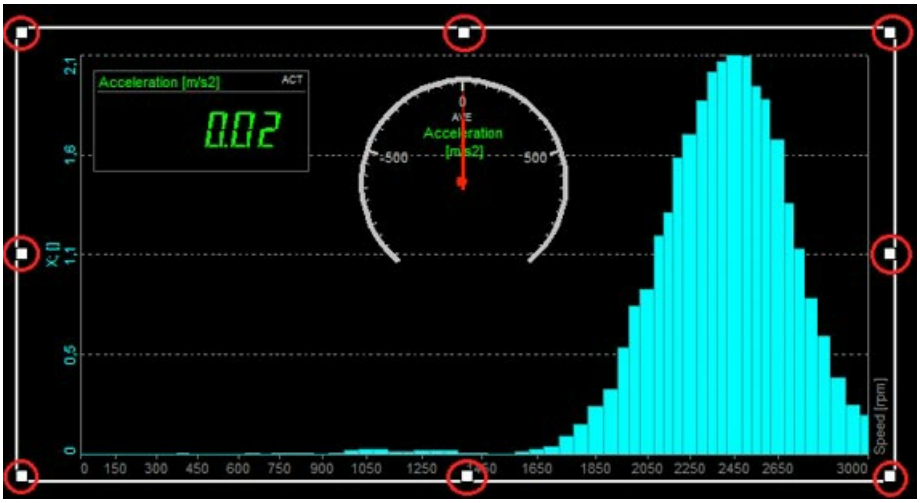
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Visual Display Settings



What is a Display, and what a Widget?

The primary goal of the Dewesoft design online **display** screen is to create a clear and intelligible appearance of acquired and calculated data in different instruments called **widgets** on the screen for revision and analysis of this data.

In Dewesoft X, we can set up different screens in the Acquisition section in Measure label.

Dewesoft X allows us to set up different instruments/widgets for each input, for example, digital meter, recorder, FFT analyzer,... and arrange them freely in front of any graphic in your system to have a simple, but an efficient overview of your signals and measurement.

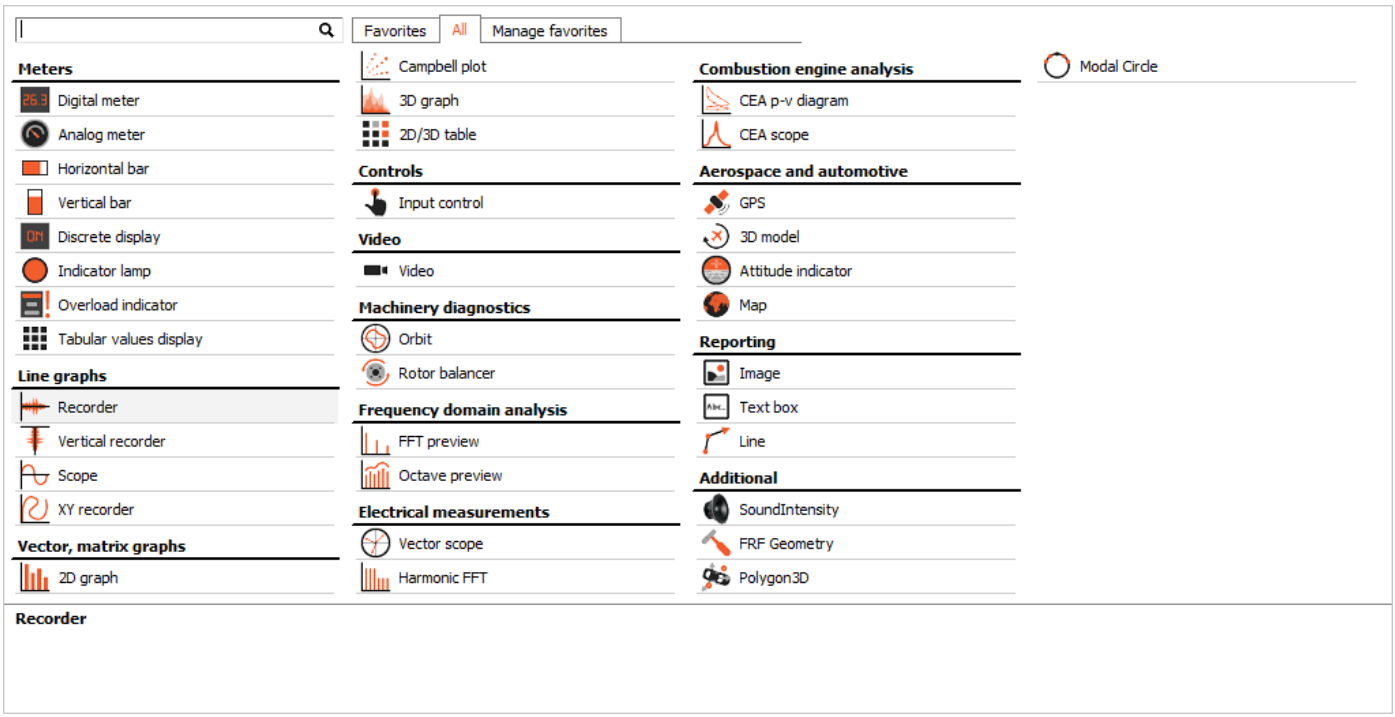
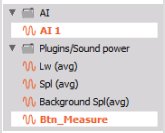
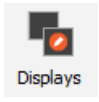
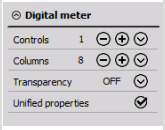


Image 1: Widget drop-down menu

All controls can be combined in one single screen or we can build several screens for a specific part of the measurement. Dewesoft X has few pre-defined displays but these screens can be altered and their own specific displays can be created with a different appearance.

Which Pre-Defined Displays can be used?

All Dewesoft X pre-defined and added displays can be adapted to meet the user's requirements and to have a simple and efficient overview of your signals and measurement. The pre-defined display is an excellent starting point to create your own display with different appearances of acquired signals on screen with:

Add Widgets		Standard instruments (digital meter, recorder, scope, analog meter, 2D graph, FFT analysis, ...) Additional instruments (vector scope, harmonics analysis, video, GPS, tubular display, ...) Additional display screen edit functions.
Channel Selector		A different view on all used channels, channels assigning or reassigning to widgets, resizing the channel selector, user-defined channel groups.
Display Manager		Manage displays: full-screen mode, add another display, rename, and delete displays.
Widget properties		Define control properties to set up predefined and new added widgets.
Display Screen edit		Define the widget's appearance on screen, size, position, common and additional control, and function.

Dewesoft X provides some default screens with pre-defined displays of different instruments for each input:

- Recorder
- Custom
- ....

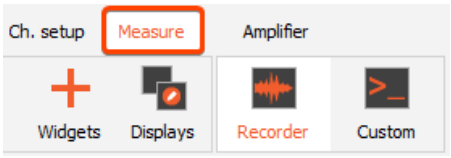


Image 2: Pre-defined screens

These instruments are built as a jump start that software acts as classic instruments like strip chart recorders, classic oscilloscopes, and so on. Some of the following pre-defined displays - screens:

Name of pre-defined display	Icon	Description
Scope		Scope - oscilloscope screen has predefined one Scope instrument, which is usually used for displaying fast, short-time events. Like in a traditional scope you can define trigger conditions.

Recorder	Recorder	The recorder screen has predefined the recorder instrument displays for all of the active channels by default. This screen is meant to display the time - history plotting capabilities and to get an idea of the acquired signals over a long time - trend.
Custom	Custom	The custom screen is intended to be defined and supplemented by the user by adding and arranging instruments.
FFT analyzer	FFT	FFT display (Fast Fourier Transformation) screen has predefined FFT and one scope instrument displays for all of the active channels by default (each graph can display up to 4 signals). The basic idea of the FFT display is to display the frequency components of your acquired data.
Power grid analysis	Power gri...	The power display screen has predefined Vector scope of selected signals and one scope instrument displays for all of the active channels by default. The basic idea of the power display is to display the voltage and current as well as the phase between them.
GPS	GPS	GPS screen has predefined GPS display, digital meters for GPS channels and one recorder instrument display. The basic idea of the GPS screen is to observe a graphical representation position data together with a display acquired values in digital meters and a recorder view for time-domain display of acquired data.

With a completely new setup, there are only a few displays that are added. These are the Recorder, Scope, and Custom.

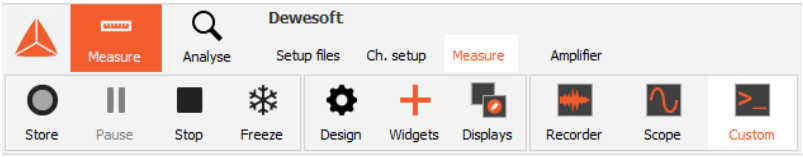


Image 3: The Recorder, Scope and Custom displays

Additional predefined displays can be added by selecting the "Displays" icon. We type the name and select an icon.

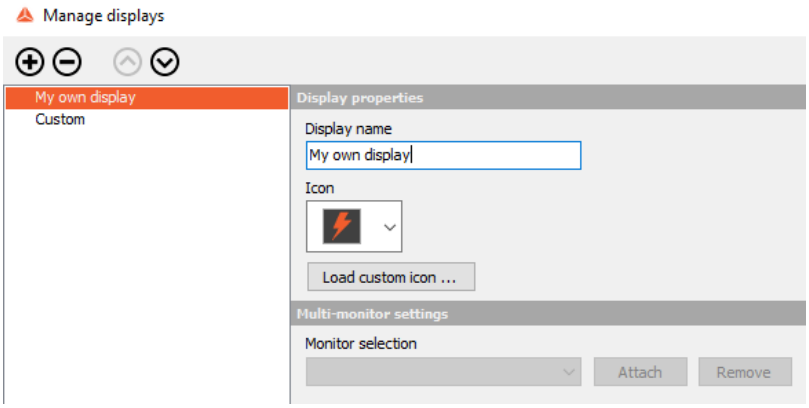


Image 4: Adding an additional predefined display

A new predefined display can be added by choosing from display templates.

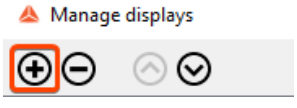


Image 5: Adding a new display

Here all the standard displays named above are shown.

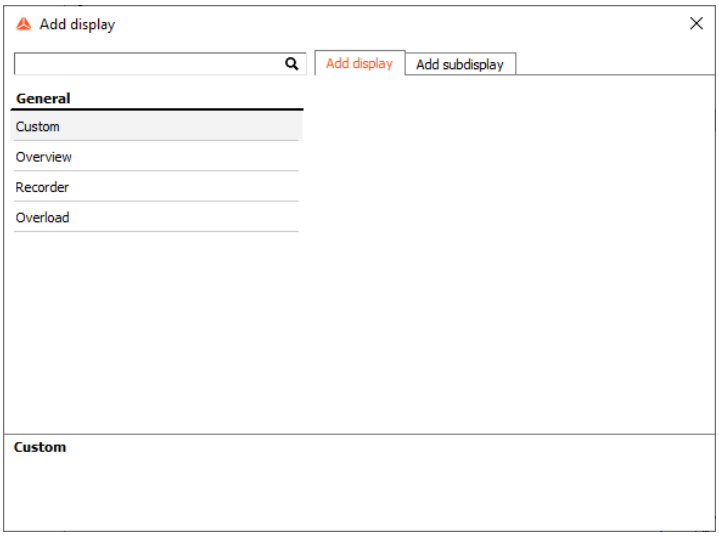


Image 6: All the standard displays names

These screens can be altered to meet the user's requirements and arrange them freely in front of any graphic in your system to have a simple and efficient overview of your signals and measurement.

What is a Design mode?

When you press the Design button from the menu bar **design mode** is selected and you are allowed to create your own display - the appearance of channels data on the screen.



Image 7: Design button

After you press the Widget button, next to the Design button, the 'Add instrument' toolbar will appear.

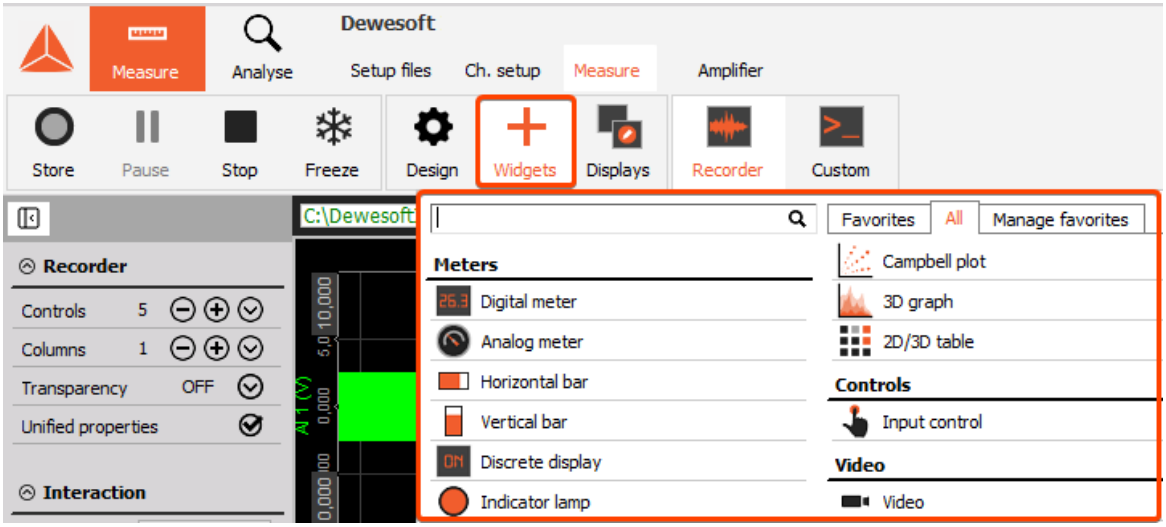


Image 8: Widget toolbar

Important: When you have finished the adaptation, please press the Design button again to fix the layout, otherwise you won't have the full functionality of the instruments.

