



AsTrend

Manual for Administrators

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ASKOM Sp. z o. o., ul. Józefa Sowińskiego 13, 44-121 Gliwice,
tel. +48 32 3018100, fax +48 32 3018101,
<http://www.askom.com.pl>, e-mail: office@askom.com.pl

Table of Contents

1 AsTrend - Functionality.....	8
1.1 What Is New	8
1.1.1 What Is New in Asix 8.0	8
1.1.2 What Is New in 8.0.2	11
1.1.3 What Is New in Asix 8.0.3.....	12
1.2 Hardware Requirements	13
1.3 Operating Modes of AsTrend	14
1.4 Privilege System of AsTrend Run with an Asix Application.....	15
1.5 Location of Configuration Options.....	17
1.6 Web Version of AsTrend	18
1.7 AsTrend Window.....	19
1.7.1 Ribbon	20
1.7.1.1 Quick Access Toolbar	20
1.7.1.2 'File' Tab	20
1.7.1.3 'Home' Tab	21
1.7.1.4 'Report' Tab.....	22
1.7.1.5 'Data' Tab.....	24
1.7.1.6 'Trend and Legend' Tab	25
1.7.1.7 'Chart' Tab	26
1.7.1.8 'Graph' Tab.....	28
1.7.1.9 'Table' Tab.....	30
1.7.1.10 'View' Tab.....	32
1.7.1.11 'Help' Tab	33
1.7.1.12 'Periods Clipboard' Tab	33
1.7.1.13 Ribbon Layout Management	33
1.7.2 Chart Area.....	34
1.7.3 Legend.....	34
1.7.4 Pasek statusu	36
1.7.5 Many Charts in a Single AsTrend Instance.....	36
1.8 Data Types of Graphs.....	40
1.9 Chart Types Depending on the Axis Type	41
1.9 Chart Types Depending on the Axis Type.....	41
1.9.1 Chart with a Single Physical Axis.....	41
1.9.2 Chart with Proportional Axis	43
1.9.3 Chart with Many OY Axes.....	44
1.9.4 Chart with Many OY Axes - Stack.....	44
1.9.5 Chart with XY Axes	46
1.9.6 X Chart	48
1.10 Chart Types Depending on the Type/Appearance of a Graph	49

1.11 Aggregation of Asix System Data	50
1.11 Aggregation of Asix System Data	50
1.11.1 Aggregates - a New Source of Statistical Data Analysis	50
1.12 Mode of Historical Data Table	53
1.13 Reports	54
2 AsTrend - Operation.....	55
2.1 Starting the Program	56
2.1 Starting the Program	56
2.1.1 Adding Graphs When Opening a Trend File	57
2.2 Setting Administrator Password and Administrator Login Method	61
2.3 Creation of AsTrend Shortcut	62
2.4 Configuration of Web AsTrend	63
2.5 Help System	64
2.6 Modification of the Ribbon Contents	65
2.7 Ribbon Independent Layouts Management	67
2.8 Trend Wizard	68
2.9 Operations in the Chart Area	69
2.10 Operations in the Legend Area	70
2.10.1 Docking the Legend in the Trend Window	79
2.11 Operations in the Status Bar.....	80
2.12 Selecting Variable Definition Database from the Asix System / OPC Server.....	81
2.13 Adding Graph Data to the Chart	83
2.13.1 Adding Graph Data from the Asix System Application	83
2.13.1.1 Adding a Raw Data	83
2.13.1.2 Adding an Aggregated Data.....	86
2.13.1.3 Adding a Bit of a Variable.....	87
2.13.1.4 Adding an SQL ALarm.....	89
2.13.1.5 Adding an Alarm	90
2.13.1.6 Adding a Graph from the Clipboard.....	92
2.13.1.7 Adding a Variable from the Asix Archive File	92
2.13.1.8 Adding a Calculated Variable	93
2.13.2 Adding a Constant	96
2.13.3 Adding a Variable from External Data Source	98
2.13.4 Adding a Data from OPC-HDA Server	99
2.13.5 Adding a Graph from an AsBase Database	100
2.13.6 Adding a Variable from an AsLogger Database	100
2.13.7 Adding an Empty Graph.....	101
2.14 Selecting the Data Type (Genuine/Aggregated Data).....	102
2.14.1 Selecting the Aggregation Function for Data Reading	104
2.15 Setting Time Period.....	105
2.15.1 Setting Time Period Using Trend Moving Buttons	105

2.15.2 Setting Time Period Using Period Editor.....	105
2.15.3 Setting Time Period Using the Period Clipboard	107
2.15.4 Setting Time Period Opening a Trend Definition.....	107
2.15.5 Setting Time Period Using the Mouse	108
2.15.6 OPC Time Editor	108
2.15.7 Setting the Length of Data Display Period.....	110
2.16 Displaying Aggregated Data Based on Data of Currently Displayed Period	111
2.16.1 Displaying Data with Time Stamps of Millisecond Resolution.....	111
2.17 Setting Additional Time Period	112
2.18 Setting the Chart Type Depending on the Axes Type	115
2.19 Setting the Chart Type Depending on the Graph Type/Form.....	117
2.19.1 Linear Chart.....	117
2.19.2 Bar Chart.....	118
2.19.3 Area Chart	118
2.19.4 Binary Variable Chart	119
2.20 Displaying Variable State Descriptions	120
2.21 Operations on Variables	121
2.21 Operations on Variables.....	121
2.21.1 Selection of One or All Variables	121
2.21.2 Removal of Variables.....	122
2.21.3 Displaying the Variable Metric.....	122
2.21.4 Displaying Labels	123
2.21.5 Displaying Measurement Points.....	124
2.21.6 Changing the Variable Range	125
2.21.7 Replacing a Variable.....	126
2.21.8 Changing Interpolation	127
2.21.9 Showing/Hiding a Variable Graph	128
2.21.10 Colour Change.....	129
2.22 Operations on Displayed Graphs	130
2.22.1 Live Mode - Continuous Data Registration	130
2.22.2 Zooming.....	130
2.22.3 Panning.....	132
2.22.4 Readout of Variable Values.....	133
2.22.5 Variable Selection	133
2.22.6 Restoring Original Appearance of the Window	134
2.22.7 Window Size/Position Block/Unblock	134
2.23 3D Chart Handling	136
2.24 Program Options.....	139
2.25 Chart Options.....	149
2.25.1 Chart Type and Labels.....	149
2.25.2 Chart Appearance	150

2.25.3 Chart Axes.....	151
2.25.3.1 Axes Type and Appearance	151
2.25.3.2 Physical OY Axis	152
2.25.4 Chart Legend	153
2.25.3 3D.....	155
2.26 Trend Options	156
2.26.1 Trend Period Options.....	156
2.26.2 Trend Input Data Options.....	159
2.26.3 Trend Appearance Options	162
2.26.3.1 Appearance.....	162
2.26.3.2 Legend.....	164
2.26.3.3 Table	165
2.26.3.4 Printout.....	166
2.26.3.5 Color Palette	168
2.26.4 Trend Window Options.....	169
2.27 Graph Options	170
2.27.1 Graph Data Source Options	179
2.28 Data Export Options	181
2.29 Reading the Trend Definition	182
2.30 Printing Trends.....	184
2.30.1 Print Preview.....	185
2.30.2 Printing	186
2.30.3 Printing Trends with More than 8 Graphs.....	186
2.31 Closing a Displayed Trend / Creating a New Trend	188
2.32 Saving the Trend Definition	189
2.33 Exporting the Trend / Graph / Historical Data Table	193
2.34 Context Menus	200
2.35 Period Clipboard	204
2.35.1 Clipboard Functions.....	204
2.36 0-100% Percent Scale	207
2.37 Handling the Table of Current Data.....	208
2.38 Handling the Table of Historical Data	211
2.39 Handling the Report Mode / Report Options	213
2.39.1 Running the New Report Window	213
2.39.2 Adding/Removing Variables to/from the Report.....	214
2.39.3 The Report Parameterization / Report Options.....	216
2.39.4 Exporting the Report	221
2.39.5 Adding New Summarizing Aggregates to the Report.....	222
2.40 Changing the Color Palette.....	223
2.41 Operation of Multiple Graph Mechanism	227
2.42 Changing the Language of the Program.....	230

2.43 Declaration of Network Parameters.....	231
2.44 Aslink Network Module Setup	232

1 AsTrend - Functionality

The AsTrend program task is to visualize in chart or table form an archival data stored by SCADA application. The program may run in two modes:

- it may statically draw data stored within some archive files;
- it may dynamically display data while they are being collected from an object (simulation of a data logger).

To be able to analyze data from Asix application, you need a variable definition database defined. It is created by the application administrator.

Variable values can also be retrieved from historical data of other SCADA application. You need to use a server compatible with OPC HDA standard.

AsTrend program may chart data from external sources: *.txt, *.csv files, *.xls files, and/or external databases accessible via the OLE DB mechanism (such as MSSQL and/or Access). The data structure of external source must allow data readout in ordered way.

1.1 What Is New

1.1.1 What Is New in Asix 8.0

Support for Multiple Charts

You can display up to 3 additional charts - each in an individual window - with full support for docking

Docking Windows

Full support for docking additional chart windows, legend, table and period clipboard: the floating window, the window on the second one (bookmarks), adjacent window, combinations of the above. Window layout is stored in the AsTrend program automatically when you exit the program - but there is also the ability to save the window state for a given trend file.

Integration with AsLogger and AsBase

New type of graphs have been defined - retrieving data from AsLogger (program of fast measurement series) - with the time stamp up to 1 μ s and AsBase (Recipes and Selective (Event-Based) Data Logging).

Operations on Multiple Graphs

Added the ability to select multiple graphs and do operations at the same time for all of them:

- inclusion of points, labels;

- shape change: linear / bar / area;
- removal;
- transfer between charts;
- move up / down in the legend.

New Graph Attributes Displayed in the Legend:

- *Graph Name*;
- *Graph Address*.

Value Labels Define in a Trend File

Added editor that allows you to define the text labels that are used instead of numerical values:

- on the graph: hints and labels of points;
- in the legend: *Sample Value of Read Line 1/2*;
- on vertical axis in case of multiple axes OY or percentage chart; in the case of a physical axis labels will be displayed only when they are the same for all graphs;
- in the table: value columns;
- when exporting data: value columns.

Adding Graphs During Opening a Trend File

The user has the ability to decide which graphs are to be watched. This applies the following data types: Raw Data, Bits of Data, Aggregated Data, a field of archiving collection of AsBase, AsLogger measured point. It can be done by the command opening AsTrend and by operator action.

X Chart

Chart X gives you the opportunity to present different values of a variable (regardless of time or other variable) in the order of their registration. The horizontal axis contains the indexes of samples instead of time stamps - samples are indexed from 1.

More Flexible Stack Chart

- By default, each run in a separate line.
- Ability grouping any number of graphs in each row.
- Selecting the vertical axis on the left or right side.

Support for Mobile Devices and Touch Screens

- Full support for UI scaling in Windows 8.
- Reduced dialog boxes fit on the screen 1024x720 px (eg. tablet 10 FullHD + Scaling 150%).
- Detection of touch support and activation UI elements, more tolerance for a "click".
- Support for gestures: shifting a period, changing a period (zoom).
- On-screen keyboard.

Print and Export

- Export of BMP.
- New option specifies whether the printed or exported trend background to be preserved colored or converted into white.
- Printout of multiple graphs.
- Removal of frames and visual fixes for printing or exporting to PDF / BMP.
- Printout from the default tray.

Visual Improvement

Chart

- Better animation smoothness.
- New options for 3D charts and bar charts.
- Support for additional timeline (period change / shift with the use of mouse).
- Bar chart conversion to linear when the number of samples > 60.

Table

- Colouring columns with the same colour as of graphs.
- Right-aligning for values.

Font

Ability to define font (typeface, appearance, size) for the whole trend.

Other Improvements

- Accelerated data reading from an aggregator.
- Added read progress window for graph values (with the possibility of reading interruption).
- Automatic support for short periods of time (milliseconds editor visible when the time < 60s).

1.1.2 What Is New in 8.0.2

The list includes the function of tabular reports generated ad-hoc for different time periods and aggregates. This is an alternative to the reports created in MS Reporting Services, but when they are not complicated reports.

AsTrend has also been extended by the following items:

- *Area Chart* has *Base Line* added.
- Remembering layout of windows separately for charts and reports.
- Extended support for calculated graphs - 3 kinds of calculated graphs: 1. aggregation of data calculated from raw samples; 2. read of data calculated from aggregated sample values; 3. Aggregation of data calculated from aggregated sample values.
- New internal aggregate added: sum of sample values.
- AsTrend in browser version has the ability to open files from network directories declared by the designer.

1.1.3 What Is New in Asix 8.0.3

- Support for external variables in report mode.
- Support for aggregates for external data graphs.
- Ability to zoom in charts with multiple Y axes.
- Ability to zoom in XY chart.
- For trends with multiple charts zooming is available only when at least one of charts enables zooming and is visible.
- Mouse wheel blocked for XY chart.

1.2 Hardware Requirements

The AsTrend program may run on any computer running one of the following operating systems: Windows XP or later version. The sole hardware requirement necessary for correct operation of the program is screen resolution – it must not be lower than 1024x768 (optimal resolution: 1280x800).

1.3 Operating Modes of AsTrend

The AsTrend program may operate in two modes: **in conjunction with an Asix system application**, or **alone**.

In both modes the to-be-displayed data may be served by the same computer, on which the AsTrend program runs, or else by any of the networked computers.

Details on how to start AsTrend are given in chapter [2.1 Starting the Program](#).

1.4 Privilege System of AsTrend Run with an Asix Application

Starting the Program with an Asix.Evo Application

While using Asix.Evo:

- Users are defined in an Asixa.Evo application. Privileges are defined in AsixEvo.exe in **Security** panel > **Roles/Privileges** tab. Only a user with the Asix.Evo application administrator role is automatically assigned with full permissions of AsTrend operation.

Starting the Program with a Classical Asix Application

While operating in conjunction with Asix AsTrend has two modes of privileges:

- privileges of users are defined in AsAudit module;
- operator / administrator mode.

Privileges of Users are Defined in AsAudit Module

Privileges are defined in AsAudit. Full list of functions (associated with AsTrend) which depend on privileges of the logged user includes:

- administration of AsTrend (changing the AsTrend program settings),
- creating new files,
- modification of files,
- modification of read-only files,
- having own system of menus and toolbars,
- modification of the common menus and toolbars.

Operator / Administrator Mode

Operator

Access control mechanism without the AsAudit module enables each user to log-in as an Administrator or as an Operator only.

Each time the program is started from an application of the asix system, it is set into the operator mode.

Operator:

- create and modify .TRNX files with the "read-only" attribute (See: [2.32 Saving the Trend Definition](#));
- can read trend patterns, change them and save them under new names, as well as create completely new trend definitions (in working directory only).

Administrator

The mode is activated by the command **Administrator Mode**  from: AsTrend main window > **View** tab > **Security** group. It demands the proper password to be entered, except the first time AsTrend is run on the computer – it is enough then to press **OK**. "Empty password" will be active till the administrator sets a new one.

Administrator can perform additional operations:

- open all files on computer disks,
- write trend files with the "read-only" attribute set – such files can not be modified by operators,
- use the options: **Window Size Block**  (AsTrend main window > **View** tab > **Window** group) and **Stały układ okien** (AsTrend main window > **View** tab > **Window** group > window **'Trend Window Options'** activated by the  button),
- modify layout of menus/toolbars,
- export charts to . PDF or .BMP files
- export legend to text, HTML and XLS files.

 In the operator / administrator mode you can give the operator the AsTrend administrator rights. This should be done in the Architect> module **Start Parameters> Programs / AsTrend** tab > option **Always work as Administrator** / Grant operator rights of Administrator of AsTrend program.

 After 15 minutes the administrator mode will be automatically terminated and the program will return to the operator mode.

 If a trend definition is stored in the administrator mode with the window re-size function enabled, the function will remain enabled after the definition is opened as a pattern in the operator mode.

See also: [2.1 Starting the Program](#).

1.5 Location of Configuration Options

Operating with Asix Application in Classical Asix

There is capability to define separate menu/toolbar layouts for Operators and for Administrators. These definitions are stored in an internal program file residing in the application directory.

Operating with Asix Application in Classical Asix with User Privileges defined in AsAudit

There is capability to define separate menu/toolbar layouts for users with *Right to own set of menu and toolbars* set in AsAudit. These definitions are stored in an internal program file residing in the application directory.

Operating with Asix Application in Asix.Evo

There is capability to define separate menu/toolbar layouts for users with ***Right to own private menu and toolbars*** set in AsixEvo.exe. These definitions are stored in an internal program file residing in the application directory.

Operating without Asix Application

A separate menu/toolbar layout may be defined for each user of the operating system. Configuration files are then stored in respective Documents and Settings subfolders of the Windows folder.

* * *

All remaining configuration options regarding trend display are stored in a single file residing in the application folder or in the Documents and Settings folder.

1.6 Web Version of AsTrend

Since Asix 6 the Web version of AsTrend is available with full functionality of the standard window version.

Configuration of AsTrend to work in a web browser is implemented by the Asix application designer.

1.7 AsTrend Window

Main program window that appears as soon as the program has started includes the following elements:

- Ribbon** - collection of tabs with grouped commands;
- Chart area** - curves, coordinates;
- Legend** - charted data descriptions;
- Status bar** - status of the displayed trends.

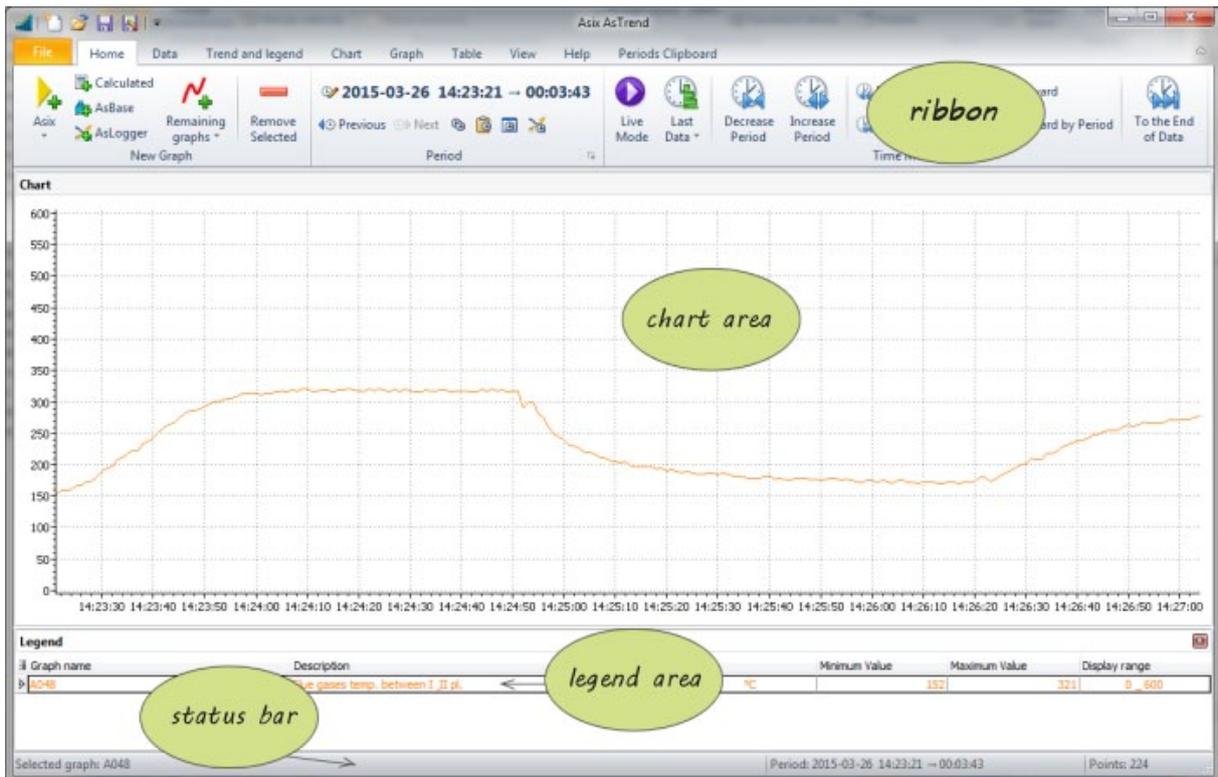


Fig. AsTrend Window.

Chart area and legend area remain empty if the program has been called without any parameter. Just after starting the program most of its functions remains inactive.

Use the trend wizard to easily complete the entire procedure of defining a trend. The wizard is recommended particularly for novice users.

1.7.1 Ribbon

Access to particular AsTrend functions is performed through the ribbon placed at the top of the AsTrend main window; commands are grouped on the tabs: **File**, **Home**, **Data**, **Trend and Legend**, **Chart**, **Graph**, **Table**, **View**, **Help** and **Periods Clipboard**.

You can also define a quick access toolbar with the commands preferred.

1.7.1.1 Quick Access Toolbar

Quick access bar is the place prepared for adding buttons with the commands that are often used by an operator or administrator. To put a new button onto the toolbar, you should select the command by pressing the right mouse button and select **Add to Quick Access Toolbar**.

To remove a button from Quick Access Toolbar, select the button by the right mouse button and use the command **Remove from Quick Access Toolbar**.

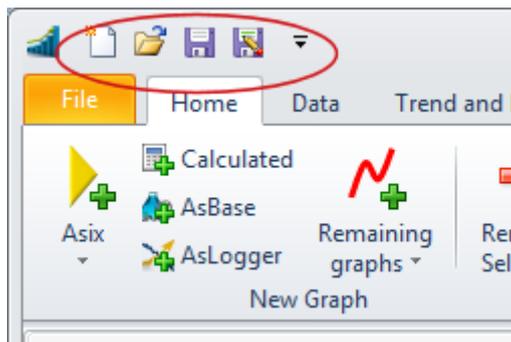


Fig. Quick Access Toolbar.

1.7.1.2 'File' Tab



New Trend - open a new trend window;



New Trend - Wizard... - run trend wizard;

New Trend - Tutorial... - run trend wizard; wizard runs in the extended version of detailed description of various stages defining a new trend;



New Report - run window of a new report;



New Report - From the Current Trend - run window of a new report based on the data from the current trend;



New Historical Data Table - run window of a new table of current data;



Reopen File - cancel modifications, restore the original trend;



Open... - open trend file;

Recently Used Files - show the list of recently opened trend/report files;

-  **Recently Used Folders** - show the list of recently opened folders;
-  **Print** - print the displayed trend/report/table;
-  **Save** - store the displayed trend/report/table;
-  **Save As ...** - store the displayed trend/report/table in another file;
-  **Create Shortcut...** - create shortcut that runs the AsTrend program; command is available when AsTrend is run without Asix application;
-  **Export To PDF** - export trend data to a PDF file;
-  **Export To BMP** - export trend data to a BMP file;
-  **Program Options** - open 'Program Options' window;
-  **Hide Main Window** - minimize the program window to a tray icon;
-  **Exit** - shut down the program; command is available when AsTrend is run without Asix application;

1.7.1.3 'Home' Tab

New Graph group:

-  **Asix**
 -  **Raw Data** - add a graph of raw data from Asix application,
 -  **Aggregated Data** - add a graph of aggregated data from Asix application,
 -  **Bits of Data** - add a graph of bit value of a variable from Asix application,
 -  **Variable from Clipboard** - add a variable form the clipboard,
 -  **SQL Alarm** - add a graph of the state of selected alarm the event archive of which is stored in SQL database; mainly for Asix.Evo application,
 -  **Alarm** - add a graph of the state of selected alarm form Asix application,
-  **Calculated** - open the window that allows adding variable calculated on the basis of other variables with use of a given expression;
-  **AsBase** - open the window that allows adding a graph from the archiving collection of AsBase database;
-  **AsLogger** - open the window that allows adding a graph from the recording plan of AsLogger database;
-  **Remaining Graphs**
 -  **External Data** - add a variable data from external files;
 -  **OPC-HDA Server** - add a variable data from OPC-HDA server; the option available with extended license of Asix HASP key;
 - Asix Archive File** - add data exported from AspadTools to the trend window;
 -  **Constant Graph** - open the window that allows adding a constant;
 -  **Empty Graph** - add an empty row to the legend and historical data table;
-  **Remove Selected** - clear the currently selected variable.

Period group:

-  **2011-07-28 10:37:11 → 2 godziny** - set a period of charted data;
-  **Previous** - set a previous period from periods history; remembered the 20 sequentially displayed periods;
-  **Next** - set a next period from periods history; remembered the 20 sequentially displayed periods;
-  **Copy to Clipboard** - copy a period to the period Clipboard;
-  **Paste from Clipboard** - insert a period from the period Clipboard;
-  **Periods Clipboard** - show/hide the window of the period Clipboard.

Time Move group:

-  **Live Mode** - start / stop the data logging mode;
-  **Last Data** - display the last data from a selected period;
-  **Decrease Period** - decrease period to the span determined by the consecutive default periods defined in AsTrend;
-  **Increase Period** - increase period to the span determined by the consecutive default periods defined in AsTrend;
-  **Backward by Period** - move backward by a period;
-  **Backward** - move backward by 1/4 of a period;
-  **Forward** - move forward by 1/4 of a period;
-  **Forward by Period** - move forward by a current period;
-  **To the End of Data** - move to the end of a data (the last data).

1.7.1.4 'Report' Tab

New Graph group:

-  **Asix** - add a graph of aggregated data from Asix application,
-  **Calculated** - open the window that allows adding variable calculated on the basis of other variables with use of a given expression;
-  **Remaining Graphs**
 -  **External Data** - add a variable data from external files;
 -  **OPC-HDA Server** - add a variable data from OPC-HDA server; the option available with extended license of Asix HASP key;



Remove Selected - clear the currently selected variable.

Type and Period of Report Data group:

Report

- select the report type; available types:

Annual report by month
 Annual report by week
 Annual report by day
 Quarterly report by month
 Quarterly report by day
 Monthly report by day
 Monthly report by hour
 Weekly report by day
 Weekly report by hour
 Daily report by hour
 Shift report by hour
 Unrestricted report - choosing this type displays additional fields: **Date** and **Time**.

Depending on the report type the following additional fields are displayed:

Year , Quarter , Month , Date ,
 Time ,
 Shift , Length ... Interval ...



Backward by Period - move backward by a period;



Forward by Period - move forward by a current period;



To the End of Data - move to the end of a data (the last data).

Report Operation group:



Options - run 'Report Options' window with options of report layout, report page layout/view;



Show Page Edge - show right edge of the report page;



Print Preview - show print preview window;



Export - export report to one of the following formats: text file, HTML, XLSX.

1.4.1.4 'Data' Tab

Connection to Archive group:



Asix - Variables and Alarms - open the variable and alarm definition database;



Asix AsBase - connect to an AsBase application database;



Asix AsLogger - connect to an AsLogger program database;



OPC HDA - Variables - open the window with parameters of connection with an OPC HDA server;

Input Data group:



Refresh Data - download data again and draw the chart;



Data Server - display information on the current data server of a taken graph;



- run the window '*Trend Input Data Options*' with the possibility of defining selected options.

Export of Data group:



Copy to Clipboard - copy data into Windows clipboard; such a data can be directly pasted into Excel spreadsheet.



Export to CSV - export data in tabular form into a file;



- run the window '*Data Export Options*' which allows setting the options of data export into clipboard or text file;

- *Header* - declare one-line or two-line header and set units and aggregates near variable names;
- *Genuine Data* - declare samples one-by-one or by timeline;
- *Quality Columns* - add the quality column and set its format;
- *Uniform Data* - set a common time column for uniform data.

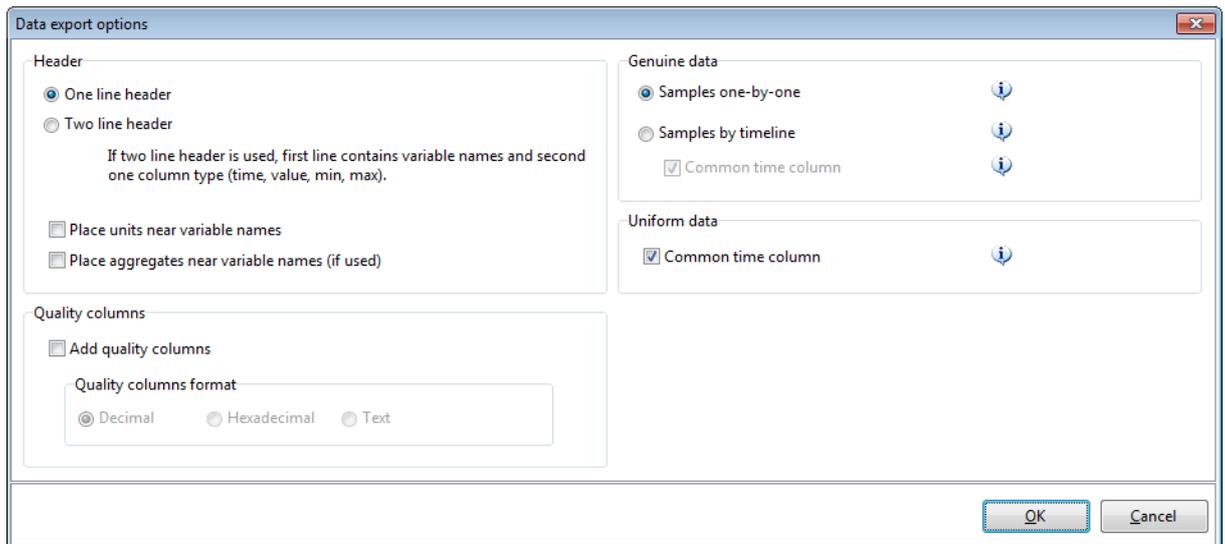


Fig. Data Export Options.

1.7.1.6 'Trend and Legend' Tab

Trend group:



Color Palette - select the color palette for added waveforms;



Trend Font - select the font (type, size, attributes: bold, italic, underline) for use in: legend, chart axis description, title, chart area and graph labels;



- run the window 'Trend Options' with the possibility of declaration of view, color palette, legend parameters and printout options for a trend.

Legend group:



Legend Columns - select the legend column;

Color - set the color of the legend row background;

Height - set height of the legend (in the amount of displayed rows);



- run the window 'Trend Options' with the possibility of declaration of view, color palette, legend parameters and printout options for a trend.

Legend Operations group:



Export Legend - export the legend into the file; available file formats: XLS, HTML, text file; export to clipboard in text form is also possible;

Restore Captions - restore default descriptions for all displayed headers;

Update Attributes - update graph attribute values from the variable definition database.

1.7.1.7 'Chart' Tab

Chart type group:



XT Chart - draw charts which measurement values of the graph are drawn as a function of time;



XY Chart - draw charts being a function of two variables;



X Chart - draw charts with values of graphs drawn in order they are registered, regardless of the time and value of other variable;



- run the window **'Trend Options'** with the possibility of defining trend options.

Axes group:



One OY Axis - display one OY Axis;



Many OY Axes - display separated OY Axes for each variable;



Many OY Axes - Stack - display separated OY Axes for each variable; axes are arranged one above the other;



Proportional Axis - display proportional axis;



Axes and Grid - display the list with the following parameters:

- set axes visible/invisible;
- set the axes colour (the same colour will be used for axes labels);
- set fixed chart arrangement;
- set the grid visible/invisible;
- set the way the grid will be displayed: dots / lines;
- set dots / lines colour;



- run the window **'Trend Axes Options'** with the possibility of defining options of trend axes.

* * *

Zoom group:

 **Zoom** - set the mode of zooming a chart area with the use of mouse scroll wheel or ribbon commands (after zooming the chart area you can catch the area by the mouse cursor and move it);

 **Zoom in** - enlarge the chart;

 **Zoom out** - reduce the chart;

 **Without Zoom** - back to the original size of the chart;

* * *

Appearance group:

 **Chart Panel Background** - specify the colour and gradient for the trend background; it is an area under the chart and around the chart; trend background is visible in its entirety when you turn off coloring the chart area;

 **Chart Background** - specify the color and gradient for the chart area; invisible background is also possible;

 **Chart Title** - title in the chart area;

 **Legend on Chart** - set a simplified version of the legend in the chart area; the legend contains the names of graphs;

 **3D** - activate 3D chart;

 - run the window '**Chart Options**' \ **Appearance** tab.

