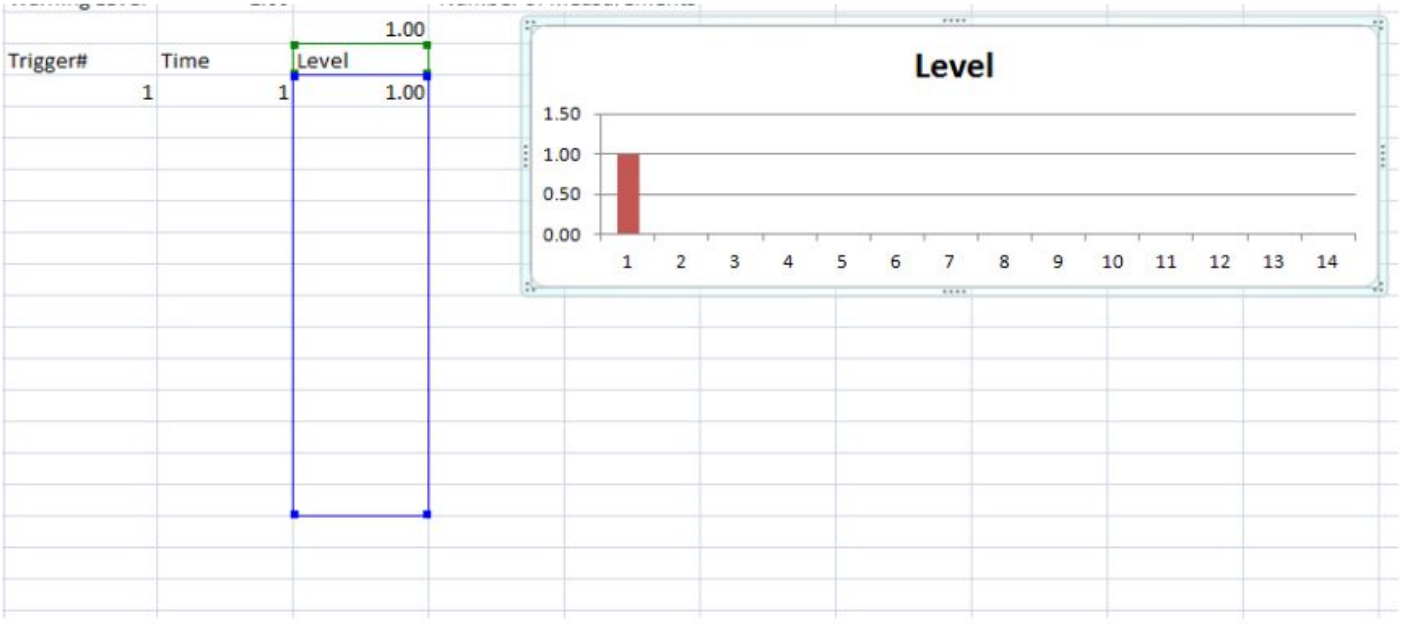


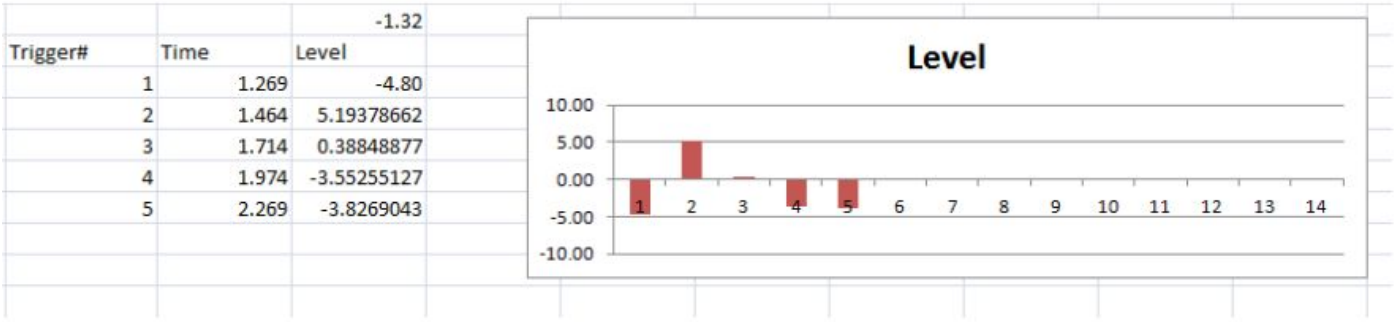
Image 52: Chart Data Area

You can see that we have selected a fixed range D7:D20 for the chart. Note, that the chart already shows 13 slots for the data.

Also for the average calculation we will use the same fixed range: D7:D20 Note: MITTELWERT means AVERAGE (a German Excel® version was used for this example) Also note, that we have included some fixed data in the template, so that the calculation works. This data will be overwritten in the final report by the real data anyway.	

Now, let's start the measurement and look at what the Excel® report looks like.

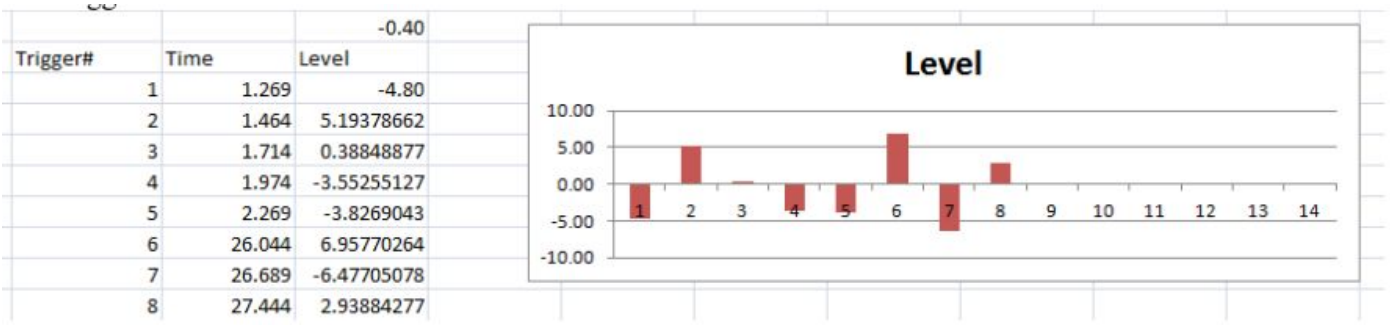
After 5 triggers you can see that the number of slots in the chart has not changed – the first 5 slots already show datathe rest is still empty.



		-1.32
Trigger#	Time	Level
1	1.269	-4.80
2	1.464	5.19378662
3	1.714	0.38848877
4	1.974	-3.55255127
5	2.269	-3.8269043

Image 53: Chart Fixed Range: 5 Triggers

After 8 triggers we have 8 slots with data:



		-0.40
Trigger#	Time	Level
1	1.269	-4.80
2	1.464	5.19378662
3	1.714	0.38848877
4	1.974	-3.55255127
5	2.269	-3.8269043
6	26.044	6.95770264
7	26.689	-6.47705078
8	27.444	2.93884277

Image 54: Chart Fixed Range: 8 Triggers

Using fixed ranges may be okay, when you always get exactly the same number of samples for each Report.

Important
A problem to keep in mind, is what will happen when you get too many data-points: e.g. 20?. This could be very bad, because the chart would not show all samples, and even worse, the Average calculation would not show the value for all the data, but only for the first 14!