After you press the Widget button again, the instrument toolbar disappears.

All **pre-defined displays** can be adapted to your own requirements with:

- Shown predefined standard instruments for selected pre-defined display (and for all used channels) on the lower right part of this screen
- Control properties and Design tool button on the upper left part of this screen to enter Design mode - Add instruments for this type of display with the Widget button on the toolbar
- Instrument setting on the middle left part of this screen
- Assigning channels to new instruments with channels selector on the right part of this screen
- Using additional screen edit function on the design toolbar of this screen and Displays menu edit display option
- Instrument appearance setting: position, size, grouping,...

How to Add an Instrument?

To add a widget to your display, after selecting the widget button just click on the desired icon on the toolbar, described at Instruments setup. The design mode for that instrument will be automatically enabled.

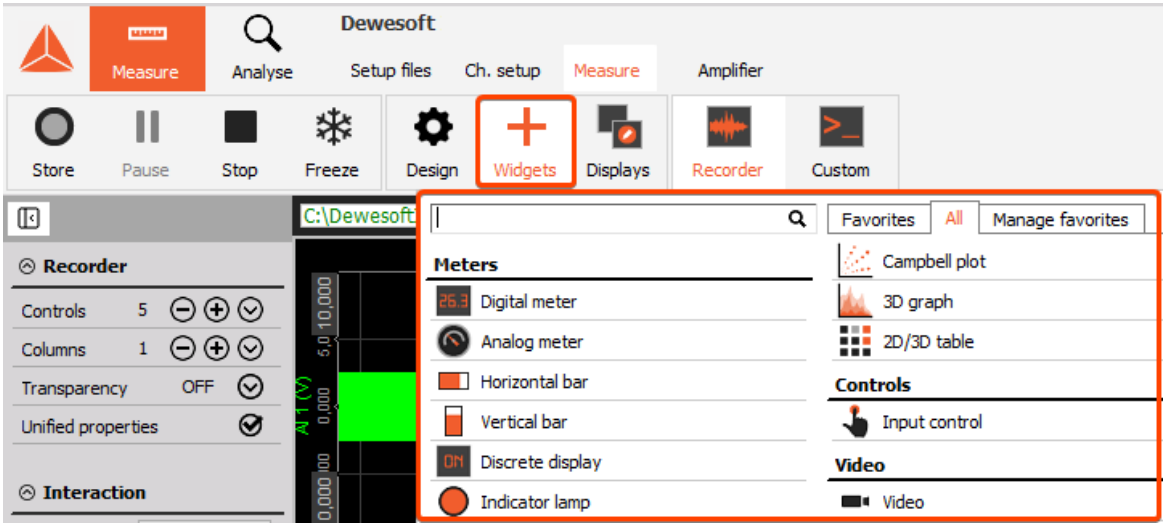


Image 9: Widget toolbar

	Digital meter		Recorder		Vector scope
	Horizontal bar		Vertical recorder		Harmonic FFT
	Vertical bar		X-Y recorder		Video
	Analog meter		Scope		GPS
	Indicator lamp		FFT preview		Overload indicator
	2D graph		Octave preview		Tabular display
	3D graph		Orbit		CEA p-V diagram
	Input control		CEA scope		Sound intensity
	Campbell plot		Polygon		3D model

	Text box		**Image**		**Map**
	Modal Circle		**FRF Geometry**		

Every time when you click on the widget icon, a new widget will be added at the left-top corner of the widget area.

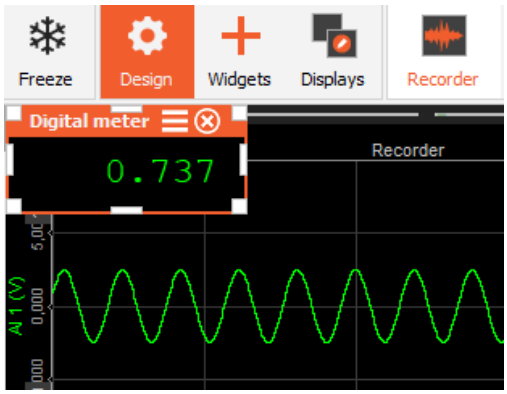


Image 10: Newly added widget

You can ***add a widget according to your requirements.*** Due to the flexibility of the Dewesoft X display screens, you can arrange the widgets according to your requirements with nearly no limitation.

Assign and reassign channels to widgets

As a standard, channels will be automatically assigned to new visual controls. But usually, you don't want these channels to be in the new instrument and you want to reassign another channel.

Make sure that the new visual control is still selected - this is indicated by a white box around the selected visual control. If it is not selected, click on it once more. Then click on any input from the **Channel selector** on the right side of the screen to assign this channel to the new instrument.

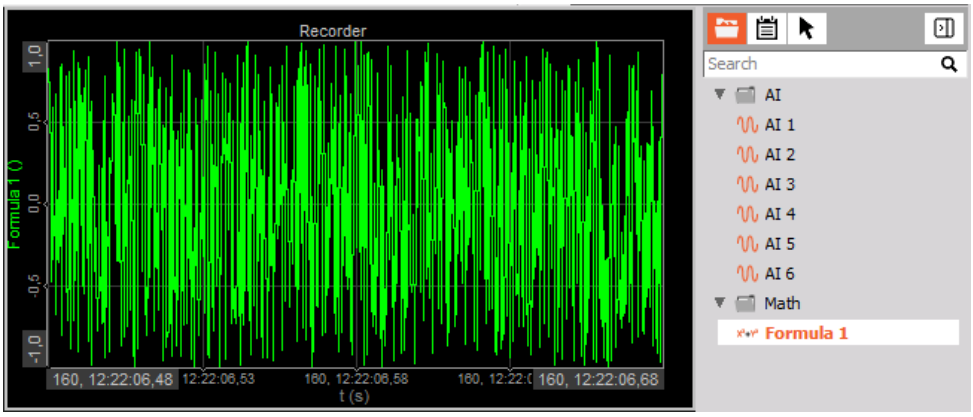


Image 11: Assigned channel

Some instruments like the Recorder, Scope, and FFT allow more channels assigned to one graph.

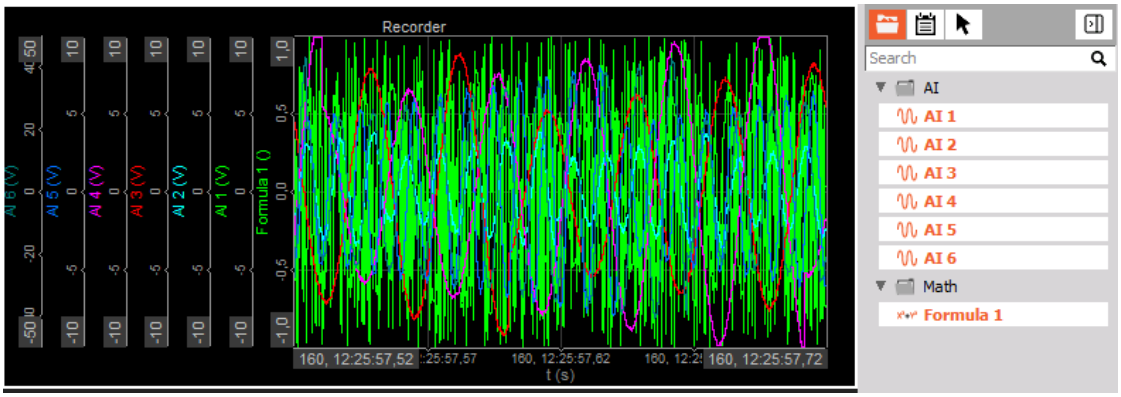


Image 12: Multiple assigned channels

To reassign any instrument from one channel to another, first click the instrument to select it, then unclick the currently selected channel from the Channel selector (depending on instrument type, it will display unassigned or simply remove the channel), then click on any other channel from the Channel list.

You can have the same channel assigned to multiple instruments if desired.

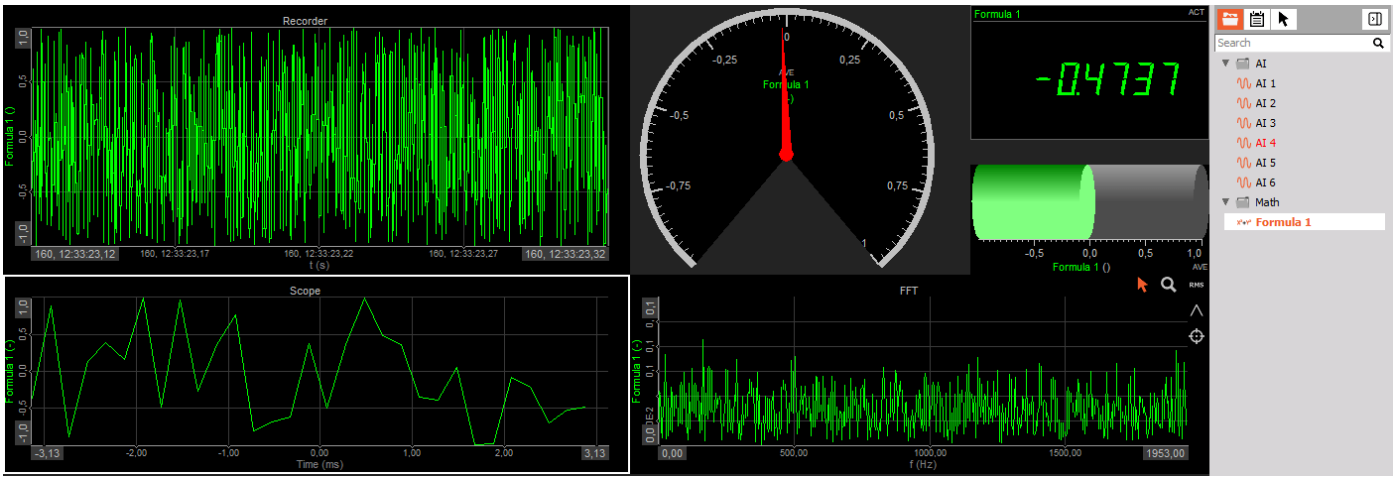


Image 13: Multiple instruments assigned with the same channel

How to apply Channels to a Widget?

Dewesoft X offers a very powerful and flexible **Channel selector**. It can display the available channels as already known in a channel list or in a grouped form.

Channel selector offers the following capability:

Channel (list) view / Group view	- different view on all used channel selector
Select / deselect channels	- assign or reassign channels to widgets

Channel (list) view / Group view

When you select the Group view, channels will be grouped according to its source. We will have groups for analog input (AI), counters (CNT), Math, and other math modules. We can see the channels by expanding the group simply by clicking on it.

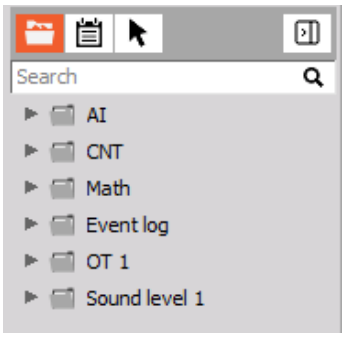


Image 14: Channel group view

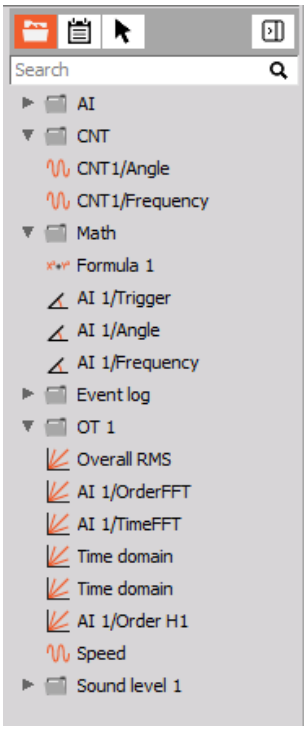


Image 15: Channel expanded view

Another view of the channels is the channel list view. Here the channels will be listed in alphabet order regardless of its source.

