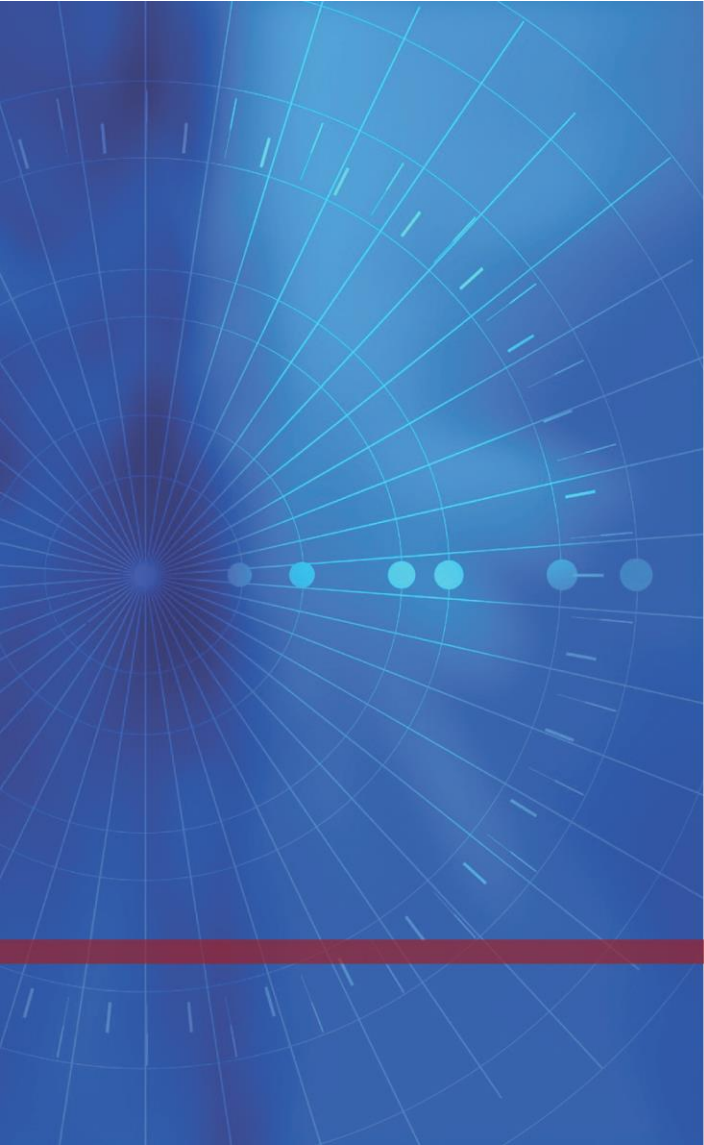




EasyView

Manual

10

intab^o *Center of Excellence*
Mät, analysera och förstå

Table of content

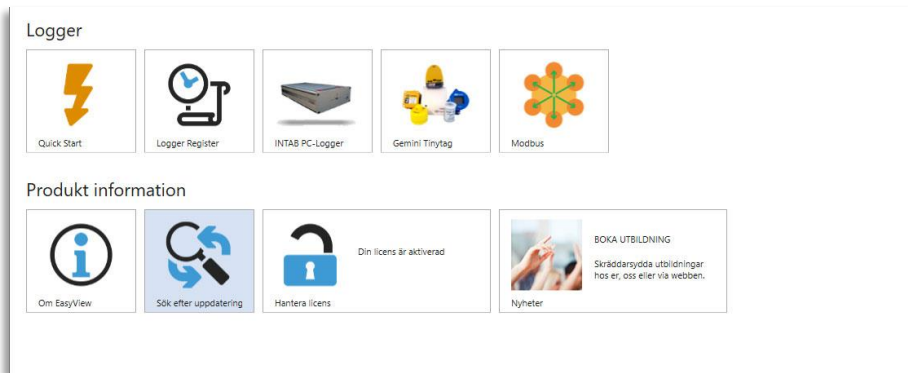
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Installation and update

On the start page, your latest version is displayed under Product Information. It also says if there is a newer version available. Tap the "check for update" box to search and update to any later version.

We recommend that you update to the latest version.



Requirement specification

Windows XP Service Pack 3 or later

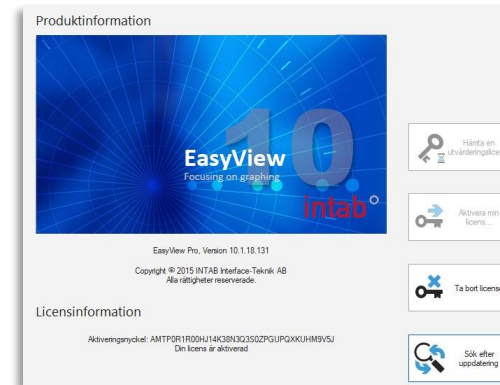
Windows Installer 4.0 or later

Microsoft Visual C++ 2015 Redistributable (x86) 14.0

Microsoft .NET Framework 4 or later

1GB RAM

Installation and activation



Here's how to install:

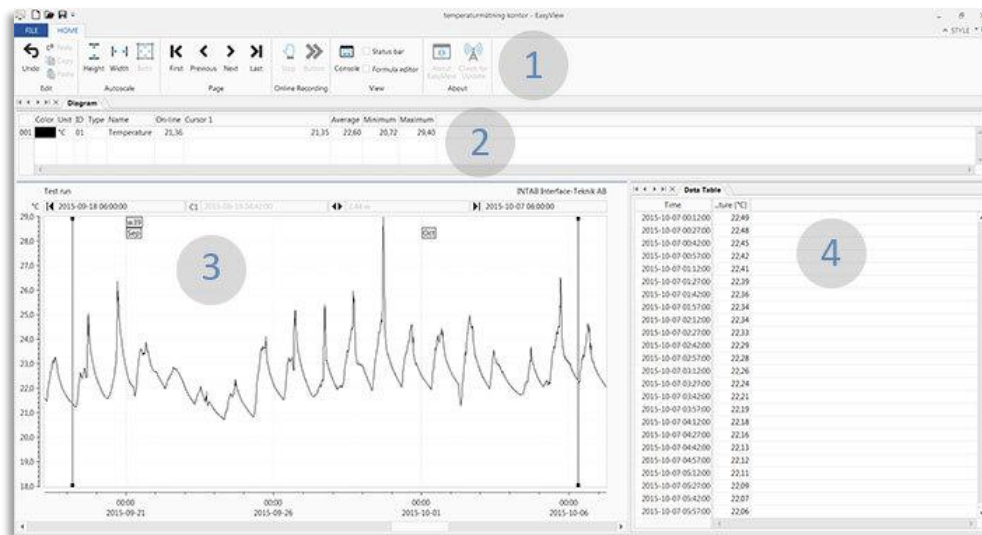
1. Run the installation file, and then click Setup.
2. Step through the installation.
3. When the installation is complete, you can start Easyview by clicking the shortcut on the desktop.
4. Activate the license by clicking About in the upper right.
5. Click on "Activate my license ..." and enter your activation key in the dialog.
6. Then click Activate. Please note that this requires internet connection.
7. When you click Close, Easyview will shut down and at the next start you will have access to the features included in your license.

When a new version is available, you will get information about it on the right side of the program.

[How to enable EasyView 10 on a computer with no internet connection](#)

Get started

EasyView window



EasyView consists of several fields and windows.

1. The toolbar. Here you'll find tools to zoom and scale the measurement.
2. Info table with information about your measurement. You can choose to have several info tables with different information.
3. Diagram window.
4. Plug-in window with, among other things, data table. You control which tabs you want to display. Which tabs you have access to depends on what version of EasyView you have.

No contact with your logger

Can't get in touch with your logger? Maybe the driver for the data cable is missing.

[Download and install drivers here.](#)

Info table

In the info table you will find information about your measurement. By right-clicking in the heading, you can adjust how and what is displayed. "Adjust column width" adjusts the width of the columns to fit the text. By moving the mouse pointer between two columns, you can manually change the width of the column.

By selecting a column and pressing "Hide selected columns" you can hide it. If you want to move it, click "Sort channels". Under "Properties" you choose to show and hide information.

The screenshot shows the 'Info table' window in EasyView. A context menu is open over the table, showing options like 'Justera kolumnbredd' (Adjust column width), 'Dölj markerade kolumner' (Hide marked columns), 'Sortera kanaler' (Sort channels), and 'Egenskaper' (Properties). The table has columns for 'ID', 'Färg' (Color), 'Enhet' (Unit), 'Typ' (Type), 'Markör 1' (Marker 1), 'Markör 2' (Marker 2), 'Medelhärde' (Average), 'Min' (Minimum), and 'Max' (Maximum). The data rows show various measurements with their corresponding values.

ID	Färg	Enhet	Typ	Markör 1	Markör 2	Medelhärde	Min	Max
001 01		%RH		59.80	57.51	56.09		
002 02		°C		20.22	11.68	15.68		
003 01		%RH		65.94	N/A	59.56		
004 02		°C		20.10	N/A	19.49		
005 01		%RH		59.24	46.20	57.15		
006 02		°C		19.71	13.12	15.94	-0.70	23.31

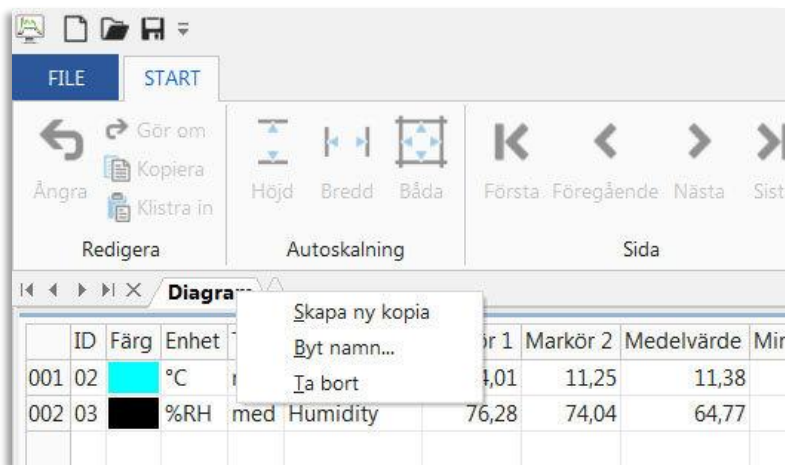
Get started

Create multiple tabs in the info table

You can create several tabs in the info table by right-clicking on the tab and selecting new copy.

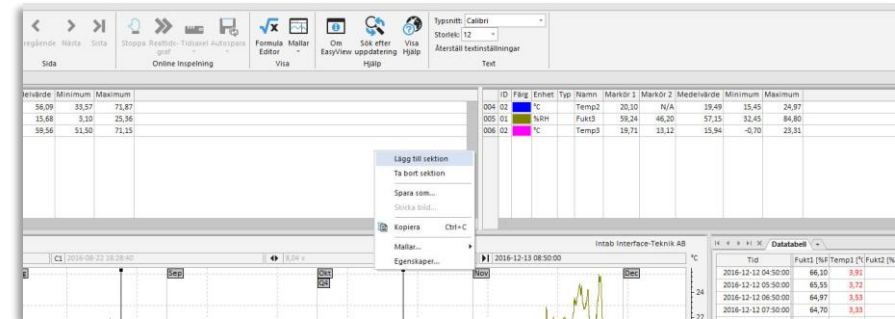
Rename tab in the info table

To rename a tab in the info table, right click on the tab and select "Rename". After entering the new name, press ENTER. tab name in the info table



Multiple info tables

You can have multiple info tables. Right-click in the info table and select "Add section". You can then choose what should be displayed in the respective table by "Properties".

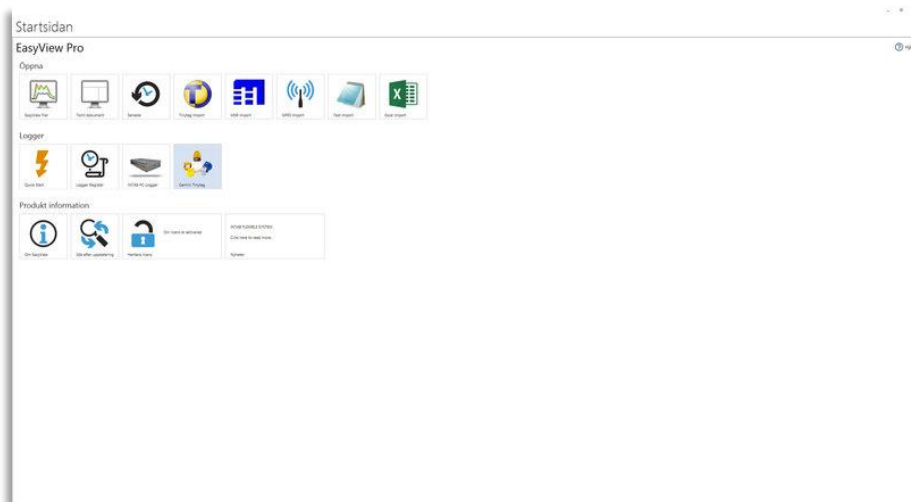


Get started - Tinytag

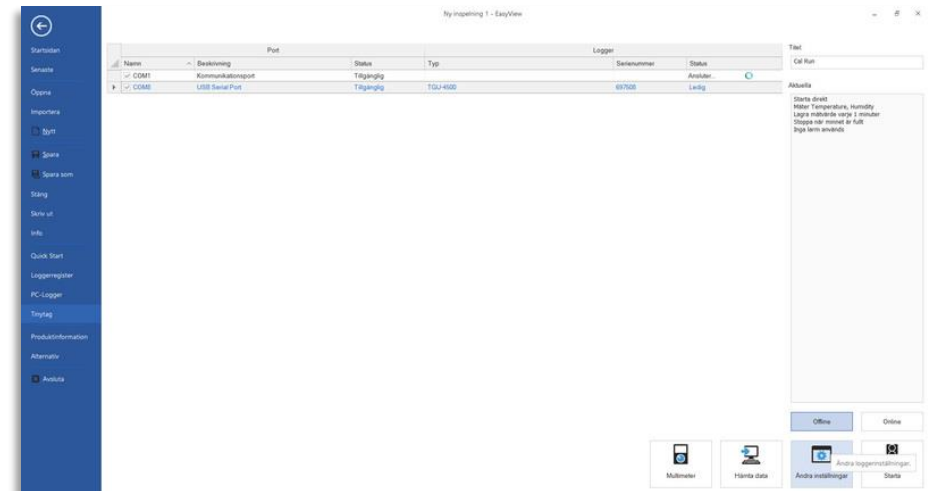
Below is a written walkthrough of the start of Tinytag. You can also watch [a short movie sequence of 40 seconds](#). Start watching 35 seconds into the movie.