5.3.2. Excel® Table

To insert a table, first, select the cells (where the table header should go) and then select *Insert – Table*.	Then we enter meaningful names for the column in the header and some fake data (just values of 1) for the table data (so that the calculation will work). We enter the formula for MITTLWERT (AVERAGE) again, but this time we refer to the table-column instead of the fixed range: =MITTELWERT(Tabelle5[Level]) Note: our table is called Tabelle5 and the column Level.

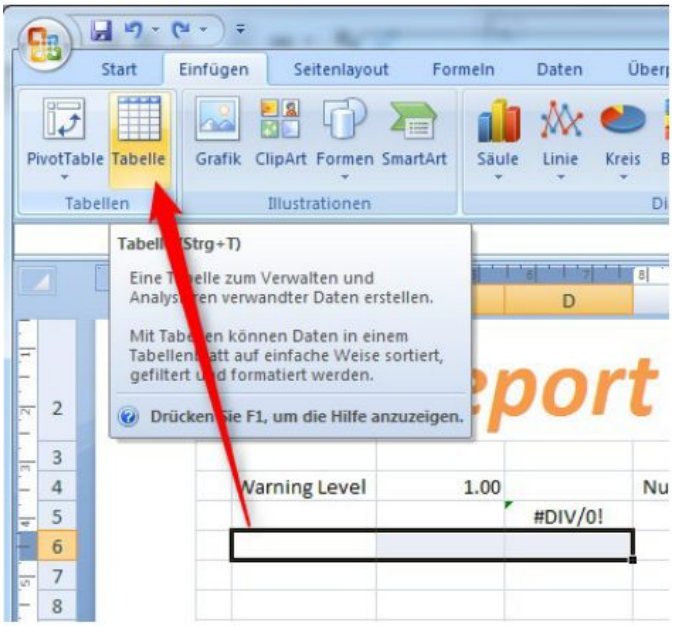


Image 55: Insert Table

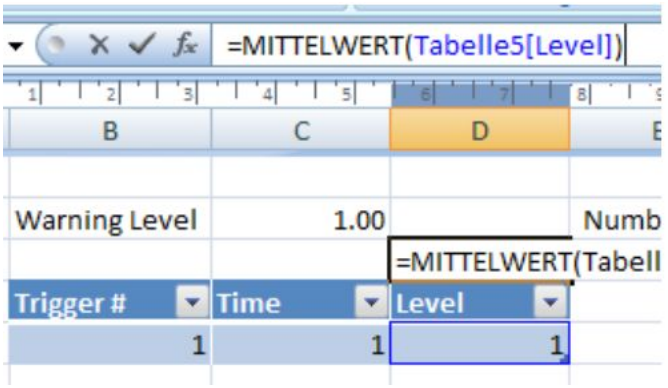


Image 56: Insert Table

Next, we prepare to insert the chart. We select the whole Level column (including the header) and then insert a chart.

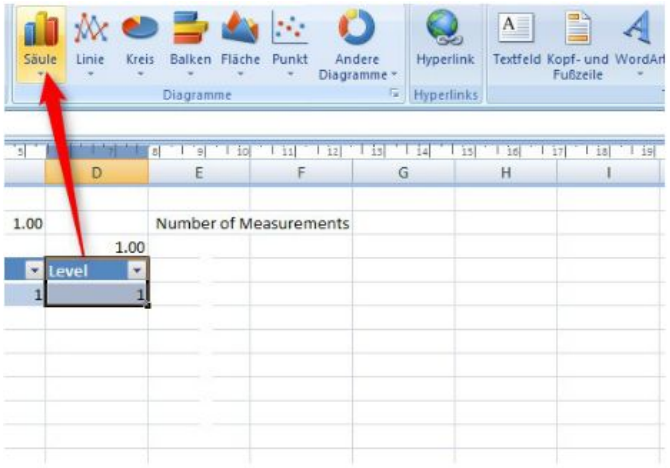


Image 57: Insert Chart

Now the Chart should look like this:

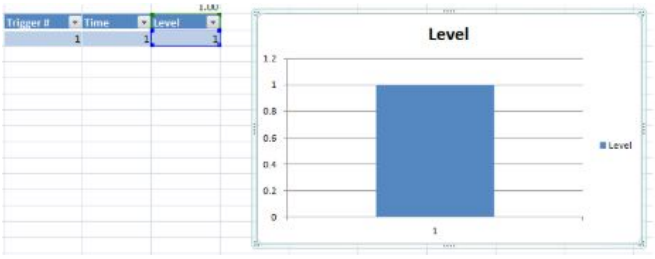


Image 58: Chart in Template

Now let's start the measurement and look at the Excel® report. After 5 triggers. You can see that the chart shows exactly 5 data-slots:

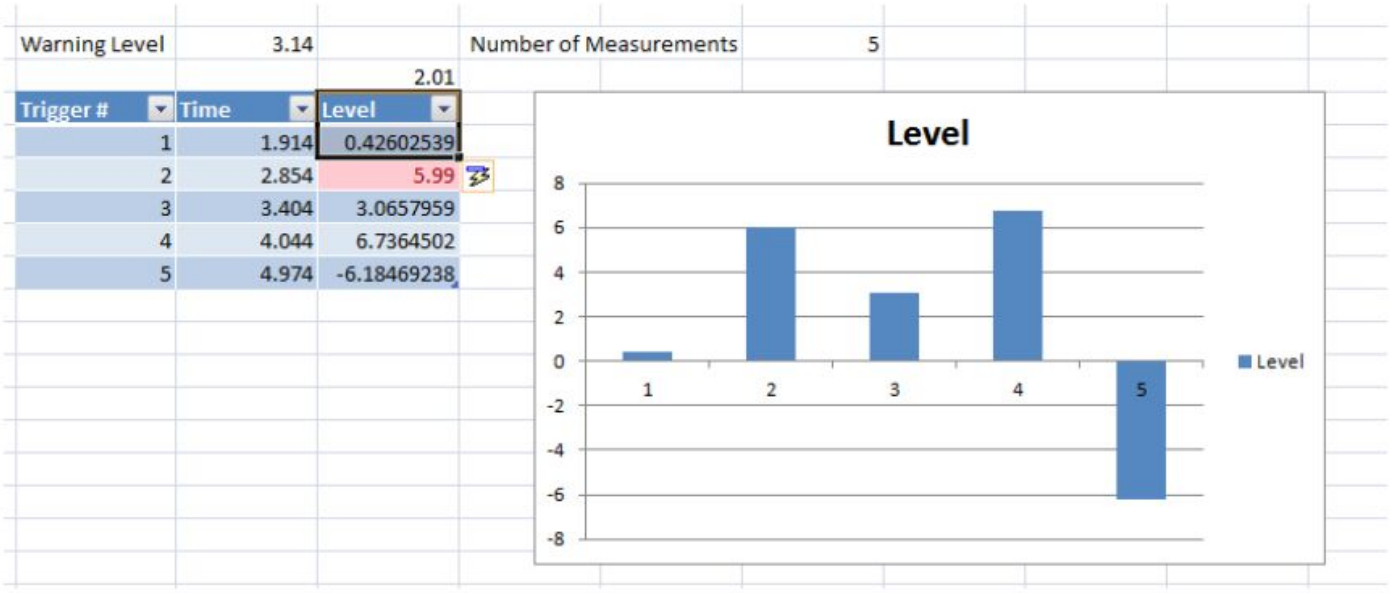


Image 59: Table-Chart after 5 triggers

After 8 triggers, you can see that the chart adapts automatically and also the average calculation has changed accordingly.