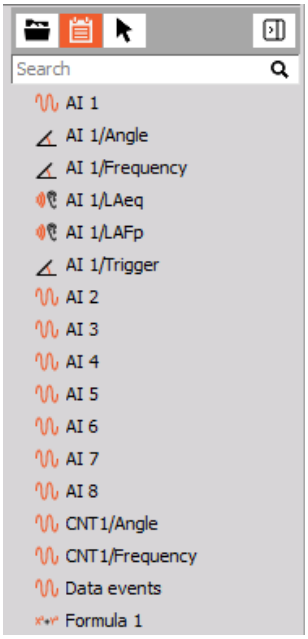


Image 16: Channel list view

A third view is the list of all selected channels (right side below). This will show the channels which are currently selected on the display. This provides an easy way to deselect channels for the current display by simply clicking on each item.

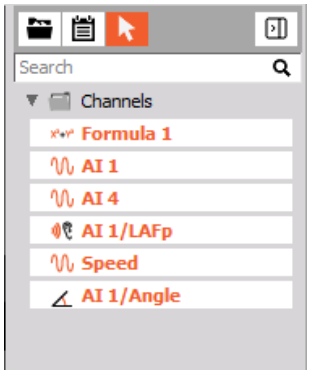


Image 17: All selected channels view

If there is only one hardware group available (e.g. AI) the channels are always displayed in List view!

Select /deselect channels

The channels, which are shown on the currently selected widget can be selected by clicking on the channel. If the channel is already on the widget, it will be marked, and clicking on it will remove it from the widget.

There are several other ways to assign a channel to a widget. We can **drag and drop** the channel to the widget. When we click and hold the left mouse button, the channel will be selected and we can drag it over to any widget. We can drop it to any place and that will add the channel to the display or we can drop it on the display's channel list to replace the channel. In the example

below the CNT2/Angle will be replaced with the AI1/FFT block count.

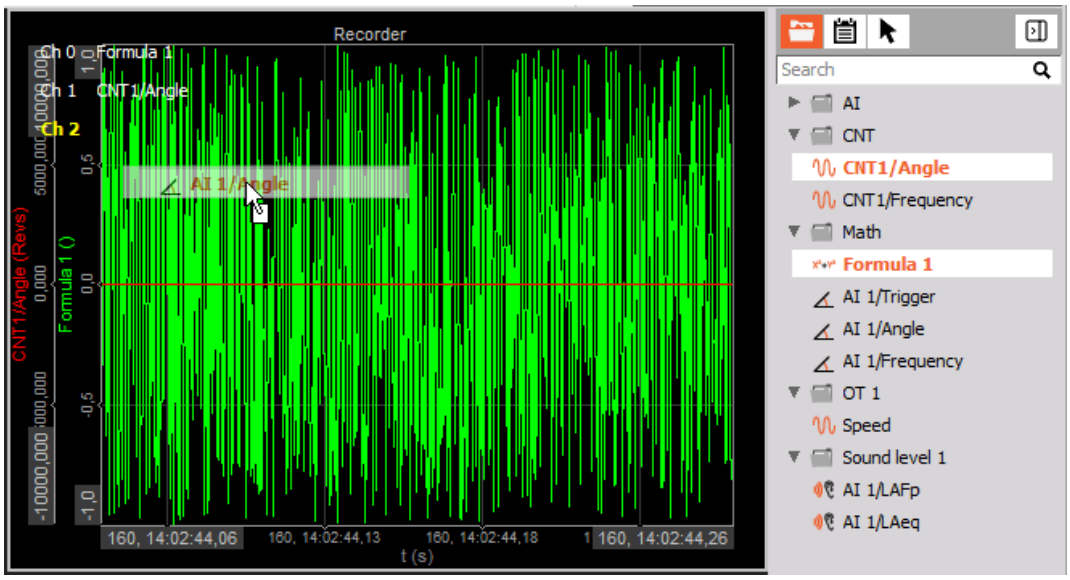


Image 18: Drag and drop method

In Design mode, we can drag and drop the channel to an empty place on the display. This will add a new widget from the type currently selected on the Design bar and automatically assign the channel to it.

Searching for channels

Dewesoft X setups can easily have hundreds and even thousands of channels. To find channels we have added a feature to search for them by the name. If we enter the keyword in the Search field, Dewesoft X will look for channels with those keywords in the name (at any place) or the channels connected to the keyword (output channels of different math modules). We can cancel the search by pressing the X button on the right side of the search bar.

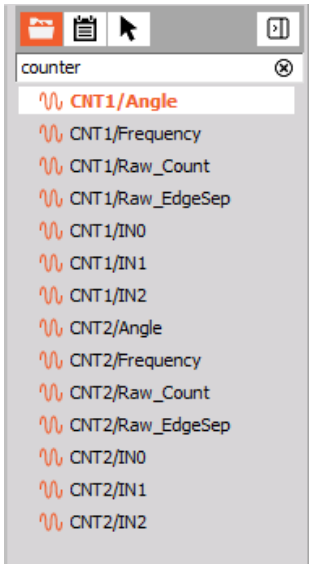


Image 19: Channel search

Additional settings in analyze mode

In the Analysis mode, the list is expanded and we can change the color of the channel, rename the channel or add any math from the channel selector:

- formula
- filtering (IIR, FIR, frequency-domain filter)
- time-domain analysis (integral, derivative, scope math, latch math, delay channel, ...)
- statistics (basic, array, classification)
- frequency domain analysis (FFT, STFT, octave, cepstrum)
- machinery diagnostics (CA, angle sensor math, envelope detection, tracking filter, ...)
- counting
- constant (from current value)
- PID control
- reference curve
- acoustics (weighting filters, RT60)

Available channels are dependent on the type of the selected channel in analysis mode.

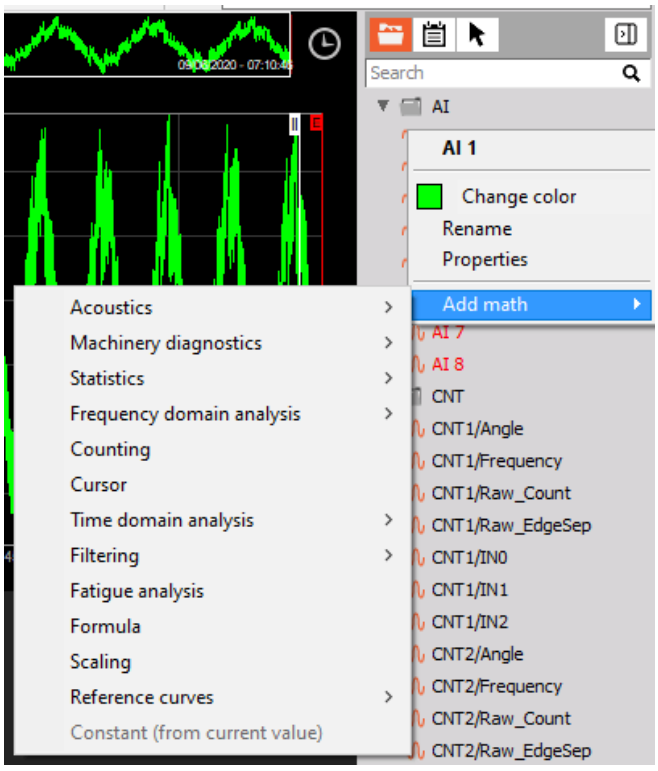


Image 20: Adding math

For example, when we want to add a filter to any channel, right-click on the channel and select Add Math -> Filter.

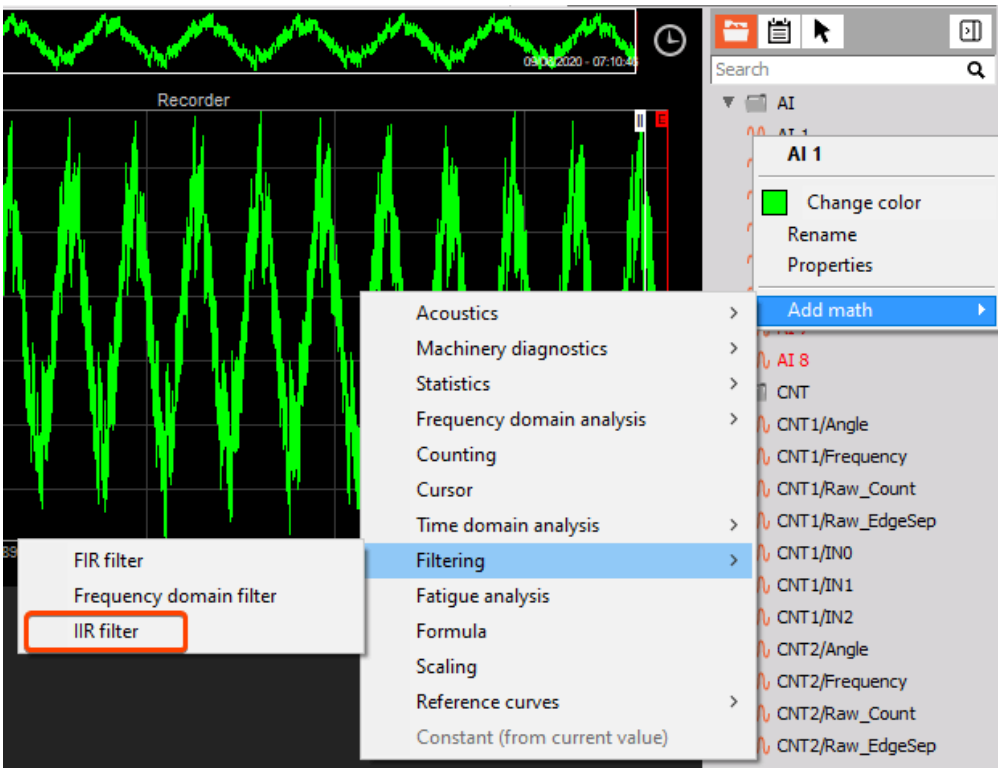


Image 21: Adding a filter

The filter window will be opened and the channel which was selected will be automatically chosen.

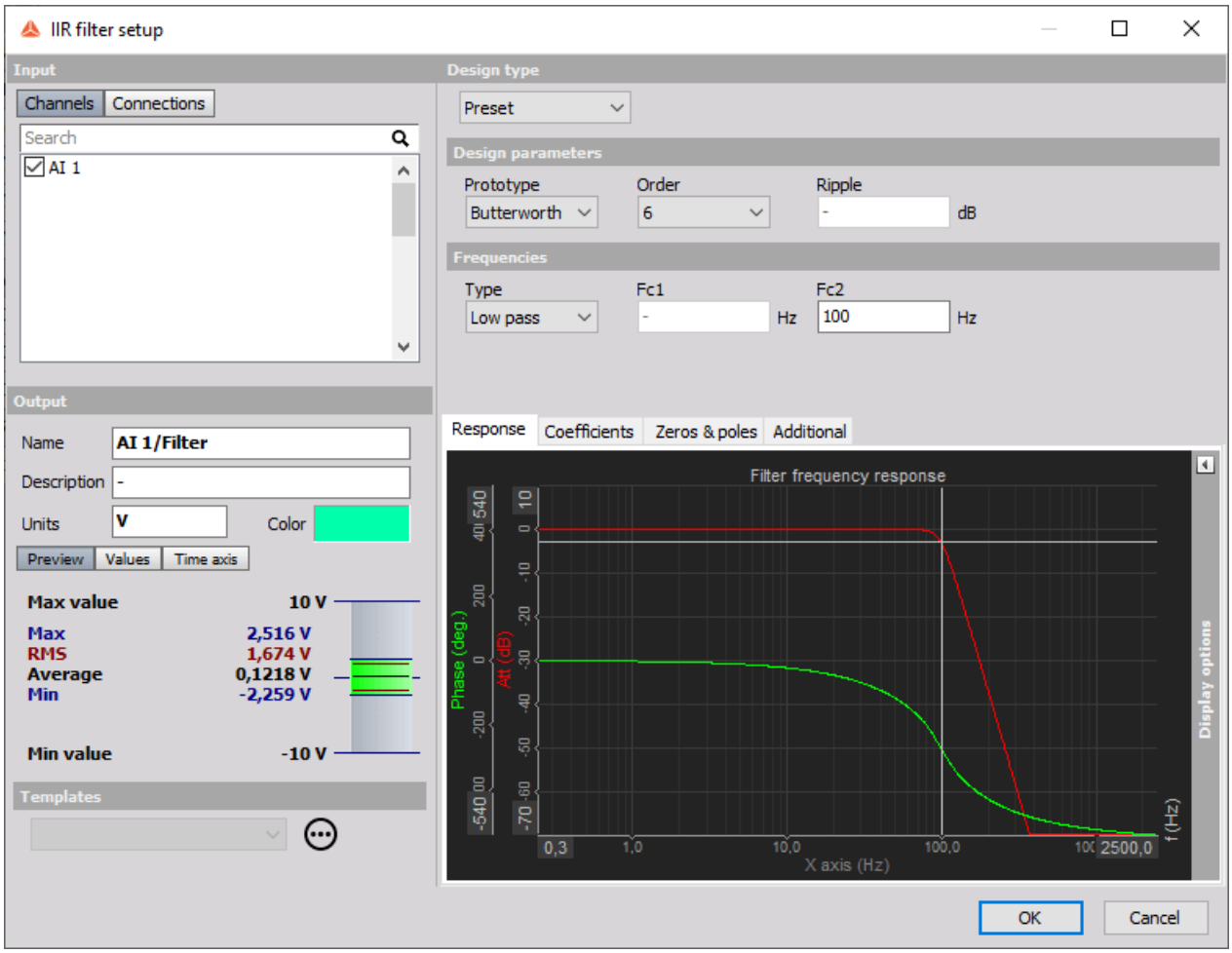


Image 22: IIR filter setup

If selected channel source is math, then we have an additional two options to **edit the math** function or to **delete the math** function.