Connect your Tinytag to your computer. If your computer does not detect the logger, you may need to [install drivers](#).

Then click on the Tinytag icon.



Now a page will open. Here you can see all COM ports on your computer. Even if you have a USB cable, it creates a COM port. The software should now automatically detect your connected logger.



Get started - Tinytag

At the top right of the page you can see the current logger settings. The title is adjustable here if you want to rename your next measurement.

The screenshot shows the Tinytag web interface. At the top right, there is a 'Titel:' field with the value 'Test'. Below it, a table displays the current logger settings:

Serienummer	Status
656464	Ledig

Below the table, the 'Aktuella inställningar:' section shows the following settings:

- Offlineinspelning
- Starta utan fördröjning
- Mäter Temperature(Normal)
- Humidity(Normal)
- Lagra en mätning varje 50 s
- Stoppa när den är full
- Inget larm är aktiverat

To change the settings of your logger, click "Configure/Start" at the bottom of the page. By activating "Offline", it shows that you change settings for an offline recording.

The screenshot shows the bottom of the Tinytag web interface. It features four buttons: 'Multimeter', 'Hämta data', 'Konfigurera/Starta', and 'Starta'. The 'Konfigurera/Starta' button is highlighted. Above the buttons, there is a section titled 'Alternativ' with two checkboxes:

- ☐ Beräkna daggpunkt
- ☐ Begränsa RH mellan 0 och 100%

During start up you choose when or how you want to start your logger. **We recommend that you always choose to start as soon as possible.**

However, you can select a date and time for start. This option should not be used if the logger is to be started within ten minutes.

If you have a magnet, you can select "With magnetic start". The logger will only start when you put the magnet against it.

The screenshot shows the Tinytag configuration dialog box. It has a 'Titel:' field with the value 'Test'. The 'Inspektion' section is set to 'Offline'. The 'Mätning' section shows 'Intervall: 50 sekunder' and 'Loggtid: 5 dagar och 10 timmar'. The 'Starta utan fördröjning' option is selected. The 'Starta efter' option is also visible, with fields for '0' dagar, '0' timmar, and '1' minuter. The 'Absolut starttid' option is set to '2018-01-26 01:00:00'. The dialog box has 'OK' and 'Avbryt' buttons.

Get started - Tinytag

Specify which values you want to save, usually only normal values.

At intervals longer than one minute, the minimum and maximum values can be selected. This will save the lowest and highest value of the interval.

With min / max it reads every minute and then takes the highest / lowest value during the interval and records it.

Normal value is an instantaneous value. Thus, the value measured after the end of the interval.

Specifies sampling interval. Below you can see how long the logger memory lasts for the selected interval.

TGP-4500 (SN: 656464)

Titel: Test

Inspektion

☒ Offline

☐ Starta utan fördröjning

☐ Stoppa när den är full

☐ Lam 1 är inte aktiverat

☐ Lam 2 är inte aktiverat

☐ Online

☐ Ta bort samplingar som är äldre än 8 timmar

Mätning

Intervall: 50 sekunder

Loggtid: 9 dagar och 10 timmar

Temperature

☒ Normal

☐ Max

☐ Min

Humidity

☒ Normal

☐ Max

☐ Min

Starta Avbryt

Here is how the memory is to be used.

You can choose to stop the measurement after a certain number of measurement values.

It is also possible to have rolling memory. Then the oldest values are written over when the memory is full.

The most common is to stop the measurement when the memory is full.

TGP-4500 (SN: 656464)

Titel: Test

Inspektion

☒ Offline

☐ Starta utan fördröjning

☐ Stoppa när den är full

☐ Stoppa efter 100 avläsningar

☐ Online

OK Avbryt

Mätning

Intervall: 50 sekunder

Loggtid: 9 dagar och 10 timmar

Temperature

☒ Normal

☐ Max

☐ Min

Humidity

☒ Normal

☐ Max

☐ Min

Starta Avbryt

Get started - Tinytag

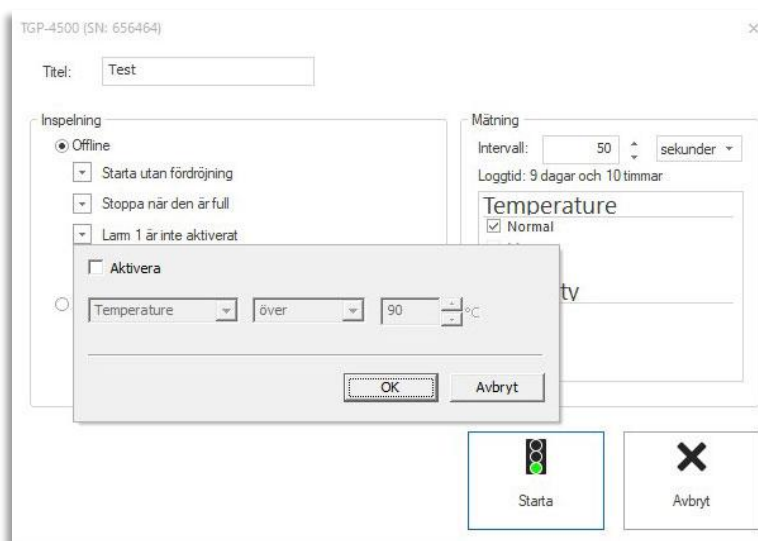
At alarms you can set any alarm limits. Choose whether the logger should alert above or below a certain level.

You can also choose to have locked alarms. This means that the LED indicating the alarm, will do so even when the logger is no longer above or below the selected alarm limit.

Note that if you have programmed "locked alarm under" and start the logger in "alarm range", for example -5°C, when the alarm limit is -2°C, the logger will not alarm until it has gone above -2°C and then below again.

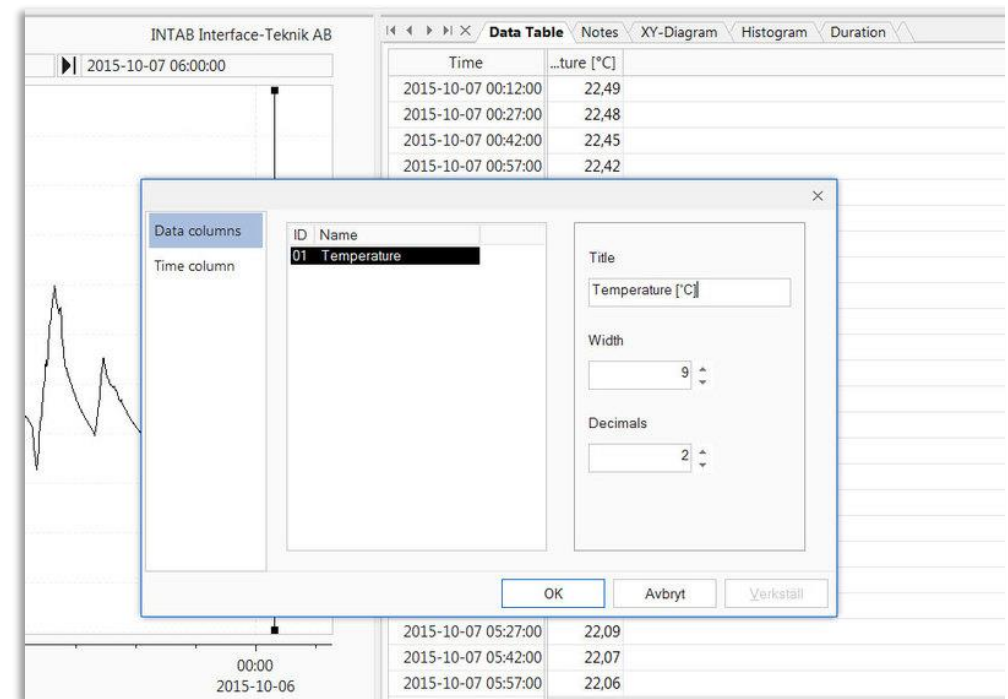
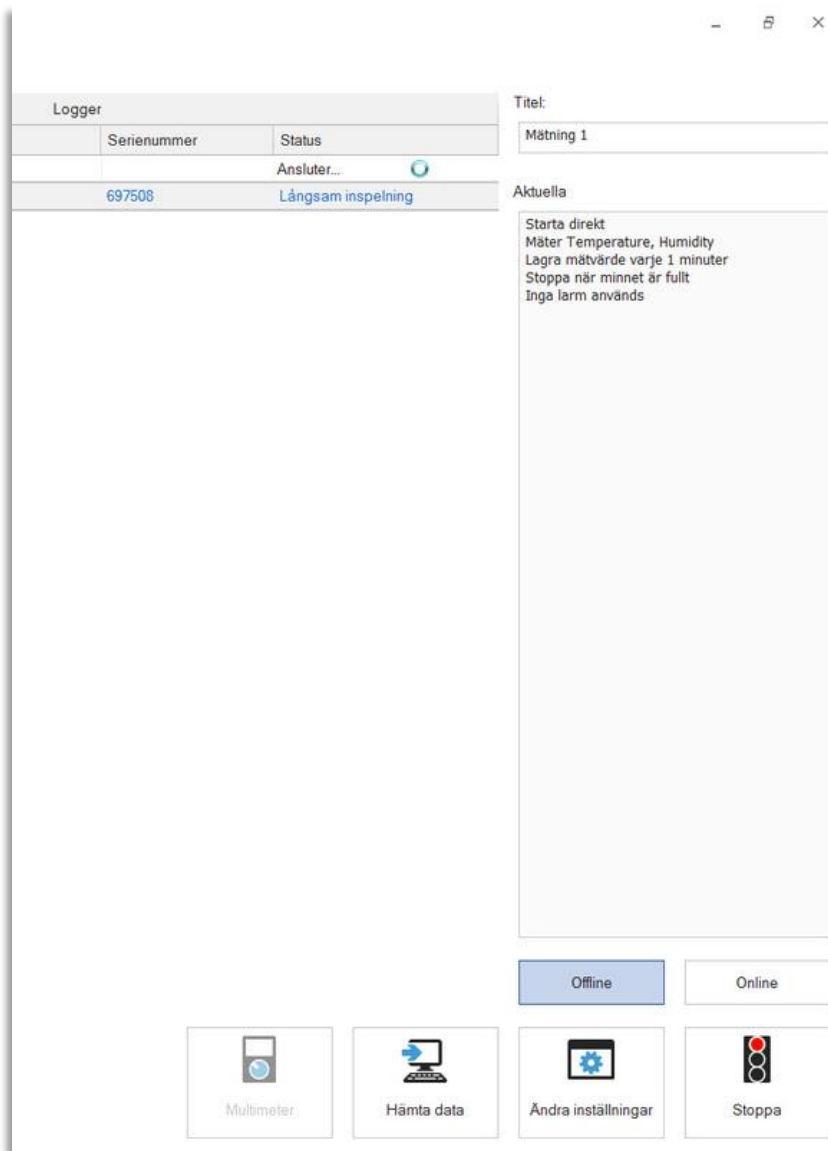
When all settings are complete, click start. After this, the status of your logger will show "Slow Recording" if you have chosen to start immediately, or "Waiting" if you have chosen to start with a delayed start. The symbol at the bottom right will show a red stop light.

It is now possible to disconnect the logger. When you connect the logger after the end of the measurement, you choose to stop the measurement by clicking on the symbol with the red stop light. Then click on "Download Data". It is also possible to retrieve data without stopping the logger.



See next page for picture.

Data table



Next to the chart window you will find the data table and possibly other plug-ins. The data table shows your samples with a timestamp.

By right-clicking and selecting "Save as" you can save the data table as a .txt file.

Under "Properties" you can select the title of your channels (for example temperature etc.) and also column width and number of decimals.

You can also choose how you want the time to be displayed.

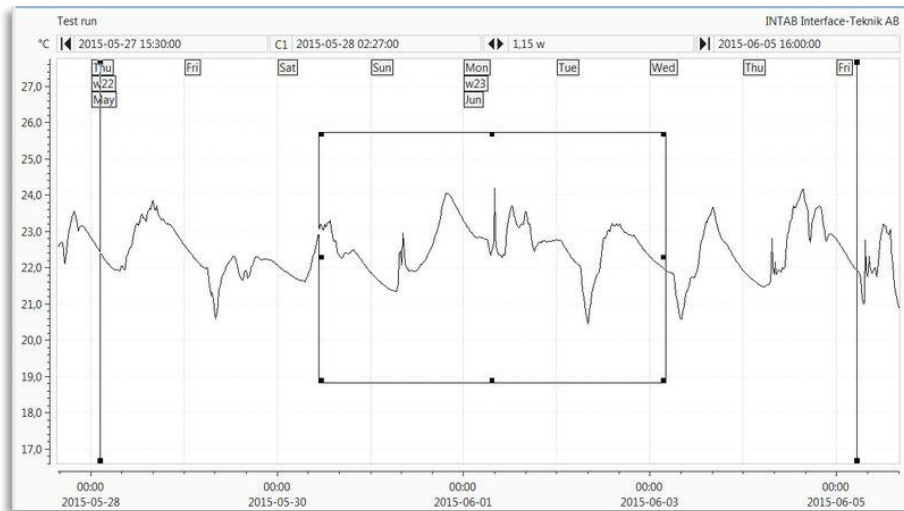
Get started - Tinytag

Zooming



If you want to take a closer look at a certain part of your measurement, you can zoom in on it. By using "Height", your measurement is zoomed in y-direction and with "Width" it is zoomed in x-joint. If you use "Both", your measurement will be zoomed to fit in the chart window.