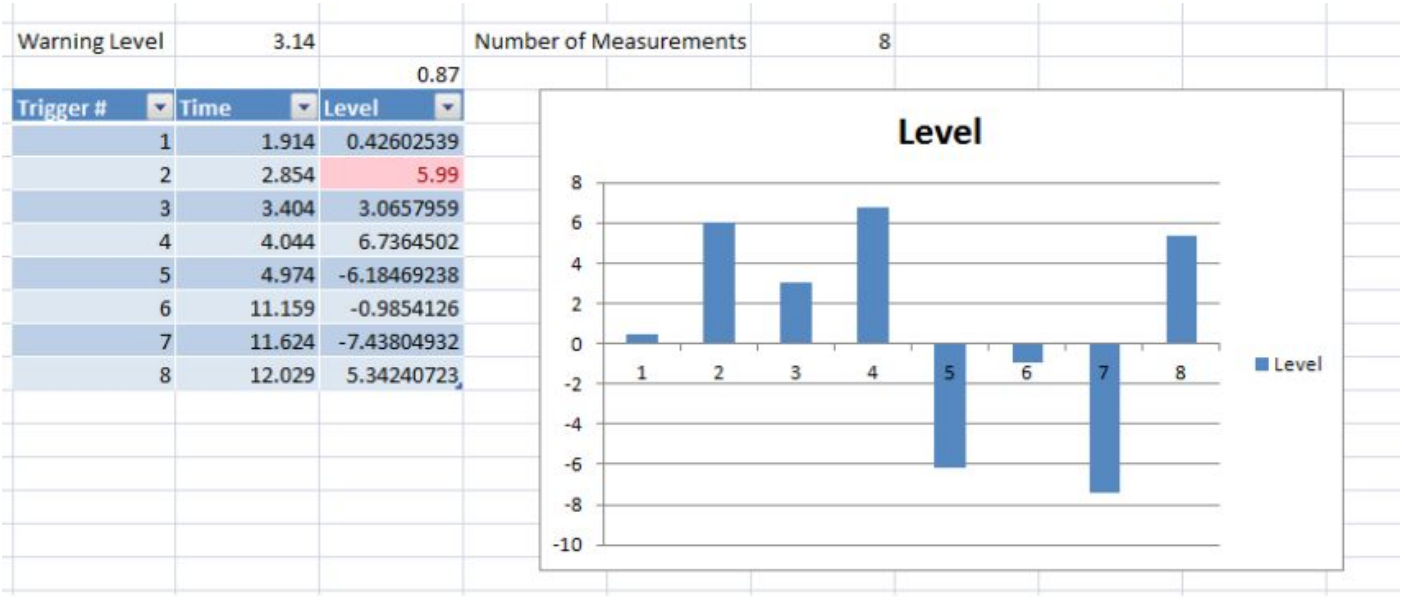


Image 60: Table-Chart after 8 triggers

Important
Take care when using the Complex Formula representation in a Excel® tables: see Complex channels

5.4. Time-based Charts

When you want to show time-based charts in Excel®, you must pass the DewesoftX® time to Excel®. This can easily be done via a simple DewesoftX® Math channel definition:

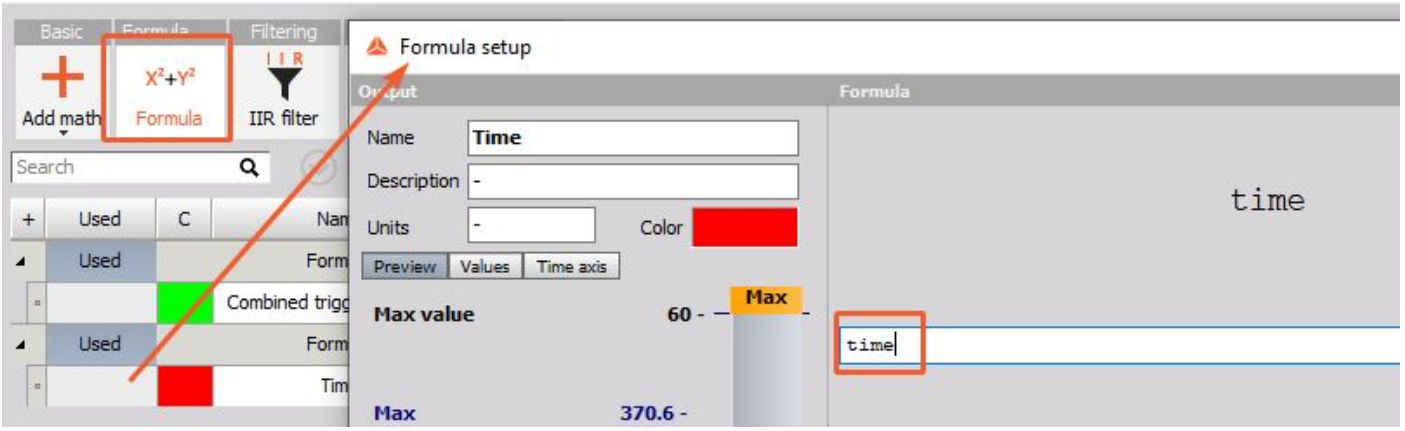


Image 61: Math Time Channel

Just add a simple Math formula: time and rename the channel to Time. Then add it as a column to the Excel® Table Definition Grid (see chapter Excel® Table Definition), so that it will be written to Excel®.

The resulting data table in the Excel® report may now look like Image 58.

The 1st column is the trigger count, the 2nd column is the Math-Time channel that we have defined and the 3rd is some data-column.

Trigger #	Time	Level
1	1.103	6.72
2	2.058	-4.44
3	6.454	1.28
4	7.109	3.97
5	9.444	5.92

Image 62: Time column

Now we can take a look at 2 different charts: one simple bar-chart that shows the *Level* data and a scatter-chart (aka. x-y chart, German "*Punkt* Diagram") which uses the Time column for the x-axis and the *Level* column as y-axis.
Note: since the scatter plot uses the time as x-axis, the distance between the data-points is not equidistant.

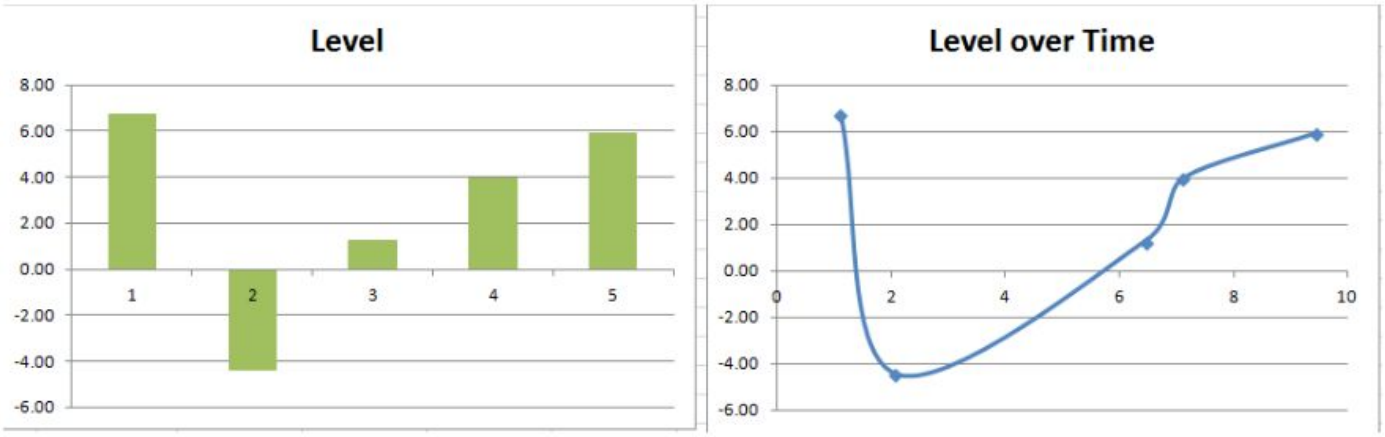


Image 63: Bar Chart vs. Scatter Chart

5.5. Multi-File Feature

When you use the DewesoftX® multi-file feature, you can choose to create an Excel® Report file for every DewesoftX® data file, or one single Excel® Report file for all DewesoftX® data-files.
This only depends on the Report File name specification (see: chapter Report File Settings).