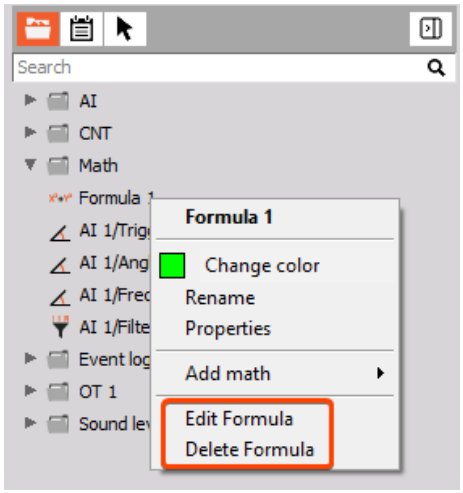


Image 23: Edit or delete math function

Instrument appearance

When you have to display a dozen channels in many elements - instruments, you must arrange them for clear appearance:

- position of the elements
- size of the elements
- define the transparency of the element



Image 24: Instrument appearance

Instrument position

Make sure that your instrument is selected (simply click on the element to select it, a white box around it will indicate the selection).

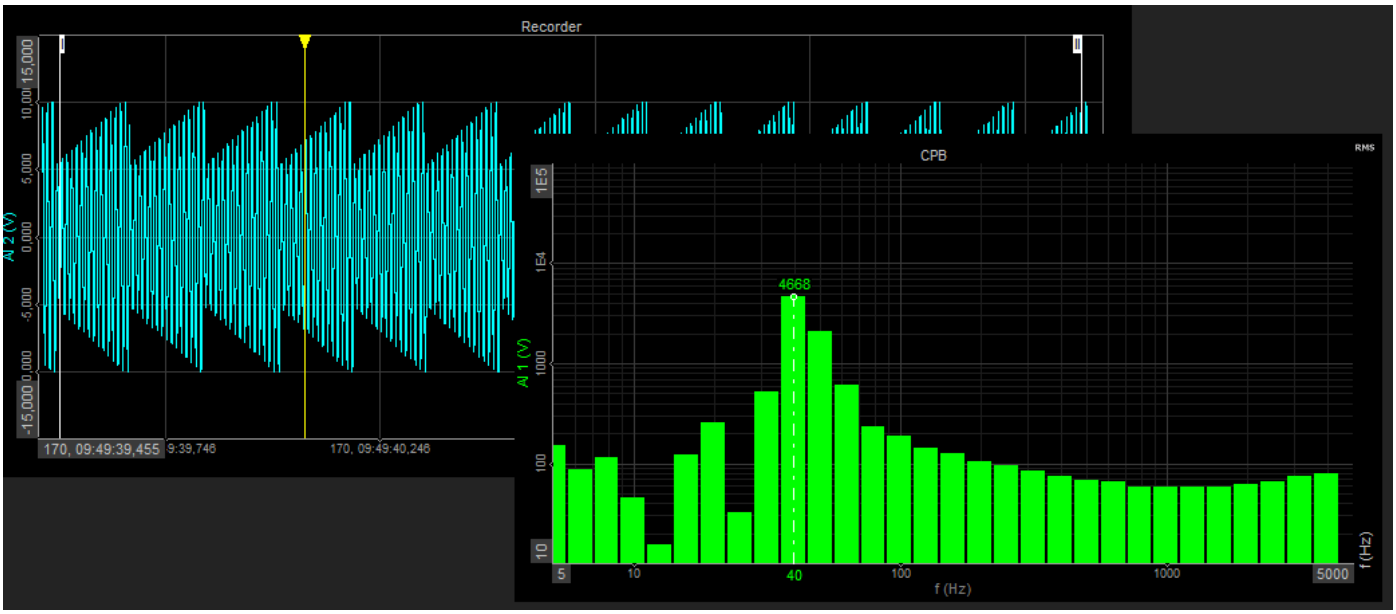


Image 25: Selected instrument

Now you have two possibilities:

- Drag the element and drop it where you need it
- Use the arrow keys to move it in the desired direction

Tip: use the SHIFT key simultaneously with the arrow keys to increase moving speed.

If the element comes in conflict with other elements, you can bring the element in front of the other one or behind it; therefore right-click on the element and then select **Bring to front** or **Send to back** from the appearing menu list.

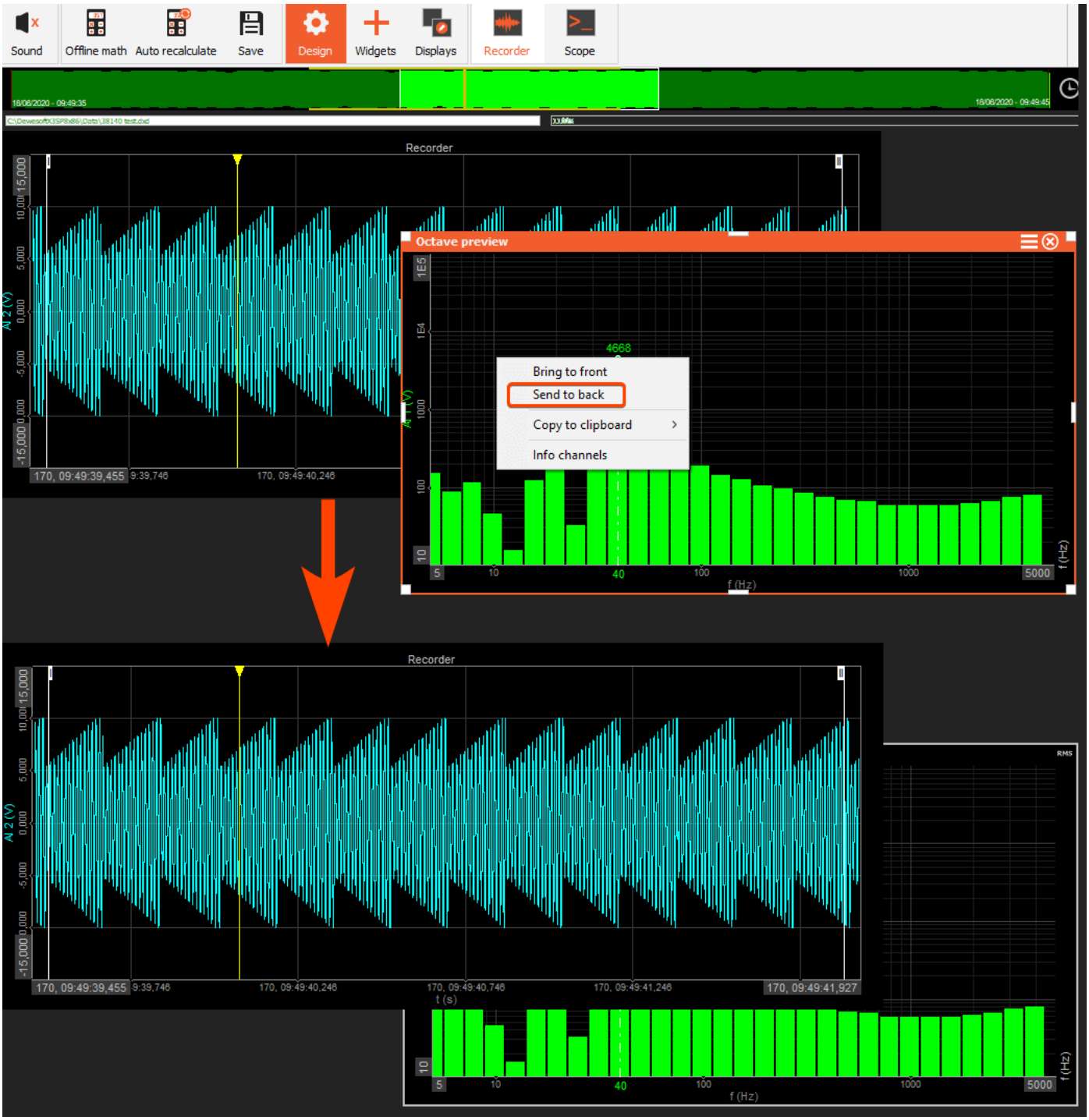


Image 26: Send to back

How to adjust the Widget Size?

You can define the size of your instrument completely free. Note that you have 8 handles around the widget.

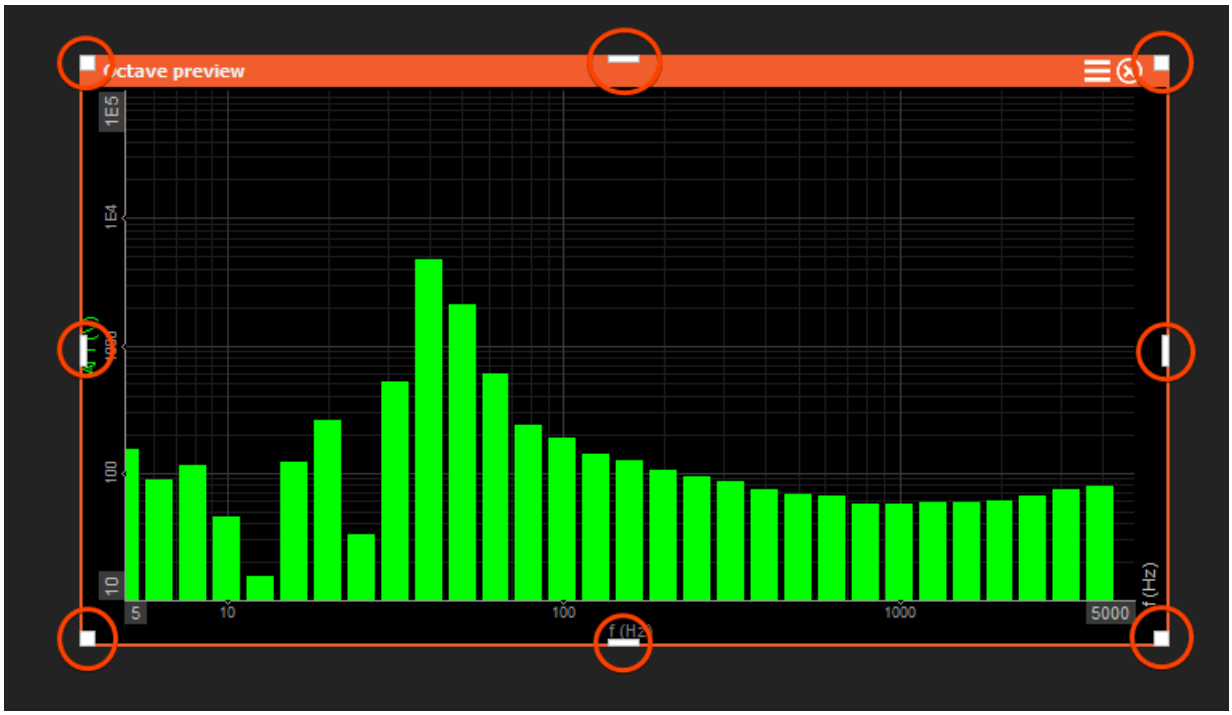


Image 27: Visible handles

We can adjust the size of the control by dragging those handles. When the instrument is selected, simply click on one of the six white boxes at the outline of the instrument (the cursor will change to double arrow), keep the mouse button pressed and move the mouse into the desired direction.

How to set the Transparency?

We have now defined the instrument, its channel(s), size, and its position. But what to do when instruments overlap one another?

Dewesoft X offers transparency for each element, which can be set to:

- None,
- 25%,
- 50%,
- 75% or
- Full transparency.

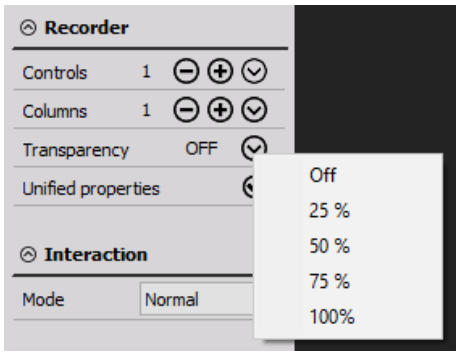


Image 28: Transparency

The transparency of the widget can be set by using the Transparent checkbox in the Control properties bar and select the transparency value from the drop-down list.