You can also select an area with the mouse pointer to take a closer look at that area. When the area is marked with a box, click in the box.



You can also zoom by dragging the x and y axes. Then the index values will follow like a rubber band.

Hold down the mouse button and drag anywhere on the x or y axis. This fixes the origin and allows the other values to be changed.

Hold down the mouse button + Shift to fix the upper limit and allow the origo to vary.

Hold down the mouse button + Ctrl to move the entire index line up or down or side to side.

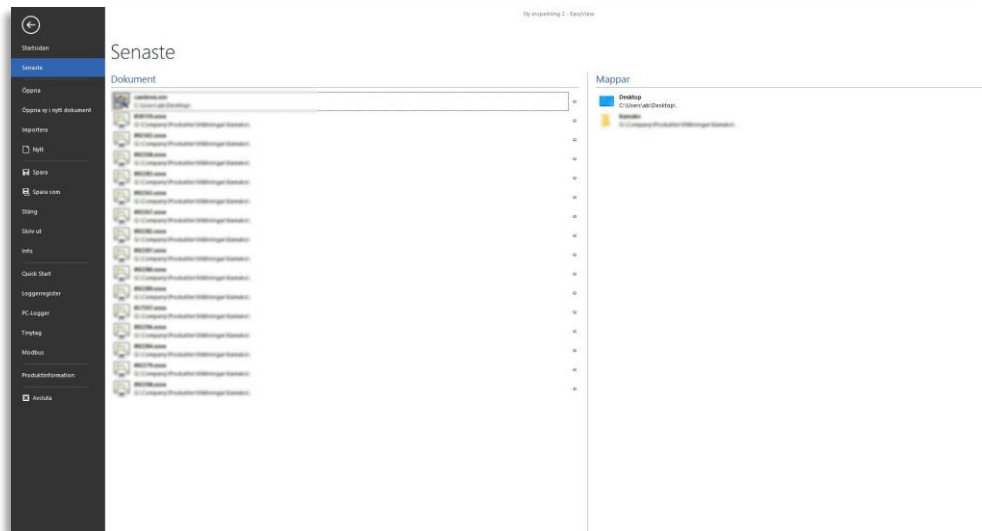
Open and import

Latest measurements

When you open a measurement, you can choose to open the latest measurements.

To the right you will see your most recently opened documents. On the right side you will see your most recently visited folders.

By clicking on the symbol to the right of the folders or documents, you can lock a folder or document there.

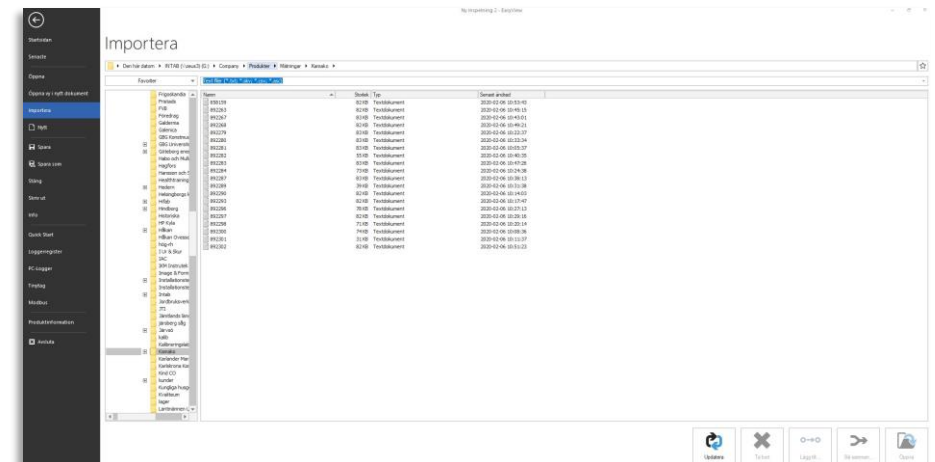


Import

There are several opportunities for import. You can choose to import from the MSR program and Tinytag Explorer directly into EasyView. You can also open files from the web interface Intab Cloud, Excel and txt files.

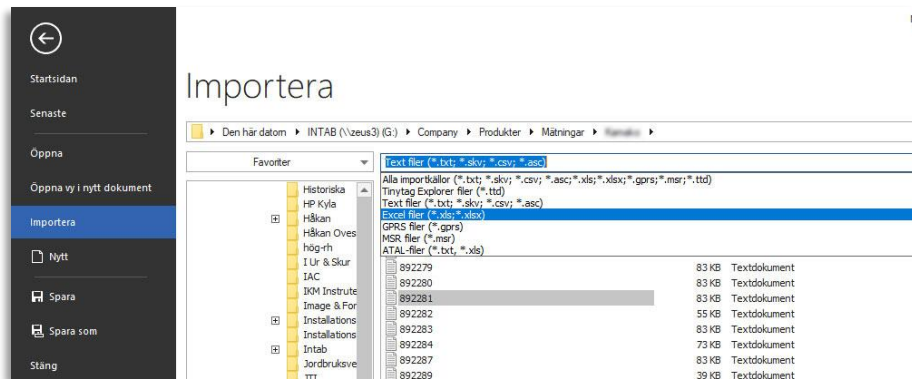
All files are opened immediately. When it comes to text files, you have the option to make some settings before importing so that everything will be right. They follow below:

Click the text import option.

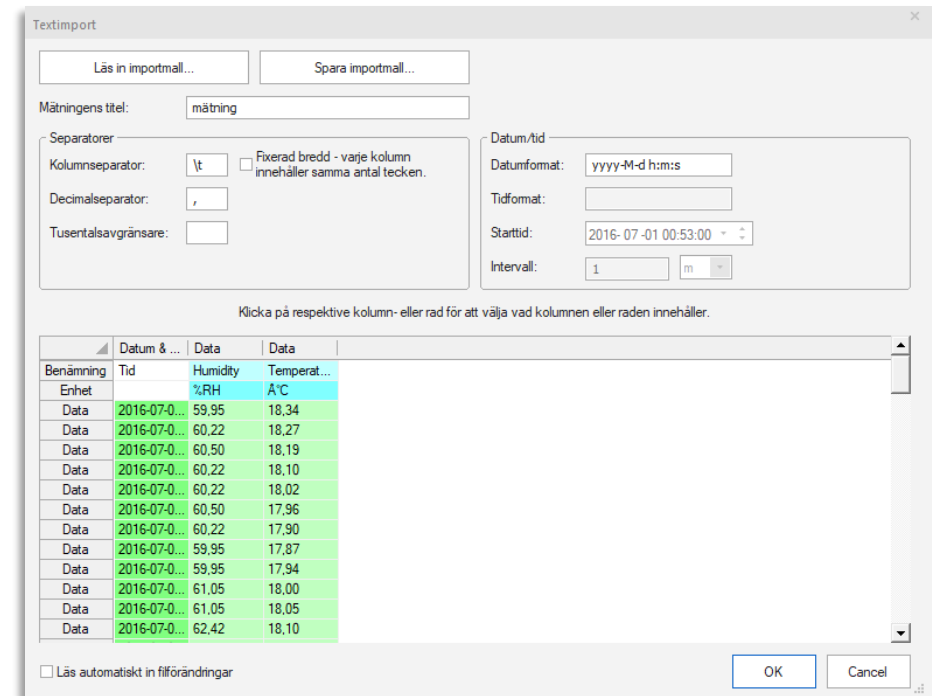


Open and import

Select the format you want to import from the drop-down menu.



A box with text import settings will be opened.



Open and import

Here you can choose column separator, decimal separator and thousands separator. You can also rename your measurement and specify which time format you want to use.

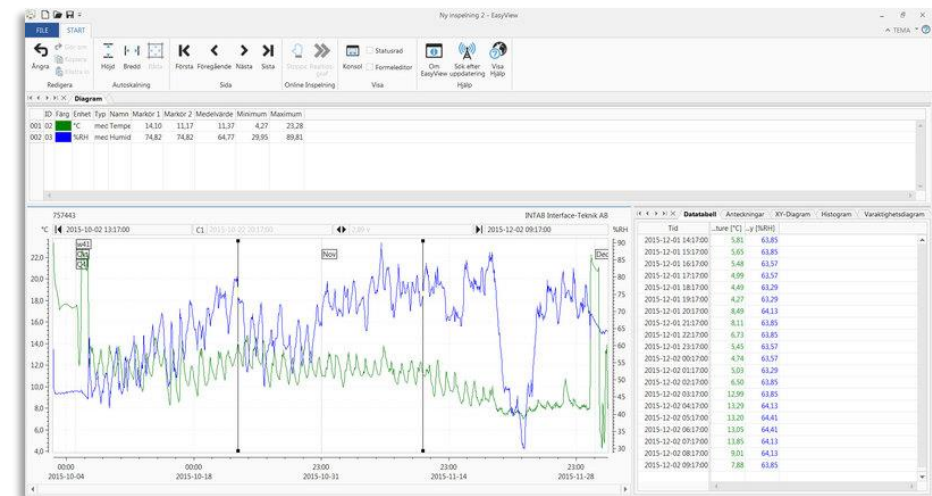
If you have an import template, you can load it by clicking the button at the top of the window.

Here you can see which values will be imported. Click on each column or row to select what the column or row contains.

If you want, you can save your settings as an import template. Then you can use the same settings for the next import.

Click ok when you are satisfied and your measurement will open.

After completing the import, you get your measurement in EasyView.



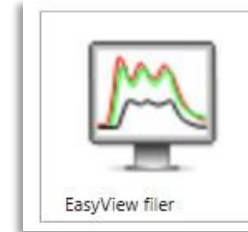
Open measurements

When you open EasyView, you get to a start page where you decide how you want to proceed. Here are alternatives for opening existing measurements, importing or starting a new measurement.

At open you get to choose what kind of measurement you want to open. You can choose to open an EasyView file, a file from the MSR program, or from Tinytag Explorer. You can also import txt movies, files from Excel and from our web interface here.



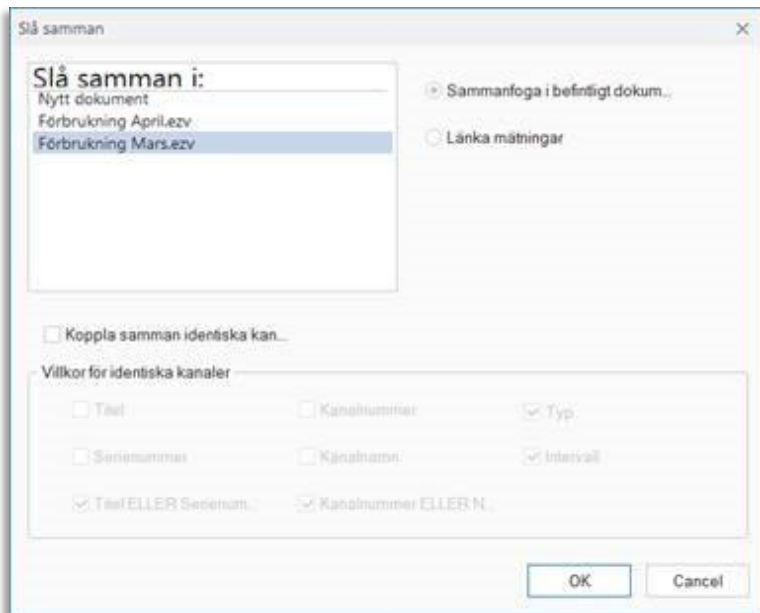
Merge measurements



You can merge several measurements by selecting "EasyView files" on the program's start page. Select the measurements you want to merge by holding down Ctrl. Then press "Merge".

Then choose whether to open the measurements in a new document or in any of the existing documents. You can also choose if you want to link measurement.

For example, if you have used the same logger for multiple measurements and want to merge this logger into the same channel, select "Link identical channels". You can then choose which properties to match for the channels to be merged, such as serial number.



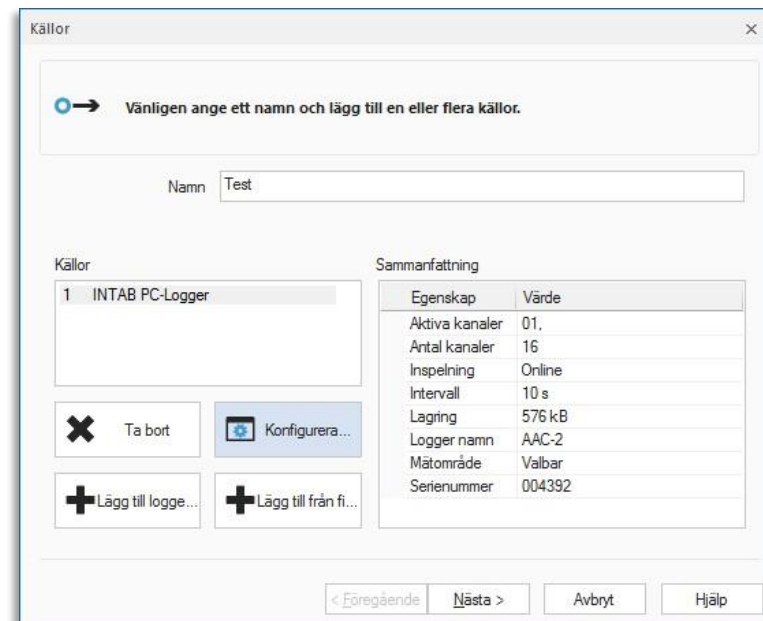
If you select "merge into existing document", the notes in the original measurement will remain. In the case of the image above, the notes in the file "Consumption Mars" will be left, and measurement data from "Consumption April" will be added.

Quick Start

What is Quick Start?

Quick Start is designed to save time for you who measure with many loggers or have many similar measurements. This can make it easier if you regularly take measurements where you want logger settings, scaling, colors and everything else to be identical every time. It is also possible to decide whether files should be saved automatically when the measurement is complete and, if so, where they should be stored and what the files should be named. Quick Start allows you to save, among other things, logger and presentation settings in a file in order to start a specific type of measurement as easily and quickly as possible.