When you use a variable in the Report File name (or in the Report Directory) that changes when a new multi file is created (e.g. Ds.File.Name, Ds.File.MultiFilePostfix), then one Excel® file will be created per DewesoftX® data-file.

When a new Workbook is created, the Trigger count (3.3.3.1 Trigger Count on page 26) will be reset.

See also: Multifile Hints

5.6. Performance

Keep in mind, that Excel® is quite slow compared to DewesoftX® - so you should only use slow trigger conditions (e.g. one trigger per second, ..). When you try to write data faster than Excel® can handle it, the data will be buffered internally and eventually be written later (see Work In Progress below). In this case, the data that you see in Excel® will lag behind the data that you see in DewesoftX®.

The possible Excel® performance also depends on the features that you use in your Excel® template: i.e. large arrays, extensive calculations, or the display of live charts will significantly slow down the write performance.
Note: to improve performance, when there are Charts in your template, you may simple activate a sheet that does not show any charts and then save your template: Then writing to Excel® will be faster (because the Charts need not be updated) and when you later switch to the worksheet with the Charts, Excel® will update the Chart.

5.6.1. Work In Progress

When you have set your trigger, to fire very often, then Excel® may be too slow to store all the data right away. In this case, when you stop storing, you may see the dialogue: Image 60: Work in progress.

Just wait until all the data has been written, or click **Abort**. When you abort the operation, the remaining data will not be written to Excel® (but it is of course already stored in the DewesoftX® data-file), and Excel® will remain open: make sure to store your Excel® workbook and close Excel®

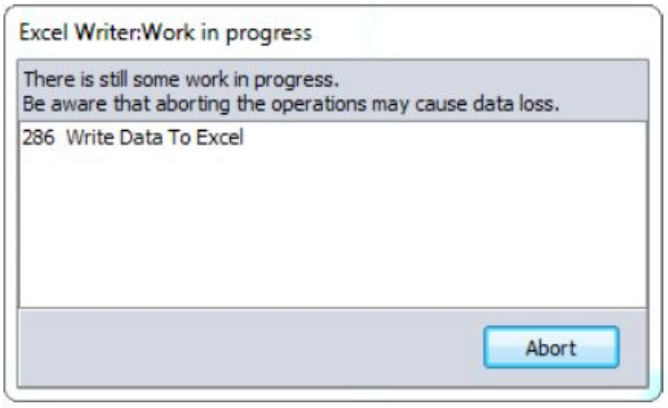


Image 64: Work in progress

5.7. Variables

In some input fields of the Excel Writer AddOn you can use certain variables. The variable handling makes it easier to reuse the same channel setup on different PCs, or with different DewesoftX® project settings: this is best explained by example, continue reading.

5.7.1. Variable Input

The variable input consists of 2 edit-fields: see Image 61.

In the top field ❶ you can enter text and variables. The variables start and end with a % (percent sign). When you really want to use a literal percent sign, you must enter 2 percent signs %% (see also the example in Image 64 below).

The bottom field ❷ will show you the result: i.e. the input text in the top edit-field where all variables are replaced with concrete values.

When you right-click in the edit-field, you will see a pop-up menu which shows all available variables and also a menu item to reset the text to the default ❸(i.e. the same value that is used when you create a new setup).

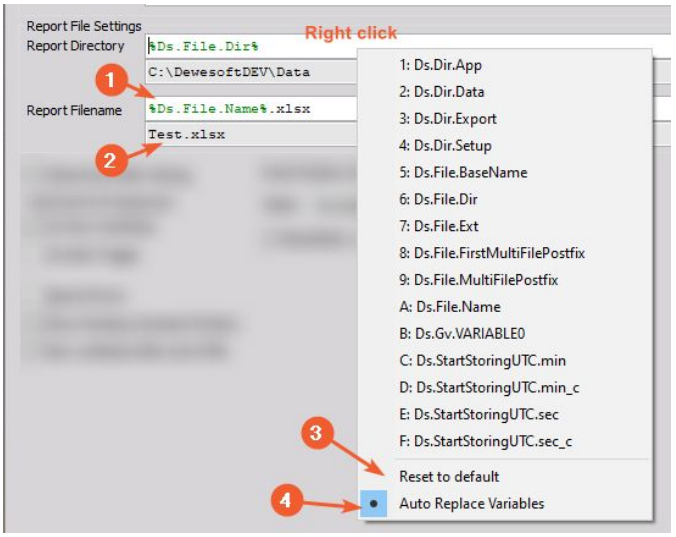


Image 65: Variable Input Fields

There may also be an Auto Replace Variables check-box ❹ . When this is activated your input

text may be replaced with a corresponding variable.
E.g. say the current file-name is set to Test , you enter the text Test.xslx as Report-filename (see Image 62) and now you press Enter (or leave the input field), then the AddOn will automatically replace the text Test with the %Ds.File.Name% variable(see Image 63).

Note: not all variables are replaced in this way: i.e. the header variables (see chapter Ds.Dh.*) are never used

Illustration 64: Input

Image 65: Result

The input field will change the colour of the text (and the result) as you type. Normal text will be black, valid variables green, erroneous variables in red and the percent sign in blue.

Let's take a look at the example in Image 64.

The first 2 input characters are 2 percent signs %% – they are displayed in blue and the result is a single percent sign. The next character is a dash – it is displayed in black and will be used verbatim in the output. Next we have a valid variable %Ds.File.BaseName%, which will be replaced with the Name of the Dewesoft data-file. Then there is some verbatim text again .xlsx. And at the end we have an invalid variable %Ds.Unknown%. This variable is unknown: i.e. it does not show up in the variable list when you right click the edit field.