* * *

3D group (available if the command **3D** is used):

 **3D Parameters** - choose between orthogonal and 3D view;
 - 3D view is subject to manipulation in space using parameters: rotation, elevation, perspective, zoom, depth and view: front, right, left;
 - orthogonal view is subject to manipulation using parameters: angle, depth and view: orthogonal projection right (default), orthogonal projection left;

 **Left Wall** - specify the colour, gradient and frame for the left wall in 3D/orthogonal view; invisible left wall is also possible;

 **Right Wall** - specify the colour, gradient and frame for the right wall in 3D/orthogonal view; invisible right wall is also possible;



Bottom Wall - specify the colour, gradient and frame for the bottom wall in 3D/orthogonal view; invisible bottom wall is also possible;

Read Lines group:



Main - display the single reading line;



Additional - display the additional reading line;



- run the window **'Read Lines Options'**;

Charts Export group:



Copy to Clipboard - copy the graph and the legend to the clipboard; the legend is included only if it is visible;



Save to BMP File - export the chart and the legend to a BMP file; the legend is included only if it is visible;

1.7.1.8 'Graph' Tab

Graph group:



Linear - set linear chart;



Bar - set bar chart;



Area - set area chart;



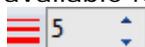
Points - display measurement points for selected graphs; not available for the bar chart;



Labels - display labels for selected graphs;



Stairs Interpolation - switch on stairs interpolation of selected graphs; not available for the bar chart;



Line Width - set the line width of selected graph;

-  0% **Transparency** - set the transparency of selected graph;
-  **Use Own Color** - enable to set own colour for the graph line;
-  (c ... - color list/palette for graphs;
-  **Gradient Scale** - set gradient scale for bar or area chart; range from -100 to 100; values greater than 0 lighten the chart and values less than 0 darken the chart; 0 means no gradient;
-  **Gradient Balance** - set gradient balance for bar or area chart; range from 0 to 100; the option moves the graph gradient up or down; 50 means a steady gradient;
-  **Base Line** - set the base line for the chart at a given value of the variable; only for area charts;
-  **Gradient Upside-Down** - swap the initial and final colour of the gradient; for bar and area chart only;
-  **Graph Depth** - change the depth of the graph in the range from 5% to 100%; it concerns the 3D chart;
-  **Bar Width** - change the width of the bar in the range from 5% to 100%; it concerns the bar chart;
-  **Bar Offset** - move the bar horizontally in the range from -100% to 100%; it concerns the bar chart;
-  **Rectangle** - apply to charts with graphical markers of measurement points; select the shape the markers;
-  4 - apply to charts with graphical markers of measurement points; specify the size of markers;
-  - apply to charts with graphical markers of measurement points; set the outliner for markers;
-  **Data from the Main Period of Time** - set the option the graph contains the data from the period specified by the main timeline;
-  **Data from the Additional Period of Time** - set the option the graph contains the data from the period specified by the additional timeline;
-  **Linear Axis Scale** - use a linear scale for the vertical axis;
-  **Logarithmic Axis Scale** - use a logarithmic scale for the vertical axis; the axis can be logarithmically scaled only if the range of the minimum and maximum is greater than zero;
-  **Vertical Axis on the Left Side of the Chart** - set the OY axis on the left side of the chart (for the *Many OY Axes* charts);
-  **Vertical Axis on the Right Side of the Chart** - set the OY axis on the right side of the chart (for the *Many OY Axes* charts);
-  **Vertical Axis on the Left or Right Side** - set the OY axes on the left or right side of the chart; the graph can be charted on the same chart with an adjacent graph - if they both have applied the option. For example, if 8 graphs have applied this option, they will be charted in pairs on one chart - in total it will be 4 charts (one above the other);
-  **Vertical Axis Always on the Left Chart** - set the OY axis on the left side of the chart (for the *Many OY Axes - Stack* charts);
-  **Graph Options** - open the window 'Graph Options';
-  **Graph Attributes** - display the current values of attributes from VarDef (variable definition database);

 - run the window 'Graph Options' with the possibility of defining graph options.

Graph Location group:

-  **Hidden** - hide the graph on the chart;
-  **Main Chart** - show graph on the main chart;
-  **Chart 2** - show graph on the chart 2;
-  **Chart 3** - show graph on the chart 3;
-  **Chart 4** - show graph on the chart 4.

Graph Operations group:

-  **Graph Data Source Options** - open the window to define the options of graph data source;
-  **Copy** - do a copy of the graph;
-  **Replace with Empty** - exchange selected in the legend graph line on a blank line;
-  **Move Up** - move the row of selected graph one up;
-  **Move Down** - move the row of selected graph one down;
- Select All** - select all graphs;

1.7.1.9 'Table' Tab

The tab is available when you switch on (by the button ) displaying a current data in tabular mode.

Columns group:

-  **Single Time Column** - switch on table view mode with one common time column and many value columns.
-  **Quality Columns** - switch on table view mode with quality columns;

* * *

Cursor Binding group:

 **No Binding** - change of active row in the table will not change the position of read line;

 **To Main Read Line** - change of active row in the table will result in changing the position of main read line; the option is relevant only if the main read line is active;

 **To Additional Read Line** - change of active row in the table will result in changing the position of additional read line; the option is relevant if the additional read line is active.

* * *

Records group:

 **Samples by Timeline** - activates a variant in which all the samples of graphs are arranged according to the time axis;

 **Samples One by One** - activates a variant in which all the sample of graphs are arranged one after the other;

* * *

Informations group:

 **Data** - display informations on data types in the table and how the data is displayed;

* * *

Look group:

 ... **Background Color of the Table Common Columns** - set the color for *No.* and single *Time* columns;

 ... **Background Color of Table Panel** - set the color for the table panel;

 - run the window 'Trend Options' with the possibility of defining table backgrounds.

1.7.1.10 'View' Tab

Window group:

 **Window Size Block** - block the ability to resize trend window,

Panels group:

 **Chart 2** - enable/disable to display the chart area in AsTrend window,

 **Chart 3** - enable/disable to display the 2nd chart area in AsTrend window,

 **Chart 4** - enable/disable to display the 3th chart area in AsTrend window,

 **Legend** - enable/disable to display the legend in AsTrend window,

 **Data Table** - call / hide the data table,

 **Periods Clipboard** - display the period clipboard window,

 **Reset Panel Composition**

Style group:

 **Ribbon** - run the list of available ribbon colour options and the option to reset the button layout,

 **Ribbon Color Accent** - run the list of available ribbon colour options and the option to reset the button layout,

 **Reset the Layout of the Buttons** - restore the default layout of buttons; the command available for Administrator;

 **Buttons Layout of the Operator** - run the button layout for the Operator; the option is available when AsTrend is run with Asix application and the current user is logged in with AsTrend administrator permissions.

Security group - available when AsTrend is run with Asix application:

 **Administrator Mode** - switch to the administrator mode,

 **Administrator Password Change** - run the window to change the administrator password.

1.7.1.11 'Help' Tab



Help Topics - open help file,



Help Topics On-Line - open WebHelp in the local browser,



About - display information on AsTrend.

1.7.1.12 'Periods Clipboard' Tab

Periods Clipboard group:

Copy to clipboard - copy the current period to the period clipboard;

Paste from Clipboard - insert the period from the period clipboard;

Empty Clipboard - delete stored graphs.

1.7.1.13 Ribbon Layout Management

While using Asix.Evo, AsTrend ribbon is fully configurable for users with the privilege to own private menu and toolbar.

While operating with the Asix application in classical version, AsTrend ribbon is fully configurable separately for Administrator and Operator.

Only Administrator can define its own ribbon layout and the layout for Operator.

While using Asix in classical version with user privileges defined in AsAudit module, AsTrend ribbon is fully configurable for users with the privilege to own private menu and toolbar.

While using AsTrend independently of Asix application, independent AsTrend ribbon layout is defined for each user of operating system.

1.7.2 Chart Area

Chart area is located directly below the ribbon.

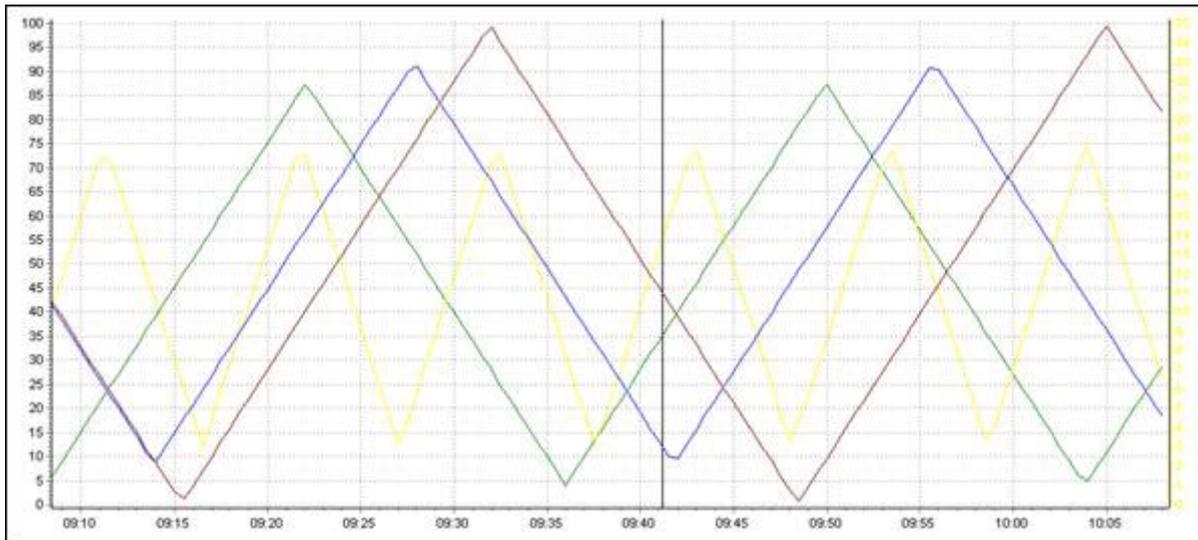


Fig. Chart Area.

Operations that may be performed directly within the chart area include:

- change the period of displayed data,
- read values and time,
- drag-and-drop read line within the chart area,
- drag a selected region boundary to grow the region,
- select the variable,
- change the OY axis display parameters,
- call functions placed in the context menu.

1.7.3 Legend

Chart legend is located beneath the chart area.

When no variable is declared, the legend displays only heading with one row with the text; "<No data to display>".

The height of the legend is rounded to the total rows. You have the possibility to change the height of the legend.

The legend area can not exceed 3/4 of the main window area. If the legend is larger than 3/4 of the main window - scroll bar appears.

The legend may include the following types of fields:

1. **Aggregates**
2. **Trend**
3. **Read line**
4. **VarDef - standard**
5. **VarDef - non-standard (declared by the user)**

By default, names and parameters of variables displayed in each row of the legend have colours corresponding to the graph colours on the chart. (More in: [2.6 Operations in the Legend Area](#)).

NOTICE: The legend with previously declared variables is displayed properly after AsTrend file opening even if there is no access to the variable definition database. This is because during adding a new variable to the chart, AsTrend reads all the attributes of the variable from the variable definition database and stores them in the file.

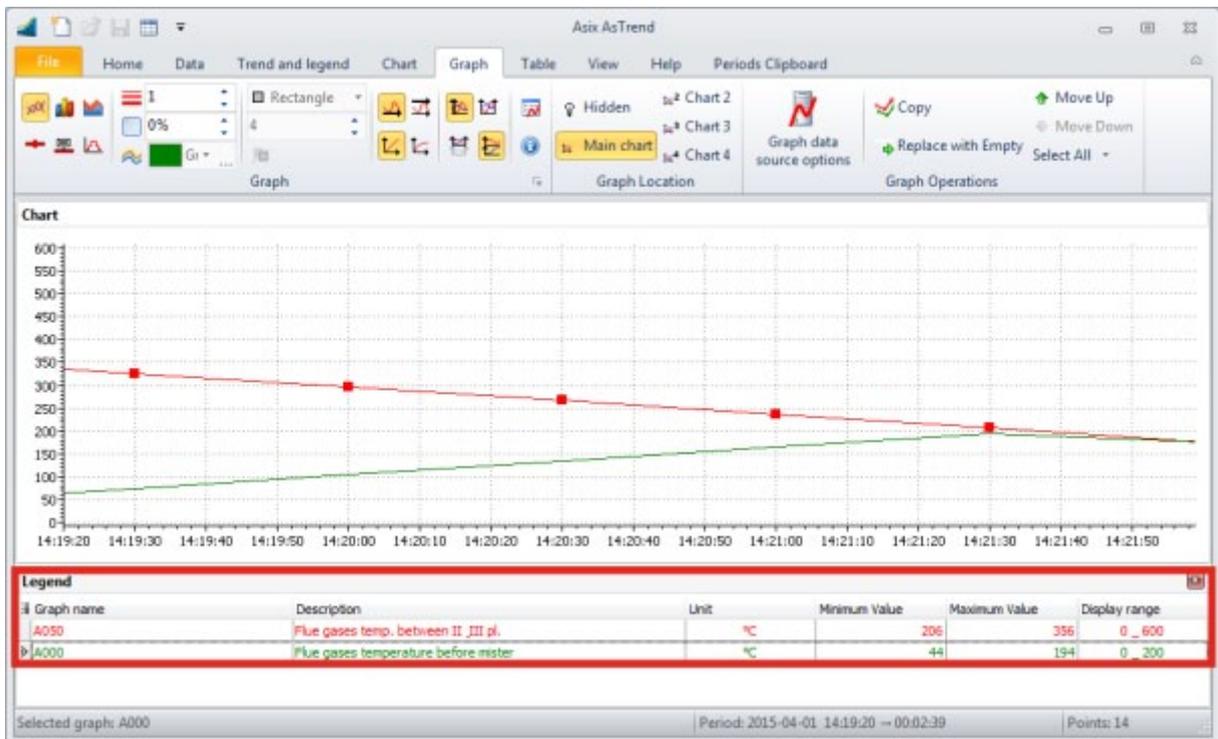


Fig. Legend.

1.7.4 Pasek statusu

Status bar is located beneath the legend. It is always visible.

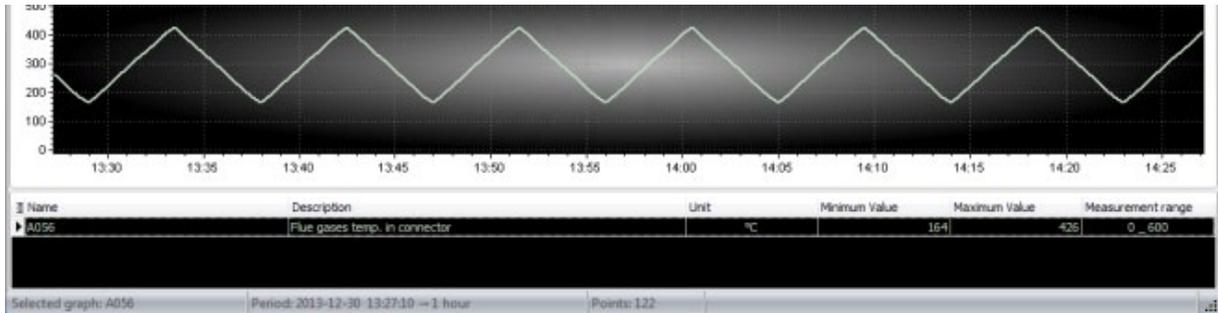


Fig. Status Bar.

1.7.5 Many Charts in a Single AsTrend Instance

AsTrend gives you the possibility to display simultaneously up to 4 charts, of which the first is the main and always visible chart. Graphs can be drawn on any of the 4 charts. Graphs can be also easily shifted and copied between the charts.

The charts are displayed in individual windows with full support of docking.

For each of the graphs you can define individual parameters.

The charts are always printed in the number 1,2 or 4 on one page (in the case of 3 displayed charts the number of charts printed on one page amounts 4).

i The appearance of a given chart that is a 'floating window' (not docked in AsTrend main window) can be modified with the use of '*Chart Options*' window run from local menu of the chart.

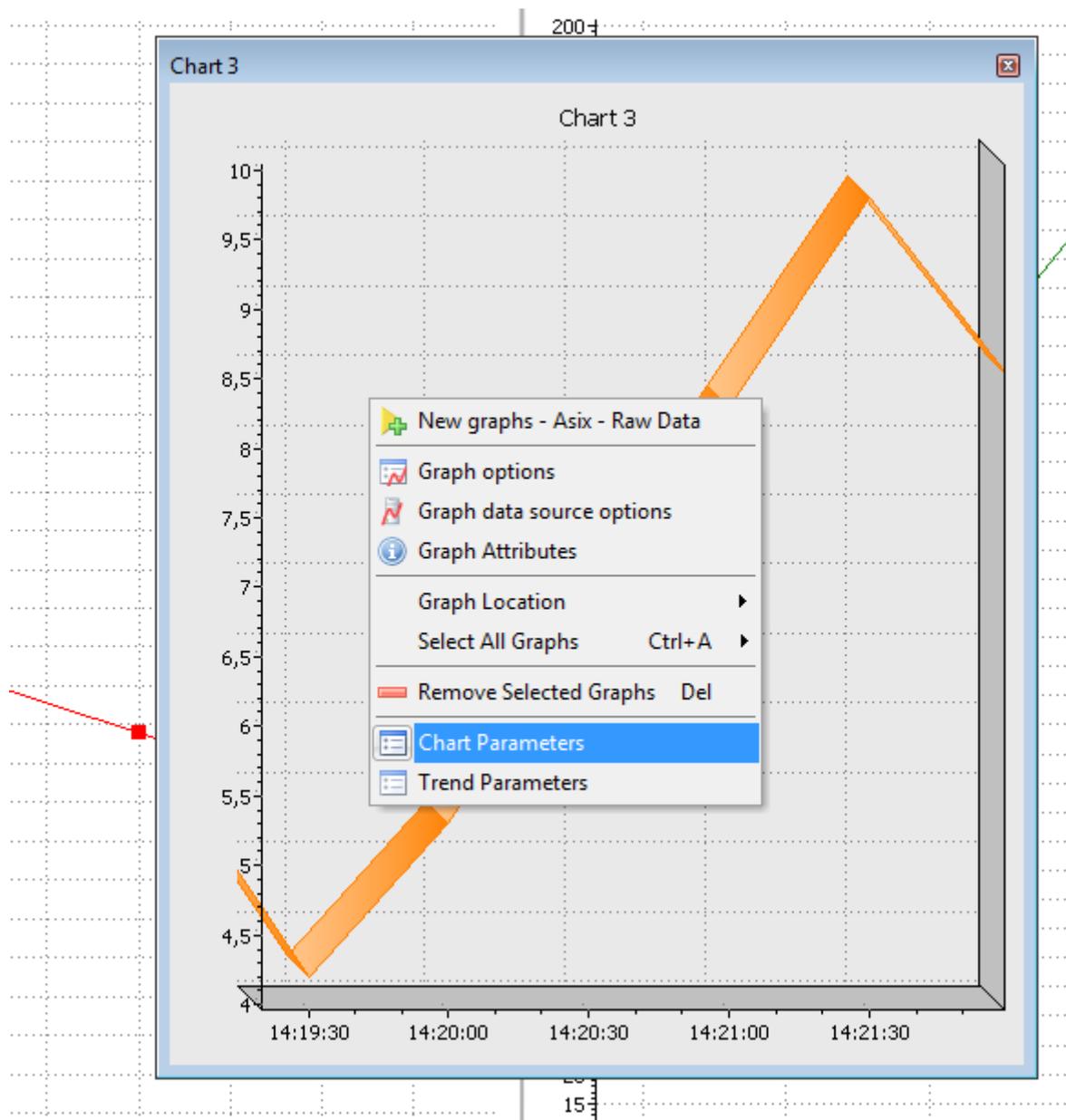


Fig. Chart Parameters Available for the Chart Displayed as Floating Window.

AsTrend

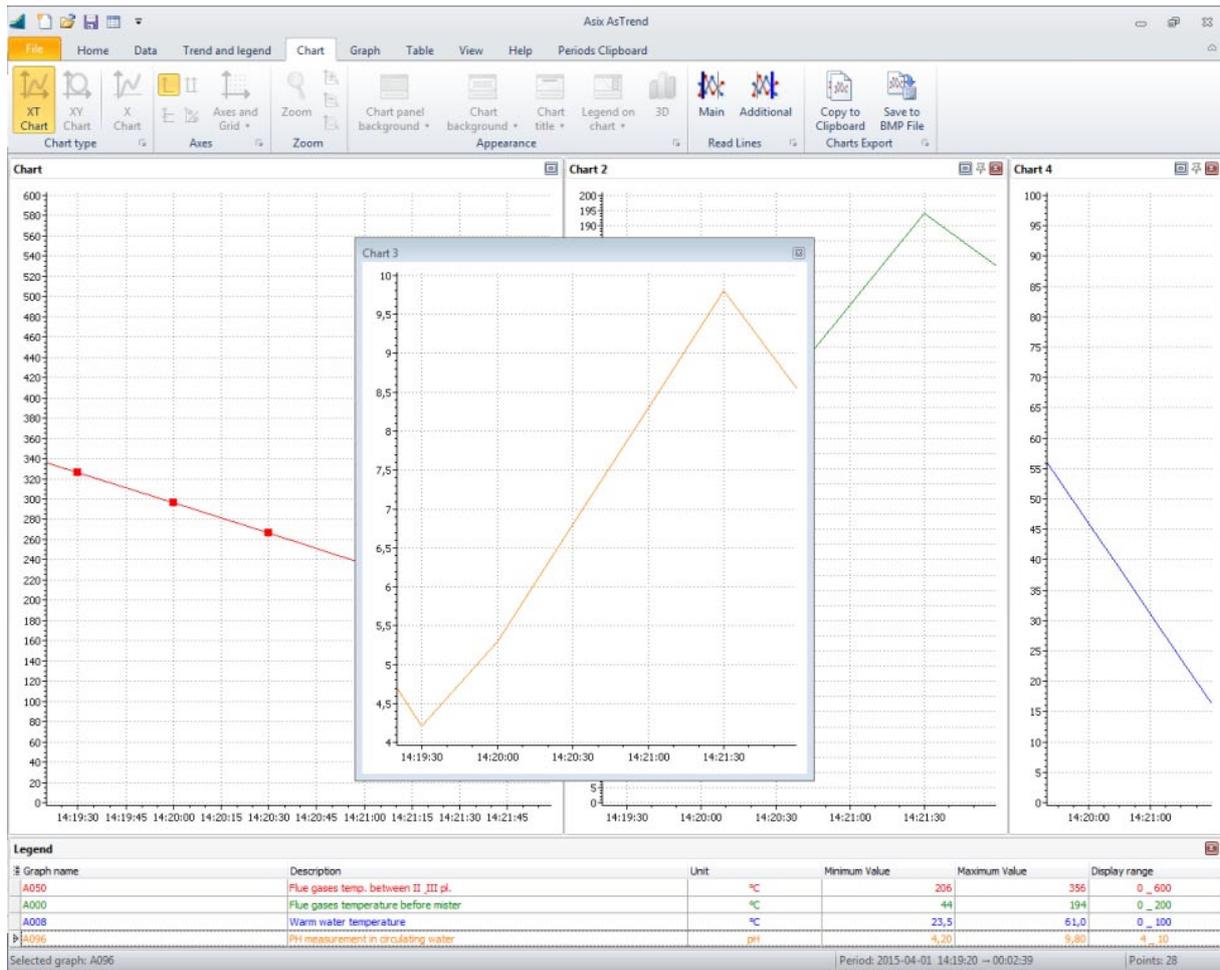


Fig. AsTrend with 4 Charts.

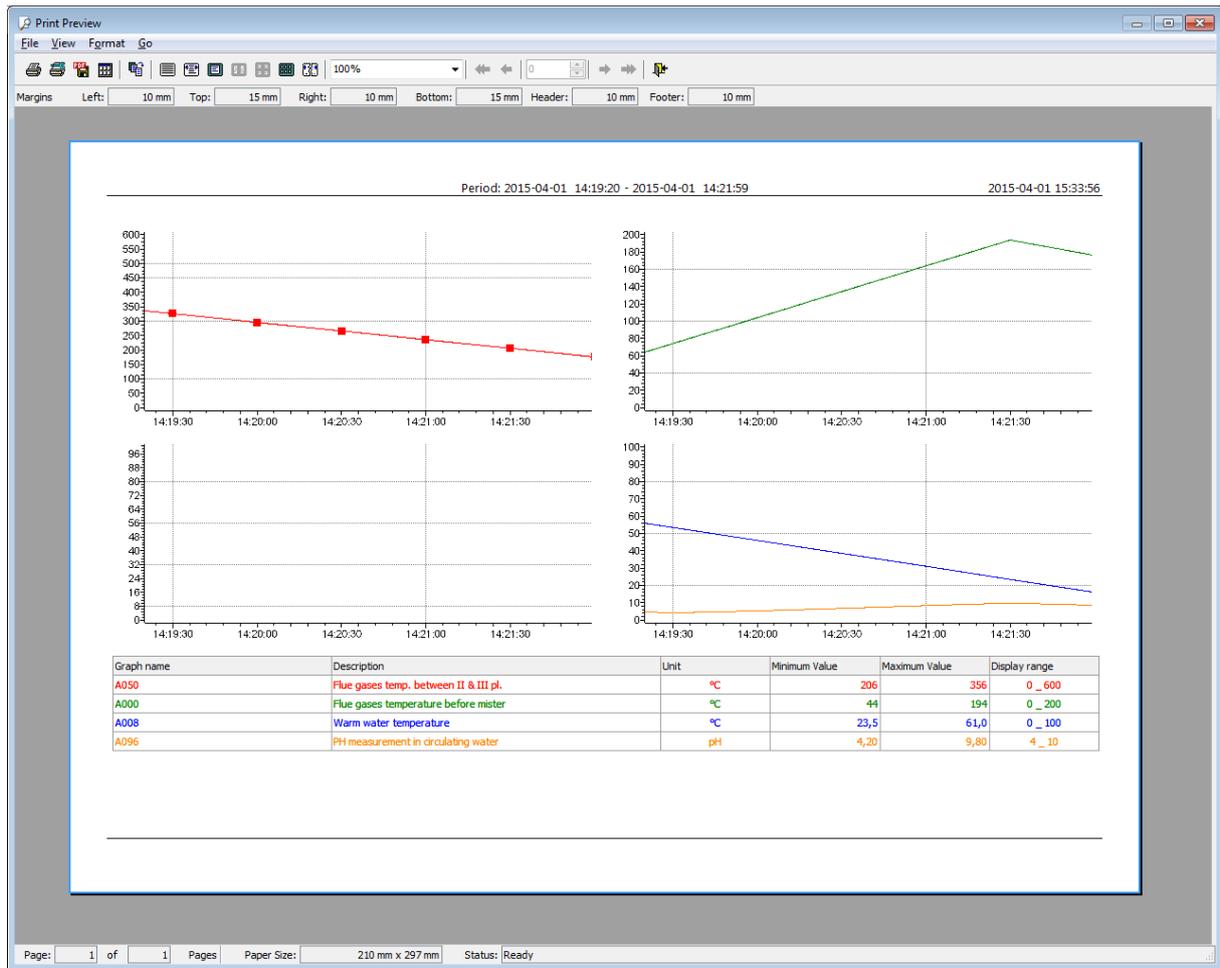


Fig. AsTrend with 3 Charts - Printout (4 chart has no graph).

1.8 Data Types of Graphs



The maximum number of graphs added to the chart is 32.

The following data can be charted:

- **Asix system application:**
 - **row data of a process variable,**
 - **aggregated data of a process variable,**
 - **bit of a variable,**
 - **alarm** - alarm (from the application of classical version of Asix system) the event archive of which is stored in binary files, and definition is stored in a text file or variable definition database (mdb or MS SQL),
 - **SQL alarm** - alarm (from the application of classical version of Asix or from Asix.Evo system), the event archive of which is stored in MS SQL database, and definition in a variable definition database (mdb or MS SQL),
 - **data from Asix archive file** - variable data exported with the use of AspadTools module,
 - **data calculated** from values of other variables,
- **external sources,**
- **OPC-HDA server,**
- **AsBase** - data from logging archive of AsBase database;
- **AsLogger** - data from registration plan of AsLogger database;
- **constant,**
- **empty** - used as a separator in the legend and in the mode of historical data table.

Each variable can be treated as an analog or binary variable.

Each alarm is treated as a binary variable. It has a separate line in the legend and a separate OY axis over the analogues chart.

An exemplary chart of alarms:



Fig. Chart of Alarms (red - alarm the event archive of which is stored in binary files; green - alarm the events of which are stored in MS SQL database).

1.9 Chart Types Depending on the Axis Type

1.9 Chart Types Depending on the Axis Type

AsTrend may chart variables using the following axis types:

- single physical axis,
- proportional axis,
- many OY axes,
- many OY axes - stack,
- XY chart,
- X chart.

Each type is presented in following chapters.

1.9.1 Chart with a Single Physical Axis

Chart with a single physical axis is a default one. The OY axis displays real values of the graph in the range that can be set by the operator.

It is possible to scale the physical axis by using **display range** of graph values. The minimum and maximum of OY axis display range take the values from display range of the graph (the values are retrieved from the variable definition database, but they can also be individually set in AsTrend). Display ranges of all the graphs displayed at the same chart are taken into account when scaling physical axis.

It is also possible to scale the physical axis by using **measurement range** of graph values. The minimum and maximum of OY axis measurement range take the values from measurement range of the graph (the values are retrieved from the variable definition database, but they can also be individually set in AsTrend).

For charts with physical axis AsTrend allows to display the names of states as labels of OY values axis.

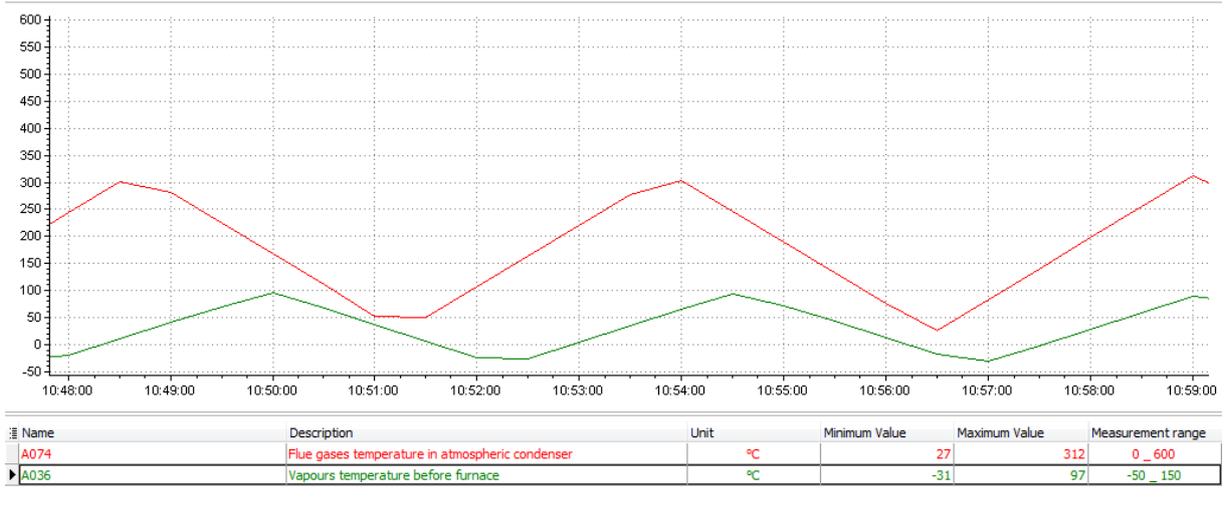


Fig. Chart with a Single Physical Axis.

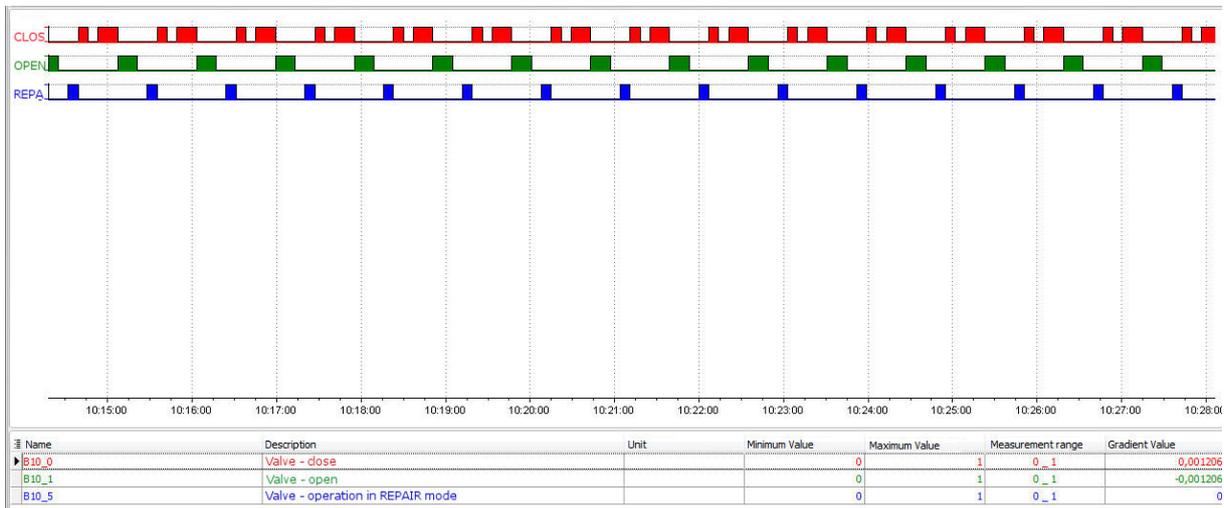


Fig. Names of States as Labels of OY Value Axis.