Create a Quick Start



To create a new Quick Start, click the "New" button at the bottom. When you do this, a dialog box will appear where you will be able to enter your Quick Start name and choose which loggers should be included in your Quick Start. Click "Add logs ..." to search for connected logs or click

"Add from file ..." if you want to add a logger that you used in a previous measurement. If you want to change a logger's configuration, you can select it in the list under "Sources" and then click "Configure ..." to get to the configuration box.

As you advance to the next step, you will have the opportunity to choose whether you want files to be saved automatically and, if so, where to store them and what they should be called. Under "When the measurement is created", you can choose whether you want the measurement file to have a serial number, a timestamp or if you want to fill an existing file.

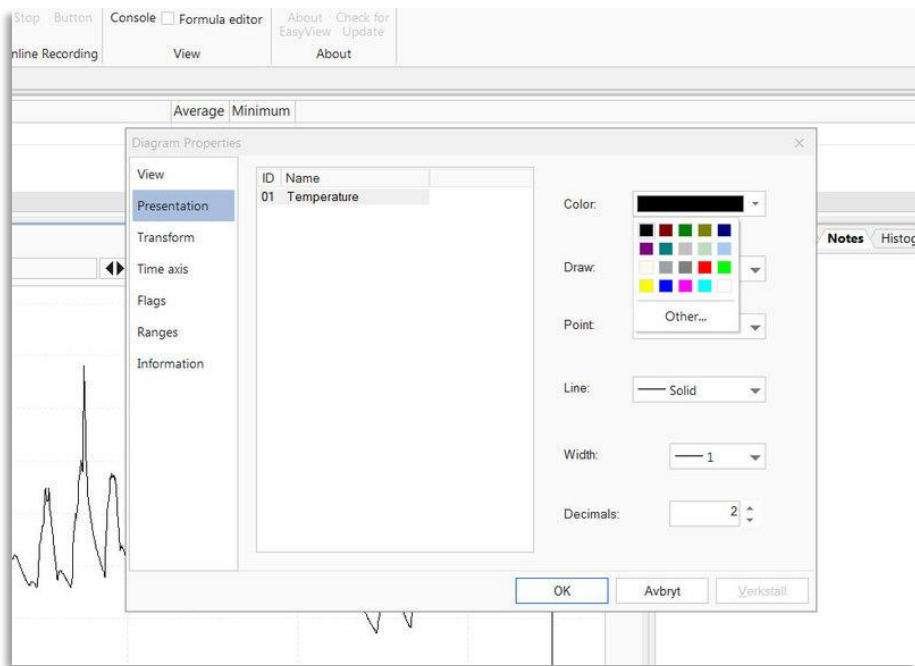
In the next step, you can choose whether to copy a presentation template from an existing file. Note that the presentation template is copied from the existing file so any changes you make to the template file afterwards will not affect your Quick Start.

Change settings in an existing Quick Start

If you select an existing Quick Start on the left, the settings in the table on the right are presented. The cells that are highlighted in blue can be edited by clicking on the cell and then clicking on the three points that appear to the right of the cell.

Appearance

Change appearance

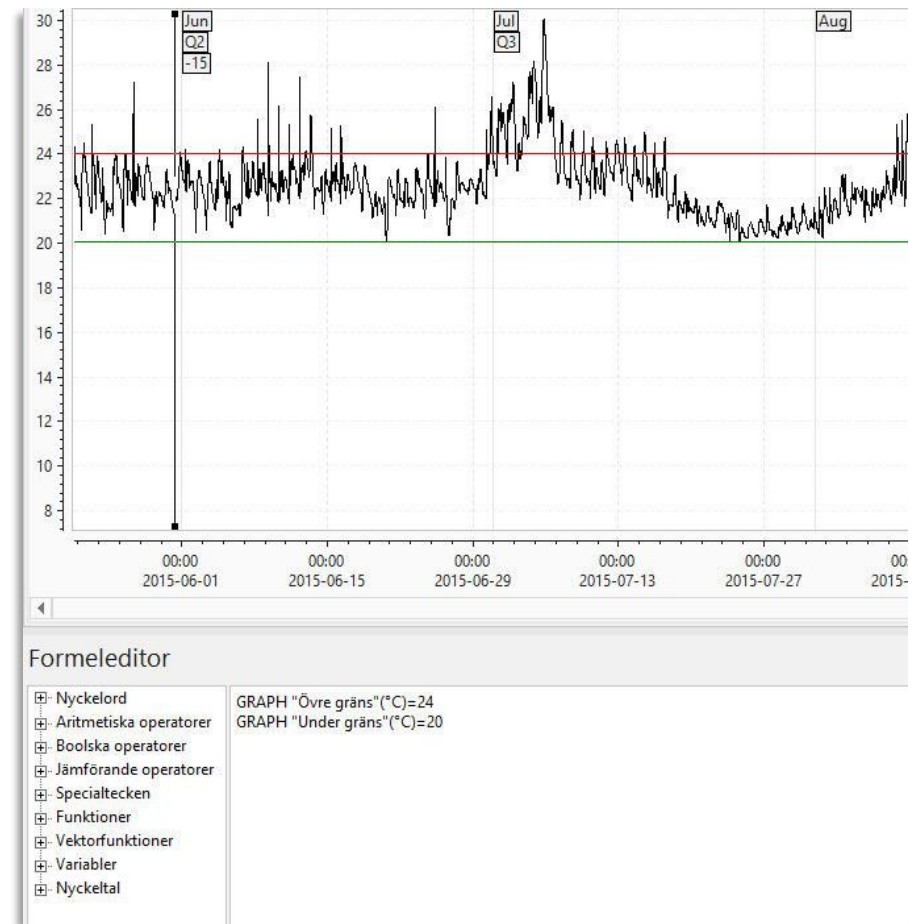


By right-clicking in the chart window and selecting "Presentation" you can change the appearance of the graphs. There are opportunities to choose color, how the curve should be drawn and whether the measuring points should be marked with a symbol. You can also choose whether the graph should be solid or, for example, dotted and how thick the line should be. During presentation you also choose how many decimals to display.

The color of the graphs can also be changed by double-clicking the boxes in the Color column in the info table.

Functions

How to set limit values?



Sometimes you may want your measurements to be between certain levels. For example, when measuring temperature, where temperatures above 24°C indoors are indicative of continued measurement. If you want to get a line on limit values for easier viewing of conditions, use limit values. It below the limit for indicating measurement is 20°C.

The formula looks like this:
 GRAPH " Upper limit "(°C)=24
 GRAPH " Lower limit "(°C)=20

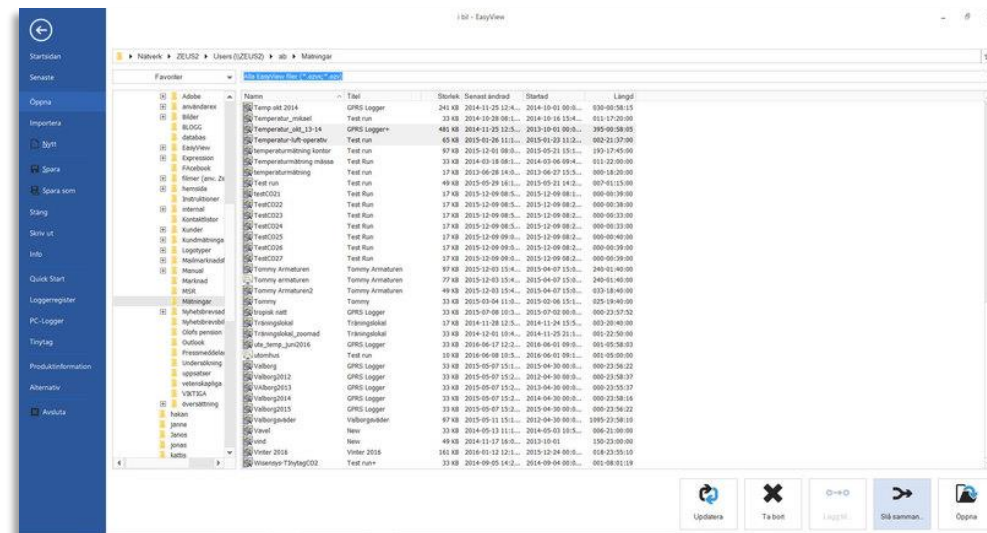
Open your measurement and double-click in your chart.

Under "Transformation" you select which unit you want to transform to, and set the upper and lower limits for the values.



How to merge multiple measurements in EasyView?

[Here you can see an instructional film on how to merge measurements in EasyView.](#)

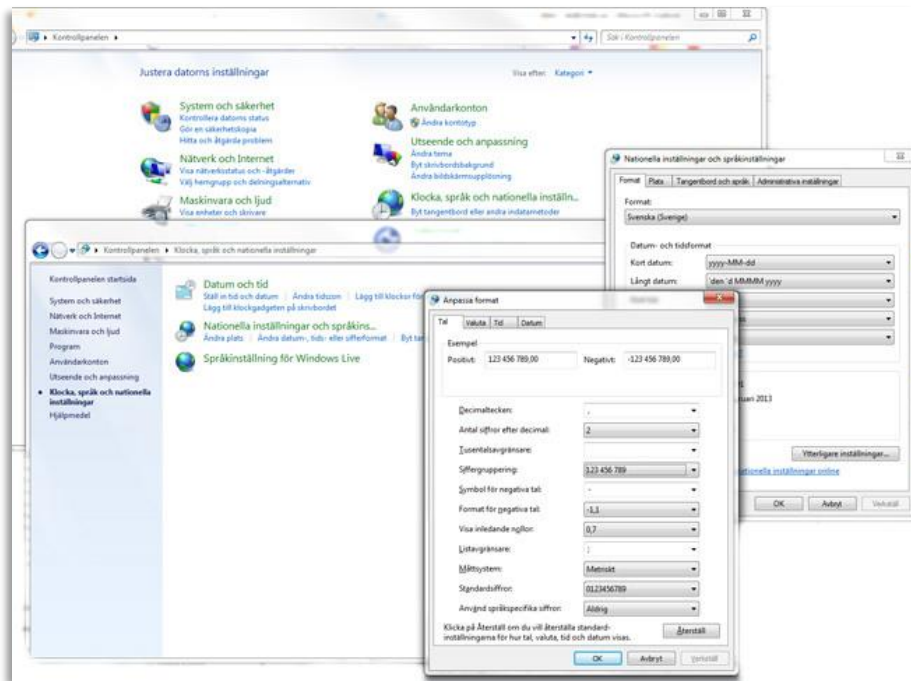


Functions

Why is my export strange when it contains numbers over 1000?

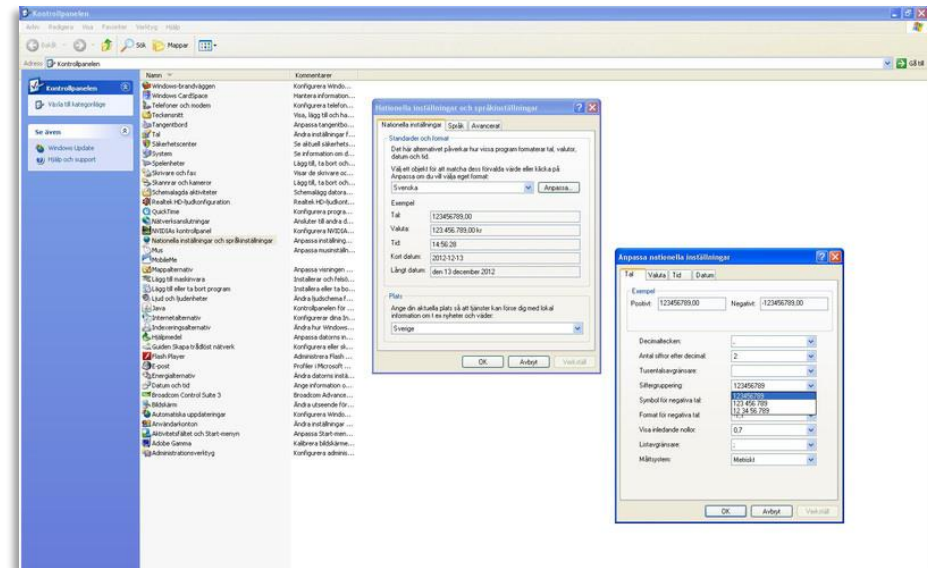
In Windows 10

Go to the Control Panel and select Clock, Language and National Settings. Select date, time and number formats. Under Additional settings, you can change number groupings. To avoid the space, digit grouping should be set to “123456789”.



In Windows XP

Go to the Control Panel and select National Settings and Language Settings. Select "Change date, time, or number format" and then click "Additional Settings". To avoid the space, digit grouping should be set to “123456789”.



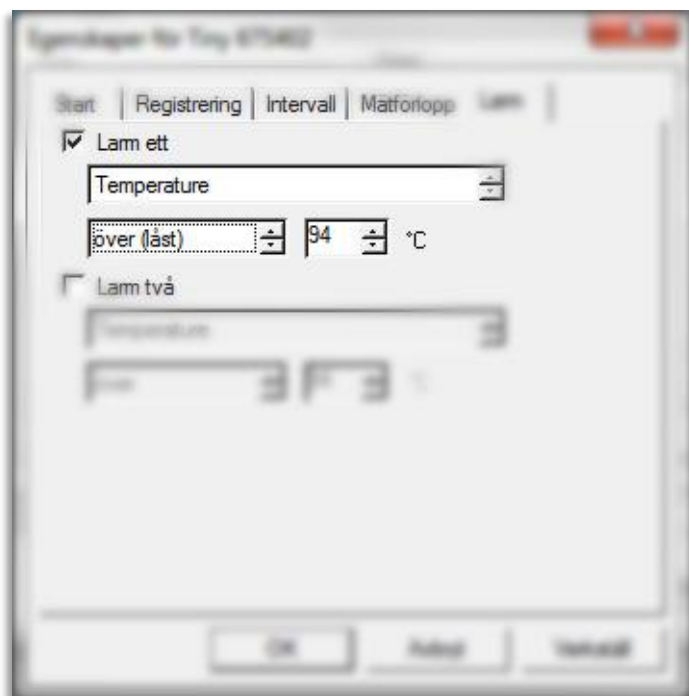
Functions

How does the Tinytag alarms work?