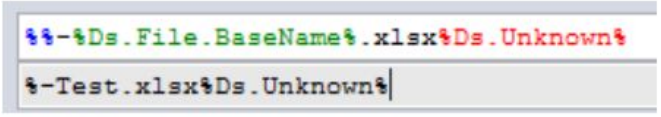


Image 66: Variable Input Colours

5.7.2. Folder Variables

The folders in the Settings dialogue can be used as variables:

Related Variables:
1. Ds.Dir.App
2. Ds.Dir.Setup
3. Ds.Dir.Data
4. Ds.Dir.Export

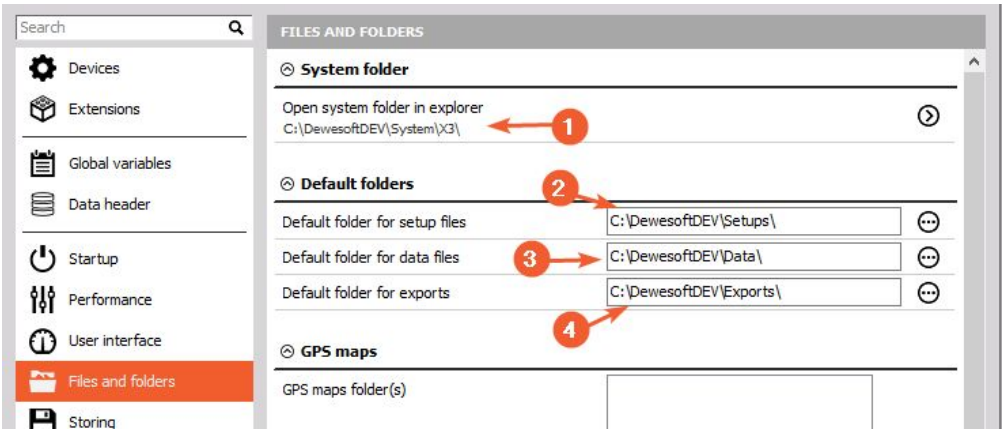


Image 67: Settings – Files and Folders

5.7.2.1. Ds.Dir.App

This variable refers to the installation folder of DewesoftX®. You can see the system folder in the Settings (but you cannot change it). See ❶ in Image 65.

5.7.2.2. Ds.Dir.Setup

This variable refers to the DewesoftX® data-directory (where the DewesoftX® channel-setup files *.dxs are stored). See ❷ in Image 65.

5.7.2.3. Ds.Dir.Data

This variable refers to the DewesoftX® data-directory (where the DewesoftX® data-files *.dxd are stored). See in Image 65.

5.7.2.4. Ds.Dir.Export

This variable refers to the DewesoftX® export-directory. See in Image 65.

5.7.3. Data File Variables

The file-name variables may be used to specify the name of the target files.

In Image 66 you can see that we have set the filename to Test and activated the multifile-feature, so that the full file-name will be Test_0000: In this case the variables will have the values as specified below.

❶ activate multi-file feature
❷Ds.File.BaseName: Test
❸Ds.File.MultiFilePostfix: 0000
❷ + ❸ Ds.File.Name: Test_0000
❹ Ds.File.Directory: C:\DXEProjects\DewesoftX\DEWEsoft\Data Image 66: Storing Options Multifile

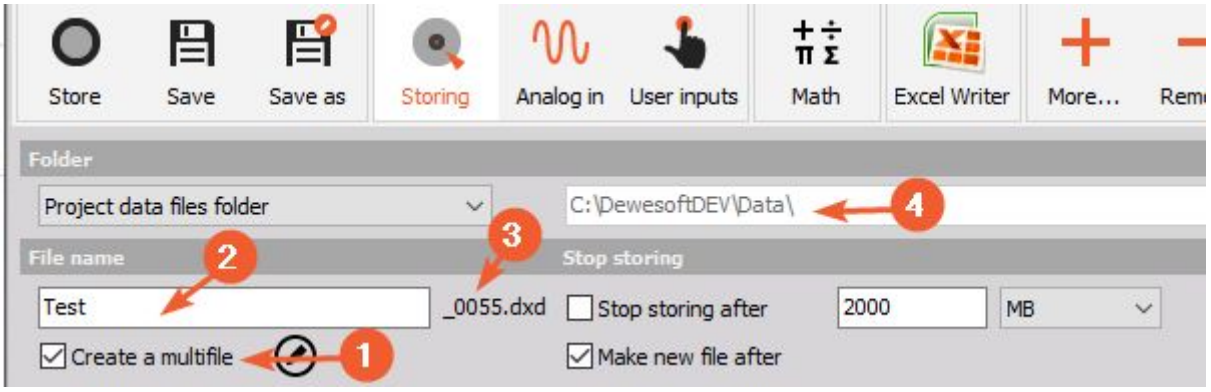


Image 68: Storing Options Multifile

5.7.3.1. Ds.File.BaseName This variable refers to the base name of the DewesoftX® data-file. If the multifile-feature is deactivated this variable will be the same as Ds.File.Name.	Test
5.7.3.2. Ds.File.MultiFilePostfix This variable refers to the multifile-postfix of the DewesoftX® data-file. If the multifile-feature is deactivated this variable will be empty (blank text). This variable will change whenever DewesoftX® starts a new multi-file.	0000
5.7.3.3. Ds.File.FirstMultiFilePostfix This variable refers to the postfix of the first multifile that you store. This variable will only change when you press the Store button. See also: chapter Multifile Hints	0000
5.7.3.4. Ds.File.Name This variable refers to the full name of the DewesoftX® data-file.	Test_0000
5.7.3.5. Ds.File.Ext This variable refers to the file extension of the DewesoftX® data-file. Note that the dot is not included.	d7d

5.7.3.6. Ds.File.Directory This variable refers to the directory of the DewesoftX® data-file.	C:\DXEProjects\DewesoftX\DEWEsoft\Data

5.7.4. Start Storing Time

The start-storing time variables may be used as part of the file name.
Note: the start storing time will NOT change when a new multi file is started (in comparison to the Ds.File.* variables).
For example, when the start storing time UTC is 20th, Nov. 2014, 19:06:30 the variables will have the values as specified below.

5.7.4.1. Ds.StartStoringUTC.min Start storing time UTC with resolution to minutes.	2014_11_20_19_06
5.7.4.2. StartStoringUTC.min_c Start storing time UTC with resolution to minutes in compact format.	Ds. 201411201906
5.7.4.3. Ds.StartStoringUTC.sec Start storing time UTC with resolution to seconds.	2014_11_20_19_06_30
5.7.4.4. Ds.StartStoringUTC.sec_c Start storing time UTC with resolution to seconds in compact format.	20141120190630

5.7.5. Ds.Dh.*

These variables refer to the Data Header variables that you can define in the DewesoftX® Settings:

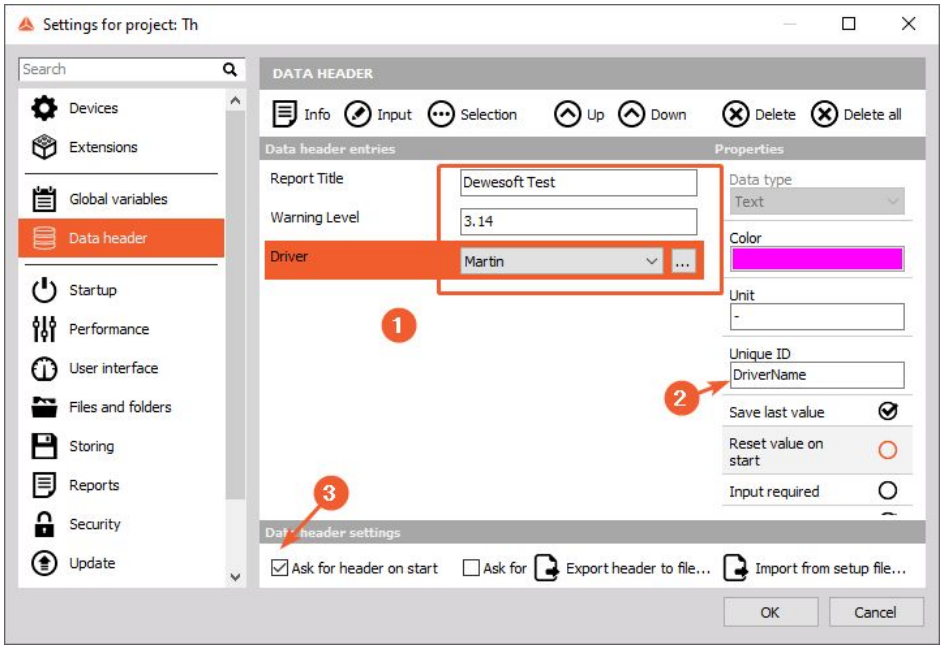


Image 69: Settings – Data Header

The data-header items that you define, can be used as variables. The variable name will be of the form Ds.Dh.Unique ID.