1.9.2 Chart with Proportional Axis

In charts with proportional axis the OY axis is on the right side and the proportional axis - on the left side of the chart area.

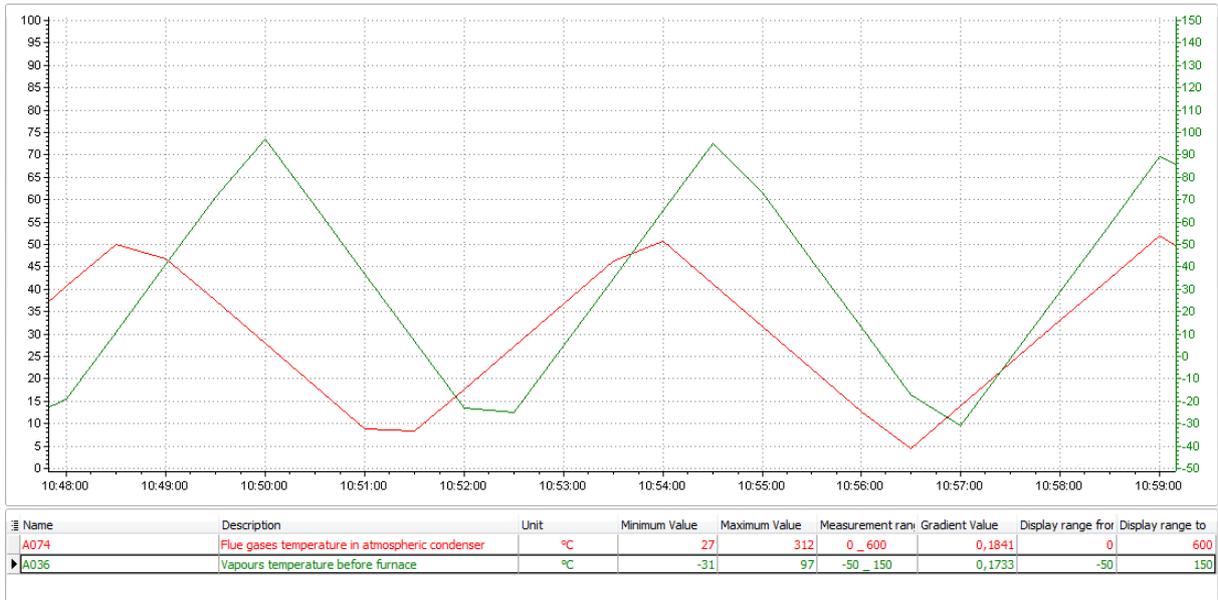


Fig. Chart with Proportional Axis.

1.9.3 Chart with Many OY Axes

Wykres z wieloma osiami wartości OY pozwala wyświetlić indywidualną oś wartości dla każdego przebiegu. Oś przyjmuje kolor danego przebiegu i może być wyświetlona po lewej lub prawej stronie obszaru wykresu.

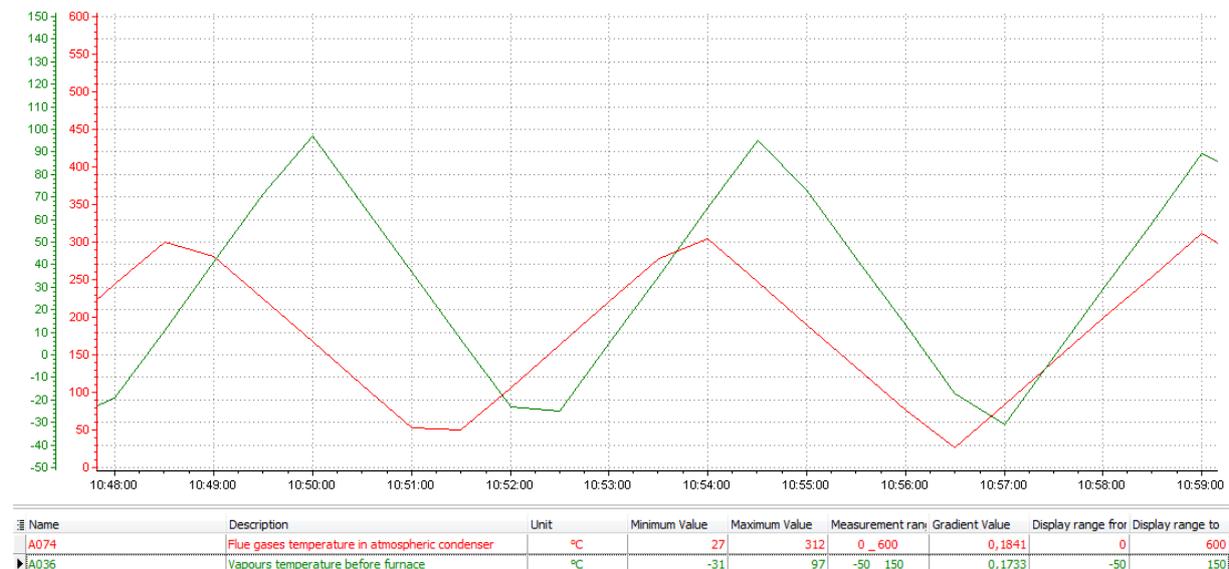


Fig. Chart with Many OY Axes.

1.9.4 Chart with Many OY Axes - Stack

Chart with many OY axes in stack allows to display individual value axis for each graph. The axis takes the colour of the graph and is located on the left side of the chart area.

Additionally, it is possible to display 2 adjacent graphs with one common axis. It is useful when area of the chart should be organized for better legibility. This option is activated in the options of adjacent graphs which are to be displayed on a common graph. Such a graph has two OY axes displayed on the left and on the right side of the chart area.

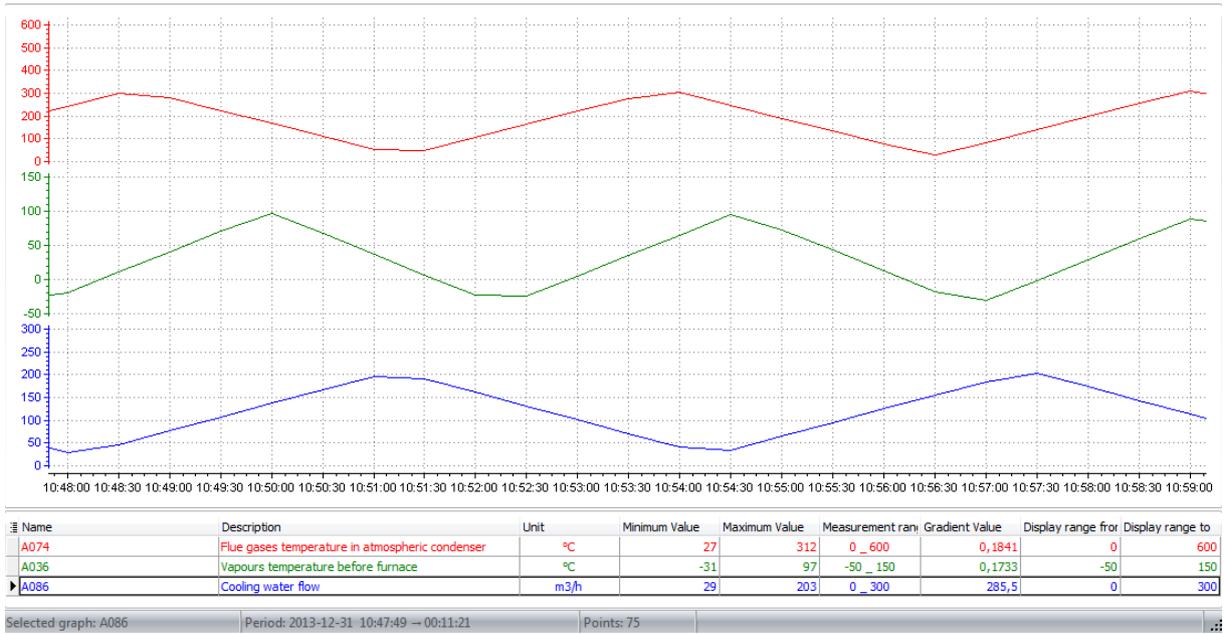


Fig. Chart with Many OY Axes - Stack.

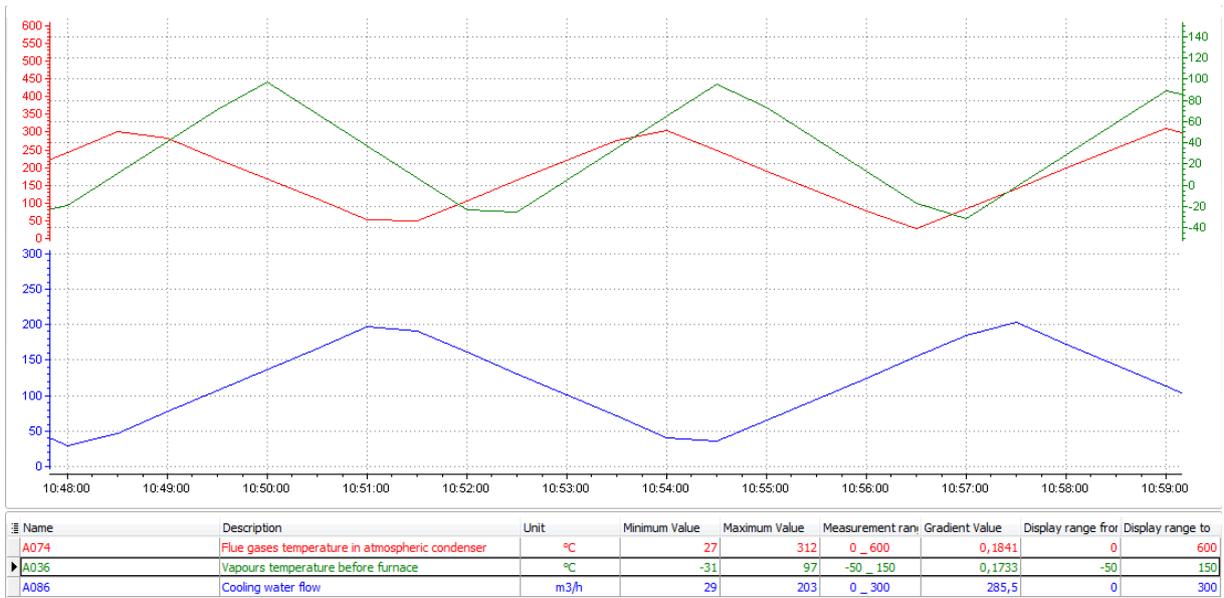


Fig. Chart with Many OY Axes - Stack with the Option of Displaying 2 Adjacent Graphs with One Common Axis.

1.9.5 Chart with XY Axes

AsTrend can create the chart being the function of two Asix variables. For each chart point, one can display the label containing:

- point time stamp,
- graph point number,
- values of samples.

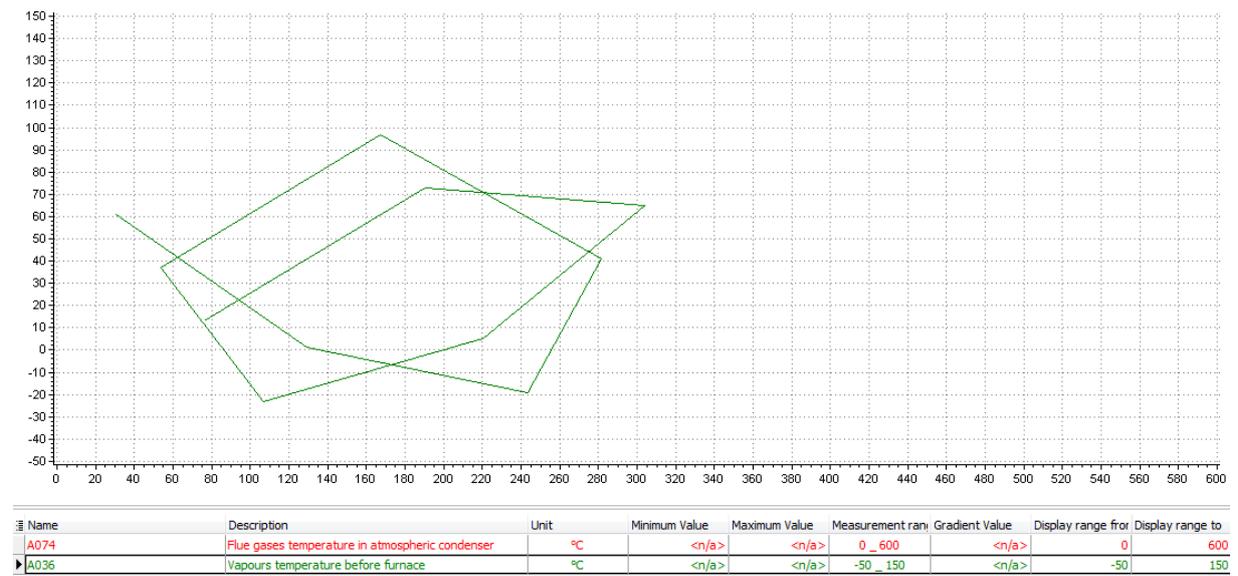


Fig. Chart with XY Axes.

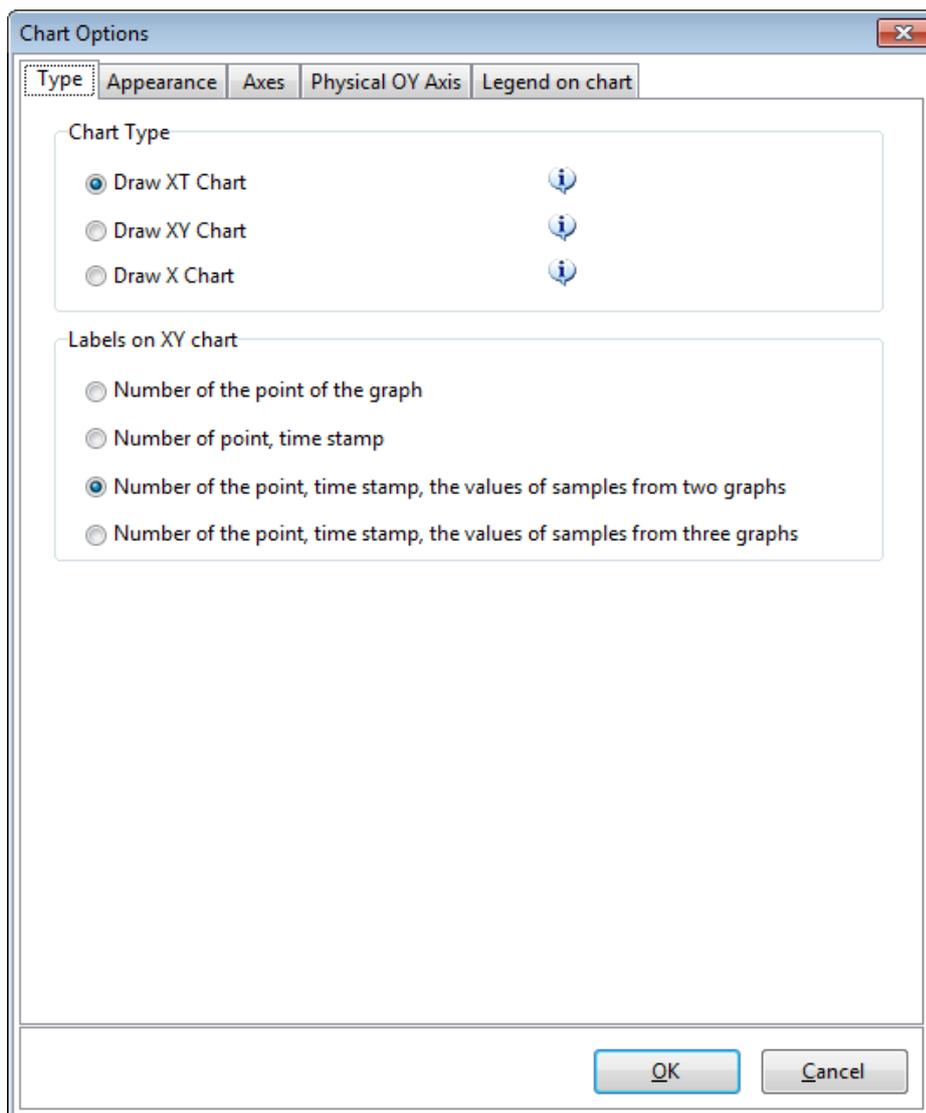


Fig. Window 'Chart Options' > 'Type' Tab - Labels on XY Chart.

1.9.6 X Chart

The X chart allows you to present different values of a variable (independent of time or other variable) in the order of their registration. The horizontal axis contains indexes of samples instead of time stamps - samples indexed from 1.

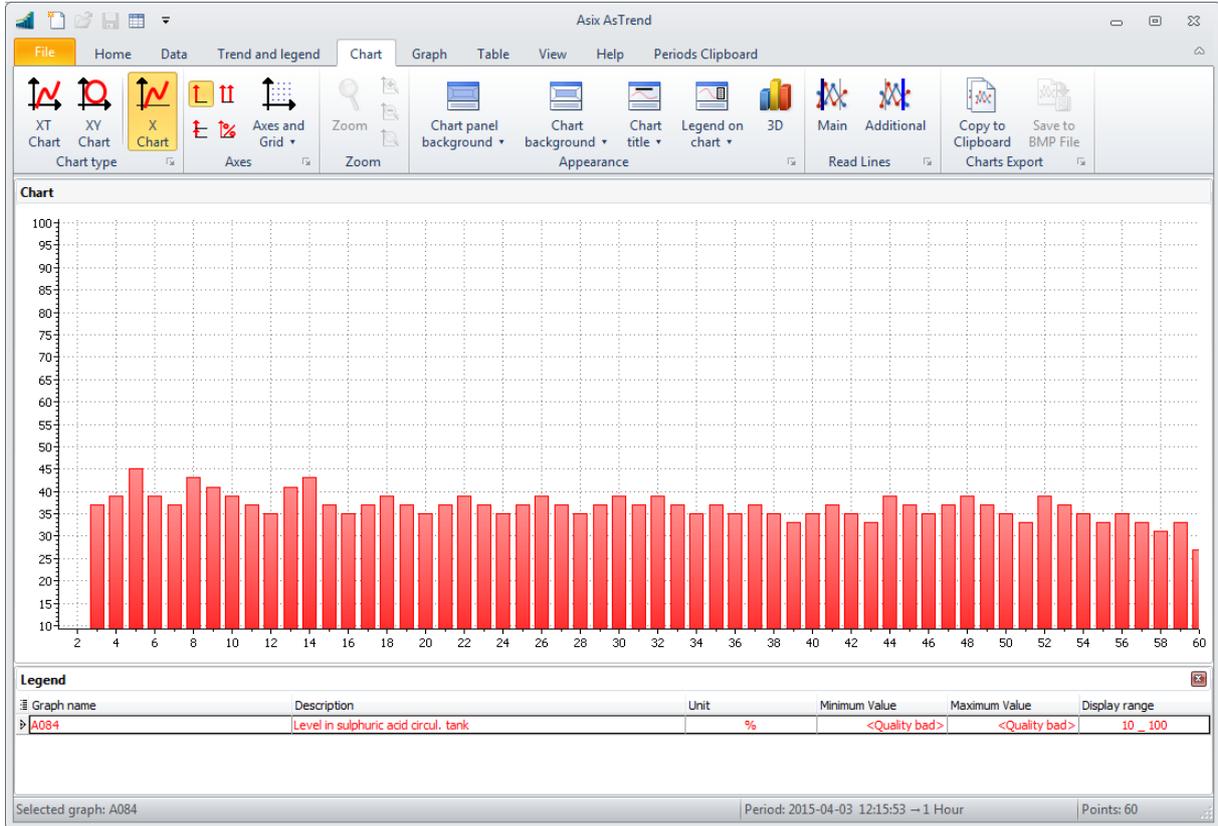


Fig. X Chart.

1.10 Chart Types Depending on the Type/Appearance of a Graph

The following chart types due to the appearance of a graph are available in AsTrend:

- linear,
- bar,
- area,
- of binary variables.

One of the chart types (linear, by default) is continuously selected and is used while adding new variables to the chart.

You can also change the existing chart type. To do this, first select a variable whose type of chart you want to change, then press one of the type-changing buttons.

Each of the chart types can be displayed in 3D version.

1.11 Aggregation of Asix System Data

1.11 Aggregation of Asix System Data

Time of drawing the chart can be accelerated by the use of archiving of aggregated data, without the need of changing any settings by the AsTrend operator. Charts are first drawn on the basis of aggregated values retrieved from Asix server archive, and if no such an archive is available - aggregated values are calculated on-line.

AsTrend selects the aggregation period and beginning of displaying data automatically according to the horizon of displayed chart. For example, if archived aggregated values were calculated from 1.00 PM, and you declare the horizon of displaying data starting with 1.05 PM - then AsTrend will use the aggregated values which are closest to the horizon set by you (data calculated since 1.00 PM).

Parameterization of calculating and archiving aggregated values is performed by the Asix application designed in the Asix system configurator - Architect module.

1.11.1 Aggregates - a New Source of Statistical Data Analysis

AsTrend user has access to extensive set of values aggregated on-demand for all data from any horizon time - all this for the purpose of effective analysis:

The list of aggregation functions includes the following items:

- **Minimum Value** - minimal value in interval
- **Maximum Value** - maximal value in interval
- **Average 0 Value** - average from time weighted values in interval; for periods when value of variables is not accessible; 0 value is used;
- **Average Value** - average from time weighted values in interval
- **Delta Value** - difference between the value at the end and beginning of interval
- **End Value** - value at the end of interval
- **Gradient Value** - measurement range divided by period length in seconds
- **Last** - the last known value in the resample interval, not including the end of the interval. For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.
- **Previous Known** - the last known value before the beginning of the resample interval. For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.
- **Quality Bad** - percentage of samples with bad quality in interval
- **Quality Bad Duration** - the duration (in seconds) of time in the interval during which the data is of bad quality
- **Quality Good** - percentage of samples with good quality in interval

- **Quality Good Duration** - the duration (in seconds) of time in the interval during which the data is of good quality
- **Quality Uncertain** - percentage of samples with uncertain quality in interval
- **Quality Uncertain Duration** - the duration (in seconds) of time in the interval during which the data is of uncertain quality
- **Range Value** - difference between maximal and minimal value in interval
- **Root Mean Square** - time weighted rms of data over the resample interval. The result is always FLOAT
- **Average Last Known** - time weighted average data over the resample interval; treat bad values as continuation of last known value. The result is always FLOAT.

Average_Last_Known is a better solution for variables which have constant value in long periods, e.g. device operation signal, than Average is.

- **Standard Deviation** - time weighted standard deviation of the data over the resample interval. The result is always FLOAT.
- **Start Value** - value at the beginning of interval
- **Sum Down** - the sum of negative value of changes from the last known value before the beginning up to the last value before the end of the resample interval.

For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.

Sum_up can be used to calculate the number of stops. All you need in this case is to aggregate a variable that takes the value of 0 when device is turned off, and the value of 1 when turned on.

- **Sum Up** - the sum of positive value of changes from the last known value before the beginning up to the last value before the end of the resample interval.

For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.

Sum_up can be used to calculate the number of starts. All you need in this case is to aggregate a variable that takes the value of 0 when device is turned off, and the value of 1 when turned on.

- **Time of Maximum** - timestamp of the maximum value
- **Time of Minimum** - timestamp of the minimum value
- **Total Last Known** - totalized value (time integral) of the data over the resample interval; treat bad value as continuation of last known value

One of the way of using Total_Last_Known is calculation of the time of device operation. All you need is to aggregate a variable that takes the value of 0 when device is turned off, and the value of 1 when turned on. The result will be the operation time in seconds.

- **Total 0 Value** - the sum of time weighted values (time integral). For periods when the sample quality is bad, the value of 0 is being used.
- **Total** - sum of time weighted values in interval (time integral)

The aggregates can be used for two purposes:

1. to calculate and display the graph values aggregated in a given time horizon;
 2. to calculate aggregated values on the basis of data from the time period currently displayed on the chart and display these values in the fields of the legend.
- in the first case, the user determines oneself the type of aggregation function used to read the data (regardless of the chart data type: genuine, uniform, approximated, averaged) as well as the period (interval) of aggregation function, which is the basis for calculating the successive aggregated values. With Aggregator (the Asix system module to calculate and archive statistical data), the data is calculated by the Asix server, where calculated by the

AsTrend

- in the second case, the aggregated values are calculated locally by the Astrend program for the values displayed on the graph over a given time horizon (regardless of the chart data type: genuine, uniform, approximated, averaged). Aggregated values are displayed in the legend fields.

1.12 Mode of Historical Data Table

AsTrend allows you to view historical data in a tabular mode as well. It is run with one button that allows you to switch the program to interface designed to support the table.

Mode of historical data table is saved in the *.trnx file by the person logged in as an Administrator of AsTrend. Opening the file by the person with the privileges of Operator of AsTrend switches AsTrend into the mode of historical data table and displays Administrator-defined variables and columns.

Each table record presents the values of selected attributes of a variable and the variable value from a given point of time. Navigation between the variable values from different points of time is performed with the use of navigation buttons.

Name	Description	Unit	Min. V.	Max. V.	Display range
A046	Acid gases temperature	°C	10	590	0 _ 600
A076	Flue gases temperature in atmospheric condenser	°C	235	559	0 _ 600

Fig. AsTrend - Mode of Historical Data Table.

1.13 Reports

AsTrend program has a function to create *ad-hoc* tabular reports for different periods of time (shift, day, month, quarter, year, any period of time) and associated default time intervals (hour, day, month). Ease of creating reports in AsTrend will convince each and every user. When selecting variables from the tooltip window, the user can simply choose reporting the values as one of the proposed aggregates. The following aggregate types are available, including minimum/maximum value, initial/final value, increment within a range, average and total value. It is also possible to create a report for variables calculated on the basis of archived graphs. For each report, you can easily define a header and summary (up to 5 rows), and finished reports can be printed and exported to PDF files.

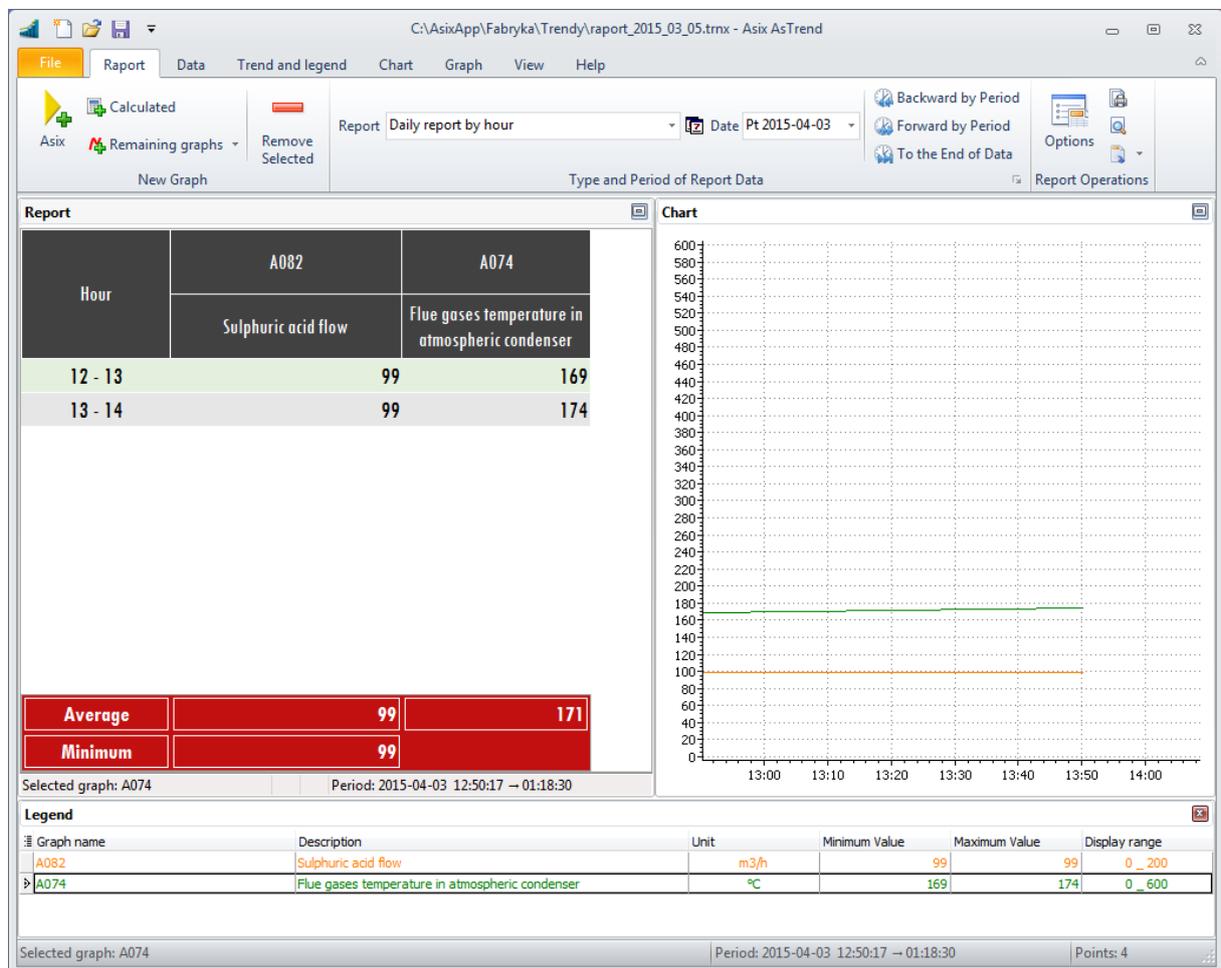


Fig. AsTrend - Report Mode.

2 AsTrend - Operation

The program may be used very easily. Typical activities include:

- display the defined trends
- perform some operations on the trends
- print the displayed charts
- define new trends.

Defining new trends can be performed with the built-in wizard.

2.1 Starting the Program

2.1 Starting the Program



Starting the Program with the Asix Application

In the former mode the program is started by the Asix system. The application designer designs the set of predefined trends and database of variable definitions. The users may browse the pre-defined trends, perform operations on them, and define own trends in the directory defined by the application designer.

The program may be started (while the application is loaded) with the use of a special parameter that the application developer puts in the application configuration file - see:
- Architect.pdf/chm, *Declaration of Programs Started Together with the Application*,
- Asix.Evo_Application_Parameterization.PDF/CHM, *Operation with AsTrend Program*.

The way you open the AsTrend file from the running application is executing the following operator action:

- ASTREND, parameterized by the application designer (in classical Asix) - see: Asix.PDF/CHM, *Operator Actions*;
- AstrendDisplay, parameterized by the application designer (in Asix.Evo) - see: Asix.Evo_Operator_Actions.PDF/CHM.



Starting the Program without the Asix Application

In the second mode, it is assumed that AsTrend is used alone and started at any time by the user.



It is possible to run more instances of AsTrend program.

The user decides which trends are to be displayed and usually defines them by oneself.

Use the following command to start the program alone:

```
Astrend.exe [trend_definition] [-dfolder] [-b]
```

where:

- trend_definition* - optional pathname to a file (*.TRN or *.TRNX extension) that contains trend definition to be displayed once the program starts;
- dfolder* - optional folder name from which the specific trend file will be read - if the file with trend definition is declared in

- trend_definition*; otherwise, the window 'Read Trend' with declared folder will be opened;
- b - optional parameter allows you to disable write of trend definition;

2.1.1 Adding Graphs When Opening a Trend File

You have the ability to declare which trends and graphs you will be watching.