EasyView can set alarm limits. The alarm can go off if the values are exceeded or below. You can also choose whether the alarm should be locked or not. Locked alarm means that the LED continues to flash even when the alarm level is no longer reached.

Locked alarm works as intended when values passed from "non alarm" to "alarm range". If you have programmed "locked alarm over" and the logger starts in "alarm range", for example 100 ° C when the alarm limit is 94 ° C, the alarm will not go until the temperature has fallen below 94 ° C and then exceeds again.

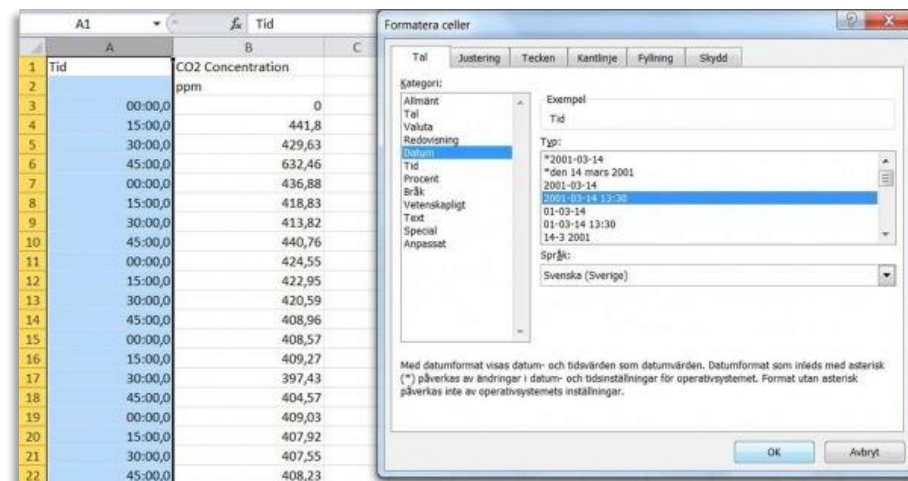
If you also want an audible alarm or trigger something, you can use the [Tinytag alarm box](#).



Why don't I get any dates when I export to Excel?

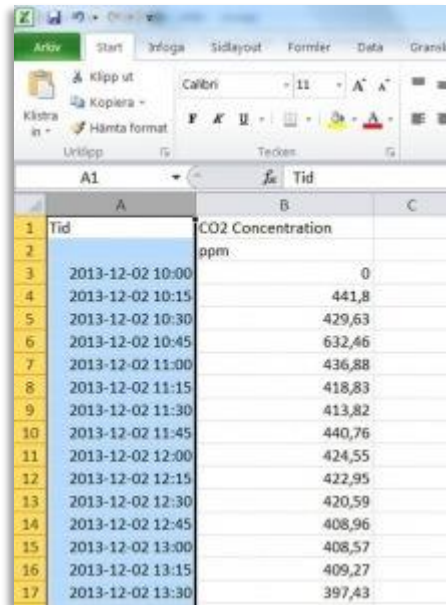
You don't get any dates when exporting from EasyView to Excel? This is because the cells are not formatted correctly.

Select the date column and right-click. Select "Format cells". You will now see the following window:

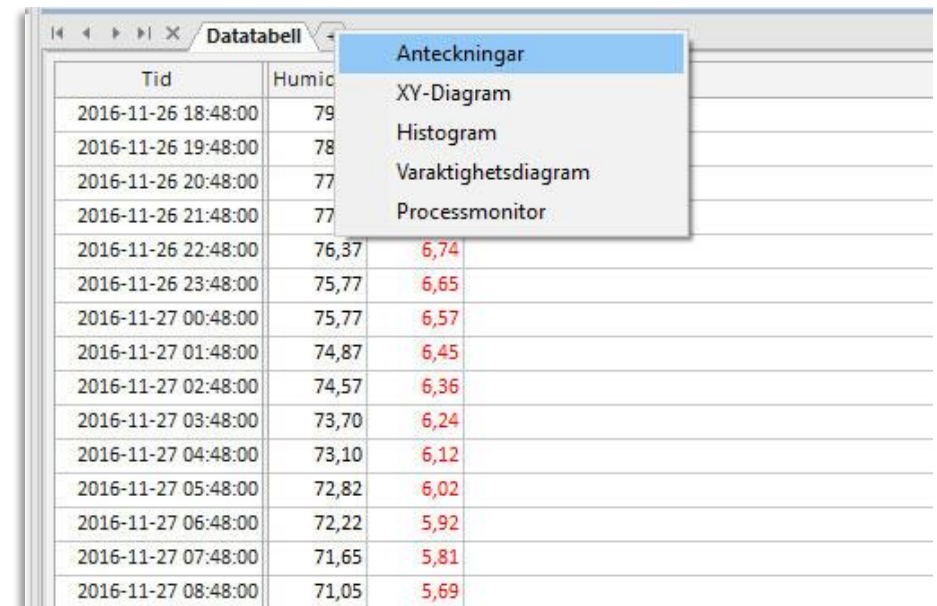


Plugin functions

Click on date and select the date format you want. Then press "OK". You should now have dates in your data table



	A	B	C
1	Tid	CO2 Concentration	
2		ppm	
3	2013-12-02 10:00	0	
4	2013-12-02 10:15	441,8	
5	2013-12-02 10:30	429,63	
6	2013-12-02 10:45	632,46	
7	2013-12-02 11:00	436,88	
8	2013-12-02 11:15	418,83	
9	2013-12-02 11:30	413,82	
10	2013-12-02 11:45	440,76	
11	2013-12-02 12:00	424,55	
12	2013-12-02 12:15	422,95	
13	2013-12-02 12:30	420,59	
14	2013-12-02 12:45	408,96	
15	2013-12-02 13:00	408,57	
16	2013-12-02 13:15	409,27	
17	2013-12-02 13:30	397,43	

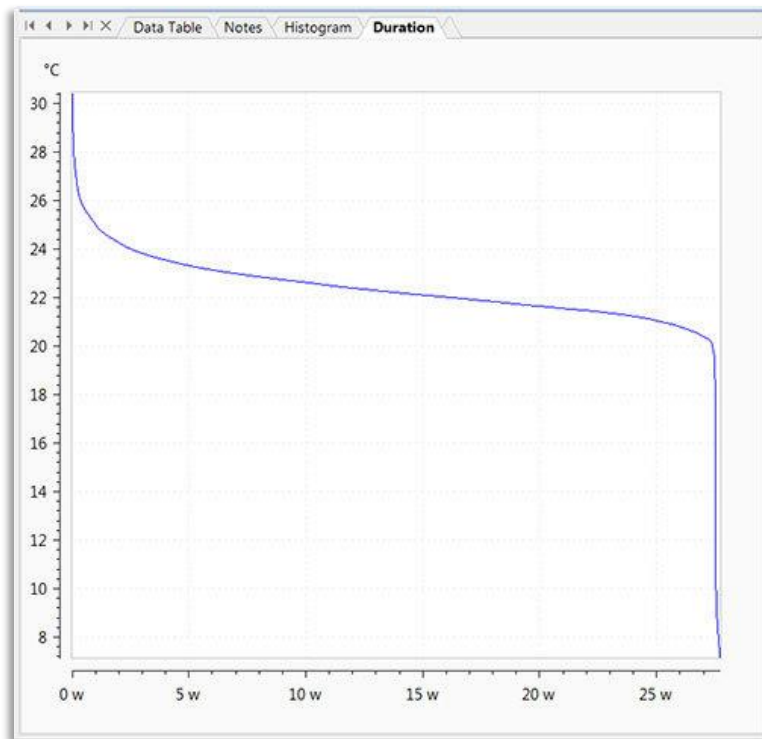


Tid	Humid	CO2 Concentration ppm
2016-11-26 18:48:00	79	
2016-11-26 19:48:00	78	
2016-11-26 20:48:00	77	
2016-11-26 21:48:00	77	
2016-11-26 22:48:00	76,37	6,74
2016-11-26 23:48:00	75,77	6,65
2016-11-27 00:48:00	75,77	6,57
2016-11-27 01:48:00	74,87	6,45
2016-11-27 02:48:00	74,57	6,36
2016-11-27 03:48:00	73,70	6,24
2016-11-27 04:48:00	73,10	6,12
2016-11-27 05:48:00	72,82	6,02
2016-11-27 06:48:00	72,22	5,92
2016-11-27 07:48:00	71,65	5,81
2016-11-27 08:48:00	71,05	5,69

Depending on whether you have a Light or Pro licens, there are a variety of plug-in features. They are displayed under tabs in the Plugin window along with the data table. By clicking on the small tab in the window you will see which plug-in features you can view. To hide it, activate the current tab and click on the cross. You can swap position of the different tabs by grabbing the tab you want to move and drag.

Plugin functions

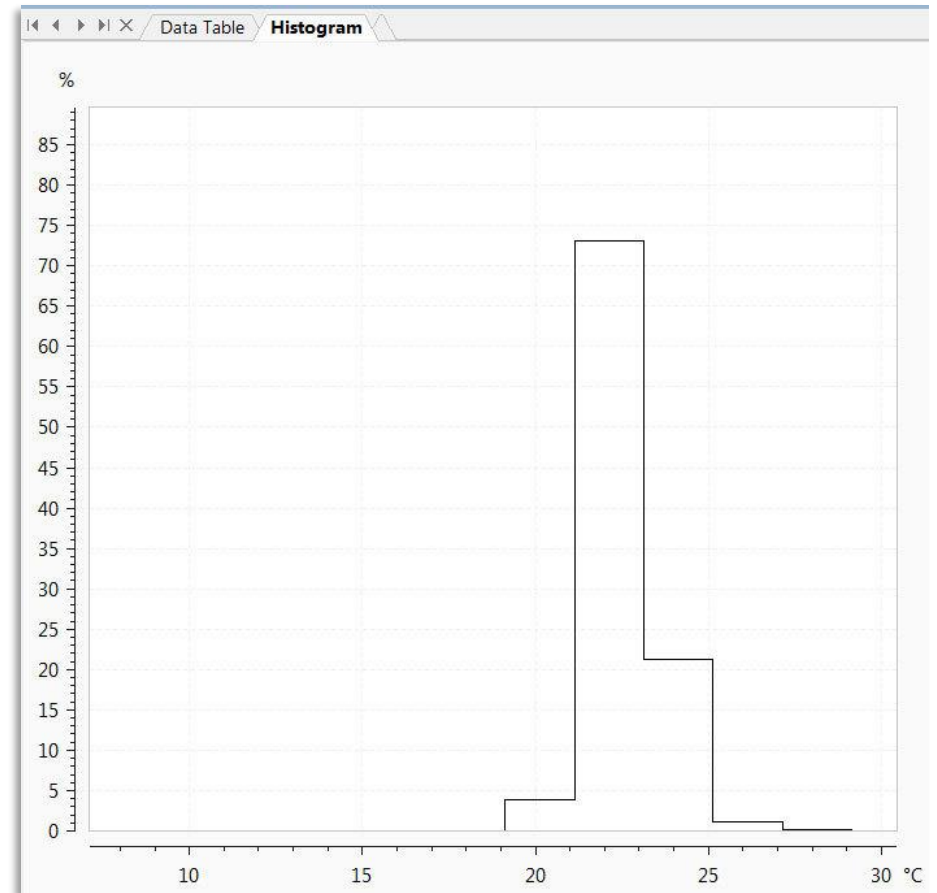
Duration chart



With the duration chart you can see for how long time a channel has been above or below a certain value. The values are sorted from the highest to the lowest.

The duration diagram can be useful for climate measurements of, for example, temperature, but also within the pharmaceutical industry for example disinfection. The temperature may need to be above 90°C for at least ten minutes for the measuring object to be disinfected, then the duration diagram is a good tool.

Histogram



When you want to see what percentage of the measurement values which were within specific levels. The "histogram" tab in EasyView Pro shows this clearly and quickly. The histogram shows how often (in % of all values) a certain group of values occurs in relation to the other values.

With the histogram you can see the relative frequency of measured values. You then get a picture of how the distribution has been within specific levels. For example, this may be interesting if you want to see what percentage of the measurement has been above or below a certain level.

Plugin functions

Process monitor

The histogram can be good to use if you want to see what percentage of the values have been above or below permissible temperatures in a freezer. It is also useful for carbon dioxide measurement to see how many percent of the measured values are above 1000 ppm that many uses as limit values.

Examples of uses of the EasyView histograms:

How much has the relative humidity of the church been outside the limit values of 50% RF and 70% RF?

What the distribution of different power levels is.

How many percent of the values are above 1000 ppm in assembly rooms.

What proportion of the temperatures were outside the limit values. In a property you may want to see values below 18°C and above 24°C. In a cold or freezer room, you may want to see what percentage of measured values have been warmer than maybe 8°C or -16°C.



To be able to relate measurement values to reality, it is possible to illustrate their measurement with a drawing or a photo.

In the image you can then insert measurement signals.

Process Monitor is a feature in EasyView. To get the feature, click the plus sign if it is not already open.

Once inside the tab, right-click in the blank area. Under properties, you can choose, among other things, whether you want an image as a background and at what cursor your indicators should point to. Cursor 1 and 2 are used to search through an already recorded recording, while the selection online should be used in an online recording.

The measurement values to be shown in the drawing / picture must be activated and placed out. To do this, right-click and select New Indicator.

Here you will get a window where you can choose how the indicator is presented. To place them in your image just drag them.

Notes

To remember the details of the measurement or to clarify it for others who read it, it is good to use notes. If you have several tabs in your measurement, each tab has its own notes. The tab for notes is located in the plug-in window.



Report / Print

How to insert header and footer?