Example

In Image 67 we have a variable with the unique ID DriverName ❷ . When you want to use this variable e.g. in the report-file name it will be called: Ds.Dh.DriverName and the value will be the currently selected value Martin ❶.

Important

Keep in mind that the AddOn will copy the template file when you begin storing: so at that time, the values of the variables must already be set. Thus, you must check the Ask for header on the start checkbox.

Hint

You should not use special characters or even a space character, to keep the variables more readable. If you use a percent sign in the Unique ID (not recommended), then it will be replaced with an underscore character in the variable name: e.g. Unique ID: Level % will become Ds.Dh.Level _. Also keep in mind, that special characters in the entered values may cause problems later: e.g. you can enter Test* as value for a variable, but when you try to use this value as part of a file/directory name, it will of course be invalid (Windows® does not allow asterisk characters in file-names)!

5.7.6. Ds.Gv.*

These variables refer to the Global Variables that you can define in the DewesoftX® Settings:

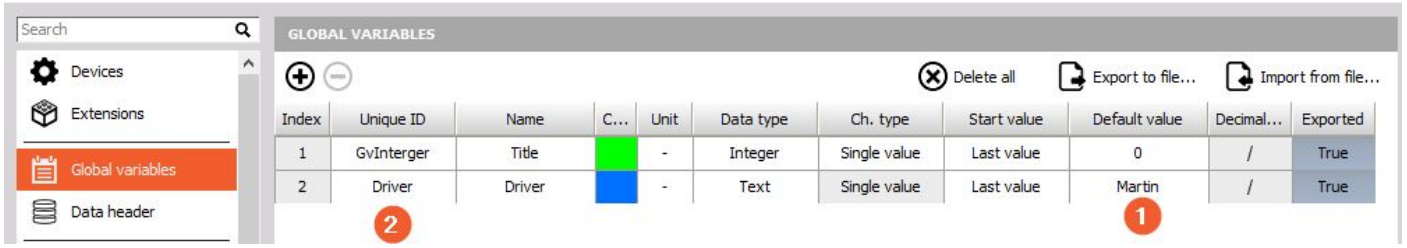


Image 70: Settings – Global Variables

Global variables are much like the Data Header – so make sure to also read chapter 4.7.5 Ds.Dh.* on page 42, but the Global variables don't have the feature to automatically show an input form to the user before storing.

The *Global Variables* that you define, can be used as variables. The variable name will be of the form Ds.Gv.Unique ID.

Example
In Image 68 we have a variable with the unique ID Driver . When you want to use this variable e.g. in the report-file name it will be called: Ds.Gv.Driver and the value will be the currently selected value Martin.

Important
Keep in mind that the AddOn will copy the template file when you begin storing: so at that time, the values of the variables must already be set. You may use the DewesoftX® Sequencer feature to change the value.

Hint
You should not use special characters or even a space character, to keep the variables more readable. If you use a percent sign in the Unique ID (not recommended), then it will be replaced with an underscore character in the variable name: e.g. Unique ID: Level % will become Ds.Gv.Level _. Also keep in mind, that special characters in the entered values may cause problems later: e.g. you can enter Test* as value for a variable, but when you try to use this value as part of a file/directory name, it will of course be invalid (Windows® does not allow asterisk characters in file-names)!

5.8. Grid

This chapter describes some general features of the grid.

5.8.1. Search-Box & Count-label

The search box can be used to easily filter the Grid, so that it only shows rows that contain the search text. The count label on the right side of the search box shows information about the rows in the grid. It can show the total number of rows, the number of filtered rows and the number of currently selected rows (you can hover over the label to see a hint).

This is best explained with a simple example: see Image 69.

We have 4 rows in the grid, the filter box is empty and no rows are selected. In this case the count-label shows the total number of rows in the grid: in this example 4.

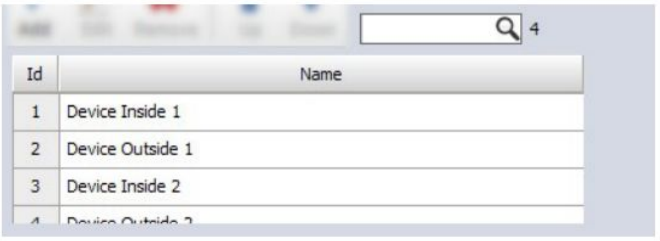


Image 71: Grid: 4 rows

When you now select 2 rows in the grid (see chapter Multi-select), you can see that the label shows 2 of 4 (2 rows of the total 4 rows are selected).

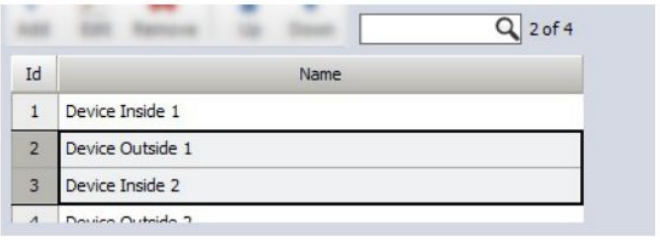


Image 72: Grid: 4 rows, 2 selected

Now let's enter the text Ins into the search box. You can see that the grid is immediately filtered and only the rows that match our input text are shown (the matching part of the text will be shown in red).

The count label changed and now shows 2 4 to indicate that only 2 of the total 4 rows are visible because we have filtered the grid.

To clear the filter, you can:

- simple delete the text in the search-box
- press the X-icon on the right side
- press the button (while the focus is on the search-box)

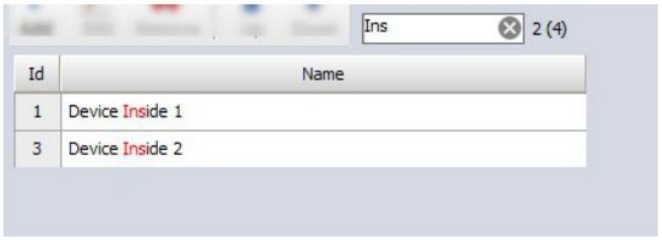


Image 73: Filtered Grid: shows 2 rows (of 4)

When you now select one of the 2 filtered rows the count label will change again to: 1 of 2 4 to indicate that one row of the 2 filtered rows is selected – and that there are 4 rows in total.

Image 72 Also shows the hint that will appear when you hoover the mouse over the count label.

Image 74: Filtered Grid – one row selected

5.8.2. Header pop-up

When you right-click on the header row of the grid, you can specify which columns you want to see (i.e. show/hide columns) and you can also sort/unsort the grid by certain columns.