To add a variable from the Asix application, you have to specify the variable name in the command running AsTrend:

I variant

```
Astrend.exe [trend_definition[#variable_name]] [-iMDBdatabase_filename |  
-iMSSQL_database_servername / MSSQL_database_name] [-dfolder] [-b]
```

where:

- trend_definition* - optional pathname to a file (*.TRN or *.TRNX extension) that contains trend definition to be displayed once the program starts;
- variable_name* - variables declared in the trend definition (.trnx, .trn); names on the list must be separated by the ’ # ' character;
- iMDB*database_filename* - optional pathname to a file with database of variable definitions (in the Jet format);
- iMSSQL_*database_servername* / *MSSQL_database_name* - optional pathname to a file with database of variable definitions in the MSSQL format;
- d*folder* - optional folder name from which the specific trend file will be read - if the file with trend definition is declared in *trend_definition*; otherwise, the window 'Read Trend' with declared folder will be opened;
- b - optional parameter allows you to disable write of trend definition;

II variant - gives the possibility to set new values of attributes of added variables

```
Astrend.exe  
[trend_definition[#/Aspad/variable_name;attribute1=value1;attribute2=value2;  
...]] [-iMDBdatabase_filename | -  
iMSSQL_database_servername/MSSQL_database_name] [-dfolder] [-b]
```

where:

- trend_definition* - optional pathname to a file (*.TRN or *.TRNX extension) that contains trend definition to be displayed once the program starts;

AsTrend

variable_name - variable name from the Asix application;
attribute - attribute name from the variable definition database of the Asix application;
value - new value of the attribute;
-iMDBdatabase_filename - optional pathname to a file with database of variable definitions (in the Jet format);
-iMSSQL_database_servername / MSSQL_database_name - optional pathname to a file with database of variable definitions in the MSSQL format;
-dfolder - optional folder name from which the specific trend file will be read - if the file with trend definition is declared in *trend_definition*; otherwise, the window 'Read Trend' with declared folder will be opened;
-b - optional parameter allows you to disable write of trend definition;



To add a bit of a variable from the Asix application, you have to use the following syntax in the command running AsTrend:

Astrend.exe
[*trend_definition*[*#/Aspad/variable_name/bit_number*;
attribute1=value1;
attribute2=value2;...]] [*-iMDBdatabase_filename* | -
iMSSQL_database_servername/MSSQL_database_name]
[*-dfolder*] [*-b*]

where:

trend_definition - optional pathname to a file (*.TRN or *.TRNX extension) that contains trend definition to be displayed once the program starts;
variable_name - variable name from the Asix application;
bit_number - number of displayed bit of the variable specified in *variable_name*;
attribute - attribute name from the variable definition database of the Asix application;
value - new value of the attribute;
-iMDBdatabase_filename - optional pathname to a file with database of variable definitions (in the Jet format);
-iMSSQL_database_servername / MSSQL_database_name - optional pathname to a file with database of variable definitions in the MSSQL format;
-dfolder - optional folder name from which the specific trend file will be read - if the file with trend definition is declared in *trend_definition*; otherwise, the window 'Read Trend' with declared folder will be opened;
-b - optional parameter allows you to disable write of trend definition;



To add a graph of aggregated variable from the Asix application, you have to use the following syntax in the command running AsTrend:

```
Astrend.exe
[trend_definition[#/AspadAgg/variable_name/aggregate_name/aggregate_perio
d; attribute1=value1;
attribute2=value2; ...]] [-iMDBdatabase_filename | -iMSSQL_database_servername /
MSSQL_database_name][-dfolder] [-b]
```

where:

<i>trend_definition</i>	- optional pathname to a file (*.TRN or *.TRNX extension) that contains trend definition to be displayed once the program starts;
<i>variable_name</i>	- variable name from the Asix application;
<i>aggregate_name</i>	- name of the function used to aggregate a variable specified in <i>variable_name</i> ;
<i>aggregate_period</i>	- interval to calculate the aggregated variable, in OPC format, e.g.: 1MO+1M (1 month and 1 minute);
<i>attribute</i>	- attribute name from the variable definition database of the Asix application;
<i>value</i>	- new value of the attribute;
-iMDB <i>database_filename</i>	- optional pathname to a file with database of variable definitions (in the Jet format);
-iMSSQL_ <i>database_servername</i> / MSSQL_ <i>database_name</i>	- optional pathname to a file with database of variable definitions in the MSSQL format;
- <i>dfolder</i>	- optional folder name from which the specific trend file will be read - if the file with trend definition is declared in <i>trend_definition</i> ; otherwise, the window 'Read Trend' with declared folder will be opened;
-b	- optional parameter allows you to disable write of trend definition;



To add a graph of a field of AsBase logging archive, you have to use the following syntax in the command running AsTrend:

```
Astrend.exe
[trend_definition[#/AsBase/logging_archive_id/logging_field_id; attribute1=value1
;
attribute2=value2; ...]] [-jMSSQL_database_servername / MSSQL_database_name]
[-dfolder] [-b]
```

where:

<i>trend_definition</i>	- optional pathname to a file (*.TRN or *.TRNX extension) that contains trend definition to be displayed once the program starts;
AsBase	- indicates the AsBase module as the source of retrieved data;
<i>logging_archive_id</i>	- id of logging archive of AsBase;
<i>logging_field_id</i>	- id of the field from the logging archive, the values of which are to be displayed on the AsTrend chart;
<i>attribute</i>	- attribute name from the variable definition database of the Asix application;

AsTrend

- value* - new value of the attribute;
- j*MSSQL_database_servername / MSSQL_database_name* - optional pathname to the AsBase database of variable definitions;
- d*folder* - optional folder name from which the specific trend file will be read - if the file with trend definition is declared in *trend_definition*; otherwise, the window 'Read Trend' with declared folder will be opened;
- b - optional parameter allows you to disable write of trend definition;



To add a graph of a point of AsLogger logging plan, you have to use the following syntax in the command running AsTrend:

Astrend.exe

[*trend_definition*[#/AsLogger/*plan_name*/*point_name*; *attribute1*=*value1*; *attribute2*=*value2*; ...]] [-g*MSSQL_database_servername / MSSQL_database_name*] [-d*folder*] [-b]

gdzie:

- trend_definition* - optional pathname to a file (*.TRN or *.TRNX extension) that contains trend definition to be displayed once the program starts;
- AsLogger - indicates the AsLogger module as the source of retrieved data;
- plan_name* - name of logging plan of measurement series in AsLogger;
- point_name* - name of measurement point in AsLogger to log measurements from one input of logging device;
- attribute* - attribute name from the variable definition database of the Asix application;
- value* - new value of the attribute;
- g*MSSQL_database_servername / MSSQL_database_name* - optional pathname to the AsLogger database of variable definitions;
- d*folder* - optional folder name from which the specific trend file will be read - if the file with trend definition is declared in *trend_definition*; otherwise, the window 'Read Trend' with declared folder will be opened;
- b - optional parameter allows you to disable write of trend definition;

2.2 Setting Administrator Password and Administrator Login Method

Administrator Login

To switch to administrator mode, use the command  **Administrator Mode** from:
AsTrend > View tab > Security group.

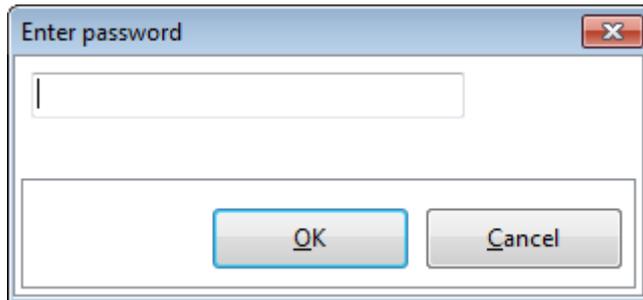


Fig. 'Enter Password' Window.

 When AsTrend is run for the first time to log on in administrator mode - just press *Enter* (after calling the window 'Enter Password') and then set up the password (AsTrend > View tab > Security group > Administrator Password Change).

Change Password

To change a password, use the command  **Administrator Password Change** from:
AsTrend > View tab > Security group.



Fig. 'Change Password' Window.

The password is stored in your computer registry.

2.3 Creation of AsTrend Shortcut

Use the command **Create Shortcut...** from *File* menu of AsTrend. It works for AsTrend run without the Asix application.

2.4 Configuration of Web AsTrend

Program settings file is located by default in the directory:

C:\AsixApp\AsTrend\AsTrend.xml

The Architect program enables automatic configuration of the 'AsTrend.xml' file, based on the settings of the Asix application configuration file, with the use of the Architect program configurator:

Architect > **Application** menu > **Configure Internet Applications...** command > **AsTrend** tab

The automatic configurator updates entries about the name of variable definition database and the ip address of data server. The file with the variable definition database will be copied to the application directory.

The configurator handling is reduced to use of two buttons:

Configure on the **Configure** tab - the command updates the configuration file of a web version of the AsTrend program - a file 'AsTrend.xml'. This command updates the network connection setup and the name of the variable definition database. The database name is taken from the current settings for an Asix system application. These options are used when AsTrend is not working with Asix.Evo.

You can declare a list of names/IP addresses of servers of the Asix 6/7 package from which the data is to be retrieved.

The operation of configuration should be performed after the change of the variable definition database file/directory name.

There is also the possibility to establish a selective access to view individual variables. You have to set the Windows authentication for application (Architect > **Application** menu > **Configure Internet Applications...** command > **AsTrend** tab) and add the attribute '**Read Authorization Group**' to the variable definition database. Then, for each variable defined in the variable definition database set the name of users' group allowed to view variable values as the value of '**Read Authorization Group**'.

Notice: Leaving a blank field for the attribute '**Read Authorization Group**' for a variable means that this variable is not visible to users.

The application will be available in the local network at:

http://<computer_name_in_Windows>/AsTrend

The application will be available locally when you use the following address in IE (6 or upper):

http://localhost/AsTrend

2.5 Help System

Help system is available in the following location:

AsTrend main window > *Help* tab > *Help Topics* command.

2.6 Modification of the Ribbon Contents

It is possible to modify the ribbon - which content is stored separately for the operator and administrator. Any changes in both sets can only be made by the administrator. By default, the Operator does not have such privileges, but there is a possibility to give him the privilege to have own menu layout and modify menus and toolbars (except in 'Operator / Administrator Mode' - see: [1.4 Privilege System of AsTrend Run with an Asix Application](#) - in this case only the administrator can modify the contents of ribbon).

When you start the program by the first time the default ribbon layout will load.



To add/remove the button from the ribbon:

1. Right-click in the tab, and then select the command *Customiza the Ribbon...*;
2. The window *'Ribbon Customization'* will appear - it allows to select commands.

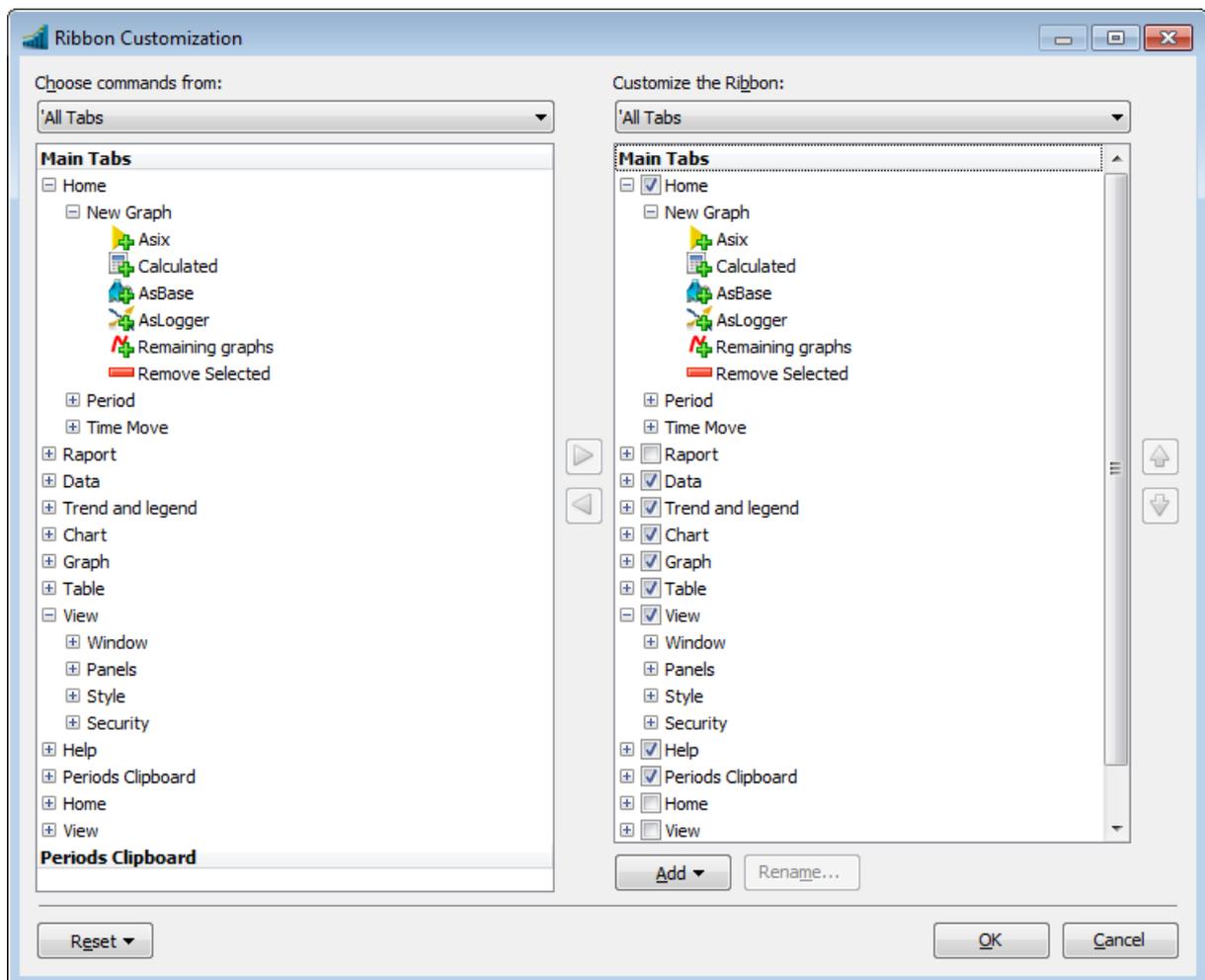


Fig. The Window 'Ribbon Customization'.

3. You can restore the default layout of buttonf with the use oc the command *Reset the Layout of the Buttons Style* on the *View* tab.

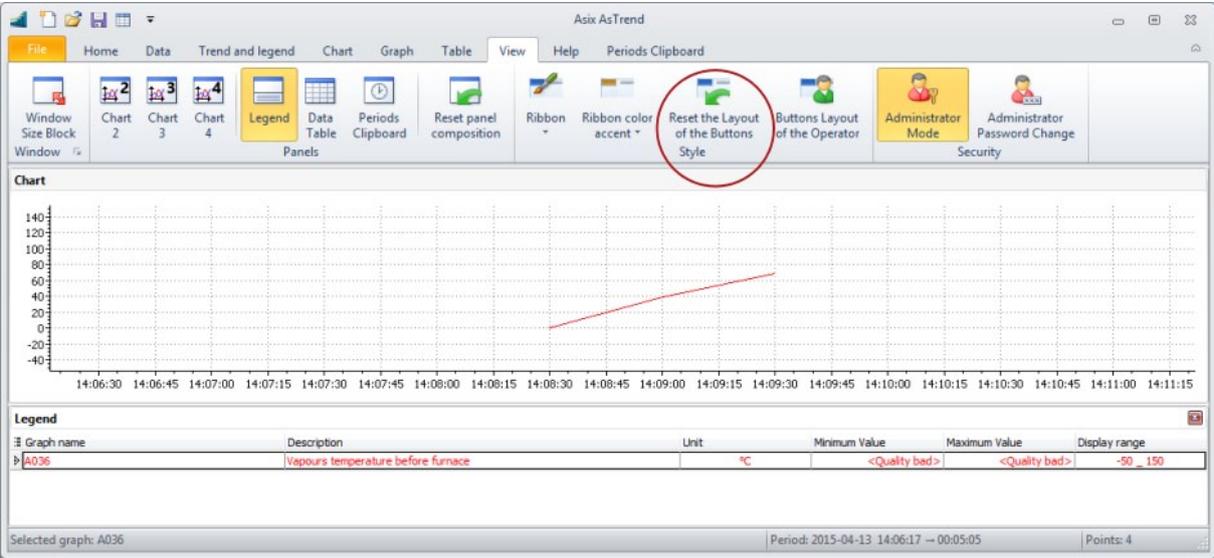


Fig. Command to Reset the Ribbon.

2.7 Ribbon Independent Layouts Management

The ribbon layout is saved in the AsTrend application directory when you exit the AsTrend program.

For Classical Asix (Operator / Administrator Mode)

AsTrend gives you the possibility to define independent menus/toolbars for Administrator and Operator (only one instance of operator) - the ribbon layout is saved separately. These definitions are stored in the internal AsTrend file, placed in the application directory.

Only the administrator can define menus/toolbars - also for the Operator.

To change the layout of Operator's ribbon (while logged on as Administrator) choose the **View** tab >  **Buttons Layout of the Operator** button. From now, all changes will be saved in the Operator scheme. When you uncheck the button, all changes will be saved and the view will return to the Administrator mode.

In addition, the *View* tab contains commands for managing the system of buttons - for example, you can restore the default layout of buttons using the command  **Reset the Layout of the Buttons** (the command available for Administrator).

For Classical Asix (Privileges of Users are Defined in AsAudit Module)

AsTrend gives the possibility to define independent systems of menus/toolbars for users with the right, set in AsAudit, to possess its own menu/toolbar. Definitions are stored in the AsTrend file, in the application directory.

For Asix.Evo

AsTrend gives the possibility to define independent systems of menus/toolbars for users with the right, set in AsixEvo.exe > Security > Roles, to possess its own menu/toolbar. Definitions are stored in the AsTrend file, in the application directory.

Independent AsTrend Operation (Not Run with an Asix Application)

Independent system of menus/toolbars is defined for each user of operating system. The configuration file is stored in the Windows system directory *Documents and Settings*.

2.8 Trend Wizard

Trend wizard is available in two versions:

- simple wizard,
- tutorial wizard.

The first one is run by the command  ***New Trend - Wizard...*** from the **File** menu. It consists of successive windows containing set of parameters required to establish a trend.

The second one is dedicated to those who want to define a trend but have never before done that. The tutorial wizard is run by the command ***New Trend - Tutorial...*** from the **File** menu. Obligatory steps must be performed to go to next step.

2.9 Operations in the Chart Area

 Operations that may be performed directly within the chart area include:

- drag-and-drop the time axis and change the data display period;
- point with the mouse to a chart point to display the point data (time, value) in the status bar;
- drag-and-drop the read line (use the button  to display one read line; use the button  to display two read lines);
- drag a selected region boundary by the left button of the mouse to grow the region;
- enlarge the chart area using the mouse wheel with the option  **Zoom** available (**Chart** tab > **Zoom** group);
- click a variable graph to select the variable;
- click an OY axis to modify its parameters;
- click by the right mouse button a point within chart area to display context menu.

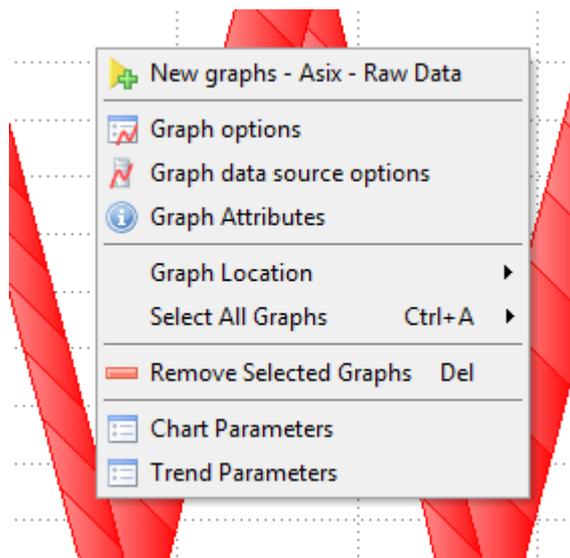


Fig. Context Menu in the Chart Area.

2.10 Operations in the Legend Area



Operations available directly within the legend area include:

- Display the legend using the button **Legend** located in: AsTrend main window > **View** tab > **Panels** group.
- Display the legend on the chart area using the button **Legend on Chart** located in: AsTrend main window > **Chart** tab > **Appearance** group.
- Change the legend height by grabbing by the cursor the edge separating the legend from the chart area; the height of the legend is rounded to the whole number of rows.
- Point by the mouse a field to display the entire field contents (displayed until mouse pointer is moved away):

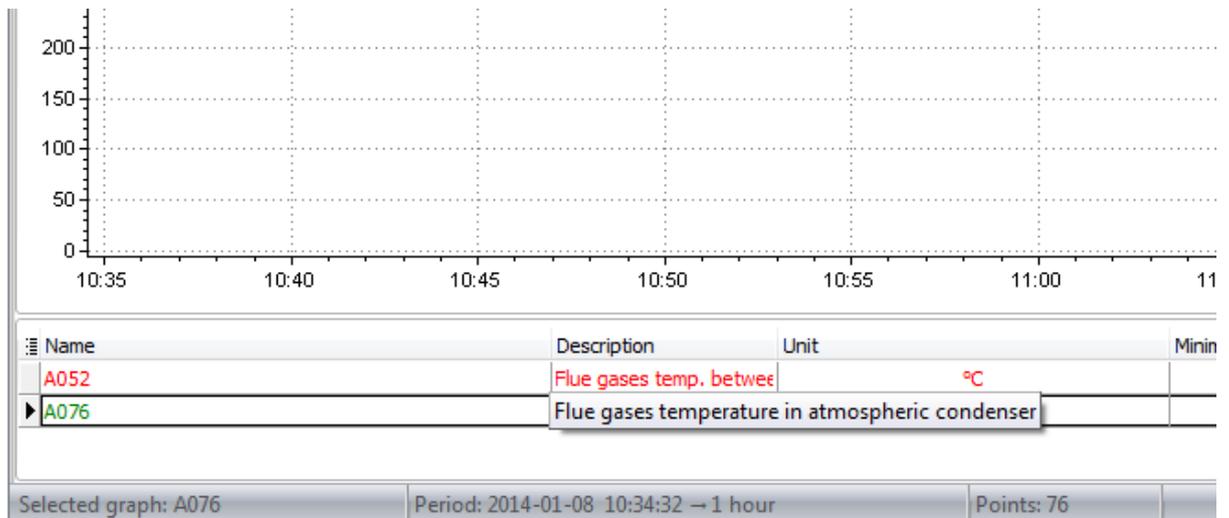


Fig. Displaying the Entire Field Contents.

- Open the window by double click in the range field to change the variable range:

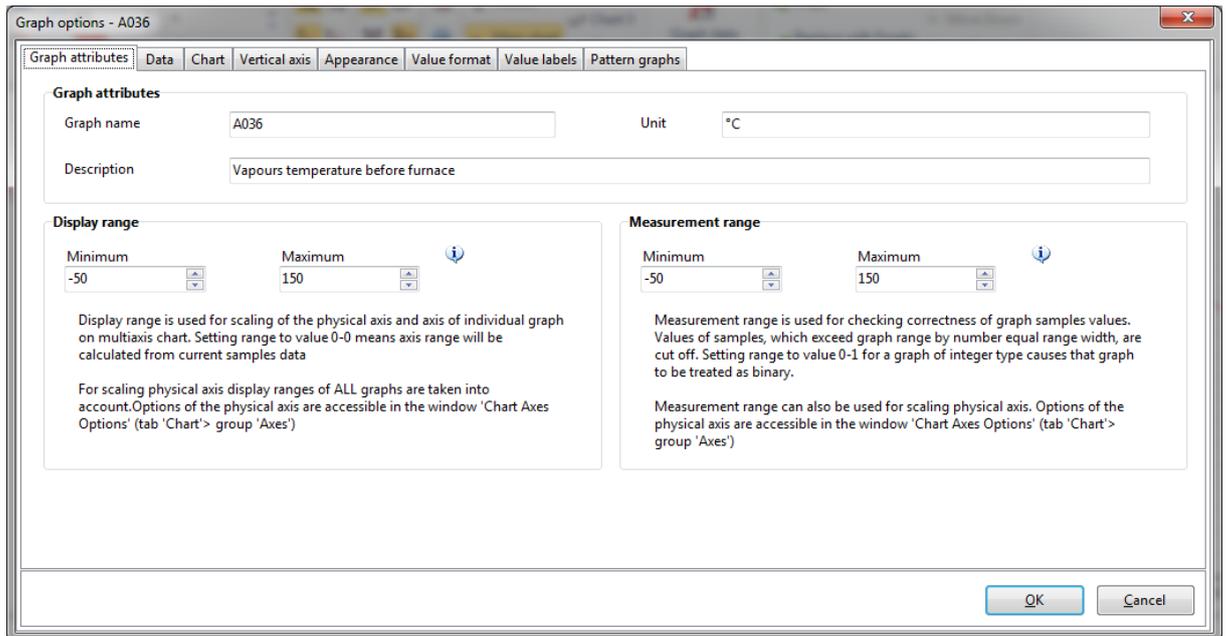


Fig. Graph Options - Ranges.

- Display context menu by right-click in the legend area:

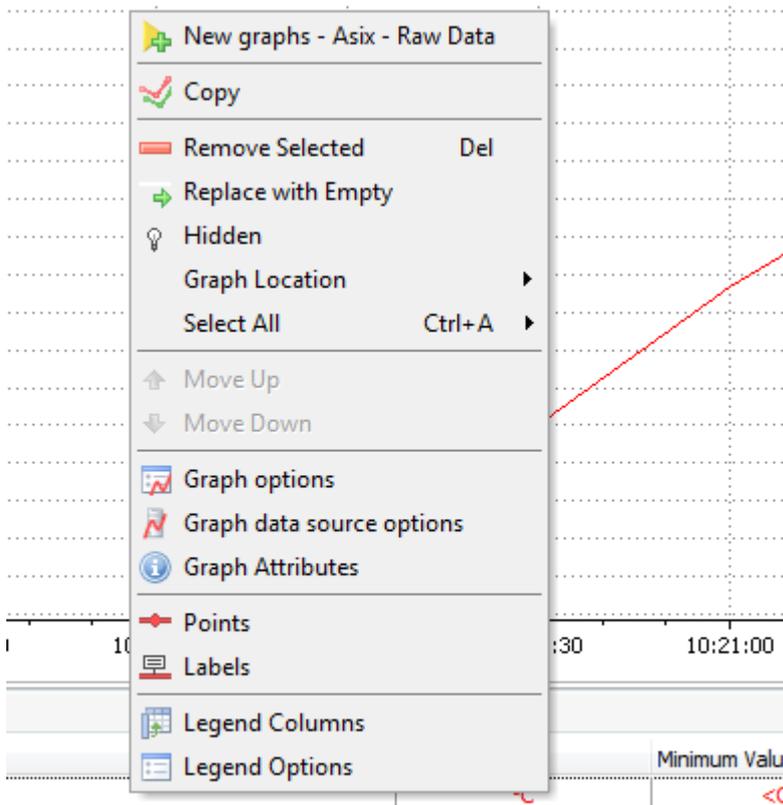


Fig. Context Menu in the Legend.

-  **New Graphs - Asix - Raw Data** - add a graph of raw data from Asix application;
-  **Copy** - do a copy of the graph;
-  **Remove Selected** - clear the currently selected variable;
-  **Replace with Empty** - exchange selected in the legend graph line on a blank line;
-  **Hidden** - hide the graph of selected variable;
- Graph Location** - indicates the numer of chart (when using many charts in one trend window);
- Select All** - select all graphs;
-  **Move Up** - move the row of selected graph one up;
-  **Move Down** - move the row of selected graph one down;
-  **Graph Options** - display the 'Graph Options' window;
-  **Graph Data Source Options** - display the 'Data Source - Asix Variable Graph' window;
-  **Graph Attributes** - display the window with the variable attributes;
-  **Points** - display measurement points for selected graphs; not available for the bar chart;
-  **Labels** - display labels for selected graphs;
-  **Legend Options...** - run the window 'Trend Options' with the possibility of defining the legend appearance;
-  **Legend Options** - display the window 'Trend Options'.

- Change caption text (right clicl in the caption of celected legend column):

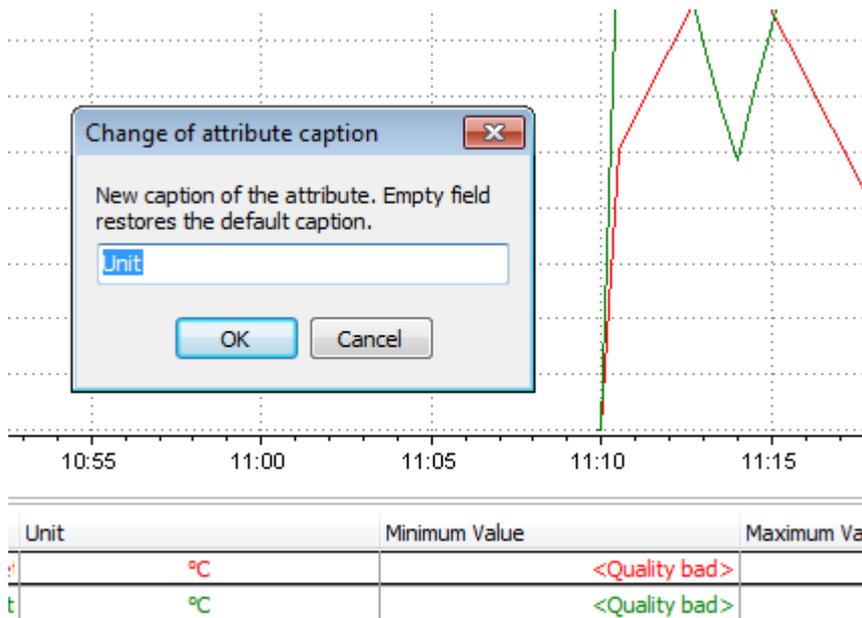


Fig. Changing the Caption Text.

- Change the colour of variable names and parameters in each legend row. By default, the data displayed in rows have the colours.
- The user can select which fields are to be displayed in the legend, using the list box dropped down by the button . When you press the button , the window 'Legend Column Selection' will appear. You can remove fields using the method 'Drag-and-Drop'.

Legend fields:

- Data aggregated by the following functions:
 - **Minimum Value** - minimal value in interval
 - **Maximum Value** - maximal value in interval
 - **Average 0 Value** - average from time weighted values in interval; for periods when value of variables is not accessible; 0 value is used;
 - **Average Value** - average from time weighted values in interval
 - **Delta Value** - difference between the value at the end and beginning of interval
 - **End Value** - value at the end of interval
 - **Gradient Value** - measurement range divided by period length in seconds
 - **Last** - the last known value in the resample interval, not including the end of the interval. For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.
 - **Previous Known** - the last known value before the beginning of the resample interval. For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.
 - **Quality Bad** - percentage of samples with bad quality in interval
 - **Quality Bad Duration** - the duration (in seconds) of time in the interval during which the data is of bad quality
 - **Quality Good** - percentage of samples with good quality in interval

- **Quality Good Duration** - the duration (in seconds) of time in the interval during which the data is of good quality
- **Quality Uncertain** - percentage of samples with uncertain quality in interval
- **Quality Uncertain Duration** - the duration (in seconds) of time in the interval during which the data is of uncertain quality
- **Range Value** - difference between maximal and minimal value in interval
- **Root Mean Square** - time weighted rms of data over the resample interval. The result is always FLOAT
- **Average Last Known** - time weighted average data over the resample interval; treat bad values as continuation of last known value. The result is always FLOAT.

Average_Last_Known is a better solution for variables which have constant value in long periods, e.g. device operation signal, than Average is.

- **Standard Deviation** - time weighted standard deviation of the data over the resample interval. The result is always FLOAT.
- **Start Value** - value at the beginning of interval
- **Sum Down** - the sum of negative value of changes from the last known value before the beginning up to the last value before the end of the resample interval.

For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.

Sum_up can be used to calculate the number of stops. All you need in this case is to aggregate a variable that takes the value of 0 when device is turned off, and the value of 1 when turned on.

- **Sum Up** - the sum of positive value of changes from the last known value before the beginning up to the last value before the end of the resample interval.

For the types FLOAT, DOUBLE and INT64 result is stored as FLOAT, for other types as LONG.

Sum_up can be used to calculate the number of starts. All you need in this case is to aggregate a variable that takes the value of 0 when device is turned off, and the value of 1 when turned on.