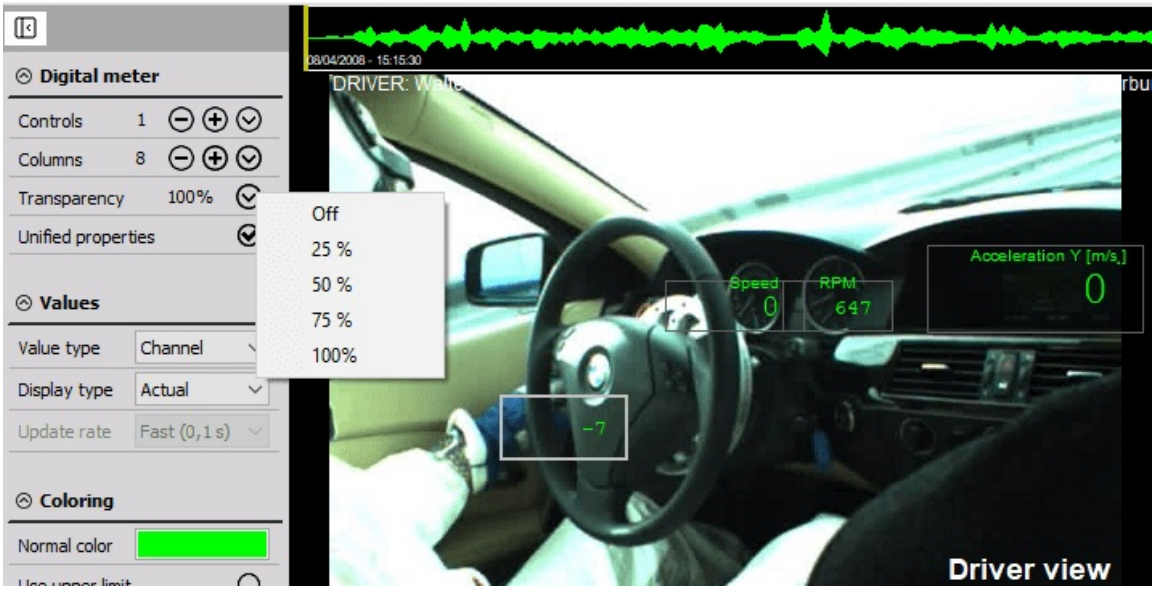


Image 29: Transparent checkbox

The following example should give you an impression of the transparency function - the Digital meter transparency has been set to 100%.



Image 30: Transparency function example

How to manage Displays?

Full-screen

Active online display screen can be enlarged on full Dewesoft X window by pressing Ctrl + F. To escape from this mode press the ESC button (or Ctrl + F) on your keyboard.

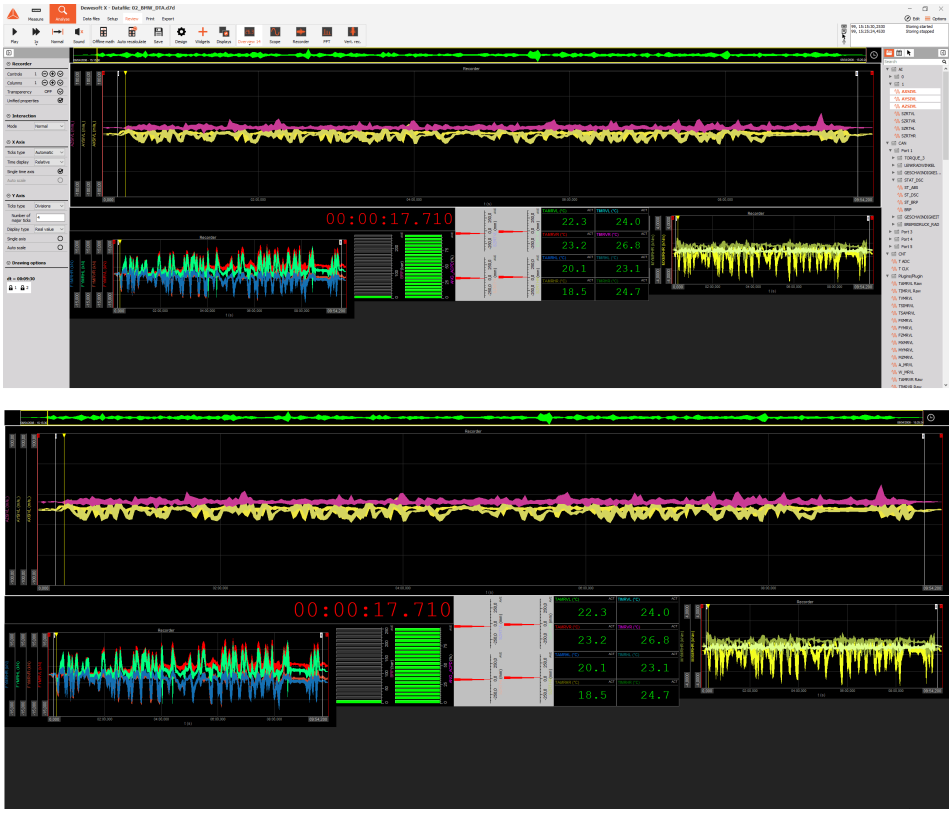


Image 31: Fullscreen

Add a new display

Displays can be managed by choosing the display icon.

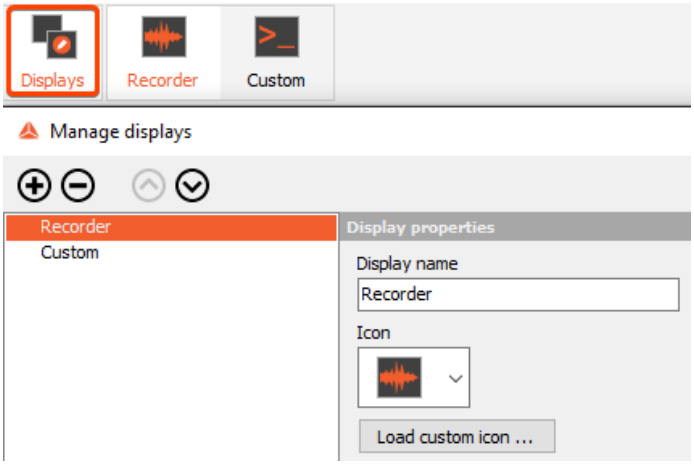


Image 32: Display icon

If we want to create a standard display, then we can choose it from the template list.

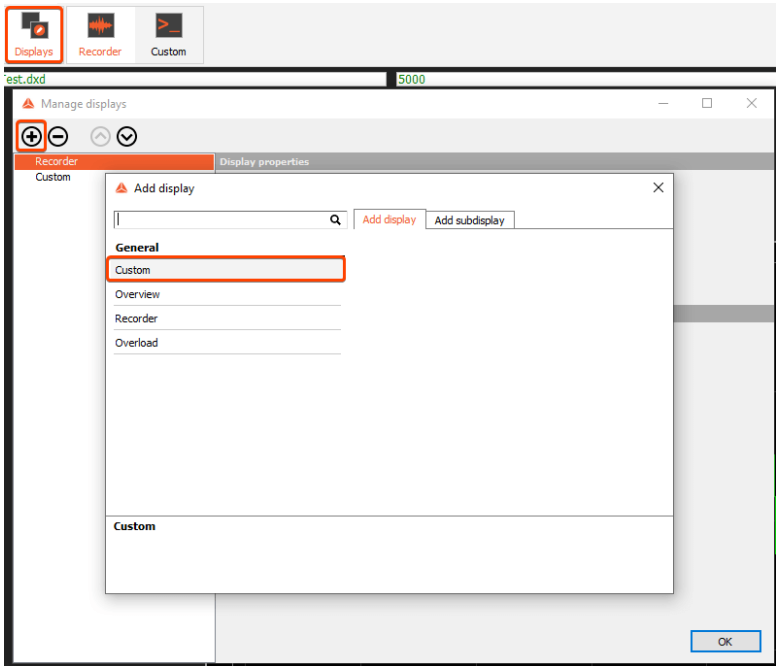


Image 33: Display template

If we want to create just an empty display, then the Custom template must be chosen. We can add the display as the **main display**.

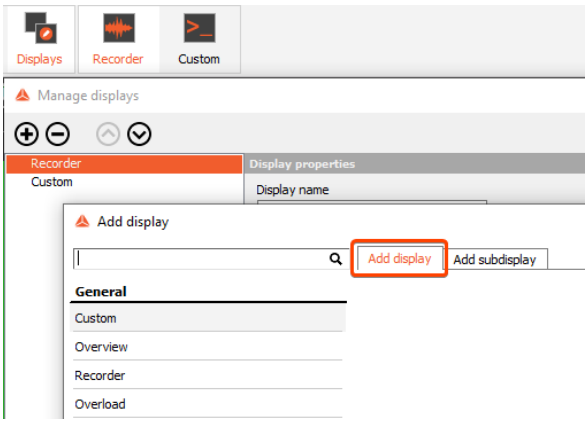


Image 34: Main display

This will add a new screen right next to the selected display on the display menu bar.

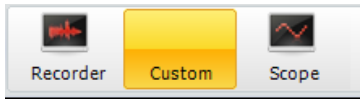


Image 35: Custom main display

We can also add the display as a **sub-display**.

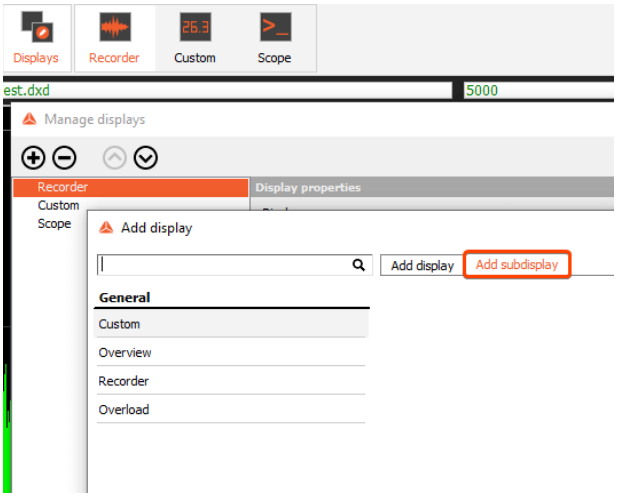


Image 36: Sub-display

This will add a new display as a child item of the currently selected screen. The display icon will get a drop-down button to change the currently shown display.

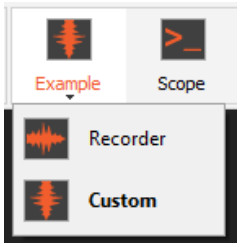


Image 37: Display drop-down button

Then we can change the name and icon by changing Display properties. The name of the displays can be changed by entering a new name in the Display name field. The icon of the display can be changed by setting one of the standard icons or by selecting any file when choosing the Custom item from the Icon dropdown and then selecting any image file. Note: 32x32 is the best resolution for custom icons.

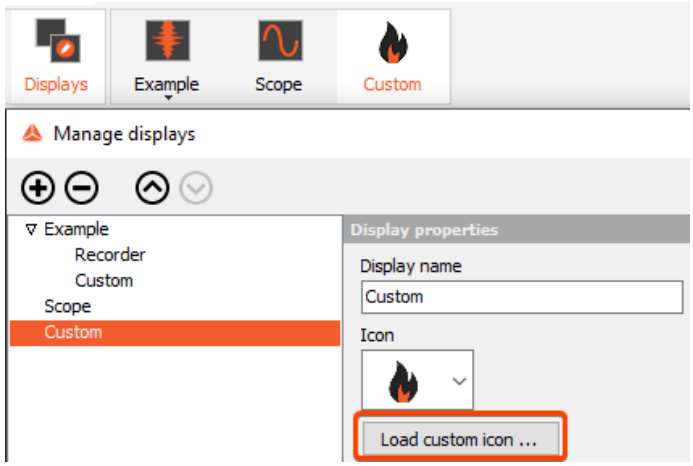


Image 38: Choosing a custom icon

We can also move the display left or right by choosing the Move up or Move down button.



Image 39: Moving the display

Remove display

Selected display can be deleted with selecting Remove display option from the Manage displays menu.

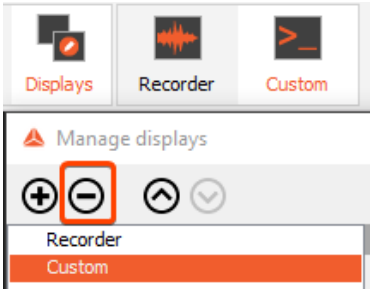


Image 40: Remove display option

How to set Group Properties?

Dewesoft X offers a Design Control properties to create a complex view off all the acquired and calculated data on the online display screen.

With the Control properties, Dewesoft X allows creating, arranging and grouping of different elements:

- Define the number of columns in a group
- Add / Remove instruments to/from group
- Adjust the transparency of instruments
- Define Unified properties (different settings for each instrument)
- And in some cases, switch between a single and multi-axis.

Columns number and Control number in a group

Placing each instrument individually on the display can take some time, especially when you have to display a dozen of channels. Therefore, Dewesoft X allows creating instrument groups, which are boxes with the same sort of instruments. In the Columns area, you can define how many columns of instruments should be allowed in a group.

You can add and remove columns and controls by clicking on plus or minus sign, or you can select a predefined number with an arrow button.