Image 75: Grid: Header Popup

5.8.2.1. Edit columns

When you click *Edit columns* from the pop-up, you will see the *Choose columns* dialogue (see Image 74). In this dialogue you can:

- change the order of the columns (Move up and Move down buttons)
- change the visibility of the columns (Show and Hide buttons)
- change the column width (edit field at the bottom)
- reset everything to the default (button Default)

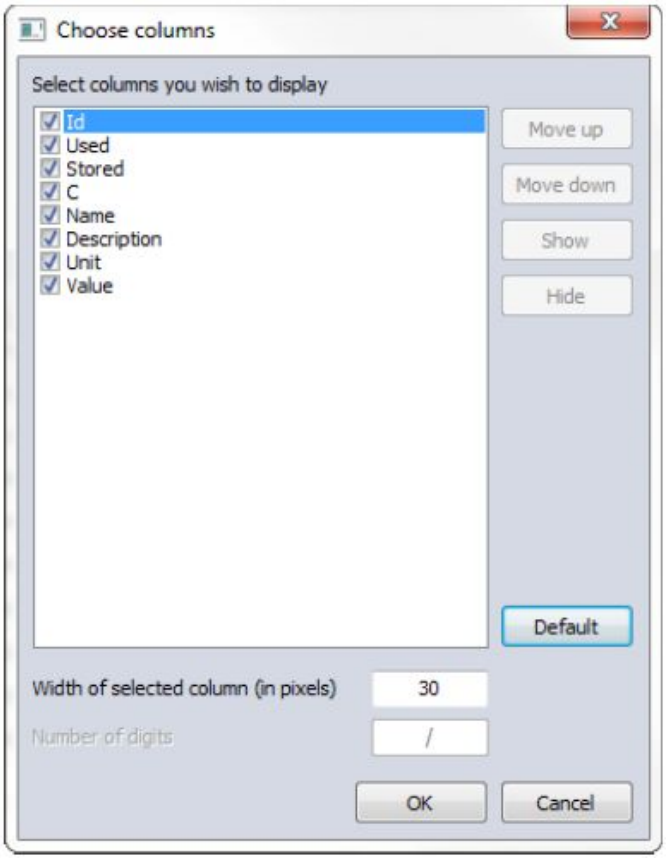


Image 76: Choose columns

5.8.2.2. Grid Sorting

When you select *Sort by this Column* from the header pop-up menu (see Image 73), the grid rows will be sorted by the values of the selected column: i.e. in Image 75 the grid is sorted by the *Name* column in ascending order. The small arrow at the bottom of the column reader (see red rectangle in Image 75) represents the sort order which is now ascending. Select *Sort by this Column* again, to change the sort order to descending.
Also note that the values of the Id column are also sorted: i.e. the Id it is not a row-number, but it is a unique number that identifies the row.
When you select Unsort from the header pop-up menu (see Image 73), the rows will be in the default order (ordered by Id) again.
Note that some Grids allow to move their elements Up/Down. This is of course only possible if the grid is Unsorted.

Id	Used	Stored	C	Name
4	Used	Stored		Row 4
3	Used	Stored		Row 3
2	Used	Stored		Row 2
1	Used	Stored		Row 1

Image 77: Sorted Grid

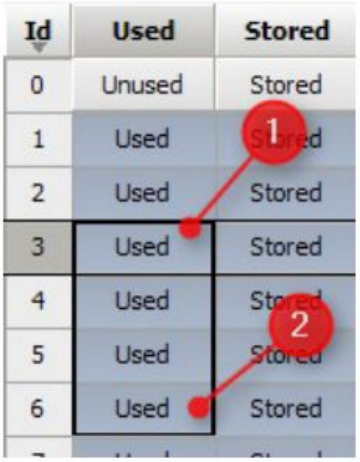
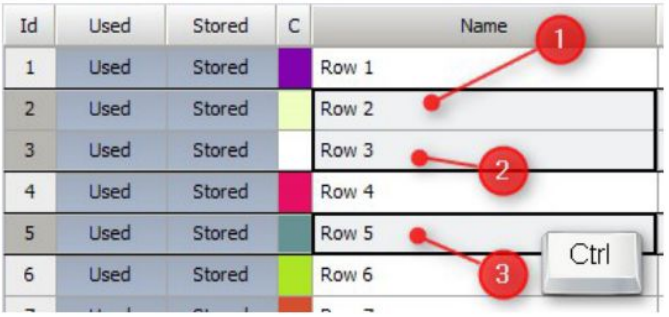
5.8.3. Multi-select

You can select and edit multiple rows/cells at once.

The selected cells will be surrounded by a black rectangle. When you click into the selected region, you can apply actions to all selected rows at once (e.g. in Image 76, clicking into the surrounded black rectangle will set the
channels 3, 4, 5 and 6 to unused).

Note: this does also work for text-columns: i.e. when you select the rows, as shown in Image 77, and start typing characters on the keyboard, the Names of the channels with ID 2, 3 and 5 will be changed accordingly.

Range selection (see Image 76):	Arbitrary selection (see Image 77):
1. left-click a cell and hold the mouse button 2. move the mouse (while still holding down the mouse button) to the target cell and then release the mouse button	1. click the Name column of row 2, to select row 2 2. hold down the ctrl key and click into the Name column of row 3, to add row 3 to the selection now rows 2 and 3 are selected 3. hold down the ctrl key and click into the Name column of row 5, to add row 5 to the selection now rows 2, 3 and 5 are selected

	Release the ctrl key when you are done selecting channels
 *Image 78: Range selection*	 *Image 79: Arbitrary Selection*

6. Warranty information

Notice
The information contained in this document is subject to change without notice.

Note:
Dewesoft d.o.o. shall not be liable for any errors contained in this document. Dewesoft MAKES NO WARRANTIES OF ANY KIND WITH REGARD TO THIS DOCUMENT, WHETHER EXPRESS OR IMPLIED. DEWESOFT SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Dewesoft shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory, in connection with the furnishing of this document or the use of the information in this document.

The copy of the specific warranty terms applicable to your Dewesoft product and replacement parts can be obtained from your local sales and service office. To find a local dealer for your country, please visit https://dewesoft.com/support/distributors.

6.1. Calibration

Every instrument needs to be calibrated at regular intervals. The standard norm across nearly every industry is annual calibration. Before your Dewesoft data acquisition system is delivered, it is calibrated. Detailed calibration reports for your Dewesoft system can be requested. We retain them for at least one year, after system delivery.

6.2. Support

Dewesoft has a team of people ready to assist you if you have any questions or any technical difficulties regarding the system. For any support please contact your local distributor first or Dewesoft directly.

Dewesoft d.o.o.
Gabrsko 11a
1420 Trbovlje Slovenia

Europe Tel.: +386 356 25 300
Web: http://www.dewesoft.com
Email: Support@dewesoft.com
The telephone hotline is available Monday to Friday from 07:00 to 16:00 CET (GMT +1:00)

6.3. Service/repair

The team of Dewesoft also performs any kinds of repairs to your system to assure a safe and proper operation in the future. For information regarding service and repairs please contact your local distributor first or Dewesoft directly on https://dewesoft.com/support/rma-service.

6.4. Restricted Rights

Use Slovenian law for duplication or disclosure. Dewesoft d.o.o. Gabrsko 11a, 1420 Trbovlje, Slovenia / Europe.

6.5. Printing History

Version 2.0.0, Revision 217 Released 2015 Last changed: 23. July 2018 at 16:54.

6.6. Copyright

6.7. Trademarks

We take pride in our products and we take care that all key products and technologies are registered as trademarks all over the world. The Dewesoft name is a registered trademark. Product families (KRYPTON, SIRIUS, DSI, DS-NET) and technologies (DualCoreADC, SuperCounter, GrandView) are registered trademarks as well. When used as the logo or as part of any graphic material, the registered trademark sign is used as a part of the logo. When used in text representing the company, product or technology name, the ® sign is not used. The Dewesoft triangle logo is a registered trademark but the ® sign is not used in the visual representation of the triangle logo.

7. Safety instructions

Your safety is our primary concern! Please be safe!