- **Time of Maximum** - timestamp of the maximum value
- **Time of Minimum** - timestamp of the minimum value
- **Total Last Known** - totalized value (time integral) of the data over the resample interval; treat bad value as continuation of last known value

One of the way of using Total_Last_Known is calculation of the time of device operation. All you need is to aggregate a variable that takes the value of 0 when device is turned off, and the value of 1 when turned on. The result will be the operation time in seconds.

- **Total 0 Value** - the sum of time weighted values (time integral). For periods when the sample quality is bad, the value of 0 is being used.
- **Total** - sum of time weighted values in interval (time integral)

- Trend:

Graph Name - symbolic name of the graph.

Display Range - graph display range.

Graph Address - symbolic address of the graph.

Graph Colour - graph colour used in the chart and legend.

Input Data - information on the type of the graph input data.

Precision - precision of graph values displayed in the legend.

Samples Count - number of read samples.

- Read line:

Approximate Value of Read Line 1 - estimated graph value at main read line position.

Approximate Value of Read Line 2 - estimated graph value at additional read line position.

Read Line Distance - distance between two read lines.

Sample Quality of Read Line 1 - quality of the first sample on the left from the main read line.

Sample Quality of Read Line 2 - quality of the first sample on the left from the additional read line.

Sample Time of Read Line 1 - timestamp of the first sample on the left from the main read line.

Sample Time of Read Line 2 - timestamp of the first sample on the left from the additional read line.

Sample Value of Read Line 1 - value of the first sample on the left from the main read line.

Sample Value of Read Line 2 - value of the first sample on the left from the additional read line.

Time of Read Line 1 - main read line position at time axis.

Time of Read Line 2 - additional read line position at time axis.

- VarDef - standard: pre-defined variable definition database fields.

Table 1. List of System Attributes of the Vvariable Definitions Database (for the applications of Asix.Evo and classical Asix).

NOTICE: Differences in interpretation of the attributes for the Asix.Evo application you can find in the table 1a (following the table 1).

Table 1. List of System Attributes of the Vvariable Definitions Database (for the applications of Asix.Evo and classical Asix)

Internal name of the variable attribute (PL)	Attribute type	Default name displayed in the header (PL)	Internal name of the variable attribute (EN)	Default name displayed in the header (EN)	Type	Description
Nazwa	mandatory	Nazwa	Name	Name	T	Unique symbolic name of the process variable univocally identifying the variable for all asix system components
Opis	mandatory	Opis	Description	Description	T	A custom text e.g. containing the technological description of process variable
Kanał	mandatory	Kanał	Channel	Channel	T	Logical name of the transmission channel (one of the names given in the transmission channel)

						declaration)
Adres	mandatory	Adres	Address	Address	T	Symbolic address, whose form is specific for each asix system driver
LiczbaElementow	mandatory	Liczba elementów	ElementsCount	Elements count	N	Number of elements included in the process variable (variable can be an array)
OkresProbkowania	mandatory	Okres próbkowania	SampleRate	Sample rate	N	Period of process variable value updating (in seconds)
FunkcjaPrzeliczajaca	mandatory	Funkcja przeliczająca	ConversionFunction	Conversion function	T	Name of conversion function used to convert the value received from the controller to the value fed to asix system components
Archiwum	mandatory	Archiwum	Archive	Archive	T	Name of ASPAD resource (logical name of archive resource)
ParametryArchiwizacji	mandatory	Parametry archiwizacji	ArchivingParameters	Archiving parameters	T	Parameters of archiving of the given variable
Grupa1	optional	Grupa1	Group1	Group1	T	Grouping attribute, generated by default
Grupa2	optional	Grupa2	Group2	Group2	T	Grouping attribute
Format	optional	Format	Format	Format	T	Format of the number, used for displaying in asix system; the format is given in the manner required by C language (e.g. %4t2f is 4 digits, including 2 decimal digits)
Jednostka	optional	Jednostka	Unit	Unit	T	Physical variable unit
ZakresPomiarowyOd	optional	Zakres pomiarowy od	MeasurementRangeFrom	Measurement range from	N	Maximum range, which can be used – minimal value
ZakresPomiarowyHi	optional	Zakres pomiarowy do	MeasurementRangeTo	Measurement range to	N	Maximum range, which can be used – maximal value
ZakresSurowyOd	optional	Zakres surowy od	RawRangeFrom	Raw range from	N	Conversion function parameter – input range from &ldots;

ZakresSurowyDo	optional	Zakres surowy do	RawRangeTo	Raw range to	N	Conversion function parameter ‐ input range to &ldots;
ZakresWyswietlaniaOd	optional	Zakres wyświetlania od	DisplayRangeFrom	Display range from	N	Lower range limit for displaying the given variable ‐ for asix objects
ZakresWyswietlaniaDo	optional	Zakres wyświetlania do	DisplayRangeTo	Display range to	N	Upper range limit for displaying the given variable ‐ for asix objects
ZakresSterowaniaOd	optional	Zakres sterowania od	SteeringRangeFrom	Steering range from	N	Lower range limit for the value of the given variable set from asix
ZakresSterowaniaDo	optional	Zakres sterowania do	SteeringRangeTo	Steering range to	N	Upper range limit for the value of the given variable set from asix
BazaSlupka	optional	Baza słupka	BarBase	Bar base	T	Size loaded from the database by the BAR object
NazwyStanow	optional	Nazwy stanów	StateNames	State names	T	Name of the set of texts or directly - the set of description of variable states (specific full values)
ZestawStanow	optional	Zestaw stanów	StateSet	State set	T	Name of the set of state descriptions, where the current line belongs to. Attribute used only for lines including the state description set element.
WartoscStanu	optional	Wartość stanu	StateValue	State value	T	Number of state, whose description is used in the current line. Attribute used only for lines including the state description set element.
MaskaZmiennejKontrolnej	optional	Maska zmiennej kontrolnej	ControlVariableMask	Control Variable mask	T	Indicator of the status bit signaled by the control variable
ZmiennaKontrolna	optional	Zmienna kontrolna	ControlVariable	Control variable	T	Name of variable representing the

						measurement variable status
LimitLoLo	optional	Minimum krytyczne	LimitLoLo	Limit LoLo	T	Name of axis system variable containing the critical minimal value for the measurement variable
LimitLo	optional	Minimum	LimitLo	Limit Lo	T	Name of axis system variable containing the minimal value for the measurement variable
LimitHi	optional	Maksimum	LimitHi	Limit Hi	T	Name of axis system variable containing the maximal value for the measurement variable
LimitHiHi	optional	Maksimum krytyczne	LimitHiHi	Limit HIHi	T	Name of axis system variable containing the critical maximal value for the measurement variable
ZakresWyswietlaniaKrok	optional	Zakres wyświetlania krok	DisplayRangeStep	Display range step	L	It is used by CHART object. It means span of units of main scale on OY axis (at how many unit intervals the label will be displayed on OY axis)
ZakresWyswietlaniaSzer	optional	Zakres wyświetlania szerokość	DisplayRangeWidth	Display range width	L	It is used by CHART object. It means the width of value label displayed on OY axis
ZakresWyswietlaniaPodzial	optional	Zakres wyświetlania podział	DisplayRangeDivision	Display range division	L	It is used by CHART object. It determines the segmentation of main scale units defined by DisplayRangeStep attribute into smaller ones on OY axis
PolozenieSuwaka	optional	Położenie suwaka	SliderPosition	Slider position	T	Name of variable, where the values representing the position of the SLIDER object during moving of such slider will be entered.
RejestracjaSterowania	optional	Rejestracja sterowania	ControlLogging	Control logging	Logical value	Value 1 means that control actions of the

						variable are registered in AsAudit module
--	--	--	--	--	--	---

T ‐ text, N ‐ 64-bit floating point number

- VarDef - non-standard: variable definition database fields declared by the application designer.

2.10.1 Docking the Legend in the Trend Window

The legend panel can be docked in the trend window (over, under or in the place of the chart panel). In the third variant the chart area is covered by the legend panel, but you can switch between chart/legend using the tabs: *Graph* or *Legend*.

Docking is done by dragging the legend in the chart area and dropping in the virtual scheme of window arrangement.

Back to independent arrangement of the legend panel is achieved by dragging the tab out of the chart area.

Back to independent arrangement of the legend panel displayed on the background of the chart area is achieved by dragging the legend tab over the chart area while pressing the *Ctrl* key.

The window layout is saved in AsTrend automatically while exit the program - but there is also the possibility of saving the current window layout to the trend file using the command **Storing Windows Layout** from:

AsTrend > View tab > Window group > 'Trend Window Options' window opened by the button .

You can reset panels using the command **Reset Panel Composition** from:

AsTrend > View tab > Panels group

2.11 Operations in the Status Bar

In individual fields of the status bar may appear:

- name of selected variable - in the field *Selected Graph*;
- value of the time period to display values of variables - in the field *Period*;
- number of measurements points displayed currently in the chart area - in the field *Points*.



In status bar it is possible the following operation:

- click in the field *Period* opens the window of setting periods.

2.12 Selecting Variable Definition Database from the Asix System / OPC Server

 To select a variable definition database of the Asix system, press the button **Asix - Variables and Alarms** , available in: AsTrend main window > **Data** tab > **Connection to Archive** group.

 To select a database from the OPC server, press the button **OPC HDA - Variables** , available in: AsTrend main window > **Data** tab > **Connection to Archive** group.

 To select a database of AsBase, press the button **Asix - AsBase** , available in: AsTrend main window > **Data** tab > **Connection to Archive** group.

 To select a database of AsLogger, press the button **Asix - AsLogger** , available in: AsTrend main window > **Data** tab > **Connection to Archive** group.

The following windows will appear when pressing the above commands.

NOTICE: At AsTrend start-up the last used variable definition database opens.

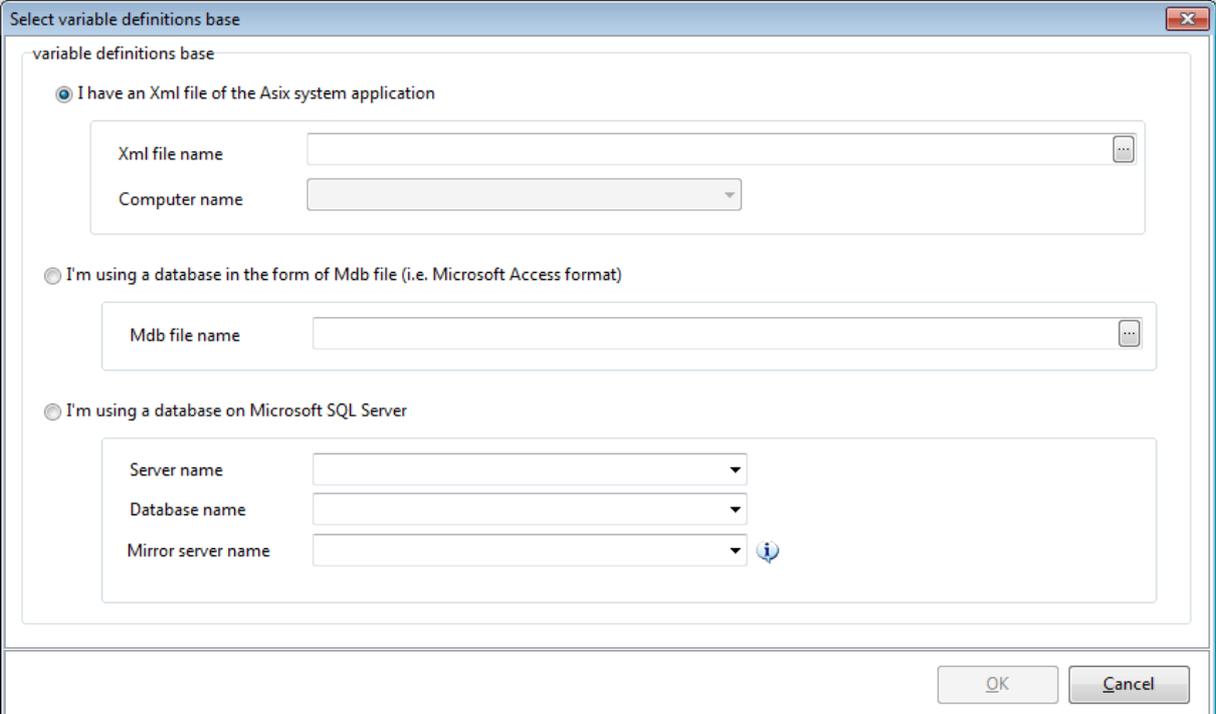


Fig. Selection of Variable Definition Database.

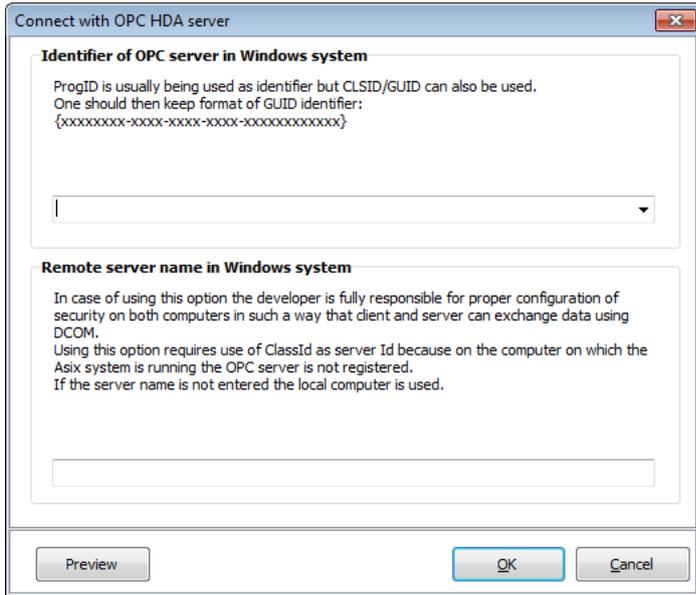


Fig. Connection with OPC HDA Server.

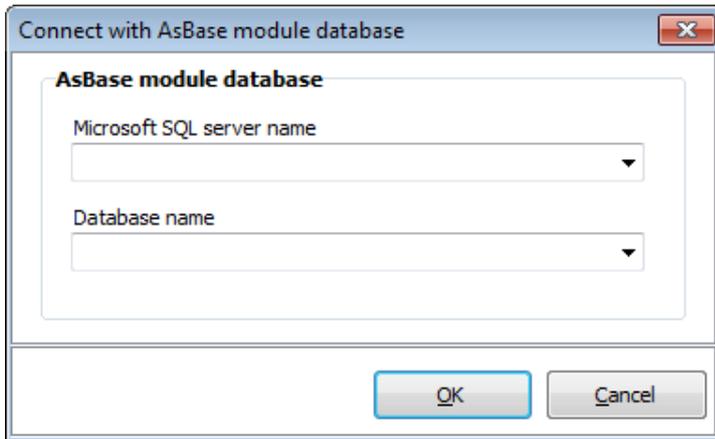


Fig. Connection with AsBase Database.

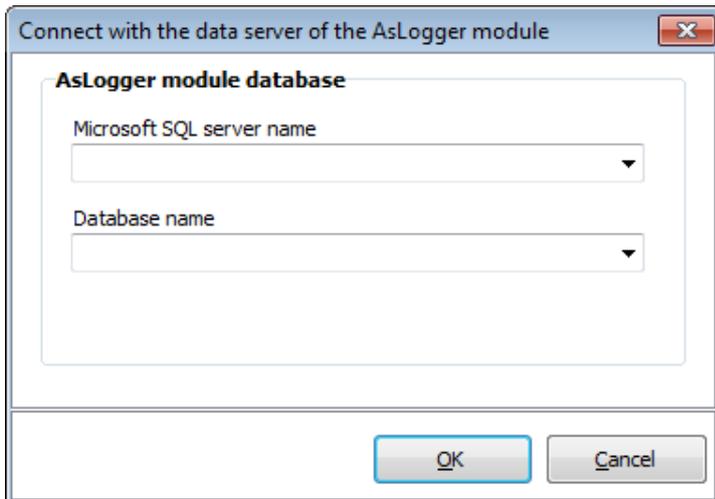


Fig. Connection with AsLogger Database.

2.13 Adding Graph Data to the Chart

2.13.1 Adding Graph Data from the Asix System Application

2.13.1.1 Adding a Raw Data



Name of the to-be-added variable may be selected in the variable selection window. To open the window you may:

- press the button  from: AsTrend main window > **Home** tab > **New Graph** tab;
- press the button  from context menu called by click of right mouse button in the chart or legend area.

Neither of the above listed capabilities is available unless a database of variable definitions is open.

It is possible to add the same variable to one trend many times. It may have a sense, for example, if we want to see the graph of a variable and the variable average, or the variable graph in two time periods simultaneously.

Pressing the button  run the window **'Select Items'**:

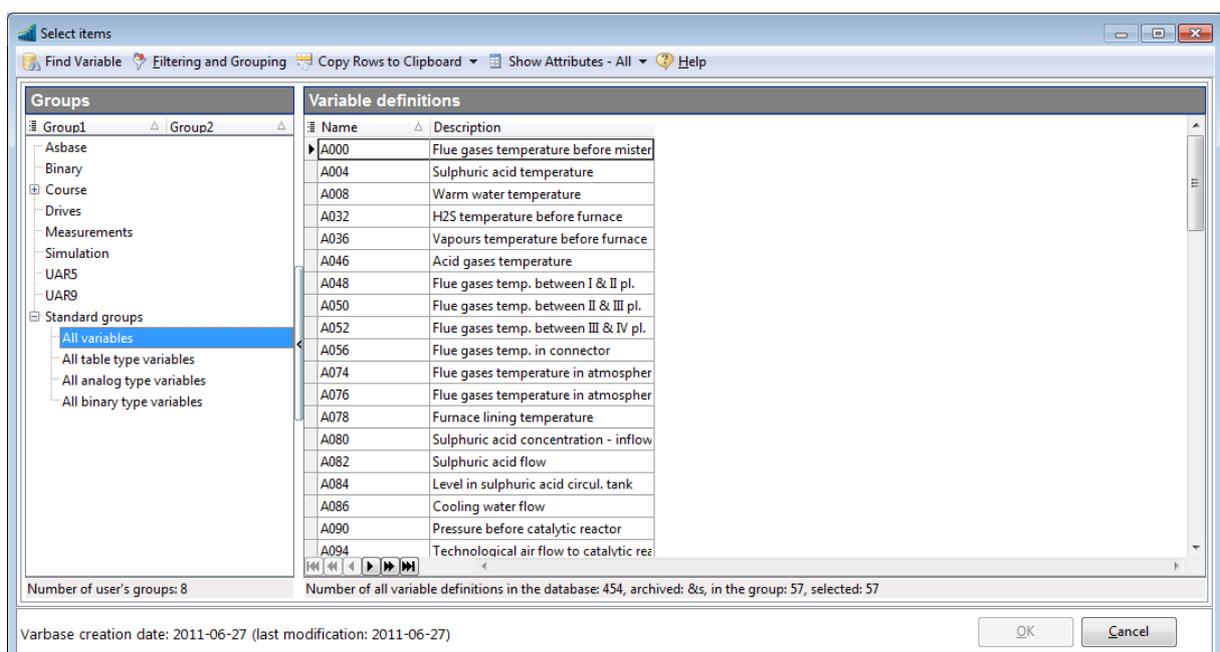


Fig. Variable Selection Window.

To select some variables in the 'Select item' window, first expand the group that contains that variables on tree in the left segment of the window. List of all variables belonging to that group appears in the right window segment.

To select some of them, highlight them on the list (hold down **Ctrl** key and click each of the to-be-selected variable), then click the **OK** button. Alternatively you may subsequently double click each of the to-be-selected variables on the list.

If there are plenty of variables in a group, search and/or filter functions may be particularly handy.

Each of the variable description column may be separately shown/hidden. To this end click the button  located to the left of the column headers, set/clear respective checkboxes on the displayed list of columns, then click some point outside the list.



To find a variable in the variable selection window:

- on the tree expand the group that contains the variable;
- click header of a column to sort records according to that column;
- click any field in the selected column;
- start to enter the variable name from the keyboard; after each entry the list of variables is scrolled to the first record matching the so-far entered characters.



To use the filtering/grouping function, do as follows:

Use the **Filtering and Grouping** button to turn on the record filtering/grouping function. The function must be turned on to be able to perform the below described operations.

Aby pogrupować zmienne według wartości danego atrybutu, należy przeciągnąć nagłówek kolumny tego atrybutu na pasek znajdujący się ponad nagłówkami atrybutów.

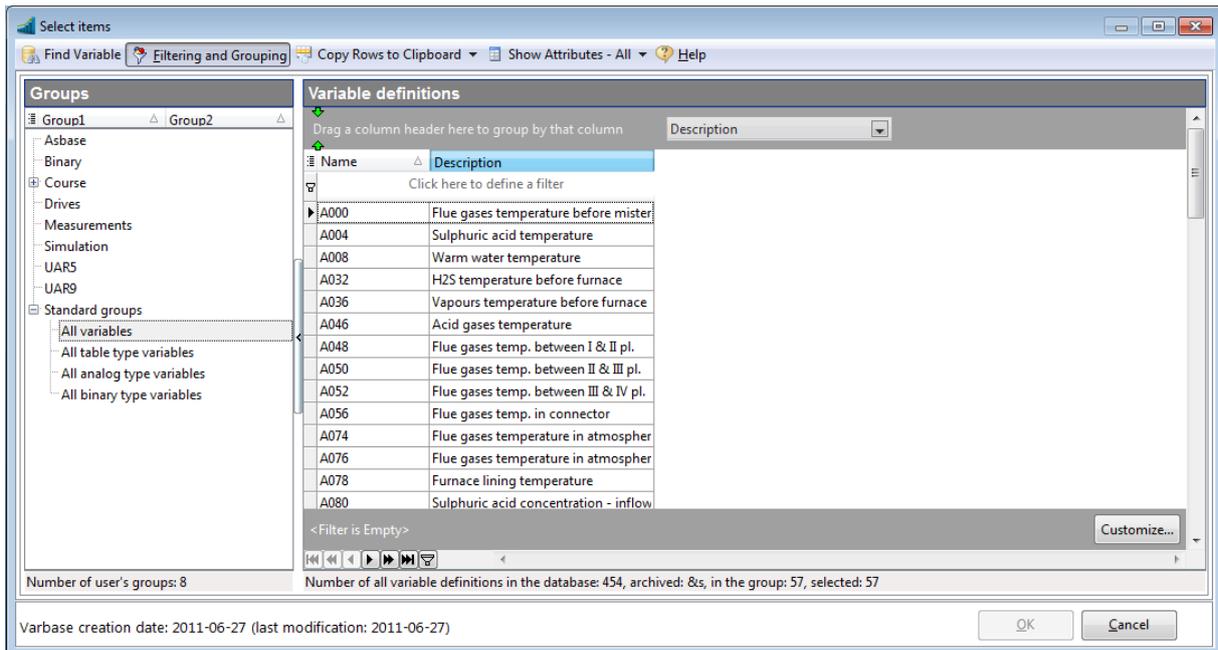


Fig. Grouping by a Column.

To simply filter records by some value in a column, press the button  next to the column header and select the desired value from the dropped down list of all values.

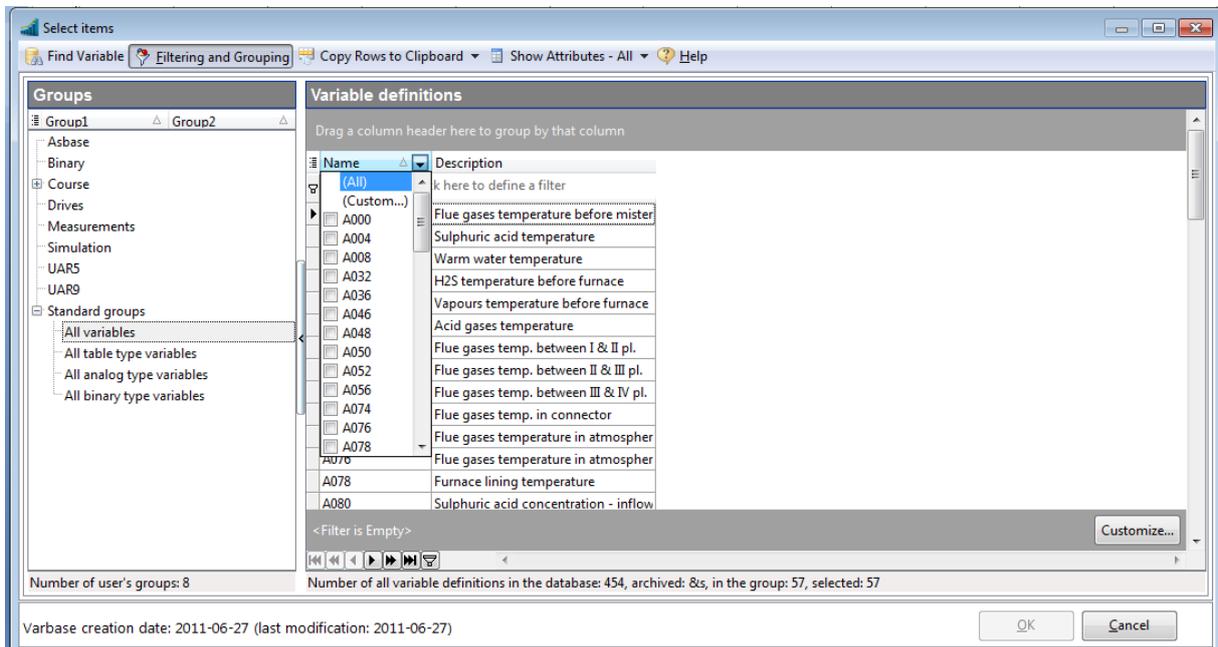


Fig. Filtering by a Column.

Use the button  located at the left bottom side of the value table to run filter wizard that facilitates defining more complicated filters.

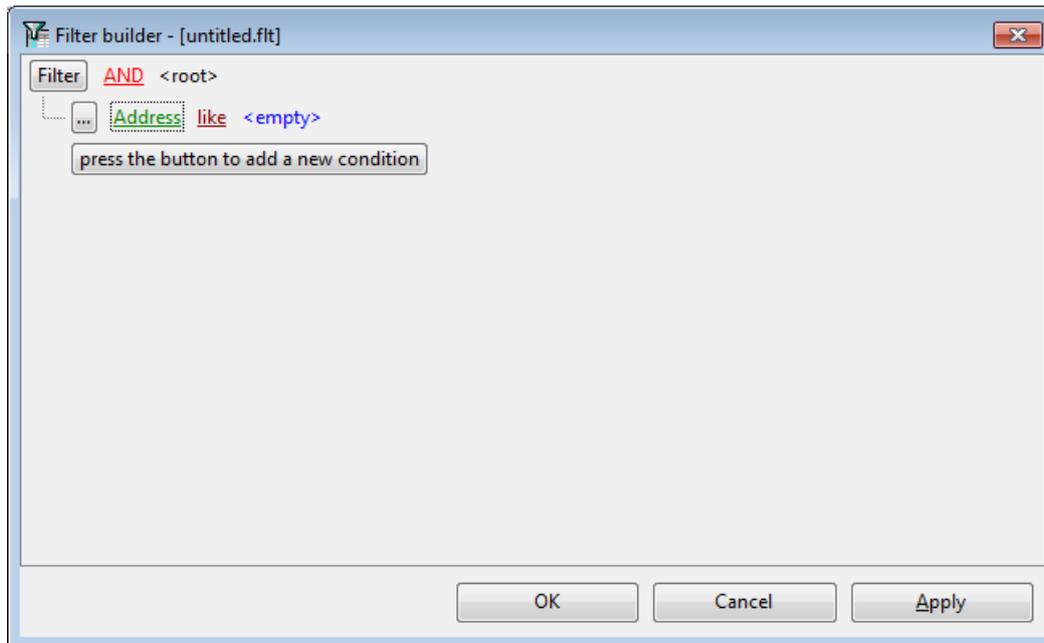


Fig. Filter Wizard.

2.13.1.2 Adding an Aggregated Data

Aggregated variable is a raw variable converted by an aggregation function. The period of time between samples is constant and equal to the period of aggregation for the aggregated variable.

If the trend uses an uniform data, the period between the samples is as defined in the trend configuration.

If your application has aggregates archiving engaged, using the interval of multiple minute may significantly speed up data retrieval.

 **Adding an aggregated data to the AsTrend window** is realized with the use of the button **Aggregated Data**  activated from: AsTrend main window > **Home** tab > **New Graph** group > the button .

Parameterization includes:

- **Variable Name**;
- **Aggregate Name**;
- **Aggregate Interval**;
- **Aggregate Timestamp** (beginning of interval, end of interval).

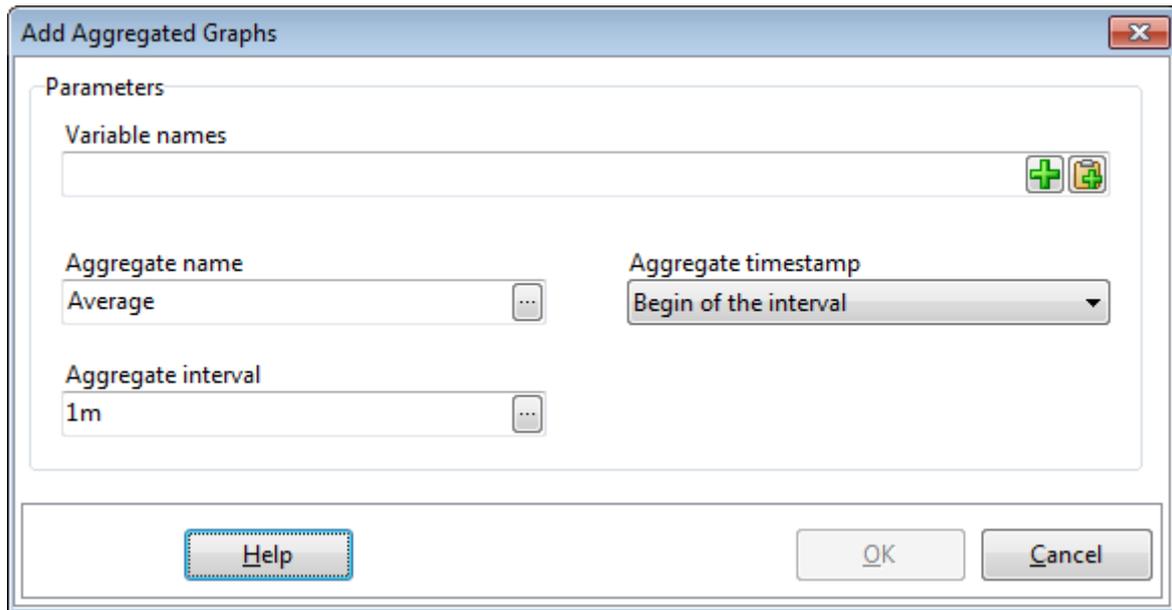


Fig. The Window 'Add Aggregated Graph'.

2.13.1.3 Adding a Bit of a Variable

 To add a bit of a variable, use the button  from: AsTrend main window > **Home** tab > **New Graph** group > the button .

The button  runs the window in which you have to determine:

- **Variable name**,
- **Attributes Retrieved from Bit Definition** which are to be displayed in the legend:
 - **Only Description** - in the legend, in the description column the description of the variable bit will be displayed; in other attribute columns the variable attribute values will be displayed;
 - **Only Description Merged with Variable Description** - in the legend, in the description column the description of the variable bit merged with the variable description will be displayed; in other attribute columns the variable attribute values will be displayed;
 - **All** - in the legend, in the columns of all attributes the values of variable attributes will be displayed; the ability to retrieve all the attributes from a bit definition is blocked if the database does not have the attribute **State Names** defined.