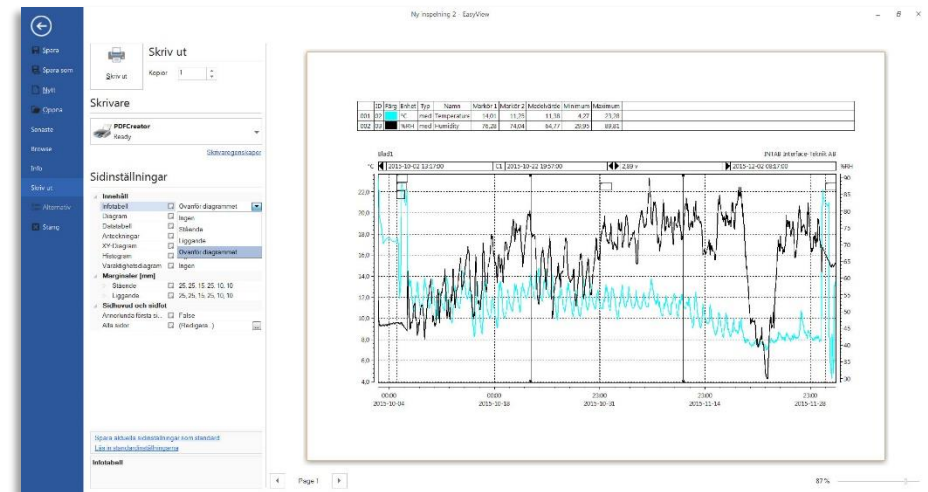
If you want a header or / and footer in your document when printing, this is easily fixed. Click "Print" in the menu. At the bottom you will find "Header and footer". Click here and you will see a box where you can easily choose what you want in your document. You can click on the buttons to, for example, include dates and so on, or enter what you want in the different boxes yourself.

Create a PDF report

If you want to create a report of your measurement, use a PDF printer. Examples of such are Adobe, or PDF creator.

Then select File and Print. As a printer, select your PDF printer.

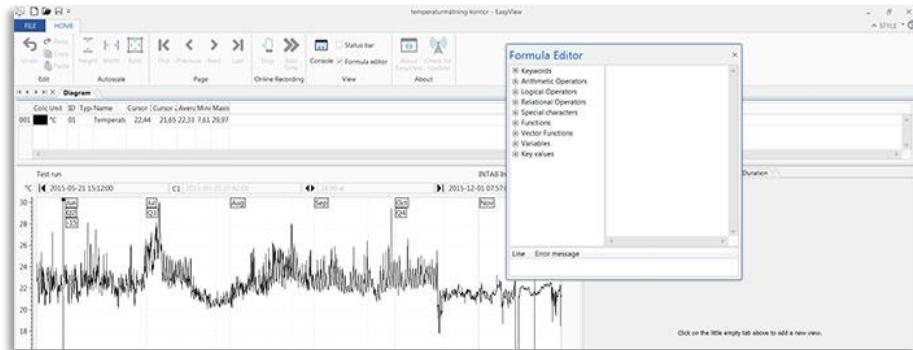
Here you can choose what your report should look like (see image below). By clicking on the arrow behind the different parts of the measurement you can select landscape or portrait. As for the info table, there is also the option if you want it to be placed on the same page as the chart, as in the image. You also choose what you want to include, such as XY charts or notes. These then end up on their own pages.



Formula

Find the formula editor

You can get the Formula Editor by checking the Formula Editor option in the main menu. It then opens as a popup box.



Writing formulas

The structure of a formula always looks like this:

GRAPH " formula name" (sort) = formel

or:

GRAPH " formula name" = formel (Without sort, the curve is not plotted, but the values are calculated.)

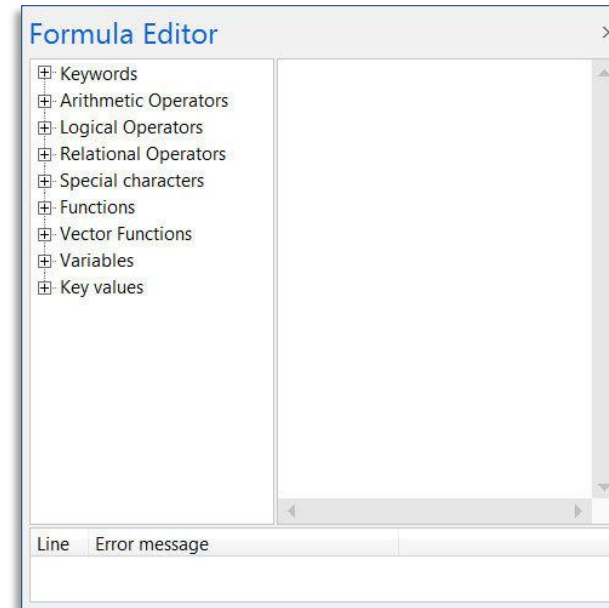
GRAPH is a so-called keyword.

A "**formula name**" is a name that you can find yourself.

A **formula** is a mathematical expression that you construct using operators and more.

You can click ahead to create a formula, or write it by hand.

Formula



If you choose to write by hand, consider the following:

Functions and operators and more must be written in capital letters.

Formula names containing spaces must be enclosed in quotation marks.

The variables must be written exactly as they are in the variable list.

Functions

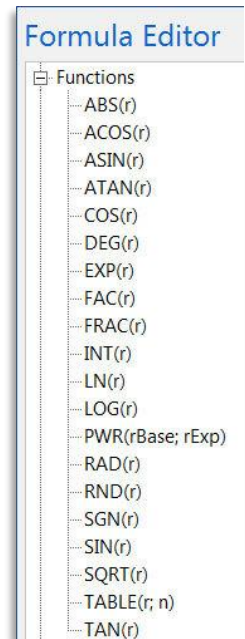
Functions Description

ABS(r)	Returns absolute values Ex: ABS(-10) → 10
ACOS(r)	Returns the angle whose Cosinus is (r) Ex: ACOS(1) 0 → (0°C)
ASIN(r)	Returns the angle whose Sinus is (r) Ex: ASIN(1) 1,57 → (90°C)
ATAN(r)	Returns the angle whose Tangens is (r) Ex: ATAN(1) 0,785 → (45°C)
COS(r)	Returns Cosinus by r Ex: COS(3,14) → -1
DEG(r)	Transforms radians to degrees Ex: DEG(3,14) → 180°
EXP(r)	Calculates the exponential function Ex: EXP(4) → $e^4 = 54,6$
FAC(r)	Calculates the faculty Ex: FAC(4) → $1*2*3*4=24$
FRAC(r)	Returns the decimal part of a floating point Ex: FRAC(31,232) → 0.232
INT(r)	Returns the integer part of a floating point → 31 Ex: INT(31,232)
LN(r)	Returns the logarithm of values greater than zero Ex: LN(10) → 2,30..
LOG(r)	Returns the 10 logarithm of values greater than zero Ex: LOG(10) → 1

Formulas in EasyView

Formler

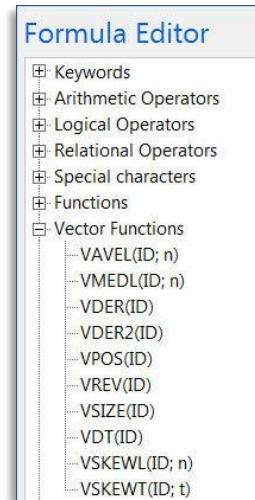
PWR(x;y)	Returns the result of y raised to x Ex: PWR(2;ID1) → <i>Kvadraten på kanal1</i>
RAD(r)	Transforms degrees to radians Ex: RAD(180) → 3,141592653589793238..
RND(r)	Returns a random number of zero and r Ex: RND(30)
SGN(r)	Returns +1 if the number is positive and -1 if negative
SIN(r)	Returns the Sinus of r Ex: SIN(3,14) → 0
SQRT(r)	Returns the square root of the value Ex: SQRT(144) → 12
TABLE(ID;r)	Returns a transformed value by interpolating between entries in Tabler.txt (where r is a serial number).
TAN(r)	Returns the Tangens of r Ex: TAN($\pi/4$) → 1,548



Vector functions

Functions preceded by V are called vector functions. These are used to make calculations with reference to a number of sampling points.

Funktion	Beskrivning
VAVEL(ID;n)	Returns the mean over $2n + 1$ samples at each measurement point. Example: VAVEL (ID1; 5) returns an average of over 11 points, five back, five forward and the point calculated.
VDER(ID)	Returns the derivative calculated as follows: $(f(t-2dt) - 8*f(t-dt) + 8*f(t+dt)) - f(t+2dt))/12$ Ex: VDER(ID1)
VDER2(ID)	Returns the second derivative calculated as the direction coefficient for the chord from $t-dt$ to $t + dt$ on the first derivative. Ex: VDER2(ID1)
VMEDL(ID;n)	Returns the median value of $2n + 1$ values Ex: VMEDL (ID1; 3) results in the median value of 7 values from channel 1

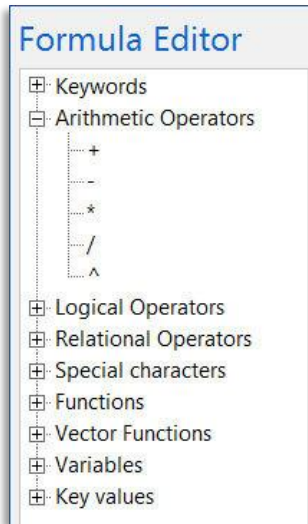


Formulas in EasyView

VPOS(ID)	Returns the relative time as a floating point. The unit is in day. Ex: VPOS (ID1) ex. 2.1323 which means 2 days, 3 hours, 10 m and 31 sec (approximately).
VREV(ID)	Returns the value of a reverse time curve. The end time is specified as the start time.
VSIZE(ID)	Returns a floating point for the length of the recording.
VSKEWL(ID;n)	Creates an offset curve "x" number of sample points Ex: VSKEWL(ID1;5)
VSKEWT(ID;t)	Creates an offset curve "t" number of seconds. Do not confuse this with "Offset" in the info table. It has a similar function.

Operators

Many of the operators are quite obvious, such as +, -, = etc., while others like GT, LT, etc. may need a short presentation. AND (&), BIT, OR (|) and XOR are Boolean operators. The characters in brackets can be used instead of printing the entire word. They are used in the usual way to handle binary signals.



Arithmetic operators

+ Addition

- Subtraction

* Multiplication

/ Division

^ Used as exponent operator.

Ex. GRAPH Expon (kPa) = ID1 ^ 3 (Reads as channel1 raised to three)

Formulas in EasyView

Boolean operators

AND Forms an and condition between two binary values.

& Ex: GRAPH mask (set) = ID31 AND 4 (Returns 4 if bit 2 is set on channel 31; otherwise zero)

OR Or-conditions:

| Ex.: GRAPH mask (set) = ID31 OR 4 (Returns ID31 + 4 if bit 3 was not set; otherwise ID31)

BIT Used to see if a bit is set or not.

Ex: GRAPH mask (set) = ID31 BIT 4 (Returns one if bit 3 is set on channel 31; otherwise zero)

XOR The best way to describe a so-called semi-adder is with a truth table. It applies to each position in a binary number: 0+0=0 0+1=1 1+0=1 1+1=0

Ex.: GRAPH add(bin)=5 XOR 3 (Returning 6)

~ This function "invert". A zero becomes one and everything different from zero becomes zero.

Comparative operators

- > If the condition is met, 1 is returned, otherwise 0.
Ex: GRAPH "greater than" (bit) = ID1> 5 (Is 1 when ID1 is greater than 5, otherwise 0)
- < If the condition is met, 1 is returned, otherwise 0.
Ex: GRAPH "less than" (bit) = ID1> 100 (Is 1 when ID1 is greater than 100, otherwise 0)
- = If the left is equal to the right, 1 is returned, otherwise 0.
- >= Greater than or equal to returns 1, otherwise 0.
- <= Less than or equal to returns 1, otherwise 0.
- GT "The biggest of .. and .."
Ex: GRAPH greater (° C) = ID1. GT 30
(If ID1 is greater than 30, ID1 is otherwise returned 30.)
- LT "The smallest of .. and .."
Ex: GRAPH lesser (° C) = ID1 LT 30 (If ID1 is less than 30, ID1 is otherwise returned 30.)

Finally, we provide a number of special characters that may be good to have:

- ° Degrees
- μ My, micro
- ² Raised to 2, Square

Formulas in EasyView

Variables

The variables you have available are the channels you have used in the recording.

If you have a recording where you have used a combination of, min or max, the corresponding ending will also be added:

ID1.min, ID1.max, etc.

Formulas can also be used as variables. Just make sure they are defined "before" they are used, ie. stands on some line above. Especially formulas without variety are meant to be used in this way.

Key words

The six keywords that can be used in formulas are always written first.

The following keywords can be used.

CONST This keyword declares a constant you can use in your formula.

Ex: CONST PI = 3.141592653

GRAPH Declares a formula.

Ex: GRAPH "My Value" (°) = SIN (DEG (ID1))

KEYVAL Declares mathematical expressions that generate key figures, that is, new columns in the info table.

ex: KEYVAL test = SUM / N

FN Declares a function. Common functions are, for example, $f(x)$, $v(t)$ mm. You can also have a function with several operands, such as $y(z; x)$, etc.

Ex: FN $f(x; y) = (5 * x) - y$

GRAPH function test (r / min) = $f(\text{ID1.med}, \text{ID2.med})$

REM Used to enter a comment. Can also be used to prevent a formula from being executed.

Ex: REM GRAPH test (° C) = $\text{Tempins.max} - \text{Tempout.min}$

SET Used to give your channels more easy-to-handle names in the formula.

Ex: SET U2 = 'Voltage R2'

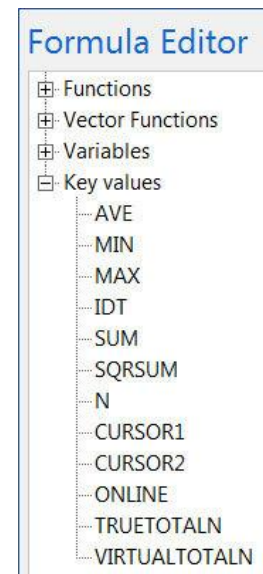
SET I1 = Current R1'

CONST R1 = 50000

GRAPH test (V) = $U2 - R1 * I1$

Formulas in EasyView

Key figures



The key figures that can be used to create new columns in the info table are:

AVE Signals mean value over time.

MIN The minimum value of the signals during the displayed time.

MAX The maximum value of the signals during the displayed time.

IDT Signals integrals for the displayed time. Ärt is in seconds.