7.1. Safety symbols in the manual

Warning
Calls attention to a procedure, practice, or condition that could cause the body injury or death

Caution
Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

7.2. General Safety Instructions

Warning

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Dewesoft GmbH assumes no liability for the customer's failure to comply with these requirements.

All accessories shown in this document are available as an option and will not be shipped as standard parts.

7.2.1. Environmental Considerations

Information about the environmental impact of the product.

7.2.2. Product End-of-Life Handling

Observe the following guidelines when recycling a Dewesoft system:

7.2.3. System and Components Recycling

Production of these components required the extraction and use of natural resources. The substances contained in the system could be harmful to your health and to the environment if the system is improperly handled at its end of life! Please recycle this product in an appropriate way to avoid unnecessary pollution of the environment and to keep natural resources.

This symbol indicates that this system complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further information about recycling on the Dewesoft web site www.dewesoft.com

Restriction of Hazardous Substances

This product has been classified as Monitoring and Control equipment and is outside the scope of the 2002/95/EC RoHS Directive. However, we take care of our environment and the product is lead-free.

7.2.4. General safety and hazard warnings for all Dewesoft systems

Safety of the operator and the unit depend on following these rules.

- Use this system under the terms of the specifications only to avoid any possible danger.
- Read your manual before operating the system.
- Observe local laws when using the instrument.
- DO NOT touch internal wiring!
- DO NOT use higher supply voltage than specified!
- Use only original plugs and cables for harnessing.
- You may not connect higher voltages than rated to any connectors.
- The power cable and connector serve as Power-Breaker. The cable must not exceed 3 meters, the disconnect function must be possible without tools.
- Maintenance must be executed by qualified staff only.
- During the use of the system, it might be possible to access other parts of a more comprehensive system. Please read and follow the safety instructions provided in the manuals of all other components regarding warning and security advice for using the system.
- With this product, only use the power cable delivered or defined for the host country.
- DO NOT connect or disconnect sensors, probes or test leads, as these parts are connected to a voltage supply unit.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non-interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals.
- Please note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, please read the corresponding specifications in the product manual carefully.
- The inputs must not, unless otherwise noted (CATx identification), be connected to the main circuit of category II, III and IV.
- The power cord separates the system from the power supply. Do not block the power cord, since it has to be accessible for the users.
- DO NOT use the system if equipment covers or shields are removed.
- If you assume the system is damaged, get it examined by authorized personnel only.
- Adverse environmental conditions are Moisture or high humidity Dust, flammable gases, fumes or dissolver Thunderstorm or thunderstorm conditions (except assembly PNA) Electrostatic fields, etc.
- The measurement category can be adjusted depending on module configuration.
- Any other use than described above may damage your system and is attended with dangers like short-circuiting, fire or electric shocks.
- The whole system must not be changed, rebuilt or opened.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until the safe operation can be verified by service-trained personnel. If necessary, return the product to Dewesoft sales and service office for service and repair to ensure that safety features are maintained.
- If you assume a more riskless use is not provided anymore, the system has to be rendered inoperative and should be protected against inadvertent operation. It is assumed that a more

riskless operation is not possible anymore if the system is damaged obviously or causes strange noises. The system does not work anymore. The system has been exposed to long storage in adverse environments. The system has been exposed to heavy shipment strain.

- Warranty void if damages caused by disregarding this manual. For consequential damages, NO liability will be assumed!
- Warranty void if damage to property or persons caused by improper use or disregarding the safety instructions.
- Unauthorized changing or rebuilding the system is prohibited due to safety and permission reasons (CE).
- Be careful with voltages >25 VAC or >35 VDC! These voltages are already high enough in order to get a perilous electric shock by touching the wiring.
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not be covered!
- Only fuses of the specified type and nominal current may be used. The use of patched fuses is prohibited.
- Prevent using metal bare wires! Risk of short circuit and fire hazard!
- DO NOT use the system before, during or shortly after a thunderstorm (risk of lightning and high energy over-voltage). An advanced range of application under certain conditions is allowed with therefore designed products only. For details please refer to the specifications.
- Make sure that your hands, shoes, clothes, the floor, the system or measuring leads, integrated circuits and so on, are dry.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- Avoid operation in the immediate vicinity of high magnetic or electromagnetic fields, transmitting antennas or high-frequency generators, for exact values please refer to enclosed specifications.
- Use measurement leads or measurement accessories aligned with the specification of the system only. Fire hazard in case of overload!
- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatise the system unpowered to room temperature.
- Do not disassemble the system! There is a high risk of getting a perilous electric shock. Capacitors still might be charged, even if the system has been removed from the power supply.
- The electrical installations and equipment in industrial facilities must be observed by the security regulations and insurance institutions.
- The use of the measuring system in schools and other training facilities must be observed by skilled personnel.
- The measuring systems are not designed for use in humans and animals.
- Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Please be careful with the product. Shocks, hits and dropping it from already- lower level may damage your system.
- Please also consider the detailed technical reference manual as well as the security advice of the connected systems.
- This product has left the factory in safety-related flawlessness and in proper condition. In order to maintain this condition and guarantee safety use, the user has to consider the security advice and warnings in this manual.

EN 61326-3-1:2008

IEC 61326-1 applies to this part of IEC 61326 but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.7 of IEC 61326-1.

Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this product family standard, IEC 61326-3-1.

Devices and systems according to IEC 61508 or IEC 61511 which are considered as “operationally well-tried”, are excluded from the scope of IEC 61326-3-1.

Fire-alarm and safety-alarm systems, intended for the protection of buildings, are excluded from the scope of IEC 61326-3-1.

8. Documentation version history

AddOn Version	Date [dd.mm.yyyy]	Notes
0.0.0.508	27.01.2016	Debug beta version for testing
0.0.0.635	05.02.2016	☑Added Ignore Errors feature ☑Added support for Data Header (Ds.Dh.*) variables ☑Added feature to auto-replace variables in variable edit fields ☑Directory Input: added warning for double backslashes
0.0.0.695	12.02.2016	☑Added support for Global Header (Ds.Gv.*) variables ☑Removed Status Channel – using standard DEWESoft message reporting system ☑Respecting the channels calc-delay
1.0.0	15.02.2016	☑Added feature to Write Header Row to Excel® ☑Added feature to define the Excel® window settings
1.1.0	22.02.2016	☑Array channels and array item channels are now supported ☑ "Remember Last Position" did not save the values back to the setup ☑Window Position now supports negative values for Top/Left (i.e. when a second monitor is used that is positioned left of the primary monitor)
1.2.0	25.04.2016	☑Added "Custom Text" feature ☑Added new variables: Ds.File.FirstMultiFilePostfix, Ds.File.Ext
1.2.1	13.07.2016	☑ Fixed possible startup issue for non-English locale settings
1.2.2	06.10.2016	☑Added check-box to hide Pending Commands Window ☑ Fixed possible problems with the Pending Commands Window
1.2.3	03.11.2016	☑Added Freeze Status channel ☑Doc ☑ Improved doc for Custom Text channel ☑Removed the Documentation Version history ☑Corrected numbering symbols in chapter 2
1.2.4	21.12.2017	☑ 64-bit version ☑ updated doc for DewesoftX® X3
1.3.0	13.09.2018	☑Added support for complex numbers ☑Added transpose feature (switch rows and columns) ☑ "About this document": removed info that array channels are not supported.
1.4.0	27.09.2018	☑Added multi-worksheet feature

V20-1	1.8.2020	New Template update New workbook after end of file option added, Show pending command window option added