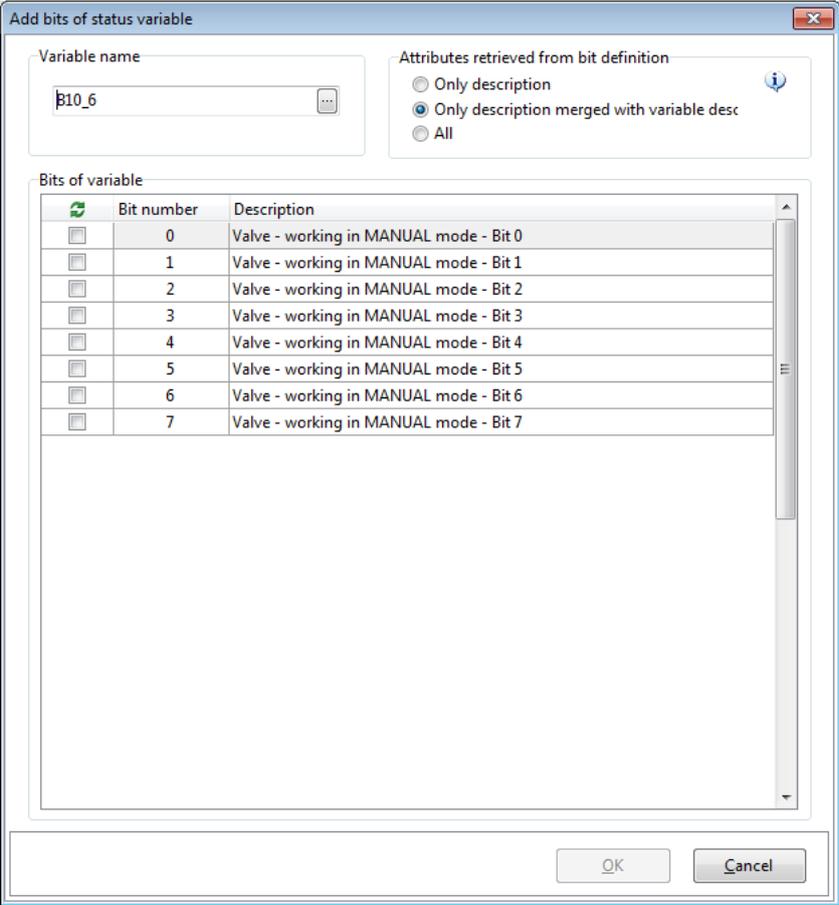


Fig. The Window 'Add Bits of Status Variable'.

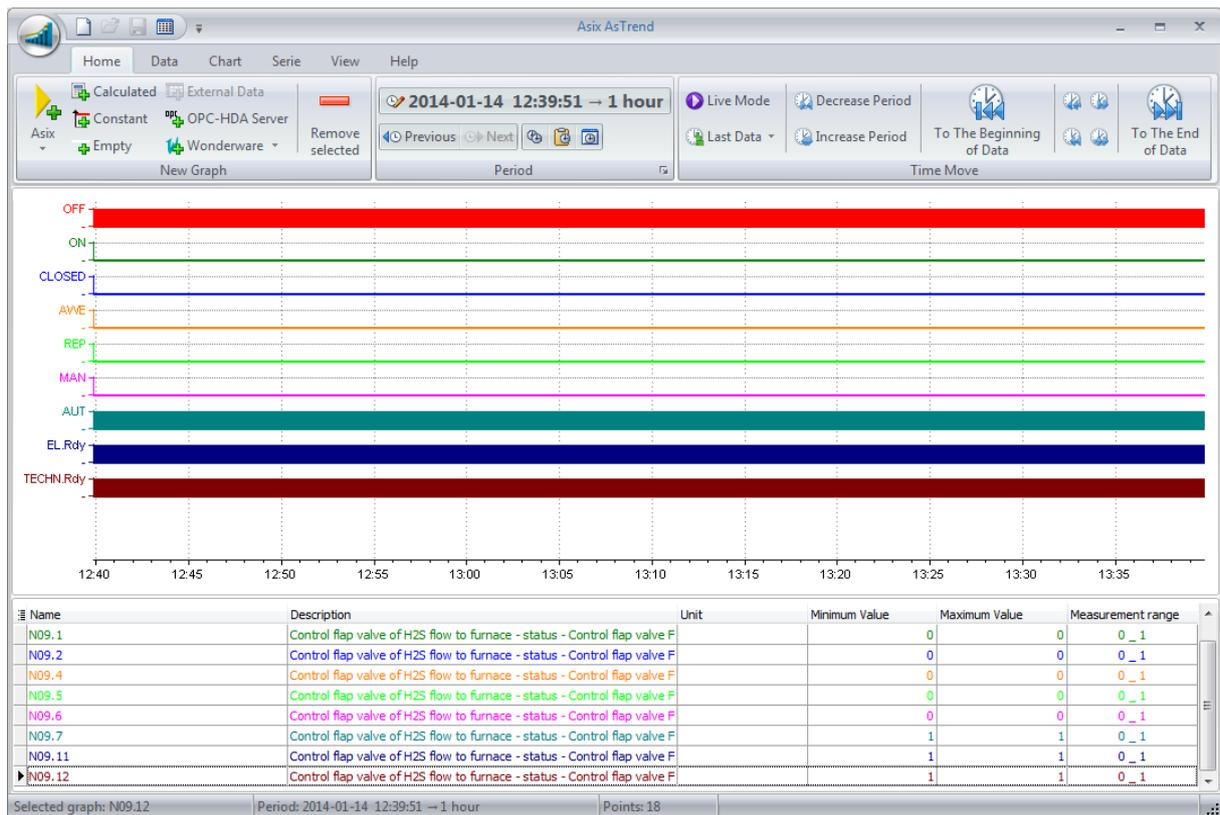


Fig. Chart of Variable Bits.

2.13.1.4 Adding an SQL Alarm

NOTICE:

Adding SQL alarms applies only to alarms the event archives of which are stored in SQL database (of classical as well as Asix.Evo applications). This requires that in addition to archiving in disk files the alarm events will archive in an SQL database.



If the variable definition database contains alarm definitions, the SQL alarms are

added to the trend by the windows **'Select Alarms'** run by the button  from: AsTrend main window > **Home** tab > **New Graph** group > **Asix** button.

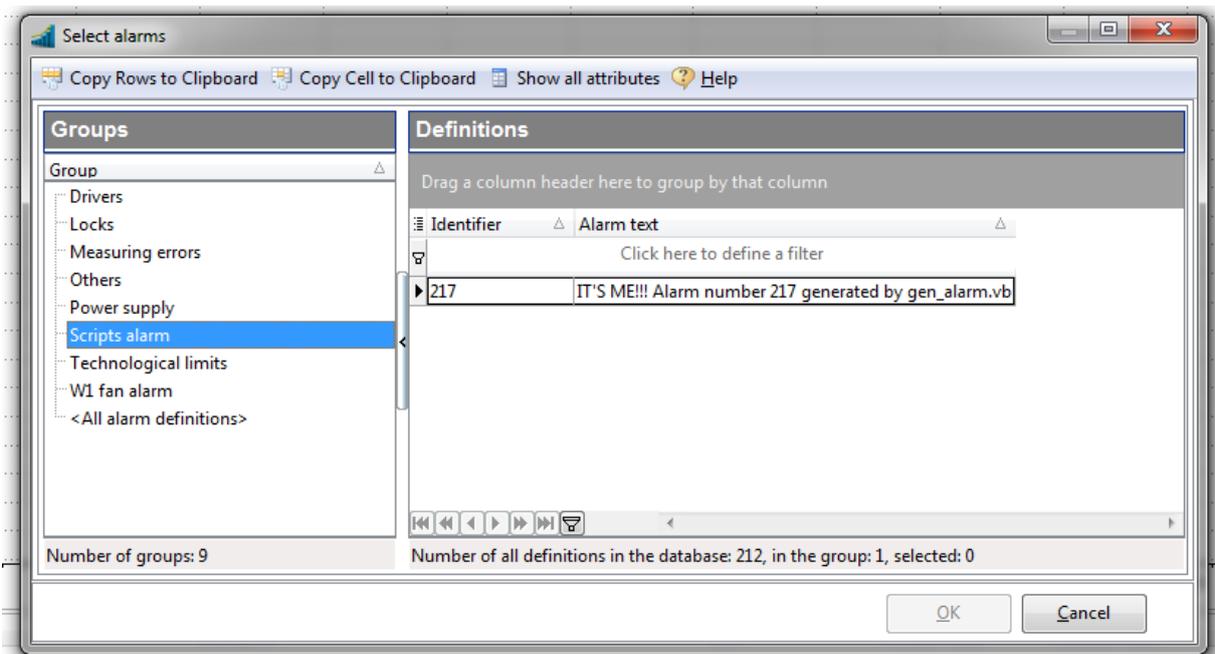


Fig. Adding SQL Alarms.

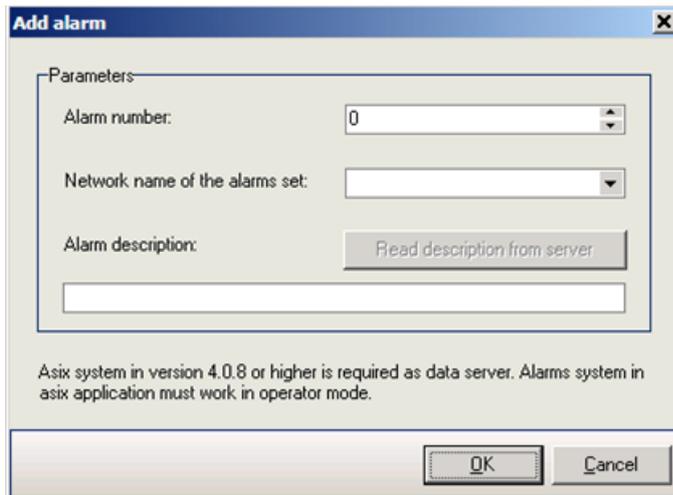
2.13.1.5 Adding an Alarm

AsTrend can retrieve alarm definitions directly from the Asix application or variable definition database (in MS SQL or MDB). It is recommended to store alarm definitions in the variable definition database - it makes it much easier to identify the alarm the graph of which is to be displayed in AsTrend.

NOTICE: Adding an alarm by the button  refers only to the alarms of classical Asix application.

NOTICE: For alarms of Asix.Evo applications use the option of adding alarms that are stored in the SQL database - see: the chapter [2.13.1.4 Adding an SQL Alarm](#).

 **If the variable definition database does not contain alarm definitions, the alarms are added to the trend by the windows 'Add Alarm' called by the button  from: AsTrend main window > *Home* tab > *New Graph* group.**



Add alarm

Parameters

Alarm number:

Network name of the alarms set:

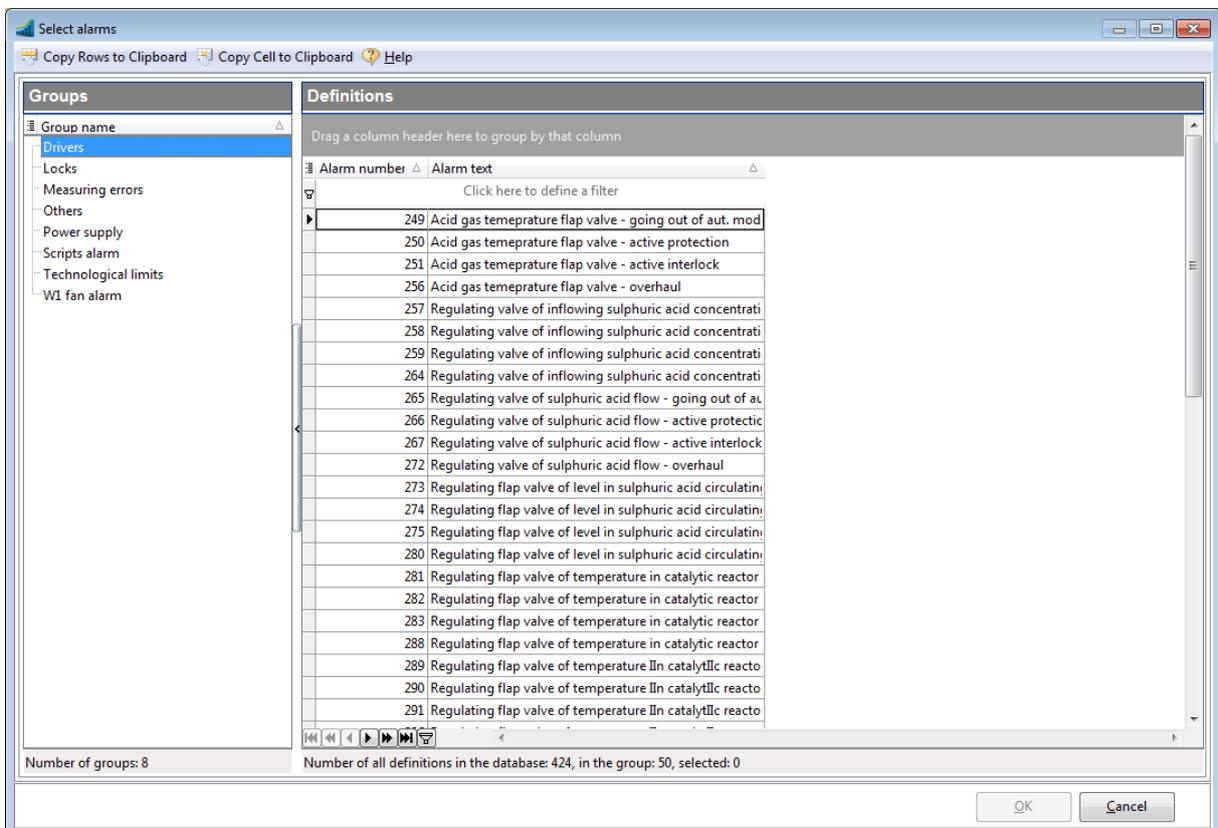
Alarm description:

Asix system in version 4.0.8 or higher is required as data server. Alarms system in asix application must work in operator mode.

Fig. The Window 'Add Alarm'.



If the variable definition database contains alarm definitions, the alarms are added to the trend by the windows **'Select Alarms'** called by the button  from: AsTrend main window > **Home** tab > **New Graph** group.



Select alarms

Copy Rows to Clipboard Copy Cell to Clipboard Help

Groups

- Group name
- Drivers
- Locks
- Measuring errors
- Others
- Power supply
- Scripts alarm
- Technological limits
- W1 fan alarm

Definitions

Drag a column header here to group by that column

Alarm number	Alarm text
249	Acid gas temperature flap valve - going out of aut. mod
250	Acid gas temperature flap valve - active protection
251	Acid gas temperature flap valve - active interlock
256	Acid gas temperature flap valve - overhaul
257	Regulating valve of inflowing sulphuric acid concentrati
258	Regulating valve of inflowing sulphuric acid concentrati
259	Regulating valve of inflowing sulphuric acid concentrati
264	Regulating valve of inflowing sulphuric acid concentrati
265	Regulating valve of sulphuric acid flow - going out of au
266	Regulating valve of sulphuric acid flow - active protectic
267	Regulating valve of sulphuric acid flow - active interlock
272	Regulating valve of sulphuric acid flow - overhaul
273	Regulating flap valve of level in sulphuric acid circulati
274	Regulating flap valve of level in sulphuric acid circulati
275	Regulating flap valve of level in sulphuric acid circulati
280	Regulating flap valve of level in sulphuric acid circulati
281	Regulating flap valve of temperature in catalytic reactor
282	Regulating flap valve of temperature in catalytic reactor
283	Regulating flap valve of temperature in catalytic reactor
288	Regulating flap valve of temperature in catalytic reactor
289	Regulating flap valve of temperature in catalytic reacto
290	Regulating flap valve of temperature in catalytic reacto
291	Regulating flap valve of temperature in catalytic reacto

Number of groups: 8 Number of all definitions in the database: 424, in the group: 50, selected: 0

Fig. The Window 'Select Alarms'.

2.13.1.6 Adding a Graph from the Clipboard

To make possible to add variables from the clipboard, it must contain the names of the variables in text format. Allowable separators of variable names there are: newline character, tab, comma, semicolon and the system list separator. Added variables must be defined in the currently opened variable definition database.



Variable names can be added to the clipboard as follows

- setting the mouse cursor over any object on the Asix application diagram and then press **Ctrl + C** (applies to the classic version of Asix; in the case of Asix.Evo you have to define the shortcut key, in particular **Ctrl+C**, performing the operator action **GetVarNames**),
- by selecting the command **Add Variable Names to Clipboard** from the variable selection window of the Architect program, in the local menu,
- by selecting the variable name from any text document and copying it to the clipboard.



The variable names stored in the variable definition database are added to the trend from the clipboard by using the command  from: AsTrend main window > **Home tab > **New Graph** group > the button .**

2.13.1.7 Adding a Variable from the Asix Archive File

To add a variable from the Asix archive file is to read the variable data exported in the AspadTools program into the AsTrend.



The Asix archive data are loaded into AsTrend by using the window **'Add Variables from an Asix archive file' loaded by the command  from: AsTrend main window > **Home** tab > **New Graph** group > **Remaining Graphs**.**

Description of the use of AspadTools is available by pressing the **Info** button in the window **'Add Variables from an Asix archive file'**.

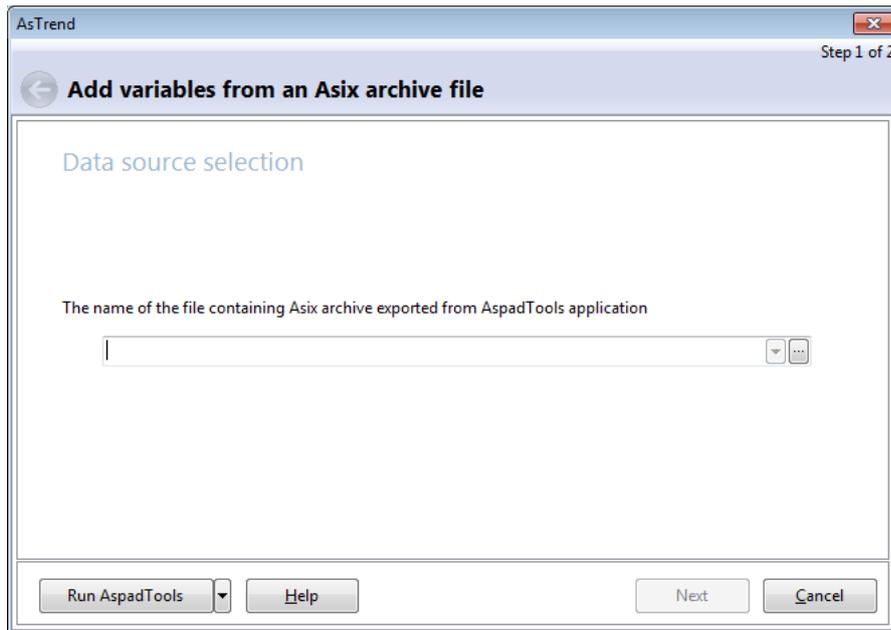


Fig. The Window 'Add Variables from an Asix Archive File'.

2.13.1.8 Adding a Calculated Variable

 **Graphs of data calculated from values of variables using specified expressions are added by the window 'Add Calculated Graph'** run by the command  from: AsTrend main window > **Home** tab > **New Graph** group.

The window contains tabs, so that the user can declare attributes of calculated graph and construct expression, according to which the variable data will be calculated.

 The tab **Calculating Algorithm** allows you to declare:

- **Aggregation of data calculated from raw samples;**
- **Read of data calculated from aggregated sample values;**
- **Aggregation of data calculated from aggregated sample values.**

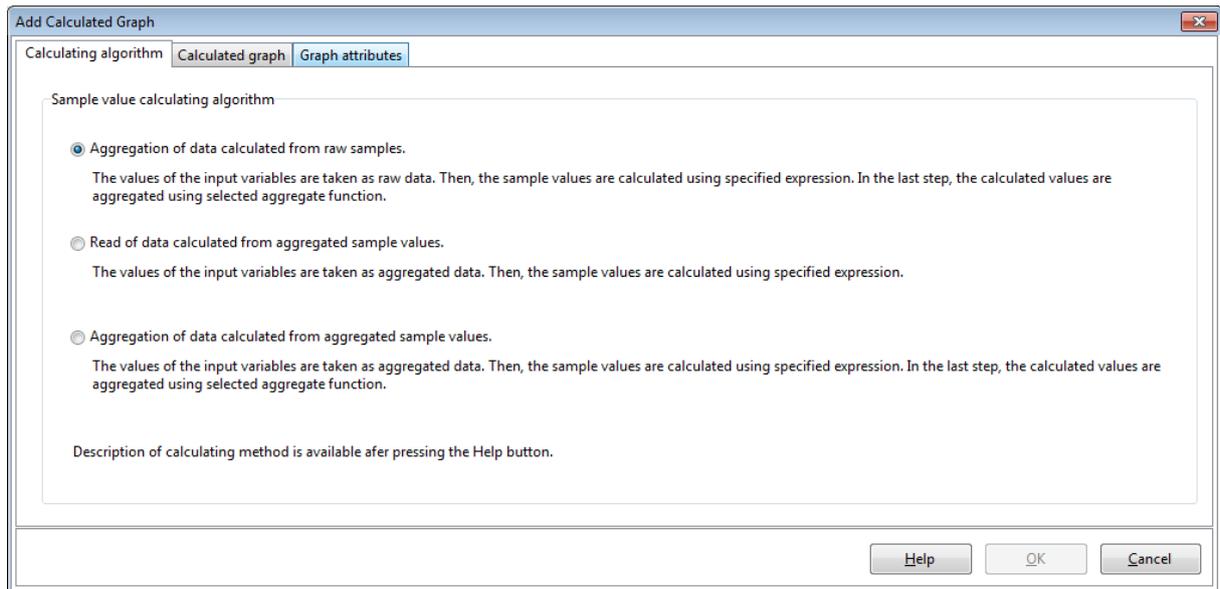


Fig. 'Add Calculated Graph' - Calculating Algorithm.

* * *



The tab **Calculated Graph** includes:

- **Expression** - expression to calculate the variable; to facilitate the construction of expressions, use the window activated by the button **Insert**;
- **Graph Data Type: Aggregated Data**:
 - **Aggregate Name**;
 - **Aggregate Calculating Interval**;
 - **Aggregate Timestamp**.
- **Expression Test** - verify the correctness of the expression by pressing the button **Check**; if the expression is correct, the window with the message "Correct" appears;
- **Input Variables** - enter the variables of variable definition database used to calculate the value points of calculated graph; the button  run the window **'Select Items'**; the button  displays the metric of selected variable; maximum number of variables used to calculate a graph equals 50.

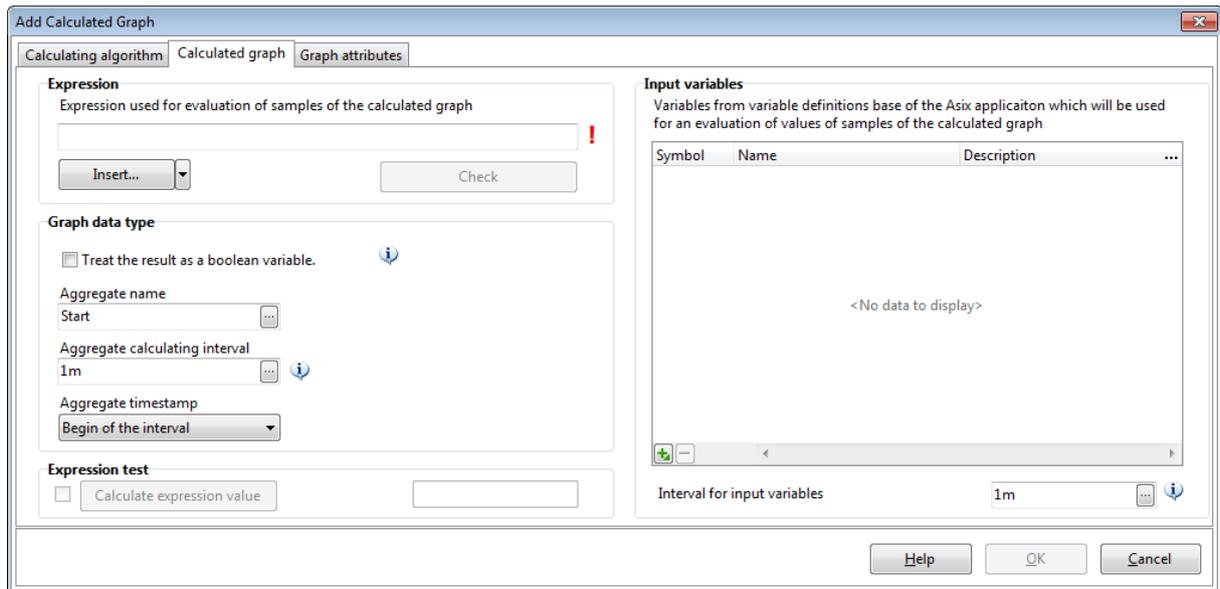


Fig. 'Add Calculated Graph' - Calculated Graph.



The tab **Graph Attributes** includes: the name, description, unit and range (measurement and display ranges of calculated variable);

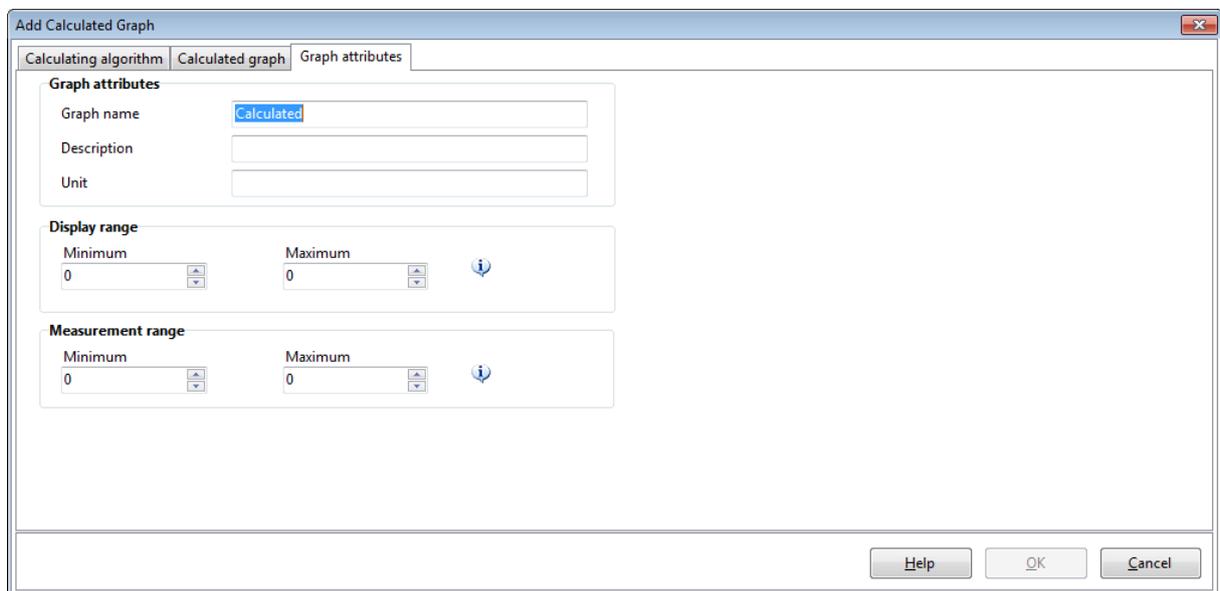


Fig. 'Add Calculated Graph' - Graph Attributes.

- **Display Range** - display range is used for scaling the physical axis and the axis of individual graph on *Many OY Axes* chart (notice: you have to set the options **Minimal Displaying Range** and **Maximal Display Range** as the minimum and maximum in the physical OY axis settings: AsTrend main window > **Chart** tab > **Axes** group >

'*Trend Axes Options*' window activated by the button  > *Physical OY Axis* tab). The range 0-0 means the absence of display range - then the physical axis range will be calculated based on the current values of the samples.

Notice: for scaling physical axis the display ranges of all the graphs are taken into account, for example: minimum can be set on the basis of the least one from minimal values defined for graphs and maximum on the basis of the highest one from maximal values. If not all of the graphs have ranges defined, the range is determined automatically.

- *Measurement Range* - measurement range is used for checking correctness of graph sample values; the values of samples that exceed the graph range by the number equal to the graph range are cut off. The range 0-1 for total value Asix system variable means that the variable is treated as a binary value.

The measurement range may also be used for scaling the physical axis (notice: you have to set the options *Minimal Measurement Range* and *Maximal Measurement Range* as the minimum and maximum in the physical OY axis settings: AsTrend main window > *Chart* tab > *Axes* group > '*Trend Axes Options*' window activated by the button  > *Physical OY Axis* tab).

Notice: for scaling physical axis the measurement ranges of all the graphs are taken into account, for example: minimum can be set on the basis of the least one from minimal values defined for graphs and maximum on the basis of the highest one from maximal values. If not all of the graphs have ranges defined, the range is determined automatically.

2.13.2 Adding a Constant

It is possible to put into the chart constant value displayed as a horizontal line or an area.

 **The constant is added by** the command  from: AsTrend main windows > *Home* tab > *New Graph* group > *Remaining Graphs*.

The window '*Add Constant Graph*' includes the following tabs with constant attributes:



The tab **Value** allows you to declare a constant value:

- **Expression** - expression to calculate the value of a constant; to make it easier use the window of the library with functions, operators and constants, activated by the button **Insert...;**
- **Expression Test** - check expression syntax by pressing the button **Check;** if the syntax is correct, the window with the message "Correct" will appear;

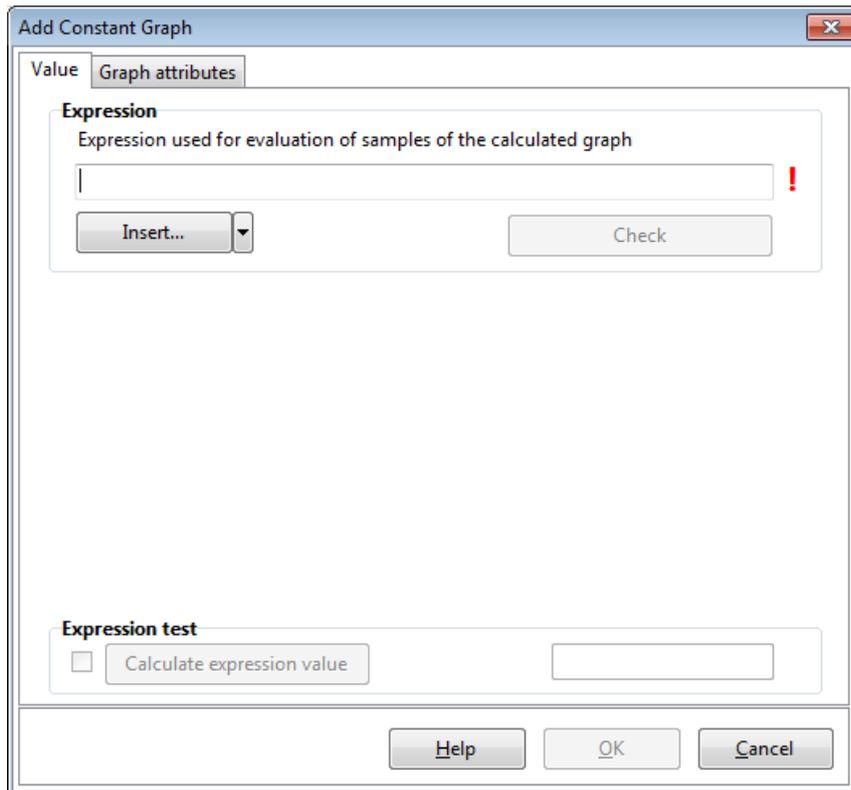


Fig. The Window 'Add Constant Graph' - the 'Value Labels' Tab.



The tab **Graph Attributes** allows you to specify basic attributes of a constant:

- **Graph Name** - name of a constant;
- **Description** - description of a constant;
- **Unit** - unit of a constant;
- **Display Range** - display range is used for scalling the physical axis and the axis of individual graph on *Many OY Axes* chart (notice: you have to set the options **Minimal Displaying Range** and **Maximal Display Range** as the minimum and maximum in the physical OY axis settings: AsTrend main window > **Chart** tab > **Axes** group >

'*Trend Axes Options*' window activated by the button  > *Physical OY Axis* tab). The range 0-0 means the absence of display range - then the physical axis range will be calculated based on the current values of the samples.

Notice: for scaling physical axis the display ranges of all the graphs are taken into account, for example: minimum can be set on the basis of the least one from minimal values defined for graphs and maximum on the basis of the highest one from maximal values. If not all of the graphs have ranges defined, the range is determined automatically.