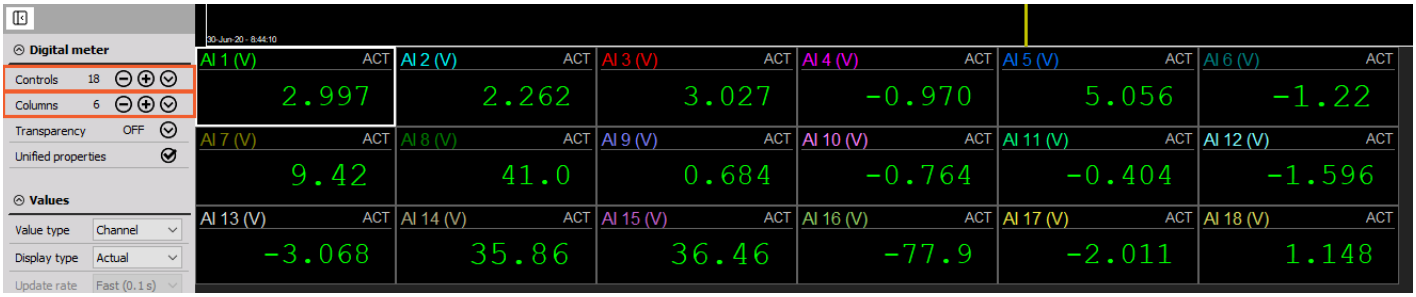


Image 41: 6 columns and 18 controls

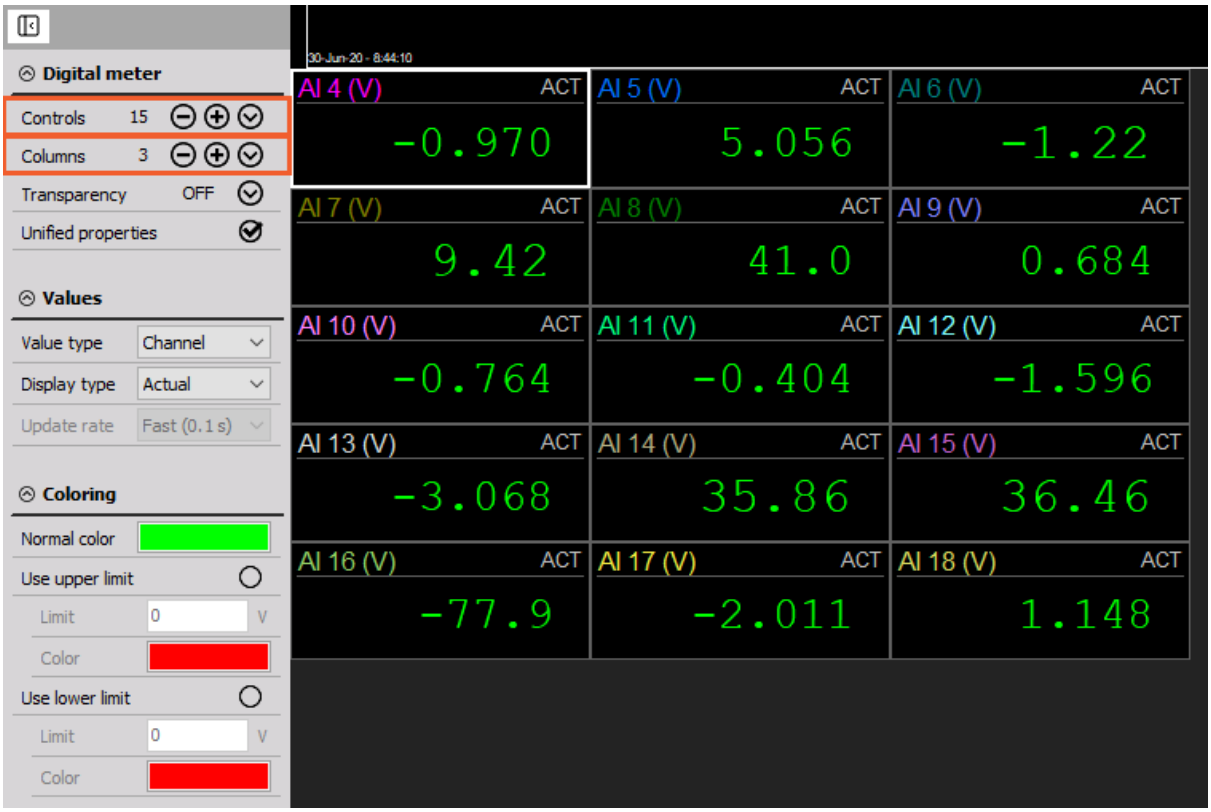


Image 42: 3 columns and 15 controls

Unified properties

As a standard, all instruments within one instrument array (group) have the same properties. For example, all digital meters within an array are set to 50% transparency, show the peak-peak value with very slow (5s) average time.

Untick the Unified properties checkbox to allow different settings for each instrument within the selected group. In our example now you can set e.g. AC RMS value for the first instrument, MIN for the second, AVE for the third, and -PK for the fourth.

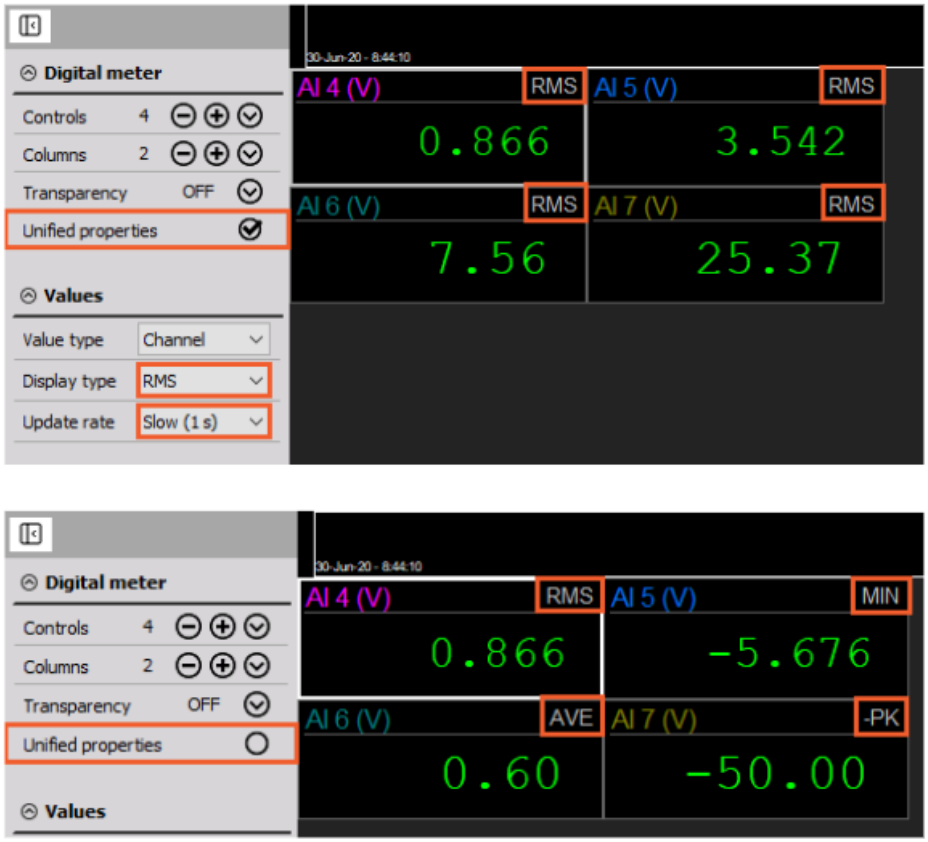


Image 43: Unified properties

How to Copy or Remove Widgets?

Dewesoft X offers an additional screen edit function to create intelligible display all channels data on the screen.

Instruments appearance	arrange elements - instruments with positioning, size and define transparency
Common function	to copy & paste, delete widgets
Additional controls	to illustrate your measurement with the background picture; to write text on the screens with text element; to draw lines and shape, connect different elements with line element

Copy and paste the existing group of Widgets

You can use the **Copy** function to create a new group or an element. For this to work, you need to have enabled the **Design mode.** The new elements will have exactly the same settings and can be edited as all other.

To copy the element, right-click on the element and select **Copy to clipboard** from the menu list. There you can copy the widget group as an image, or you can copy it as an active widget by choosing the option 'Widget group'.

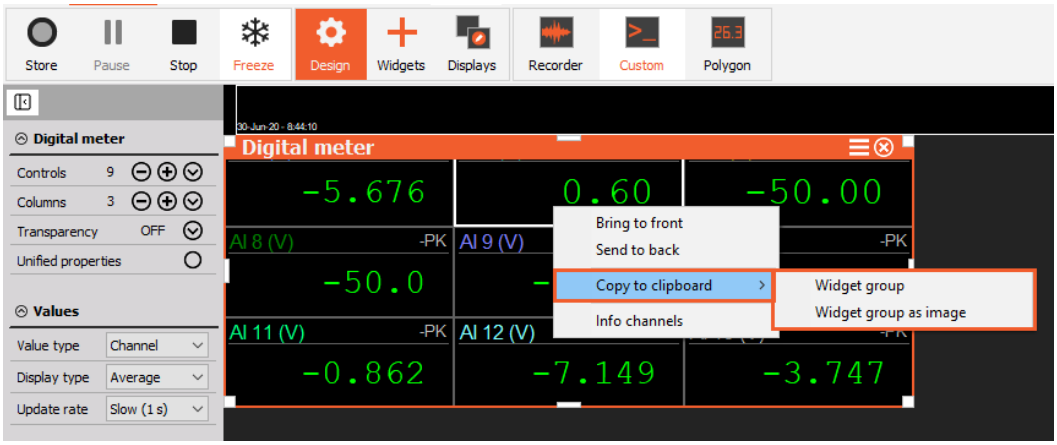


Image 44: Copy group to clipboard

Then move the cursor to the desired position (must be on the screen *outside the group*), *right-click again* and select button **Paste**. That's all - the new element is available with the same settings and applied channels.

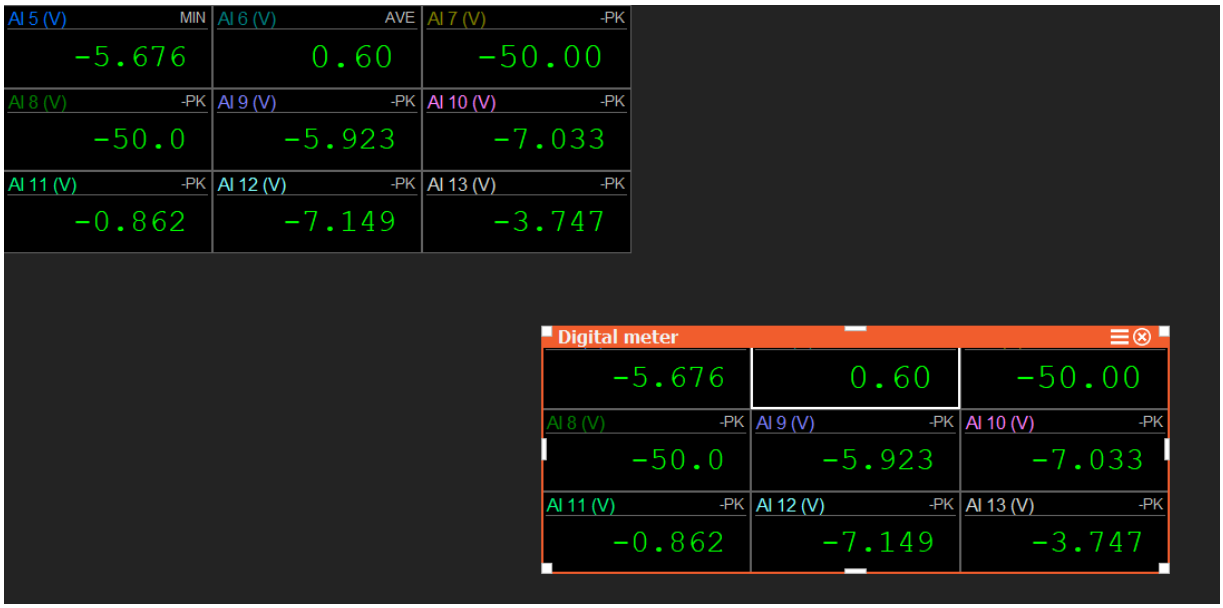


Image 45: Pasted Widget group

Delete widget

You may want to delete the instrument from the display screen. To delete any instrument, enable the **Design mode** first and click on the ⊗ sign on the upper right side of the widget frame, or click the delete button on a keyboard.