SUM The arithmetic sum of the measured values over the displayed time. $\sum x$

SQRSUM The sum of the squares of the measured values. $\sum x^2$

N Number of measured values displayed.

CURSOR1 The measurement value in the position where cursor 1 is located.

CURSOR2 The measurement value in the position where cursor 2 is located.

ONLINE Latest measurement value received on-line measurement. Last value.

The syntax for creating key figures is illustrated by this formula that actually calculates variance: $\text{KEYVAL Variance} = (\text{SQRSUM} - 2 * \text{SUM} * \text{MEAN} + (\text{MEAN}^2 * \text{N}) / \text{N}) / \text{N}$ You can then easily fix a column that gives the Standard deviation. This is what it looks like: $\text{KEYVAL Standard deviation} = \text{SQRT}(\text{Variance})$ As seen, all these calculations of key figures are started with the keyword KEYVAL. It tells the program what to do with the following.

In summary, the syntax looks like this: $\text{KEYVAL name} = \text{expression}$ Allowed operators in "expression" are the arithmetic and operators. Variables in "expression" are keywords. NOTE that signals (= variables, channels) and vector functions cannot be used.

Examples of formulas

Average value

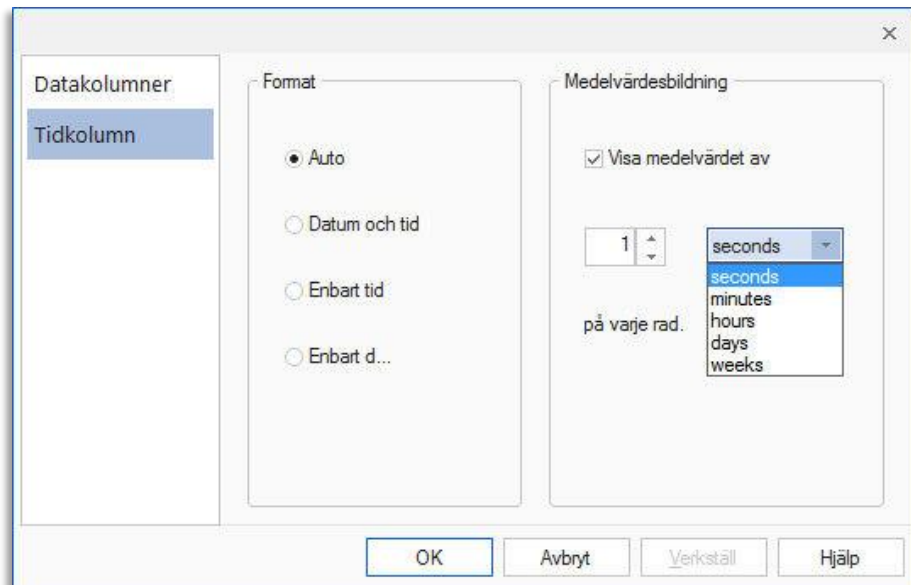
In EasyView, you see the average value zoomed-in period in the Info table ("Med").

It is also possible to calculate averages within different time periods so you can follow the mean changes for example per hour or day. This is done through the data reduction function in the data table.

Double-click in the data table and select the "time column" tab.

The mean is then calculated from the time in the time column. If part of the measurement is zoomed, it means that the mean calculation starts where the time axis begins in the time diagram.

If you want to get the average value per week, day, minute or second for your entire measurement, you should zoom out before choosing the average value calculation.



Lux hours

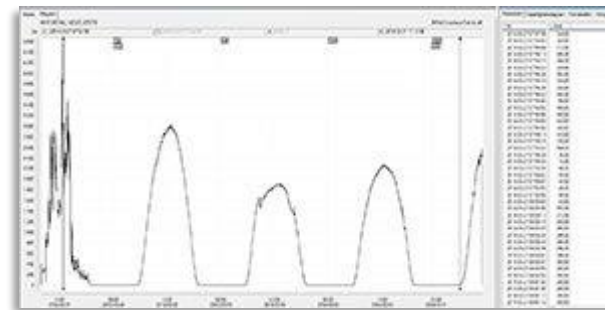
Sometimes if you measure lux you want to measure maybe every second and then get it presented in luxury hours which is a common measure for museums. They usually put the luxury hours together for example a year to see how much light an object gets.

Here's how to calculate luxury hours in EasyView:

Just divide the IDT by 3600.

KEYVAL Lux hours = IDT / 3600

IDT is similar to the key figure SUM. The difference between them is that SUM is the sum of each sample while IDT is the sum of each sample per second (regardless of sampling interval). In other words, with a sampling interval of 1 second, IDT and SUM receive the same value. IDT is thus independent of sampling interval unlike SUM. Only IDT gives you "luxury seconds", IDT / 60 gives you "lux minutes" and IDT / 3600 gives you luxury hours. kWh is calculated in the same way.

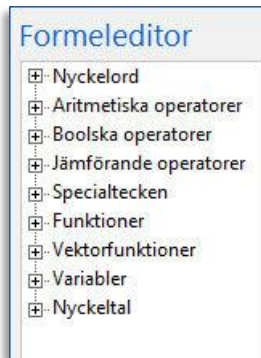


Ventilations index

The carbon dioxide content can give an indication of the air quality. To check the air quality, the ventilation system should also be tested.

To control ventilation, the CO2 content must be measured in the living area and in the exhaust air.

From this, one can calculate the ventilation index, which is the ratio (quotient) between the content of the exhaust air and the room.



The formula for this looks like this:

$$I_v = C_f / C_v \times 100$$

C_f is the content of extract air

C_v is the content of the residence zone

I_v is the ventilation index as a percentage

In EasyView the formula looks like this:

SET Extract air = ID1

SET Residence zone = ID2

GRAPH Ventilation Index (%) = (Extract Air / Stay Zone) * 100

Read about Bengt Bergqvist Energy Analysis - [Troubleshooting in heating and ventilation systems](#)

Examples of formulas

Divide the PC logger's digital inputs

A PC logger with digital card has 8 digital inputs and 4 digital outputs. An exception is PC logger 2100 which has three digital / pulse counters inputs where one can be used as digital output. The digital inputs and outputs are presented in EasyView in the form of an integer. This integer represents a binary value and can be subdivided, using the formulas below, so that each digital input and output is shown as a single curve in the diagram.

Here's how the formula looks to divide the digital inputs:

SET DigIn = ID31

GRAPH "DigIn 1"(Din) = DigIn BIT 0

GRAPH "DigIn 2"(Din) = DigIn BIT 1

GRAPH "DigIn 3"(Din) = DigIn BIT 2

GRAPH "DigIn 4"(Din) = DigIn BIT 3

GRAPH "DigIn 5"(Din) = DigIn BIT 4

GRAPH "DigIn 6"(Din) = DigIn BIT 5

GRAPH "DigIn 7"(Din) = DigIn BIT 6

GRAPH "DigIn 8"(Din) = DigIn BIT 7

Here's how the formula looks to divide the digital outputs:

SET DigOut = ID32

GRAPH "DigOut 1"(Dout) = DigOut BIT 0

GRAPH "DigOut 2"(Dout) = DigOut BIT 1

GRAPH "DigOut 3"(Dout) = DigOut BIT 2

GRAPH "DigOut 4"(Dout) = DigOut BIT 3

Examples of formulas

Dew point

By typing the following formula in the "Formula Manager" found in EasyView Pro you can calculate the dew point. Dew point is calculated from measured temperature and relative humidity.

REM The following conditions apply

REM $0^{\circ}\text{C} < T < 60^{\circ}\text{C}$

REM $0.01 < RH < 1.00$

REM $0^{\circ}\text{C} < T_d < 50^{\circ}\text{C}$

REM Adjust the ID number so that T is the temp channel and RH is the relative humidity

SET $T = ID2$

SET $RH = ID1$

CONST $a = 17.27$

CONST $b = 237.7$

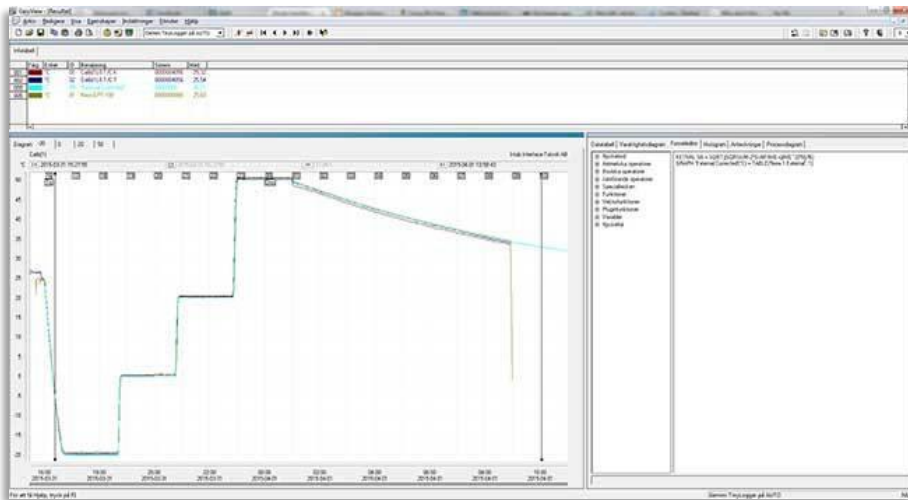
GRAPH $\alpha = (a * T) / (b + T) + \ln(RH / 100)$

GRAPH Dew Point ($^{\circ}\text{C}$) = $(b * \alpha) / (a - \alpha)$

Read our blog post where our expert Niklas answers the question ["What is the dew point?"](#).

Dew point according to National Encyclopedia:

dew point, dew point temperature, the temperature to which air must be cooled, without changing air pressure or water vapor content, for water condensation to begin.



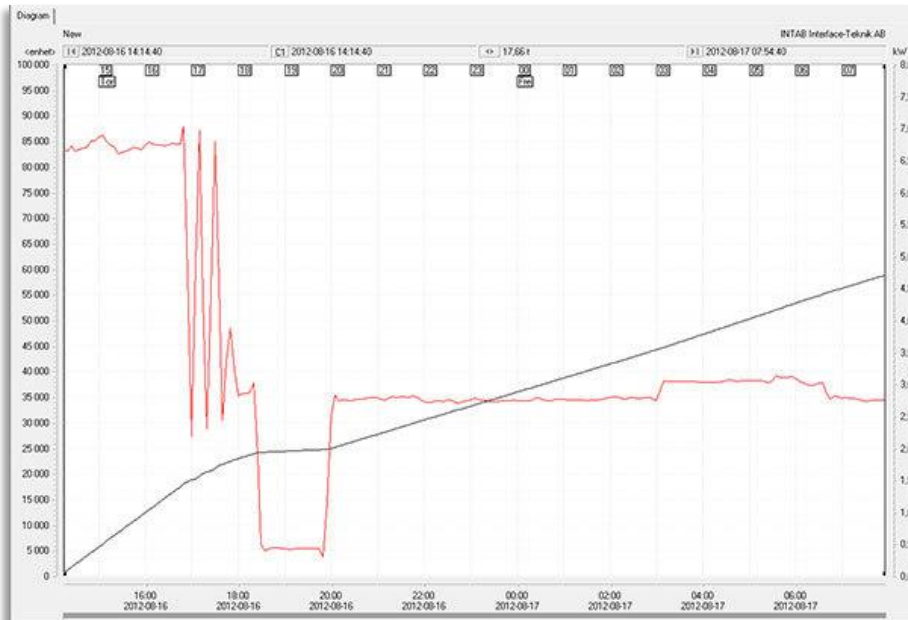
Examples of formulas

Create a derivative curve

Derivating can be interesting when you have a constantly rising curve and you are looking for change over time. Let's say you have a pulse counter that counts the number of pulses that an electricity meter gives out. For each kWh, the electricity meter emits 1000 pulses and you want to get a curve on what the effect has looked like over time. The formula for this looks like this:

$$\text{GRAPH Power (kW)} = \text{VDER (ID1)} / 1000 * 3600$$

Another application when derivation can be interesting is if, for example, you measure volume and based on this want to get a curve on the flow.



kWh

The energy consumption, referred to as watt hours, is the average power multiplied by the number of hours. An average power of 2kW for one hour means the same energy consumption as an average power of 1kW for two hours.

The formula for generating kilowatt-hours in our EasyView analysis software looks like this:

$$\text{KEYVAL kWh} = \text{IDT} / 3600$$

IDT is similar to the key figure SUM. The difference between them is that SUM corresponds to the sum of all samples, which means that elapsed time does not affect this value. IDT corresponds to the sum based on the sampling interval of one second, which means that time is also included in this value. Thus, with a sampling interval of one second, IDT and SUM will correspond to the same value. Only IDT gives you "kilowatt seconds", IDT / 60 gives you "kilowatt minutes" and IDT / 3600 gives you kilowatt hours (kWh).

The formula editor is in EasyView Pro.



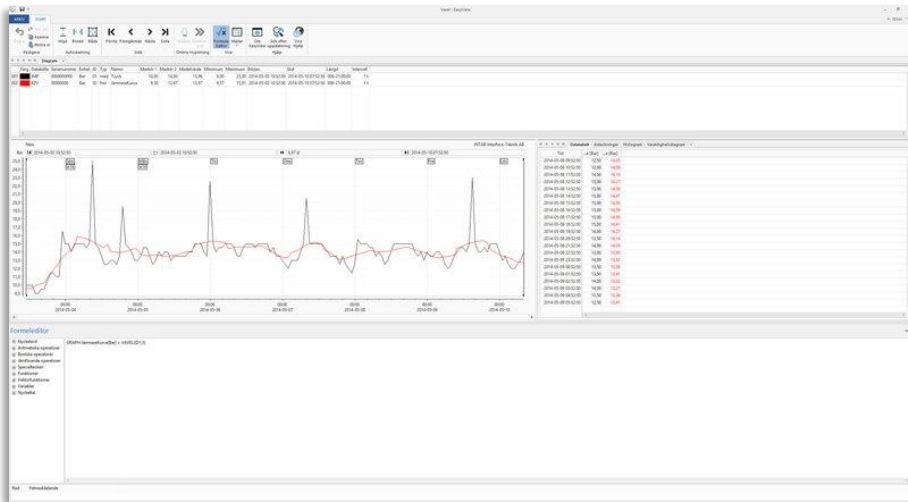
Examples of formulas

Smooth out a jumping curve

When measuring, you can sometimes get temporary peaks or get a bouncy signal. In these cases, you are often looking to see trends and then want a softer curve. This can be accomplished by calculating the average of x number of samples forward and x number of samples backwards by the following formula:

GRAPH Equalizer Curve (Bar) = VAVEL (ID1; 5)

Here we have made the ID1 curve softer by taking the average of 5 samples backwards and 5 samples forward.