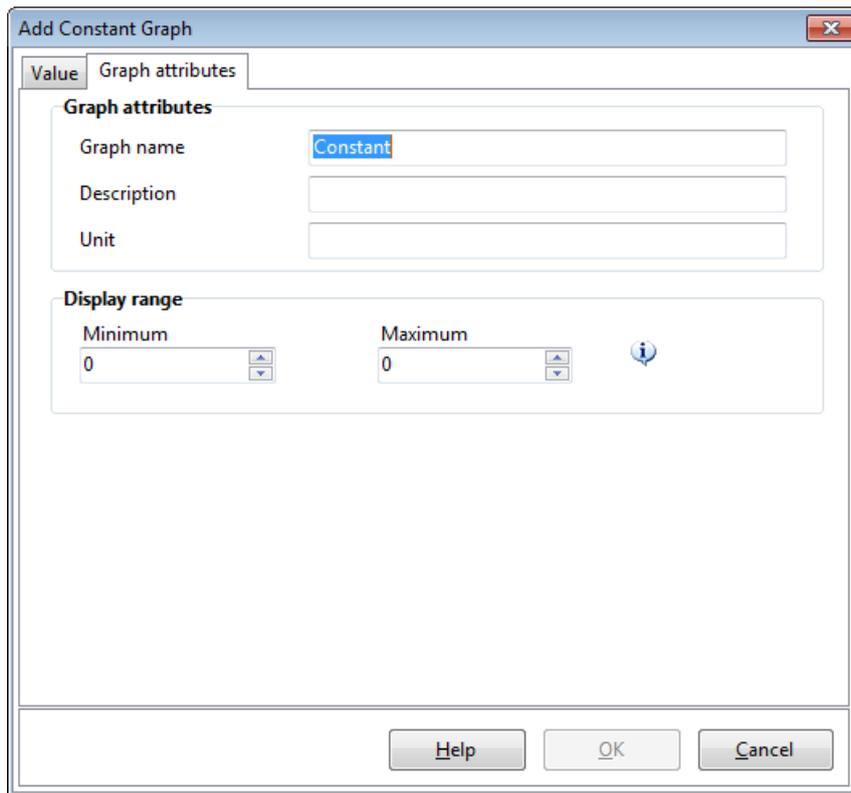


Fig. The Window 'Add Constant Graph' - the 'Attributes' Tab.

2.13.3 Adding a Variable from External Data Source

In AsTrend, there is the possibility to display charts of variables the values of which are retrieved from external data source (CSV, XLS files, as well as resources accessible by OLE DB: MSSQL, Access databases), on condition the database structure allows readout of all data in systematic manner.



You can add variables form external source with use of the command *External Data* from: 

AsTrend > **Home** tab > **New Graph** group > **Remaining Graphs**.

- **Format** - format zewnętrznego źródła danych:
 - **Plik tekstowy**,
 - **plik programu Microsoft Excel**,
 - **OLE DB**.

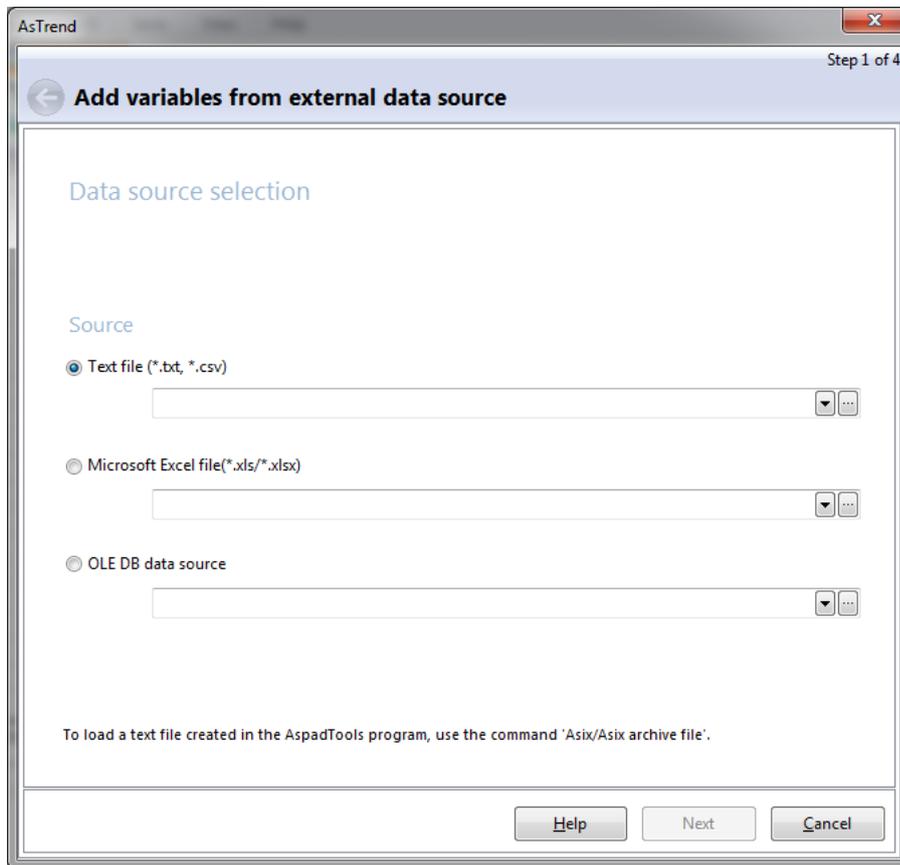


Fig. The Window 'Add Variables from External Data Source'.

Description of external source data format is available by pressing the button **Help** from the window **'Add Variables from External Data Source'**.

2.13.4 Adding a Data from OPC-HDA Server

 **Add a data from OPC-HDA server** by the command  **OPC-HDA Server** from: AsTrend main window > **Home** tab > **New Graph** group > **Remaining Graphs**.

2.13.5 Adding a Graph from an AsBase Database

There is the possibility in AsTrend to display graphs of variable values retrieved from the fields of logging archives of AsBase.

When you select a server and database of AsBase you are ready to choose the graph variable by the command  **AsBase** (from AsTrend > *Home* tab > *New Graph* group).

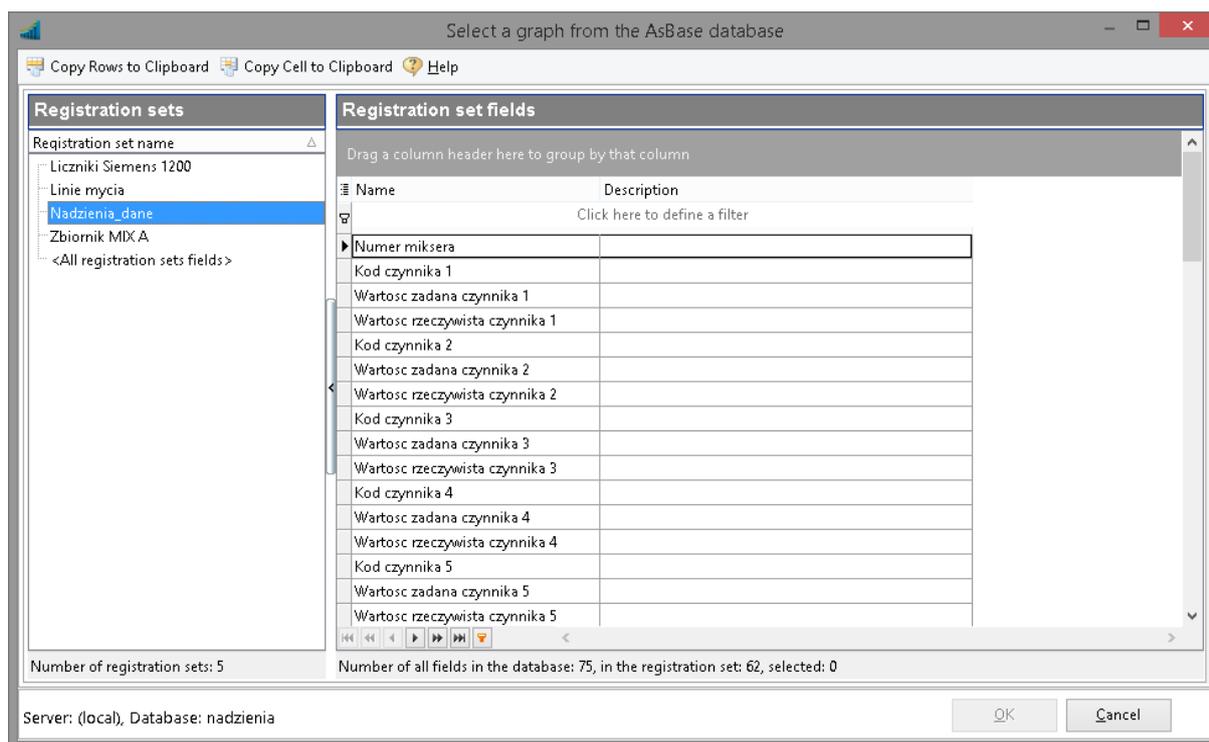


Fig. Adding a Graph from an AsBase Database.

2.13.6 Adding a Variable from an AsLogger Database

There is the possibility in AsTrend to display graphs of variable values retrieved from the logging plan of AsLogger.

When you select a server and database of AsLogger you are ready to choose the graph variable by the command  **AsLogger** (from AsTrend > *Home* tab > *New Graph* group).

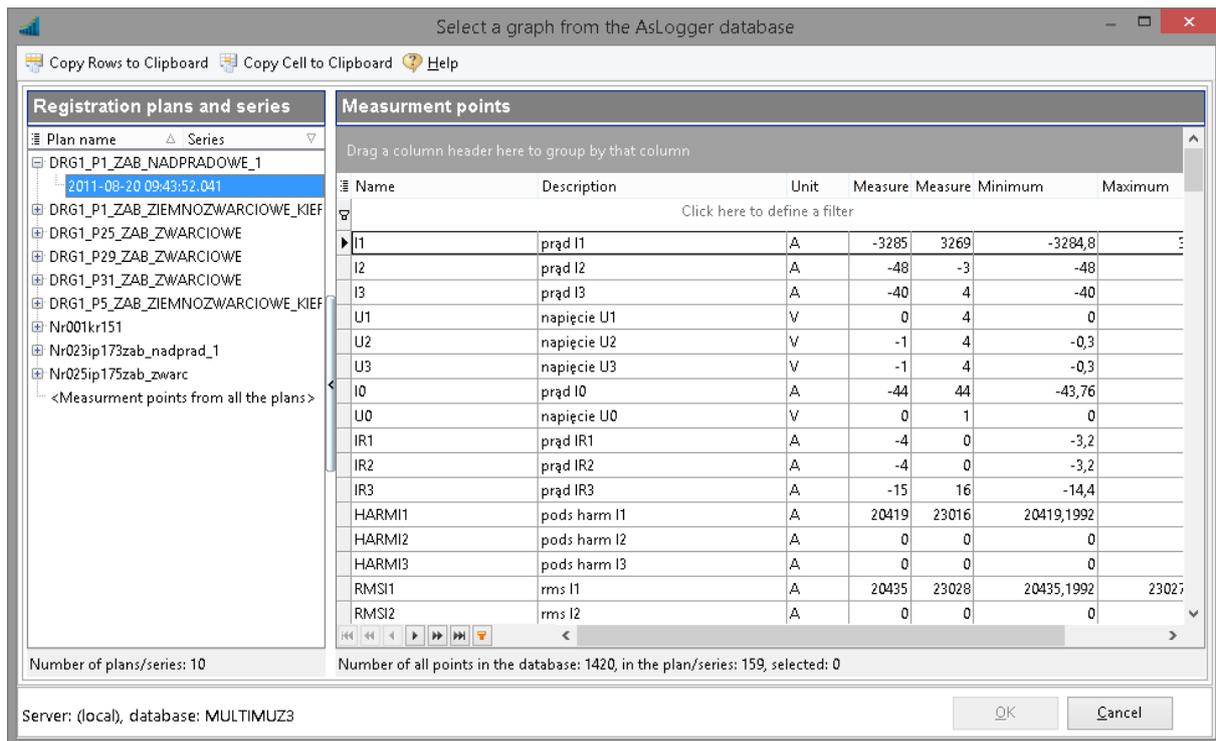


Fig. Adding a Graph from an AsLogger Database.

2.13.7 Adding an Empty Graph

 **Add an empty graph** by the command  **Empty Graph** from: AsTrend main window > **Home** tab > **New Graph** group > **Remaining Graphs**.

An empty graph is used as a separator in the legend and in the table of historical data.

2.14 Selecting the Data Type (Genuine/Aggregated Data)

AsTrend provides the following types of data:

- intervals between measurements are the same as in the archive (imposed by the backup program) - **genuine data**;
- data is always aggregated and the time intervals between successive samples are identical (enforced by AsTrend) - **uniform data**;
- intervals between measurements are enforced automatically by AsTrend depending on the length of the period for which **averaged data** and **approximated data** (minimum and maximum values) are calculated.

 The default type is - **genuine data**. The **genuine data is switched on by** the button  from: AsTrend main window > **Data** tab > **Input Data** group.

The advantage of this type is that for row data the chart points have time moments of real measurements.

 The **uniform data is switched on by** the button  from: AsTrend main window > **Data** tab > **Input Data** group. This type forces constant distance between points on the graph - it may result in adding or removing certain measurements. As the result, however, you receive the same sampling times for all variables, which facilitates comparison of variables and is particularly valuable when displaying the trend in the form of a table of values (all graphs in the table have the same number of rows).

To set own sampling period (interval between successive samples) use the option **Uniform Data - Sampling Period** from: AsTrend main window > **Data** tab > **Input Data** group > **'Trend Input Data Options'** window run by the button  > **Data** tab.

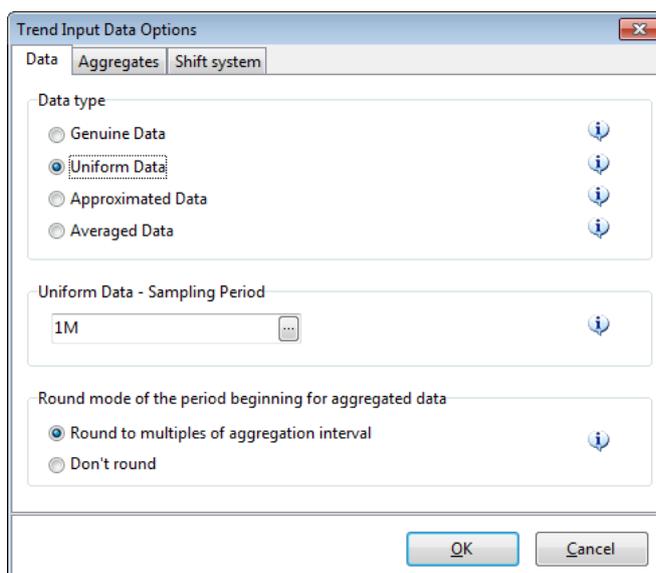


Fig. Thw Window 'Trend Input Data Options' - 'Data' Tab.

 The **approximated data** or **averaged data** are **switched on** by the buttons:  **Averaged** or  **Approximated** (AsTrend main window > **Data** tab > **Input Data** group, or in the window '**Trend Input Data Options**' run by the button  from: **Data** tab > **Input Data** group.

Averaged data:

For short periods of time genuine data is retrieved, for long periods aggregated data (averaged data) is retrieved.

The moment of change-over from genuine data to aggregated data as well as aggregation period (sampling period) are adjusted automatically.

This mode is mainly used to view data from a long time period. The archive should store pre-calculated averaged values of measurements to ensure their quick retrieval.

Approximated data:

For short periods of time genuine data is retrieved, for long periods two aggregated data sets (of minimum and maximum values) are retrieved.

The moment of change-over from genuine data to aggregated data as well as aggregation period (sampling period) are adjusted automatically.

This mode is mainly used to view data from a long time period. The archive should store pre-calculated values of aggregated data (minimum and maximum) to ensure their quick retrieval.

Approximated values are plotted as a HighLow graph, which consists of two curves representing the minimum and maximum values. The area between the curves is filled with a graph colour. Thanks to that all the extreme values of measurements are always visible on the chart.

 The uniform, averaged and approximated data are calculated by the Asix system server with the use of the Aggregator module. Thus AsTrend reads the aggregated data rather than calculate it from raw values.

2.14.1 Selecting the Aggregation Function for Data Reading

You can select the aggregation function for data reading.

 **The choice of the aggregation function for data reading can be performed in the window 'Graph Options' (AsTrend main window > Graph tab > Graph group > run the window 'Graph Options' pressing the button ).**

Aggregated data can be calculated by the Asix system server with the use of the Aggregator module. Thus AsTrend can read the aggregated data rather than calculate it from raw values - thanks to this solution the aggregated data - which the user is interested in - is delivered in a timely and efficient manner. (See: [1.8 Aggregation of Asix System Data](#)).

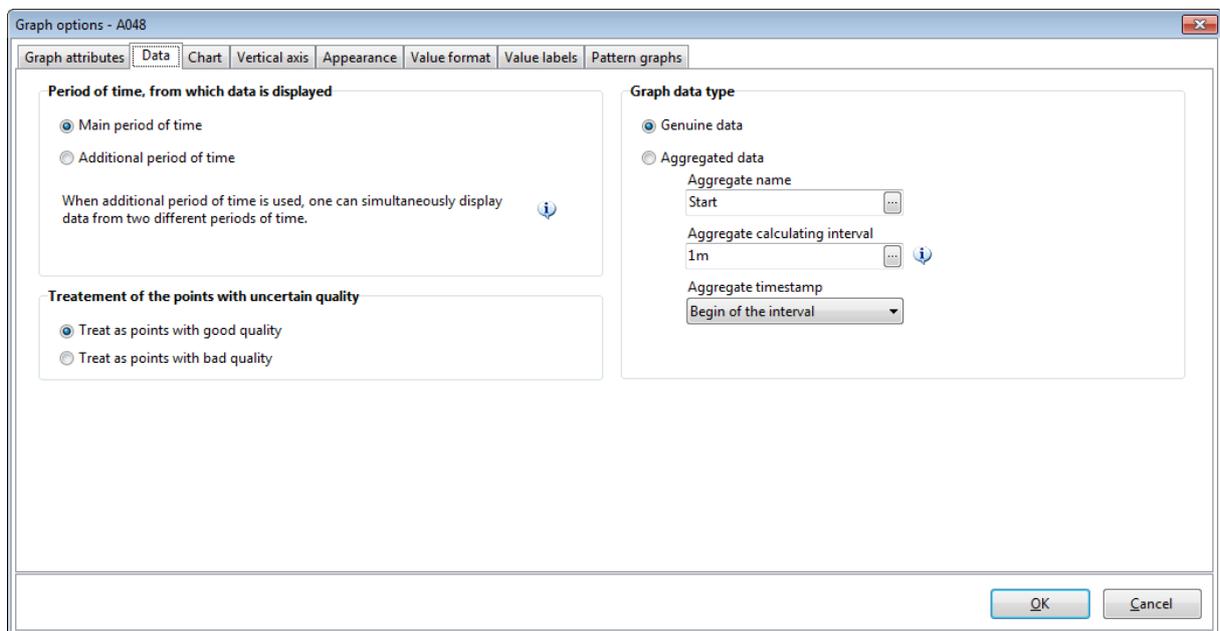


Fig. The Window 'Graph Options' - the 'Data' Tab.

2.15 Setting Time Period

2.15.1 Setting Time Period Using Trend Moving Buttons

Trend moving buttons:



Backward/Forward By Period - move horizontally by one current period,



Backward/Forward - move horizontally by quarter of the current period,



Decrease/Increase Period - reduce / enlarge a period by the successive pre-defined AsTrend periods,



To the End of Data - move up to the current time data or the end of external data,

and



Live Mode - start the data logging mode,

automatically change trend period.

2.15.2 Setting Time Period Using Period Editor

You can set a time period with use of period editor activated from: AsTrend main window >

Home tab > **Period** group > the field

 2014-01-20 09:47:53 → 1 hour

The user can:

- select pre-defined period,
- set own period.

Setting the base date needs: a data, period length and "data position" in relation to the period.

The 'Period' window supply the user with pre-defined period lengths. Smaller time units are available when you displayed a very short period of time.

- 5 milliseconds,
- 10 milliseconds,
- 20 milliseconds,
- 50 milliseconds,

AsTrend

- 100 milliseconds,
- 200 milliseconds,
- 500 milliseconds,
- 1 second,
- 2 seconds,
- 5 seconds,
- 10 seconds,
- 15 seconds,
- 30 seconds,
- 1 minute,
- 2 minutes,
- 5 minutes,
- 10 minutes,
- 15 minutes,
- 30 minutes,
- 1 hour,
- 2 hours,
- 4 hours,
- 8 hours,
- 12 hours,
- 1 day,
- 2 days,
- 4 days,
- 7 days,
- 14 days,
- 1 month,
- 2 months,
- 3 months,
- 6 months,
- 1 year.

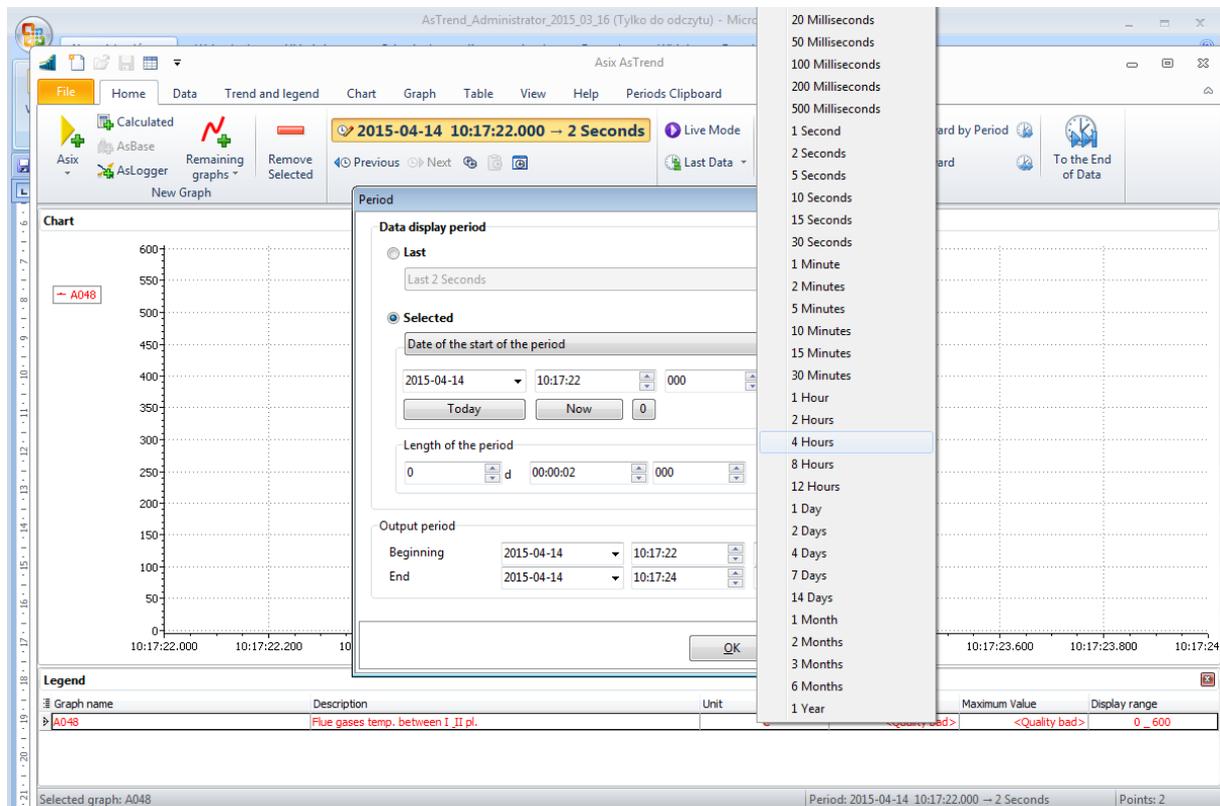


Fig. The Window of Time Period Editor.

2.15.3 Setting Time Period Using the Period Clipboard

Trend period may also be retrieved from any trend stored in the Period Clipboard. See the [2.35 Period Clipboard](#) section for description of the Periods Clipboard.

2.15.4 Setting Time Period Opening a Trend Definition

Each time a trend definition is loaded, trend period is changed to the one stored within the definition in accordance with the following option:

AsTrend main window > *Home* tab > *Period* group > the window '*Period Options*' run by the button .

Possible settings of automated period loading:

- *Like during write,*
- *Period end equals now,*
- *Current day, time without change,*
- *Last used,*
- *Set in OPC format,*
- *The newest series in an AsLogger database,*
- *Ask me.*

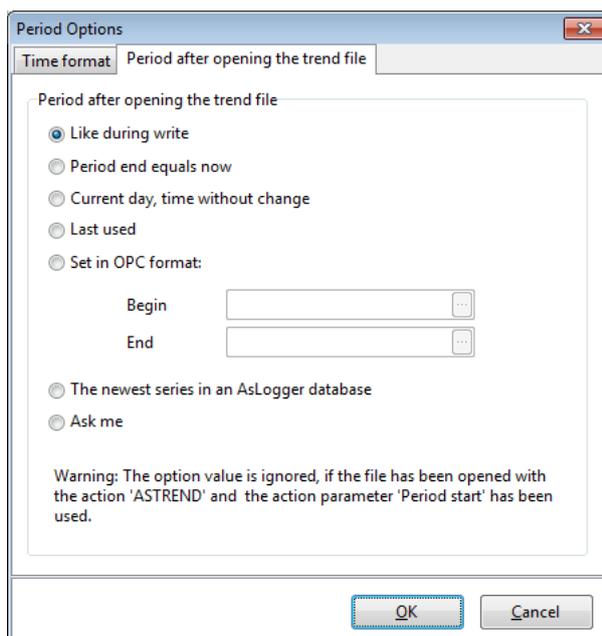


Fig. The Window 'Trend Period Options'.

2.15.5 Setting Time Period Using the Mouse

Movement of mouse roller causes moving the period forward/backward.

Movement of mouse roller with pressed **Ctrl** key causes changing the period span.

Movement of mouse roller with pressed **Shift** key causes fast movement of the period.

It is also possible to change a time period if you drag and drop the time axis by the mouse.

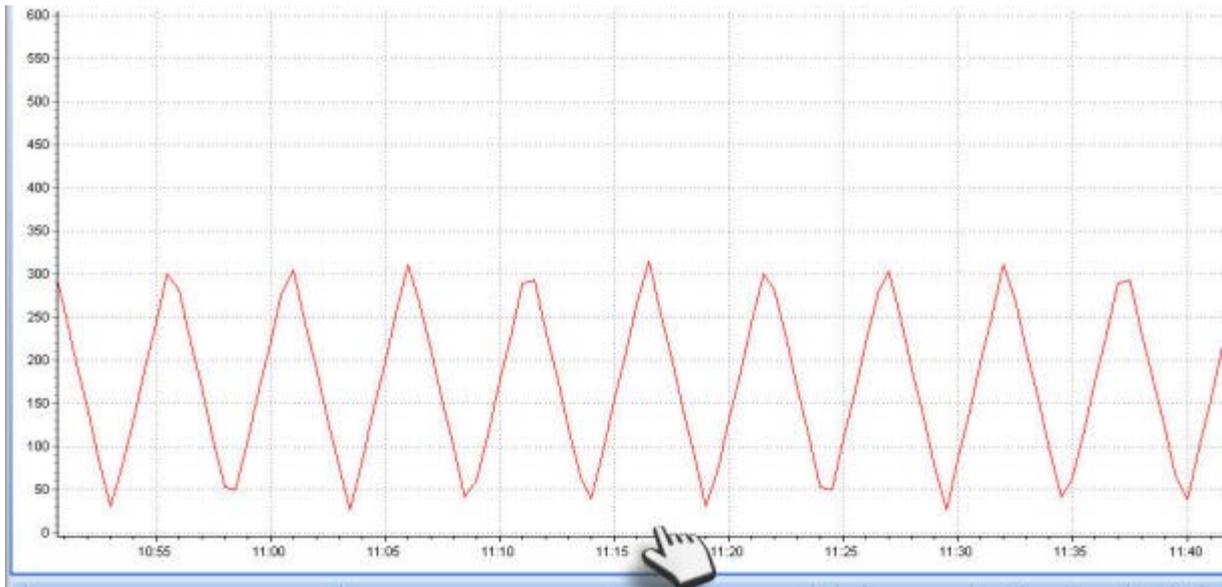


Fig. Setting a Time Period by the 'Drag & Drop' Method.

2.15.6 OPC Time Editor

The time period after opening the trend file can be expressed in OPC format, defined in:

AsTrend main window > **Home** tab > **Period** group > the window **'Period Options'** run by the button .

Clicking on the button  in fields: **Begin**, **End** run the editor.

Beginning of relative time has the following pre-defined items:

- *Current moment;*
- *Beginning of the current second;*
- *Beginning of the current minute;*
- *Beginning of the current hour;*
- *Beginning of the current day;*

- Beginning of the current week;
- Beginning of the current month;
- Beginning of the current year;
- Beginning of the current shift;

'Beginning of the current shift' refers to shifts beginning at 6:00 AM or 2:00 PM or 10:00 PM.

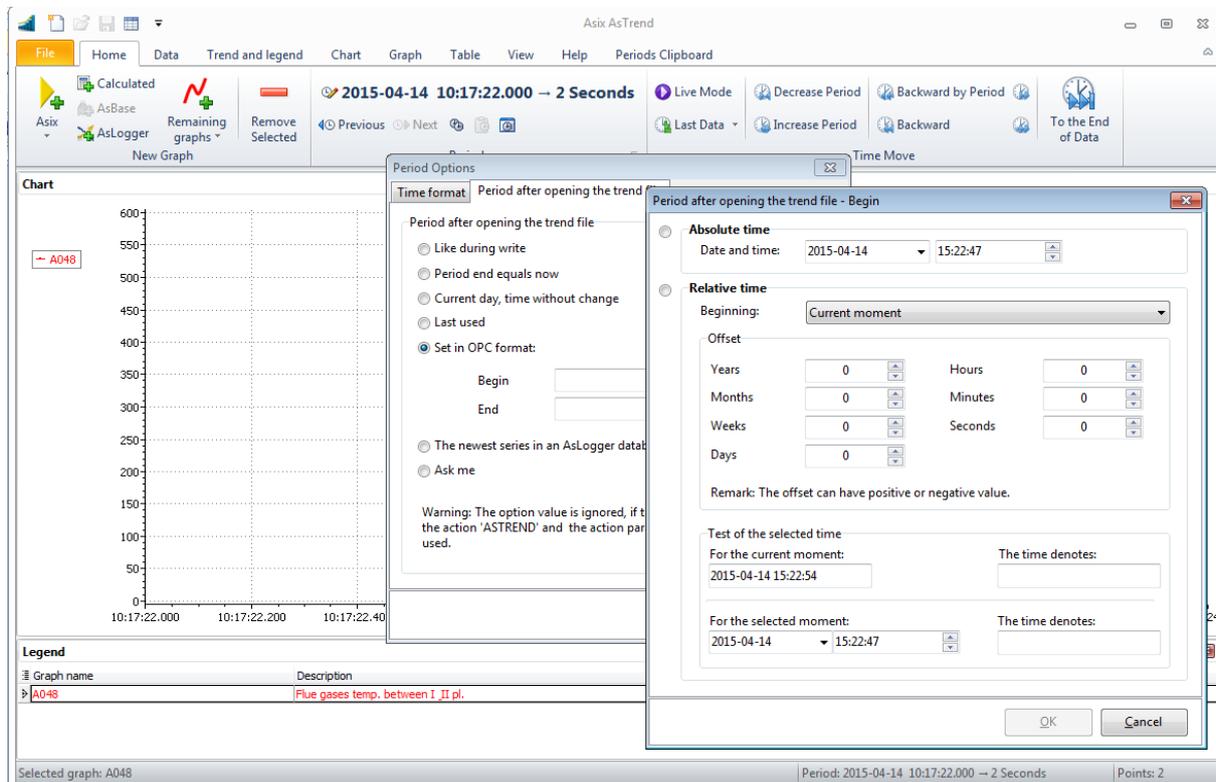


Fig. OPC Time Editor.

2.15.7 Setting the Length of Data Display Period

The length of data display can be set using the buttons on the *Home* tab > *Time Move* group:



Decrease Period - decrease period to the span determined by the consecutive default periods defined in AsTrend;



Increase Period - increase period to the span determined by the consecutive default periods defined in AsTrend.

The second way is to define its own length of time using the window *'Period'* displayed by clicking on the field with the current period displayed on the *Home* tab > *Period* group.