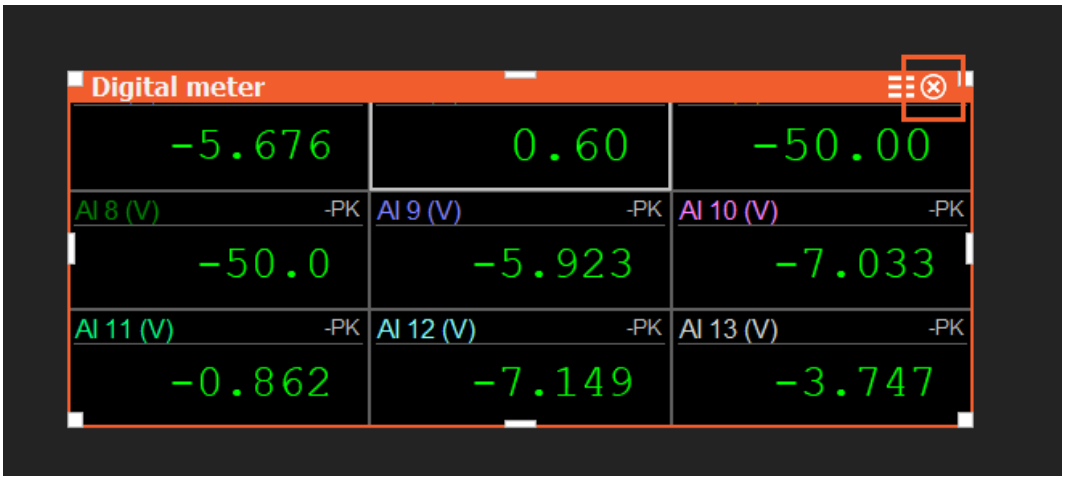


Image 46: Delete widget

IMPORTANT: When one instrument in a group is selected with using this function, the whole group will be deleted!

What Widget Properties can be edited?

Dewesoft X offers two different time base types for multiple graphs on the X-axis: **single time axis** or **multiple time axes**.

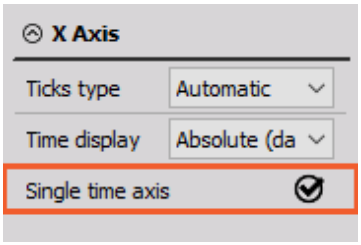


Image 47: Single time axis enabled

Single time axis

The advantage of the single time axis is to have more space to display the data.

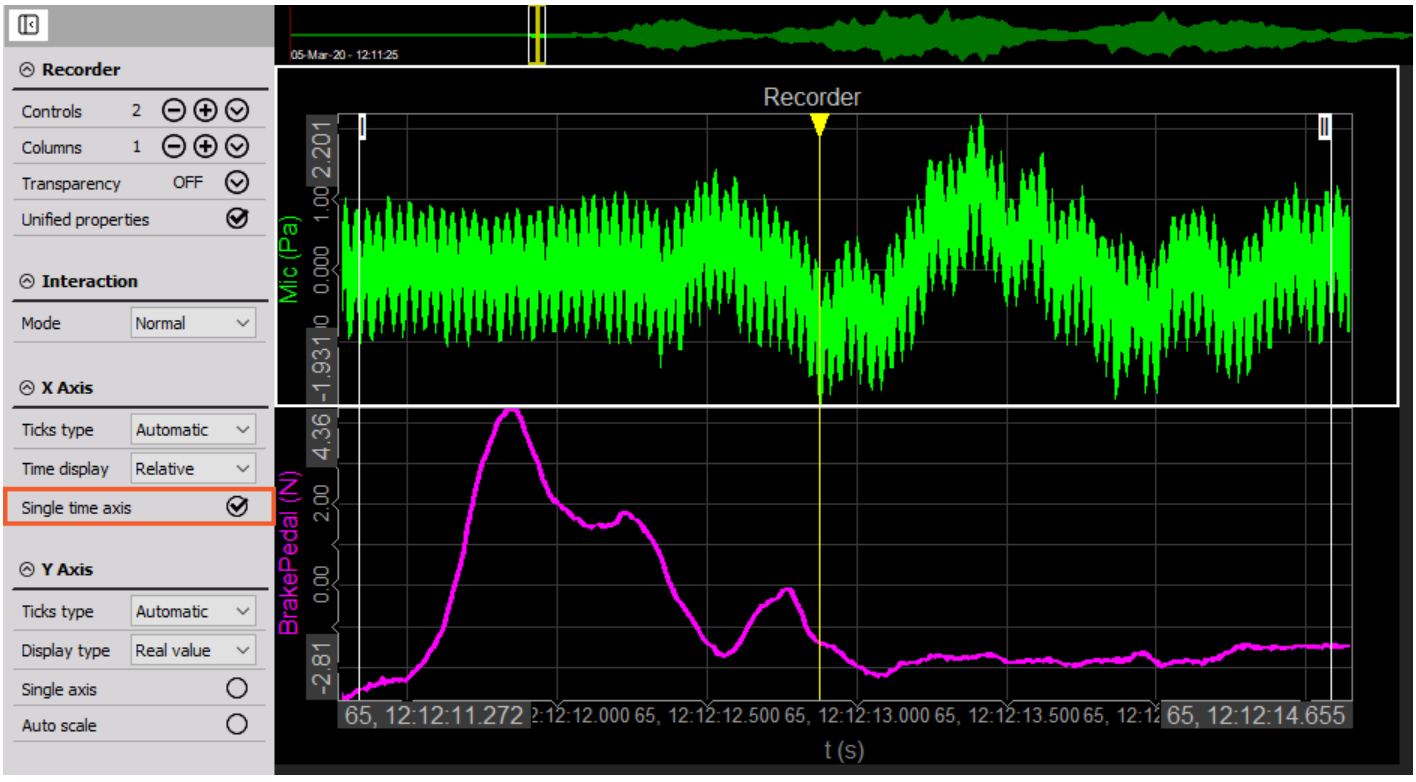


Image 48: Single time axis

Multiple time axis

The advantage of the multiple time axes is to make it easier to read time-related information.

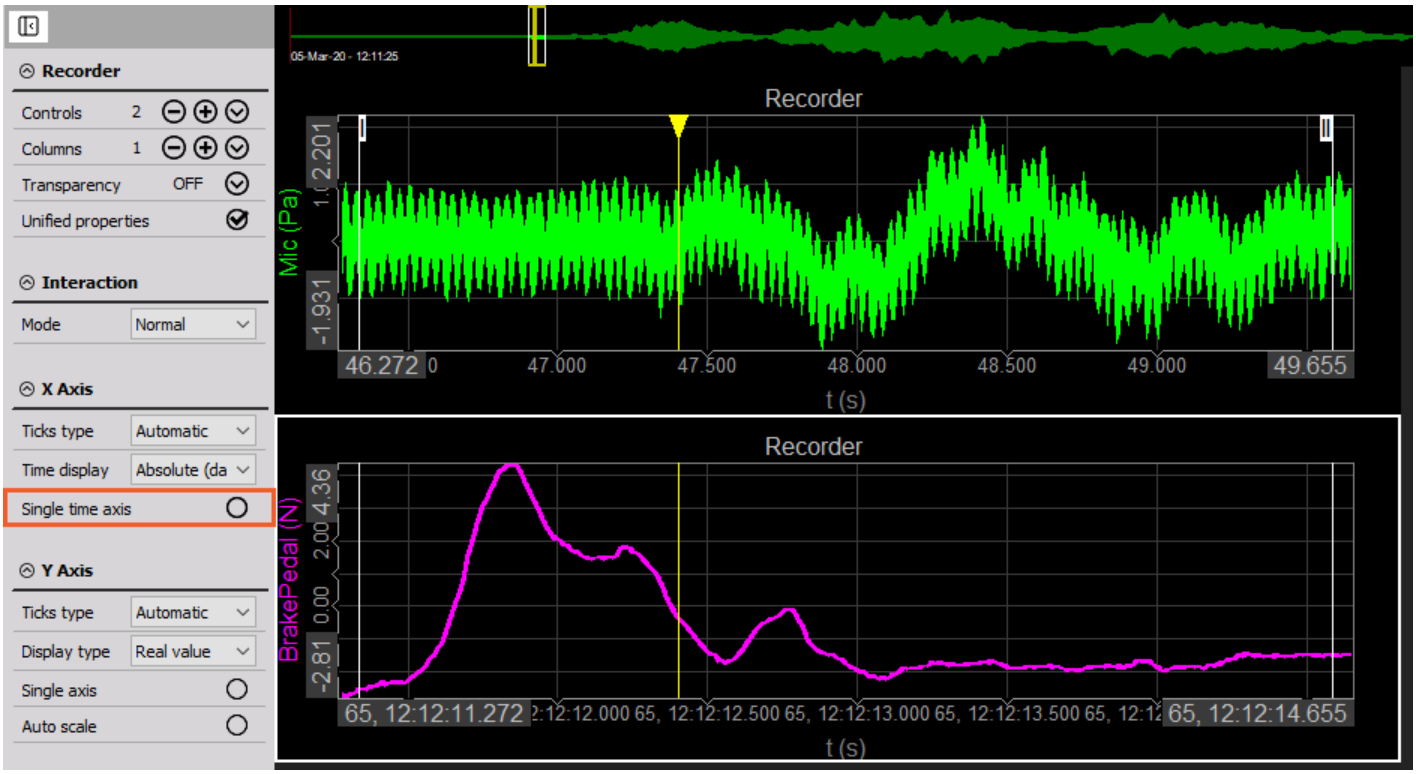


Image 49: Multiple time axis

Time axis type

You can show either **absolute** or **relative time** in the Time display option (in case of the Vertical recorder in the vertical direction) for each graph. Click on any graph to select it and then use the selector to make your choice.

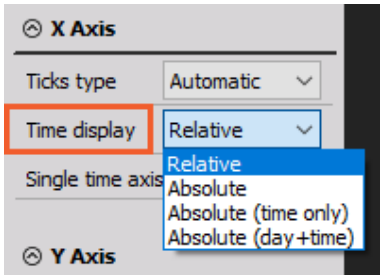


Image 50: Time display type

- **Relative**- elapsed time since recording or monitoring began



Image 51: Relative time

- **Absolute**- current date and time; this format is compatible with the timing information according to UTC



Image 52: Absolute time

- **Absolute (time only)**- current time only



Image 53: Absolute time only

- **Absolute (day+time)**- day in year and current absolute time



Image 54: Absolute day and time

Grid resolution and Ticks type

To make the analysis more comfortable, Dewesoft X contains the possibility to change the number of grid lines in the recorder display. This can be done either in the X or Y direction. You can change this by switching the **Ticks type** option to *Divisions* or either *Step.* The only difference is that the Step tick type have also minor ticks, not only major ones as the Divisions tick type has.

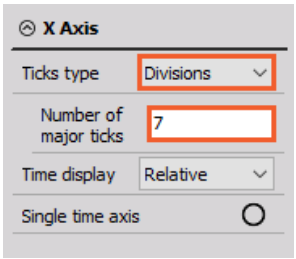


Image 55: Edit grid resolution by defining the number of ticks

Depending on the range and signal, it may be more practical to change the number of grid lines in Y-axis ticks from 2 (default) to 8 - or remove them completely.

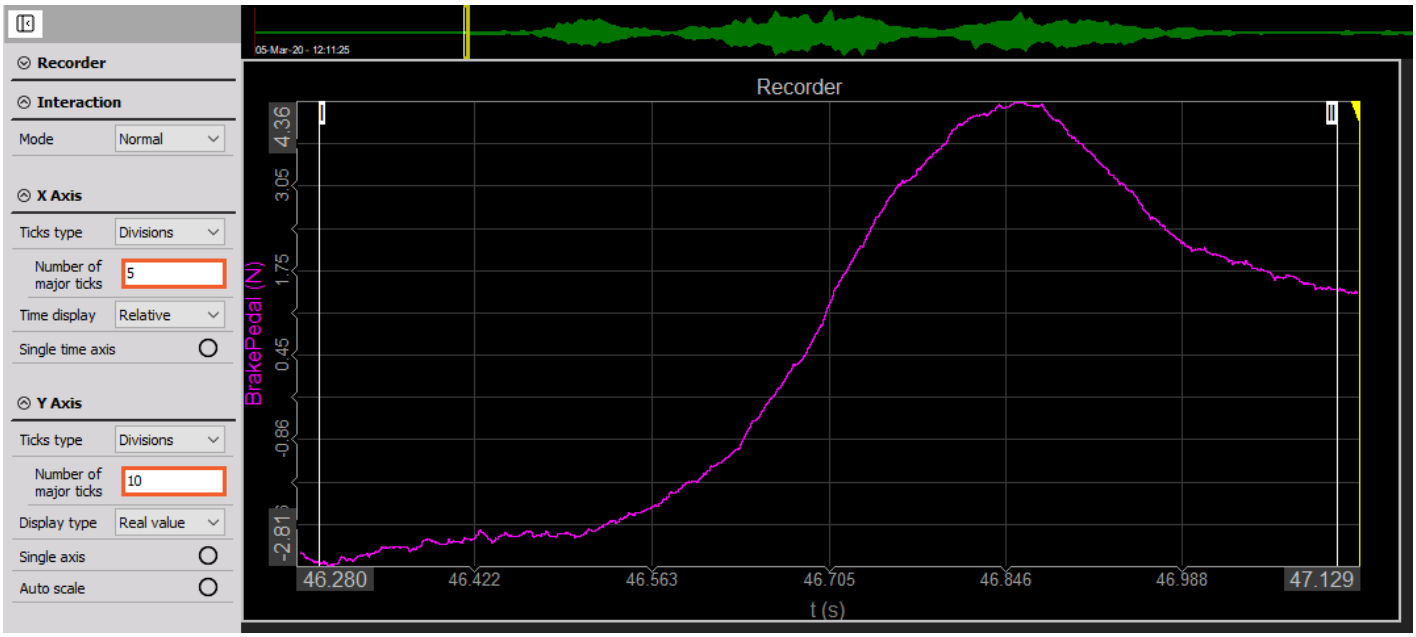


Image 56: Adjusting the grid resolution

Display type

Your acquired signal may not be only a static signal; if you have ever tried to display a high-dynamic signal with digital values, you know that you have to make some kind of statistic to get representative values. Therefore, all instruments offer different display types, which can be selected from the Display type drop-down list (Different setups will give you a different number of display types).