Absolute humidity

Here is the formula for calculating the absolute humidity. To do this, you need to measure temperature and relative humidity.

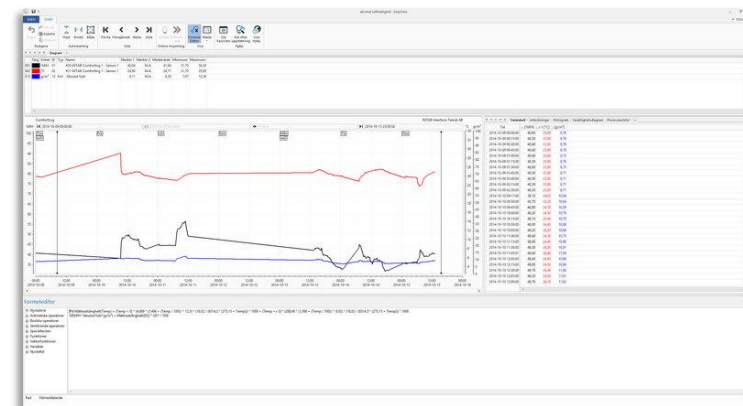
FN Saturation vapor content (Temp) = (Temp < 0) * (4,689 * (1.486 + (Temp / 100)) ^ 12.3) * (18.02 / (8314.3 * (273.15 + Temp))) * 1000 + (Temp >= 0) * (288.68 * (1.098 + (Temp / 100)) ^ 8.02) * (18.02 / (8314.3 * (273.15 + Temp))) * 1000

GRAPH "Absolute moisture" (g / m³) = Saturation vapor content (ID1) * (ID2 / 100)

[Click here to open a sample survey.](#)

In [our blog](#) we describe the absolute humidity as follows:

Absolute humidity indicates the mass of water vapor in one cubic meter of air (g water / m³). The maximum amount of water vapor varies with temperature. At higher temperatures, the air may contain more water vapor before condensation is formed than is possible at lower temperatures. The absolute humidity is therefore three to four times higher in summer compared to winter. This is because a larger proportion of water evaporates in the summer heat. At -10°C, the maximum level of absolute humidity is 2g / m³, at 30 °C it is 30g / m³ and at 70°C 200g / m³.



Examples of formulas

Convert temperature unit

Here are the formulas for converting your temperature measurement to another unit. The FN means function. After the FN, the formula for conversion between different units is written. Below are six different functions, such as Celsius to Fahrenheit.

The graph you want to make is created after GRAPH. In the example below, Celsius is converted to Fahrenheit from the values of channels ID1. If another conversion is to be done, use another one of the functions below.

FN CelsiusToFahrenheit(input) = input * 9/5 + 32

FN CelsiusToKelvin(input) = input - 273,15

FN FahrenheitToCelsius(input) = 5/9 * (input - 32)

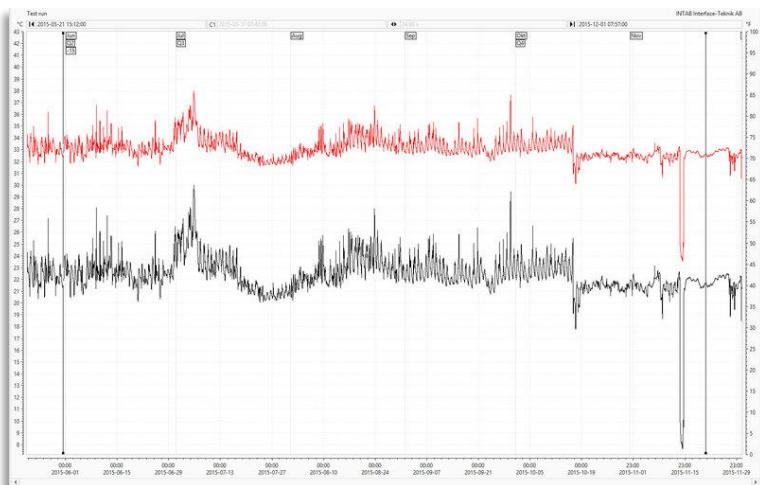
FN FahrenheitToKelvin(input) = 5/9 * (input - 32) + 273,15

FN KelvinToCelsius(input) = input + 273,15

FN KelvinToFahrenheit(input) = 9/5 * (input - 273,15) + 32

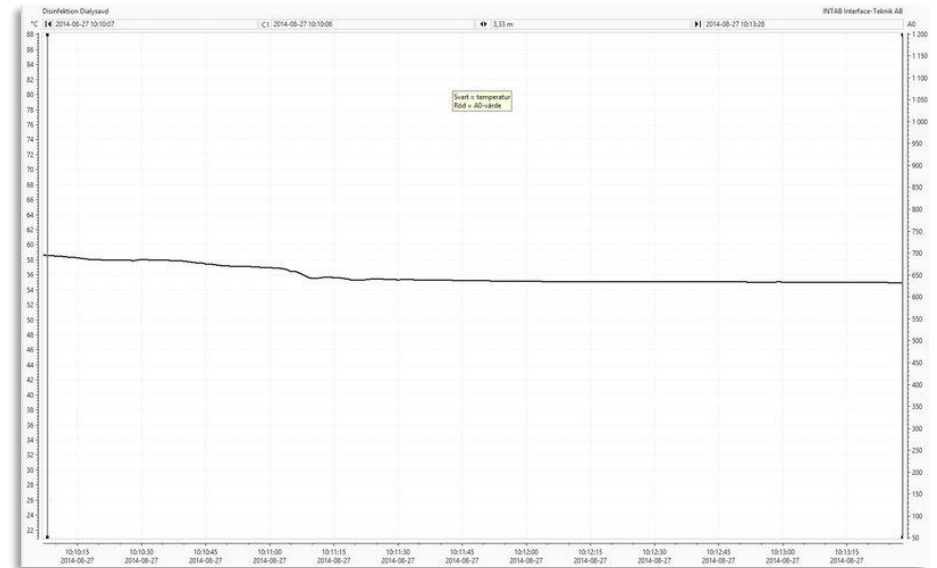
GRAPH DegreesFahrenheit(°F) = CelsiusToFahrenheit(ID1)

The image below shows the black line Celsius and the red Fahrenheit.



A0 value in disinfection

A0 value is used to ensure the quality of the washing process of surgical instruments. To ensure that the right conditions regarding time and temperature are achieved, the A0 value must be at least 600.



The A0 value is the time in seconds at 80°C during which the number of microorganisms is reduced by a ten-potency at a 10°C high temperature rise.

The A0 value is calculated as follows (see next page):

Examples of formulas

$$A_0 = \sum 10^{\frac{(T-80)}{z}} \Delta t$$

t = selected time in seconds

T = temperature in °C

A0 = A value when z is 10°C

A0 value 600:

100 minutes at 70°C

10 minutes at 80°C

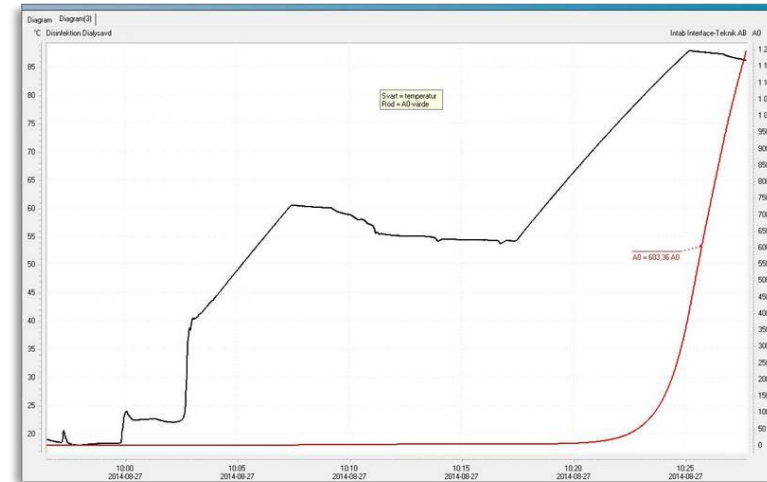
1 minute at 90°C

In EasyView, this can be calculated using the following formula.

SET channel = ID1

GRAPH Time = VPOS (Channel) * 60 * 60 * 24

GRAPH A0 (A0) = (10 ^ ((Channel - 80) / 10) * (Time - Time [-1])) + A0 [-1]



[Further information on disinfection processes.](#)

[See a survey in EasyView.](#)

Installation and start-up

Keep the path and quick start when installing

If you want to include your paths and shortcuts when re-installing EasyView on a new computer, you need to move with the file that contains this information manually.

By including the Table1.txt file in C:\ProgramData\Intab\EasyView10 with the moving, the settings follow.

Modbus

What is Modbus?

Modbus is a protocol that many measuring devices use to make current readings available for other systems. Measuring equipment with support for Modbus has a table of registers which contains, among other things, current readings. A so-called "master" can connect to one or more measuring equipment (called "slaves") and read current values from specific registers. Often a master is some form of hardware such as a PLC but also software such as EasyView can act as a master.

Get started

If you are connected to your device via USB cable or via a USB to RS485 adapter, select "RTU" at the top. If you are connected to your device via network then select "TCP".

If you want to log via Modbus TCP, you need to know which IP address your device has and which port to use. If the unit has a display, sometimes the IP address and port can be found there. Otherwise, you can find out the IP address by logging into the network router. The default port for Modbus TCP is 502.

If you want to log via Modbus RTU, you need to know COM port, baud rate, parity, stop bits and data bits. COM port can be found by seeing which COM port is added in the Device Manager in Windows when connecting the USB cable. Other settings are often found in the manual or selected in the device's configuration software. If you are connected to a Flexible Main Unit via the USB jack on the front of the unit, baud rate, parity, stop bits and data bits do not matter.

When the communication settings are correct, click on "New register" at the bottom to add a new register. A new row should now appear in the table where you can enter slave address, register, number of decimal places, function code, data type, name, unit and interval.

If the devices you want to communicate with have a display, the slave address is often visible there. Otherwise, you may need to use the device configuration

software to find out and change the slave address. It is important that no devices have the same slave address. If you are connected to a Flexible Main Unit via Ethernet or via the USB jack on the front, the slave address is 255 by default.

Which registers correspond to what, number of decimals, function code and data type are often stated in the unit's manual. Note that some manufacturers start counting from register 1 while others count from register 0. EasyView starts counting from register 0 so if you run into concerns, it may be good to try the previous register. Also note that some manufacturers compile registers and function code. For example, if it says register 30001 in the manual, it often means that in EasyView you should enter register 0 and function code 04. If it is written 40001, it means that register 0 and function code 03 are likely to be used.

If in the manual of your unit, $\text{Int16} * 10$ is in the register table, it means that the value that the unit sends is 10 times as large, which means that the decimal point must be moved one step for the value to be presented correctly. In this case 1 should be entered below the number of decimal places. If you use a Flexible Main Unit, the number of decimals for each channel is selected inside the configuration software instead. In order for the value to be presented correctly, it is important that the same number of decimal places is also specified in EasyView.

When you are done with the configuration and want to make sure everything works, you can click "Read metrics ...". EasyView will then read current values and write them under "Measured value" for each register. Before you start the measurement, it may be good to save your settings. To do this, click on "Save template ..." at the top. All the configuration you have just made is then stored in a file and can be easily loaded again by clicking on "Open template ...".

Example

Below is an example of what a configuration for an Intab Flexible main unit might look like. In this case, the main unit is connected to the network and has 5 PT100 sensors connected on channels 1-5. Each channel is set to store 2 decimal places.

Startsidan

Modbus

Oppna mall... Spara mall... ☐ RTU ☒ TCP

RTU

COM-port: Kommunikationsport (COM1)

Baudrate: 115200

Paritet: Even

Stoppbitar: 1

Databitar: 8

Tid mellan meddelande: 50 ms

TCP

IP-adress / host: 10.33.2.56

Port: 502

Logga kommandon: ☐ Läs mätvärden...

Slavadre...	Register	Antal de...	Funktionskod	Datatyp	Benämning	Enhet	Intervall ...	Uppmätt...
255	3	2	03 - Read Holding R...	Int16	Kanal 1	°C	1.00	19.47
255	4	2	03 - Read Holding R...	Int16	Kanal 2	°C	1.00	19.68
255	5	2	03 - Read Holding R...	Int16	Kanal 3	°C	1.00	19.69
255	6	2	03 - Read Holding R...	Int16	Kanal 4	°C	1.00	19.61
255	7	2	03 - Read Holding R...	Int16	Kanal 5	°C	1.00	19.58

Nytt register Ta bort register

Starta

Troubleshooting

If "Measured value" turns red and it says "Failed" then it means either EasyView never received an answer, that the answer took too long or that an incorrect register was requested. If this happens, you can start by ticking "Log commands" and then choose where the log file should be stored. Then click "Read metrics ..." and then open the log file. Each row in the log file has a timestamp followed by either > or <. Rows with > are the ones sent from EasyView and rows with < are a reply. If there is no answer, it is most likely that the communication settings are incorrect.

If you try to retrieve data via Modbus RTU, do the following:

1. Make sure the specified communication settings are correct.
2. Check that the slave address and function code are correct.
3. Increase "Time Between Messages" and try again.

If you try to retrieve data via Modbus TCP, do the following:

1. Verify that the specified IP address and port are correct.
2. Check that the slave address and function code are correct.
3. Open the command prompt on the computer, send ping followed by the IP address and see that the device responds.
4. Check that communication on the specified port is allowed in the firewall.

If there is an answer in the log file but it still says "Failed" then it could mean that an incorrect register is specified.