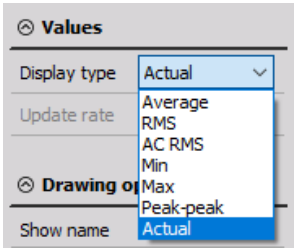


Image 57: Display type selection

IMPORTANT: Be aware that all these display types represent only statistic values for the online display. The settings have no influence on the other displays or the data storage.

Update rate

With the Average time drop-down list, you can define the **update rate** for the selected widget. As a standard, the values for the display type will be calculated Fast (0.1 s) over a period of 0.1 seconds, which also represents the internal minimum calculation period.

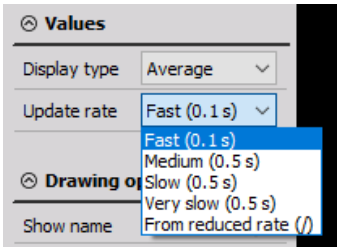


Image 58: Update rate selection

The system will still run at the dynamic sample rate and Dewesoft X will acquire the data with full speed, calculate minimum, maximum, average and RMS for this time interval, however, every data point will NOT be displayed on instrument and stored, but only these calculated values. When From reduced rate mode is selected, the display will reduce the data continuously according to the static/reduced rate selected in the STATIC/REDUCED RATE drop-down list in the channel setup.

Upper & Lower limit

You can set high and/or low alarm limits for each instrument, which will cause the instrument numbers to change from green to red when it is either above the high limit or below the low limit (colors can be easily adjusted).

If you want to use limits for an instrument, select it by clicking on it once. Check the **Use** boxes to activate/deactivate high or low limit detection. If enabled, you can enter the alarm level for each.

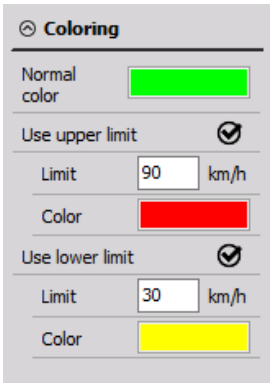


Image 59: Defining upper and lower limit

For example, if we want to have the signal change to red when it rises above 330 deg or changes to yellow when it falls below 200 deg, we set this meter up accordingly (see picture above).

Note: the number changes to red as a standard when it is outside of both limits and remains green when it is within the limit(s).

You can set Lower limit, Upper limit, or both limits for each meter. If you want to change the limit color simply click on the colored field next to the high or low limit field and choose the desired color from the appearing color selector window.

Note: The upper and lower limit is only a visual effect, it is completely independent of the Alarm monitoring function.

Minimum and maximum shown value

You can define a Minimum and a Maximum shown value for the bar graph; this feature is very important for better scaling on the display. For example, your angle measurement range is from 0Â° to 360Â°C.

Just enter both values and the bar graph scaling will change immediately.

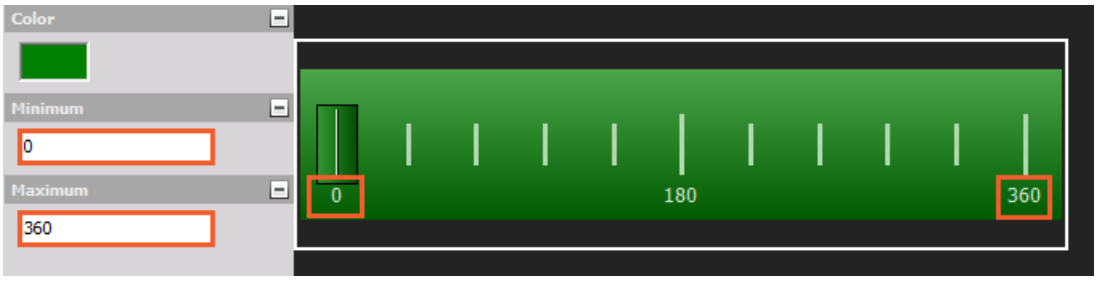


Image 60: Minimum and maximum shown value on user inputs widget

Run mode - Time axis scaling

IMPORTANT: This way of changing the Time axis can't be done in Design mode - it is available only in Run mode.

Use the blue **plus** and **minus** symbols to expand or compress the time axis.

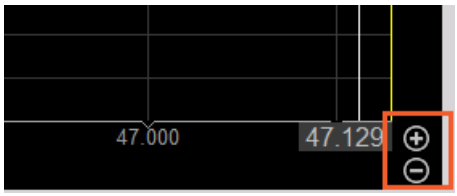


Image 61: Time axis scaling in run mode

Clicking **minus** will show more time across the graph. You can show the entire length of the recording, regardless of how long it is! Even days and days of data can be shown here.

By unchecked Single time axis - the multiple times axis, this control appears for each graph. Appearance and functionality by vertical instruments are the same, except the time axis is vertical.

Y-axis scaling/auto-scaling

IMPORTANT: This way of changing the Y-axis can't be done in Design mode - available only in Run mode.

If you want to change the Y-axis for any input, the recorder offers two possibilities:

- **Enter values**

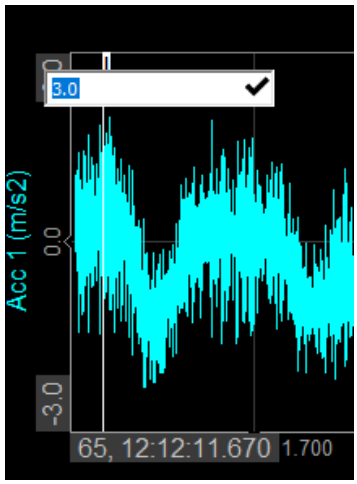


Image 62: Manually entering scaling values

  You may enter the values by yourself - simply click on the number at both extremes and then type in a new number. This is possible when the cursor has the following appearance: A grey outlined box around the scale value indicates the selected channel.
- **Auto-scale**

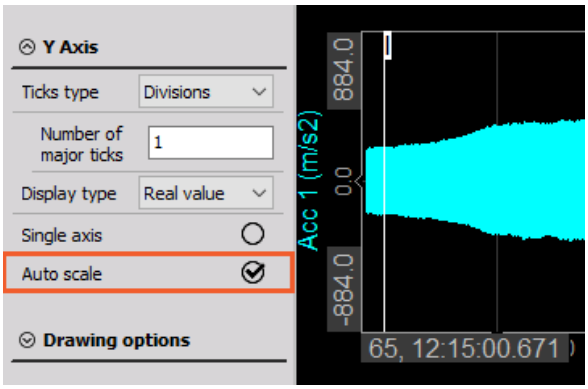


Image 63: Auto-scaling option enabled

Move cursor to the axis scale. If you have reached the auto scale area, the cursor changes to the following appearance: A gray outlined box around the scale value indicates the selected channel. Press the left mouse button to activate auto-scaling for this channel or press the right mouse button to undo auto-scaling. The auto-scaling function always calculates the minimum and maximum value of the currently displayed signal and uses these values for scaling. The scaling will be only updated when you press the left mouse button!

Additional auto-scale functions

Dewesoft X offers additional auto-scale functions when you press keys together with the left or right mouse button (it only works in the area left of the graph, where the scale is):

Left mouse button	Auto scales the selected channel (see also above).
<CTRL> + Left mouse button	Selects all available channels and scales all channels to the same maximum and minimum (highest and low estimated value within all channels).
<CTRL> + <ALT> + Left mouse button	Selects all available channels and scales each channel to its own maximum and minimum.
<SHIFT> + Left mouse button	Scales the selected channel symmetrical around zero (Ã‚Â± values are the same).
<CTRL> + <SHIFT> + Left mouse button	Scales all available channels symmetrical around zero (all Ã‚Â± values are the same)
<CTRL> + <SHIFT>+ <ALT> + Left mouse button	Selects all available channels and scales each channel symmetrical around zero (each channel to its own Ã‚Â± value).
Right mouse button	Undo auto scale for the selected channel (see also above).
<CTRL> + Right mouse button	Selects all available channels for the undo auto-scale.

How to use measurement Cursors?

Note: Displaying X and Y-axis information described this way can't be done in Design mode - available only in Run mode.

If you move the mouse cursor over the signal, a white cross appears, showing the current position of the measurement cursor. As soon as you stop moving the mouse or trackball, the cursor will fix its position on the signal and move with the time. The cursor readout is displayed above the graph and shows:

X-axis information	The absolute or relative time at the cursor position, depending on the selected axis type
Y-axis information	The signal value at the cursor position, including units.

As one graph may contain up to four signals, the measurement cursor always tracks the nearest signal next to the current position.

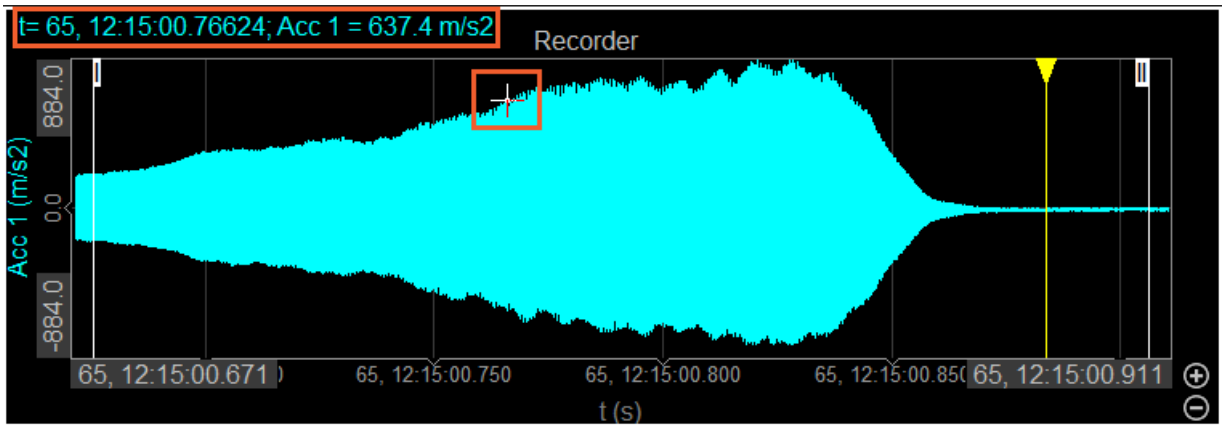


Image 64: Horizontal recorder and its cursor values

Appearance and functionality of vertical instruments are the same, except:

- Y-axis information is the absolute or relative time at the cursor position
- X-axis information is the signal value at the cursor position
- the cursor readout is displayed below the graph

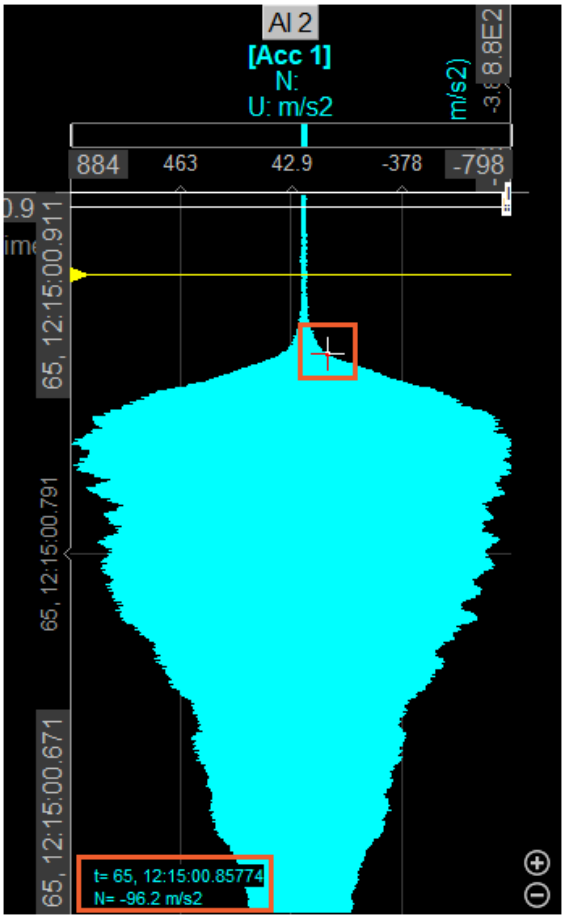


Image 65: Vertical recorder and its cursor values

NOTE: The measurement cursor is not available when the time base is set to a short time. It's only working for long time measurements.