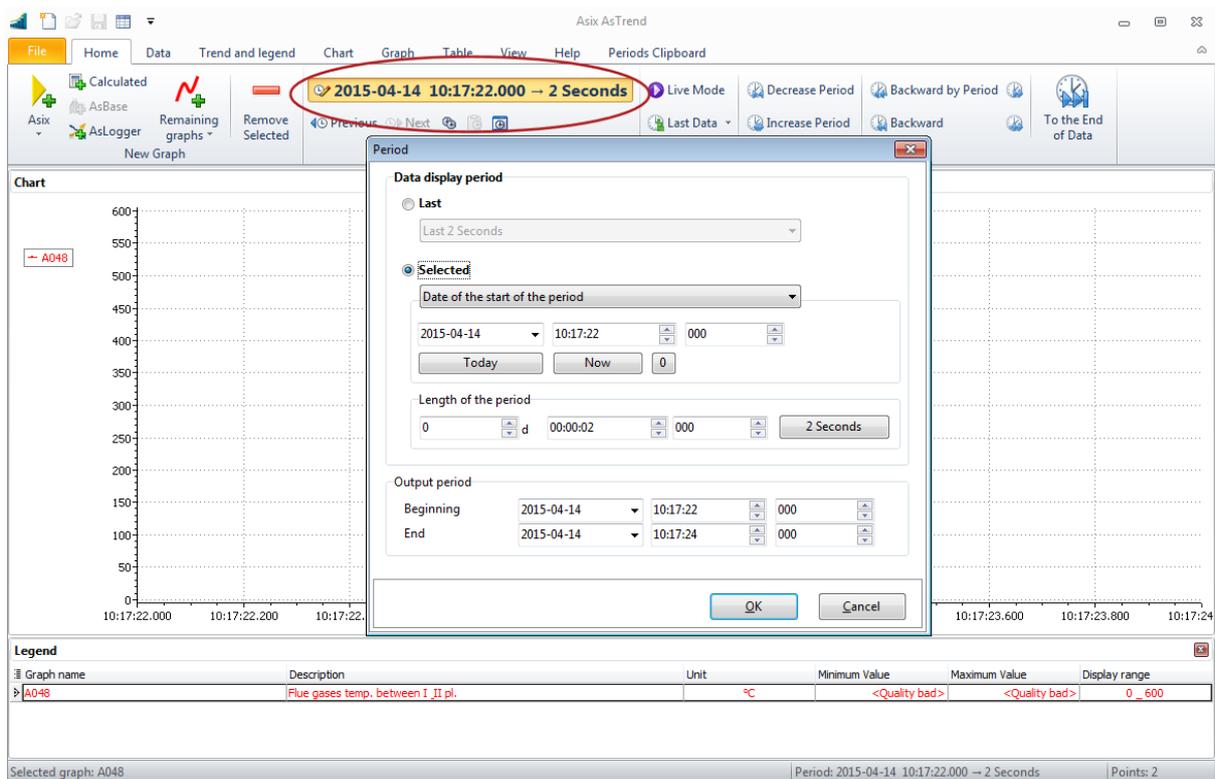


Fig. Data Display Period Defining Window.

2.16 Displaying Aggregated Data Based on Data of Currently Displayed Period

In AsTrend there is the possibility to display aggregated data in the fields of legend (the list of fields of data aggregated by specific functions - see: [2.10 Operations in the Legend Area](#)). Aggregated data is calculated by AsTrend locally **based on data of chart graph displayed within a set time period** (regardless of data type: genuine, uniform, approximated, averaged).

The additional reading line gives the possibility to separate **any time interval within the chart time period, for which aggregated data will be calculated** and then displayed in the legend fields (if reading lines are off the legend fields display aggregated data calculated for the whole displayed time period).

2.16.1 Displaying Data with Time Stamps of Millisecond Resolution



If you use the option *Enable Support of Short Time Periods* (AsTrend main window > Home tab > Period group > the window *'Trend Period Options'* run by the button ) the chart will be switched over to raw data (if aggregation period is below 1 minute) for data with time stamps of millisecond resolution (data from Asix or external sources). Then, the window *'Period'* run from the button

 2011-07-28 10:37:11 → 2 godziny

has the following pre-defined time period:

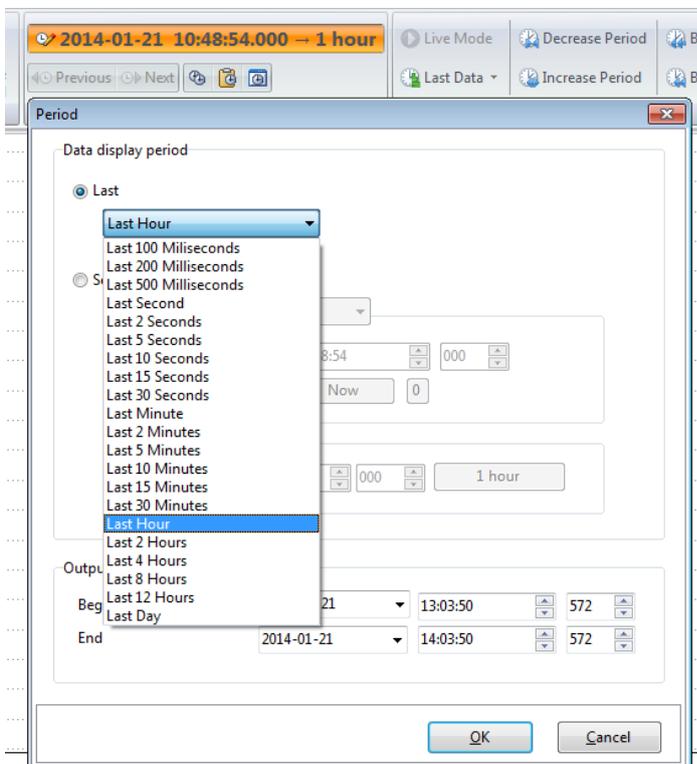


Fig. Pre-Defined Time Periods for Data with Time Stamps of Millisecond Resolution.

2.17 Setting Additional Time Period

Various fragments of a chart of one variable (charted for different time periods) or the charts of different variables may be compared on a screen. This possibility is achieved by an additional time axis that may be turned on for one of the to-be-compared charts.

When at least one graph uses an additional time period:

- second OX axis appears over the graph;
- the ability to edit the second time period appears in the period editor window.

When only one graph uses the additional time period, the additional time axis is displayed in the colour of this graph.

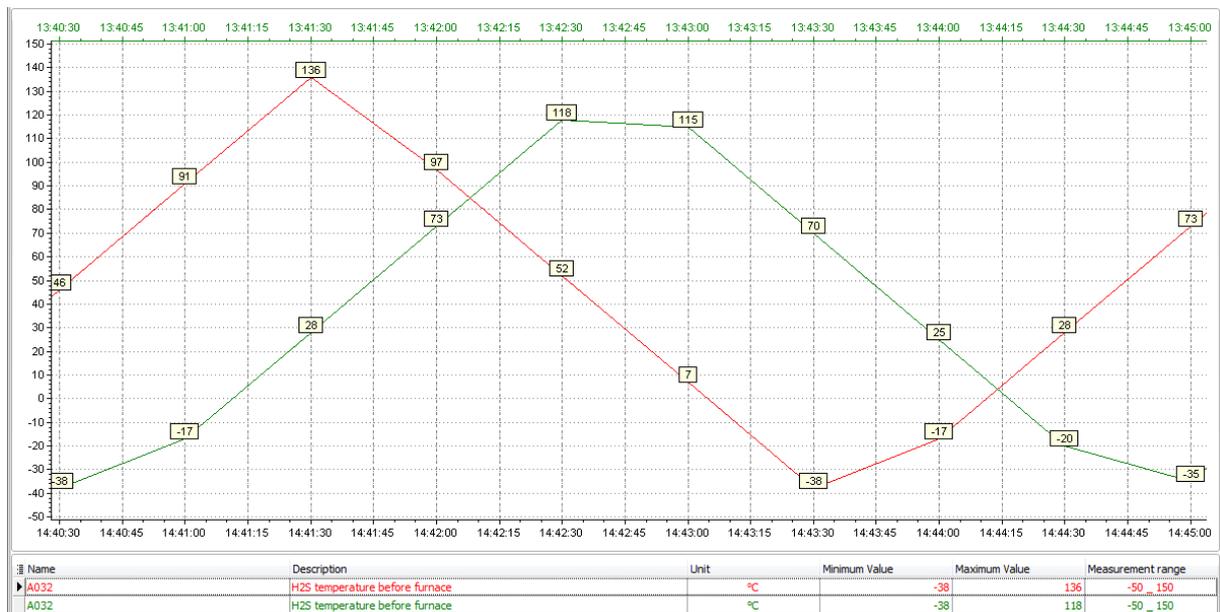


Fig. Chart with Additional Time Axis.



An additional time axis is activated for a selected graph by the button  from: AsTrend main window > **Graph** tab > **Graph** group.



Time format of additional time axis is defined in: AsTrend main window > **Home** tab > **Period** group > the window '**Period Options**' run by the button .

The standard format is "yy-mm-dd" for periods longer than a day; and the format "hh:mm" for other cases. There is also the possibility of using other formats or defining own format.

The following pre-defined formats are possible:

- yy-mm-dd hh:mm:ss
- yy-mm-dd hh:mm
- yy-mm-dd hh
- yy-mm-dd

- yy-mm
- mm-dd hh:mm:ss
- mm-dd hh:mm
- mm-dd hh
- mm-dd
- dd hh:mm:ss
- dd hh:mm
- dd hh
- hh:mm:ss
- hh:mm
- mm:ss

Its own format the user can enter directly into the fields: **Main Time Axis** or **Additional Time Axis**, e.g. yy*mm*dd.

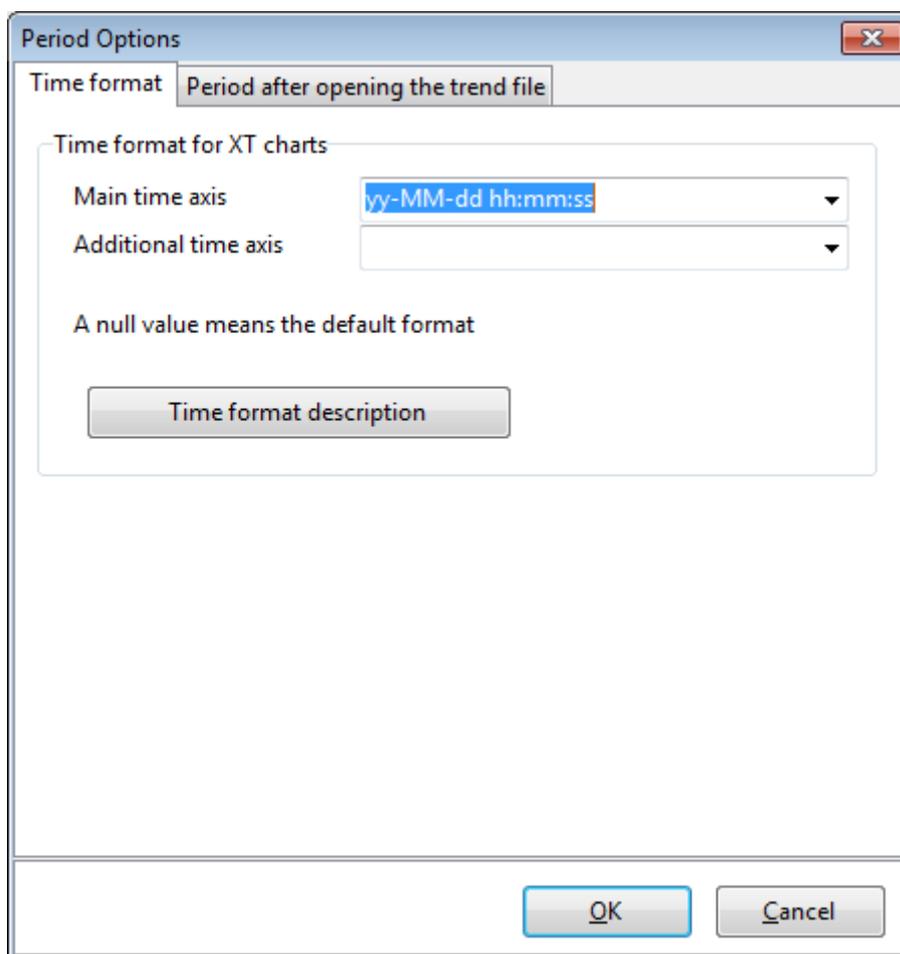


Fig. The Window 'Time Axes Options'.



Time for additional time axis is set by the button



which run the window **'Period'** (AsTrend main window > **Home** tab > **Period** group). The beginning of period of additional time axis is set by **Offset to Main Time Axis** or **Absolute or Relative Moment of Time**.

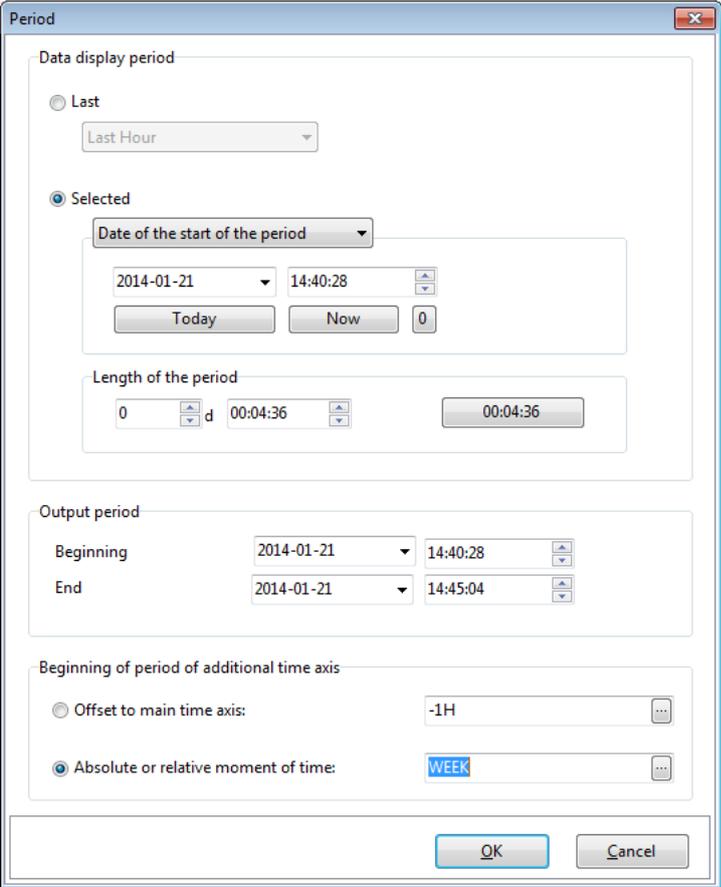


Fig. The Window for Setting Time Period for Main and Additional Time Axis.

2.18 Setting the Chart Type Depending on the Axes Type

 **One OY Axis** chart is set by the button  from: AsTrend main window > **Chart** tab > **Axes** group.

By default, a trend has *One OY Axis* chart set up.

 **Proportional Axis** chart is set by the button  from: AsTrend main window > **Chart** tab > **Axes** group.

 **Many OY Axes** chart is set by the button  from: AsTrend main window > **Chart** tab > **Axes** group.

The vertical axis on the left side of the chart - use the button  from: AsTrend main window > **Graph** tab > **Graph** group.

The vertical axis on the right side of the chart - use the button  from: AsTrend main window > **Graph** tab > **Graph** group.

 **Many OY Axes - Stack** chart is set by the button  from: AsTrend main window > **Chart** tab > **Axes** group.

Additionally, it is possible to display two adjacent variables (graphs) on one common chart (with common OX axis and two OY axes). It is useful when area of the chart should be organized for better legibility or when two graphs should be quickly correlated. Such a chart is described by two OY axes put on the left and right side of the chart. Two adjacent variables from the legend are charted on one common chart if each of them has the option **Axis on the left or right side** turned on (AsTrend main window > **Graph** tab > **Graph** group > the window '**Graph Options**' run by the button ).

The vertical axis in the same line as the axis of the previous graph - use the button  from: AsTrend main window > **Graph** tab > **Graph** group.

The vertical axis in the same line as the axis of the previous graph - use the button  from: AsTrend main window > **Graph** tab > **Graph** group.

The vertical axis on the left side of the chart - use the button  from: AsTrend main window > **Graph** tab > **Graph** group.

The vertical axis on the right side of the chart - use the button  from: AsTrend main window > **Graph** tab > **Graph** group.

 **XY Chart** is set by the button  from: AsTrend main window > **Chart** tab > **Axes** group.

Switching to a chart with time OX axis is performed by the button  **XT Chart**.

The contents of labels on the *XY Chart* is set by the option **Labels on XY Chart** from: AsTrend main window > **Chart** tab > **Chart Type** group > the window '**Trend Options**' run by the button .

NOTICE: The parameter for the content of displayed labels has to be defined for a variable which is first in the legend.

 **X Chart** is set by the button  from: AsTrend main window > **Chart** tab > **Axes** group.

2.19 Setting the Chart Type Depending on the Graph Type/Form

2.19.1 Linear Chart

The linear chart is the most common (and default) chart type.

 The linear chart is set by the button  from: AsTrend main window > **Graph** tab > **Graph** group.

The chart can be displayed in 3D.

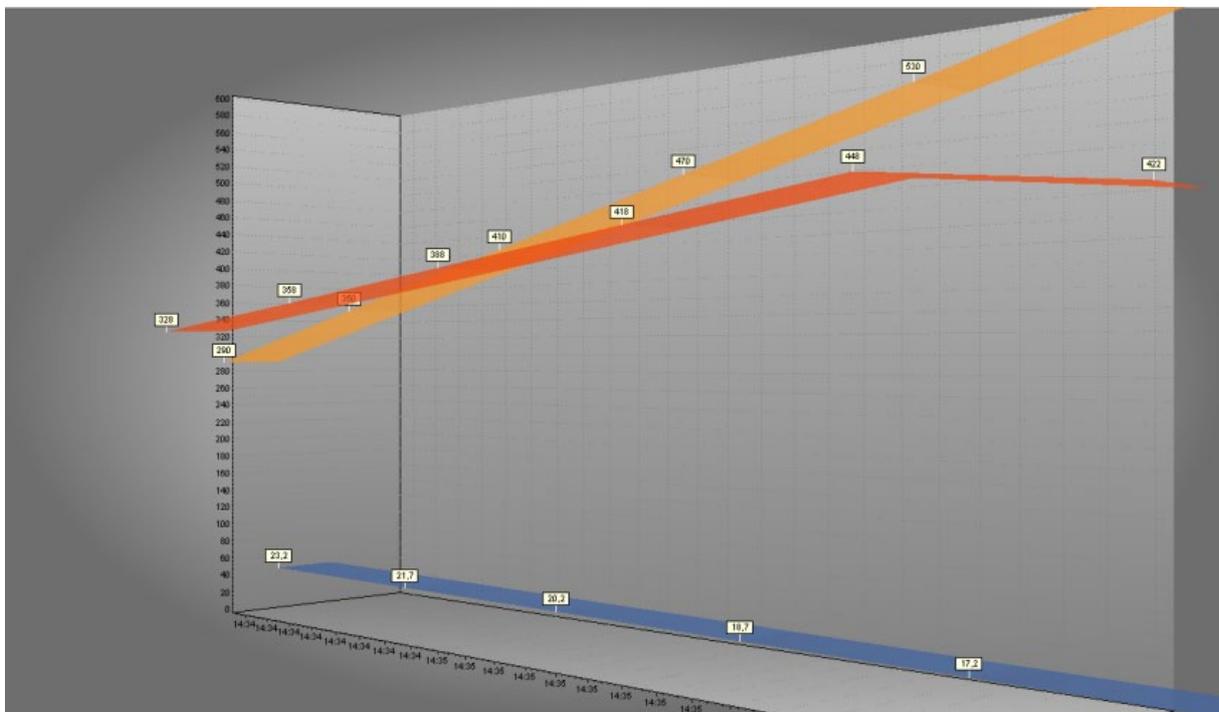


Fig. The Linear Chart.

2.19.2 Bar Chart

The bar chart is often used type of chart.

 **The bar chart is set by** the button  from: AsTrend main window > **Graph** tab > **Graph** group..

The chart can be displayed in 3D.

* * *

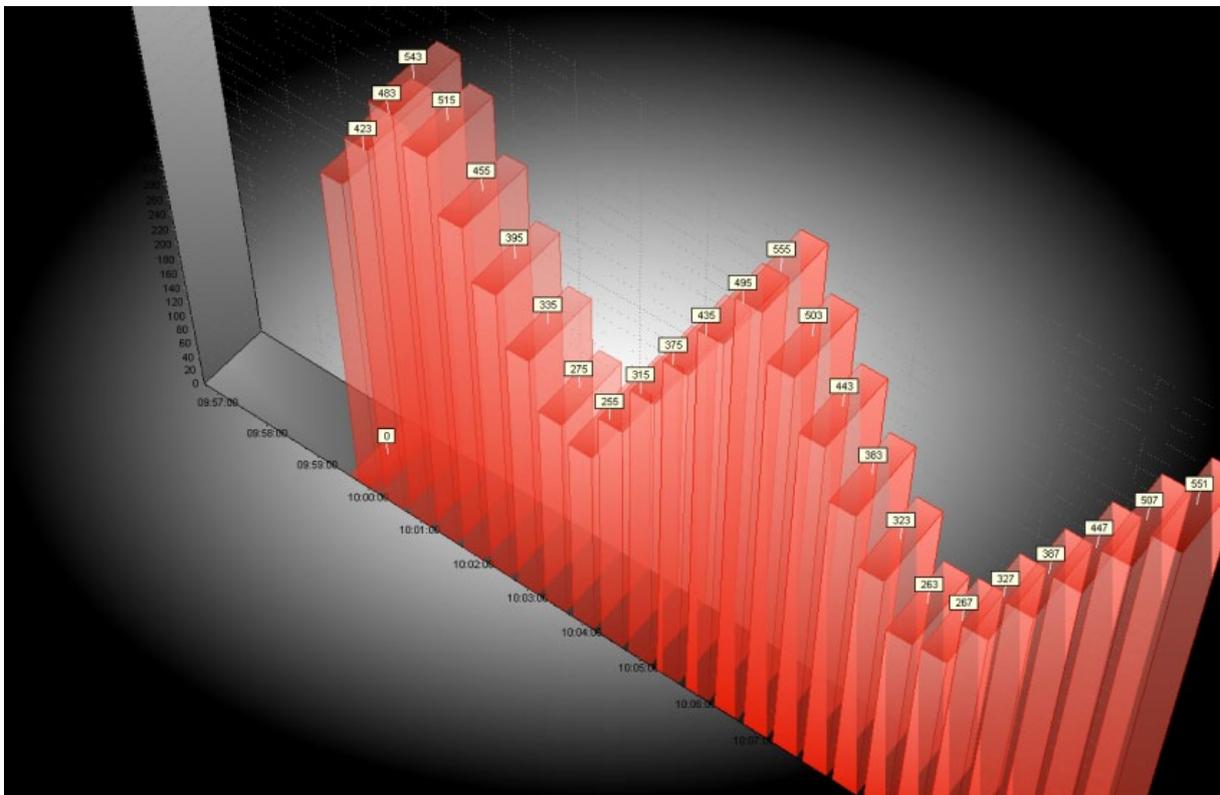


Fig. The Bar Chart.

2.19.3 Area Chart

 **The area chart is set by** the button  from: AsTrend main window > **Graph** tab > **Graph** group.

The chart can be displayed in 3D.

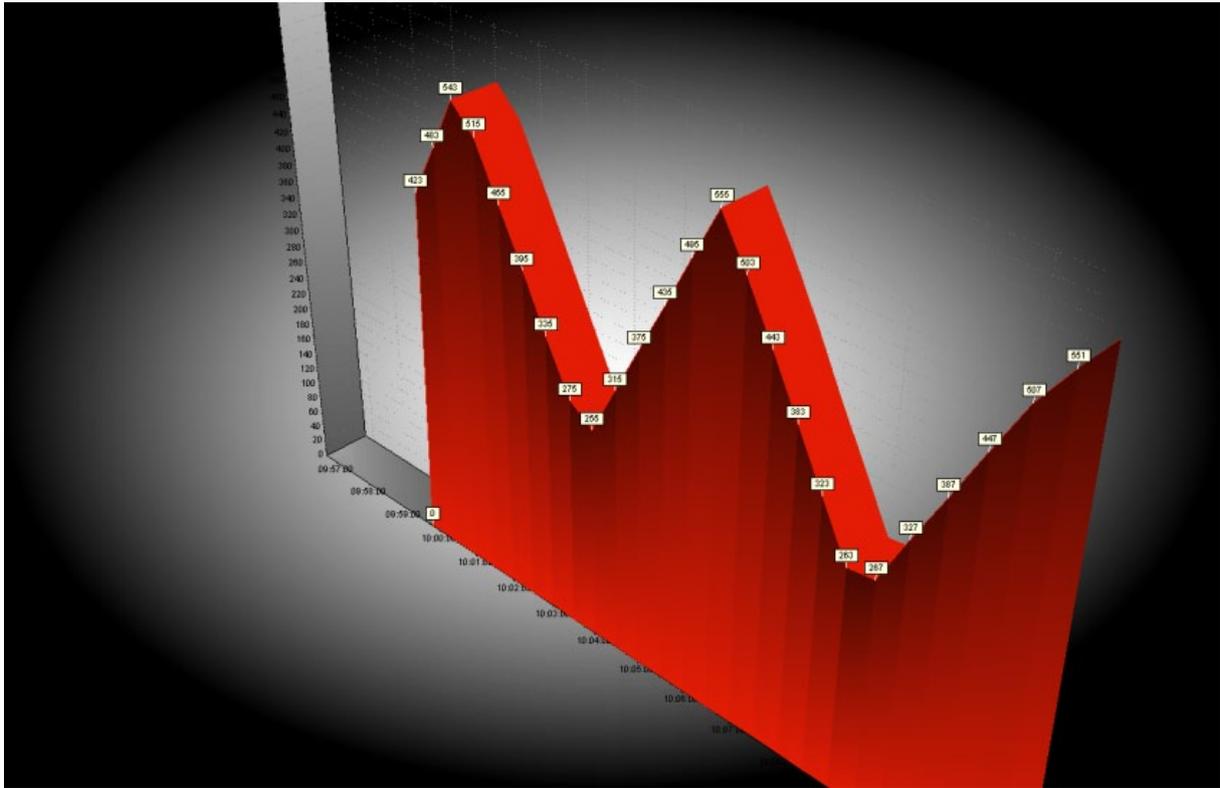


Fig. The Area Chart.

2.19.4 Binary Variable Chart

The binary variable charts are charted on separate axes for all types of graphs and all types of trend axes.

The variable is treated as a binary one in AsTrend if it has the range 0-1 and can take only integer values.

Binary value charts have the possibility to display variable state descriptions (see: [2.20 Displaying Variable State Descriptions](#)).

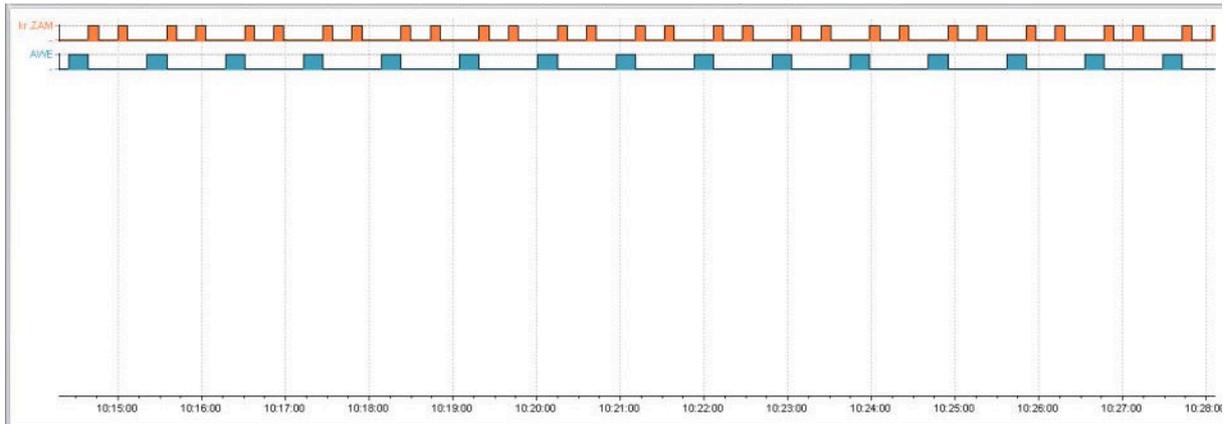


Fig. The Binary Variable Chart.

2.20 Displaying Variable State Descriptions

There is the possibility to display names of variable states as labels of value axis for physical charts.

When displaying charts of many variables - the necessary condition is that all variables have identical names of states.

The mechanism of displaying the names of states needs to declare variables that will correspond to states of the monitored variables. The definitions of variables serving the definitions of states are prepared by the Asix application designer.

NOTICE:

When you add Asix variables or external variables AsTrend checks whether a variable has state descriptions defined - and, if so, a stepped interpolation is turned on.

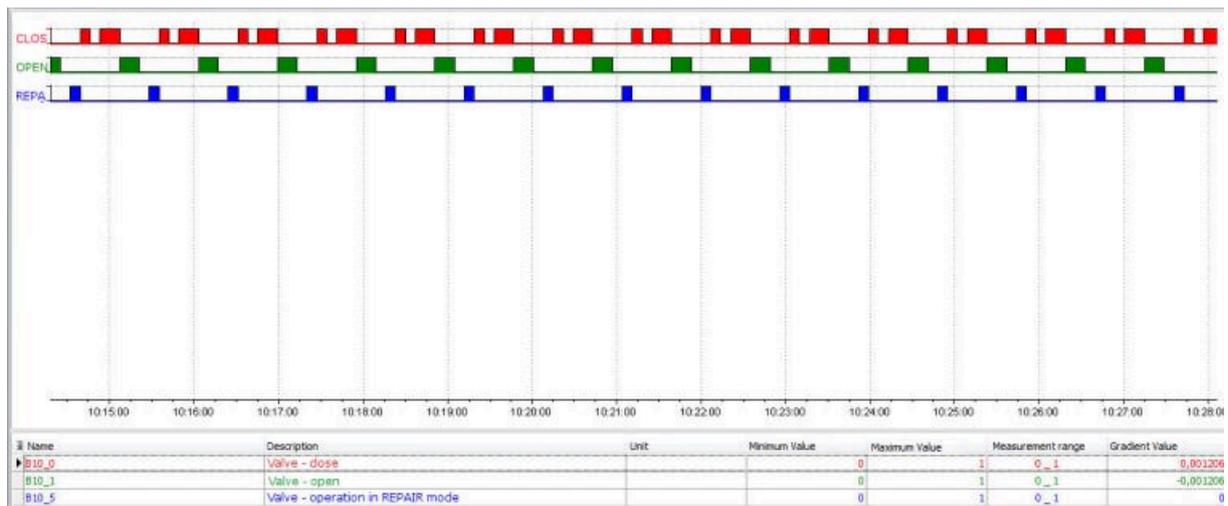


Fig. Names of States as Labels of OY Value Axis.

2.21 Operations on Variables

2.21 Operations on Variables

If neither any individual graph nor any group of graphs displayed within the chart area is selected, the commanded operation will concern all variables of the trend. Operations may be commanded by ribbon buttons or context menu.

2.21.1 Selection of One or All Variables

To perform any operation on one or all graphs it must be variable selection made.



To select a graph:

- click the graph by the left mouse button;
- click the variable row in the legend by the left mouse button.

Selecting all variables occurs by double-clicking the left mouse button on the chart area outside the graphs.

2.21.2 Removal of Variables



To remove a variable:

- click the button **Remove Selected**  from: AsTrend main window > **Home** tab > **New Graph** group;
- use ontext menu displayed in the chart area - the button ;
- click the key **DEL**.

If all variables are selected, the button  removes all variables.

Deleting a selected variable causes the next variable in the legend becomes a selected variable.

2.21.3 Displaying the Variable Metric



To display the variable metric (variable attributes):

- click the button  from: asTrend main window > **Graph** tab > **Graph** group;
- use the button **Graph Attributes** from the chart context menu.

The above methods are available when the variable has been previously selected. Otherwise, these functions are inactive.

There is an example of the metric window.

Attribute	Value
Address	ED110.4
Archive	ARCHIVE
Archiving parameters	D, 30s, 10s
Bar base	0
Bit	
C&d	TRZAH-14a
Channel	SINEC
CHANNEL_M	
Control cabinet	DS1
Control logging	no
Control variable	A004_5
Control variable mask	1
Conversion function	ANALOG_FP
DB	110
Description	Sulphuric acid temperature
Display range division	4
Display range from	0
Display range step	50

Fig. The Variable Metric.

The above data is retrieved from the variable definition database.

2.21.4 Displaying Labels

Labels are small boxes displayed above curve points, in which values of the points are shown.

 **To display labels**, use the button  from: AsTrend main window > **Graph** tab > **Graph** group;

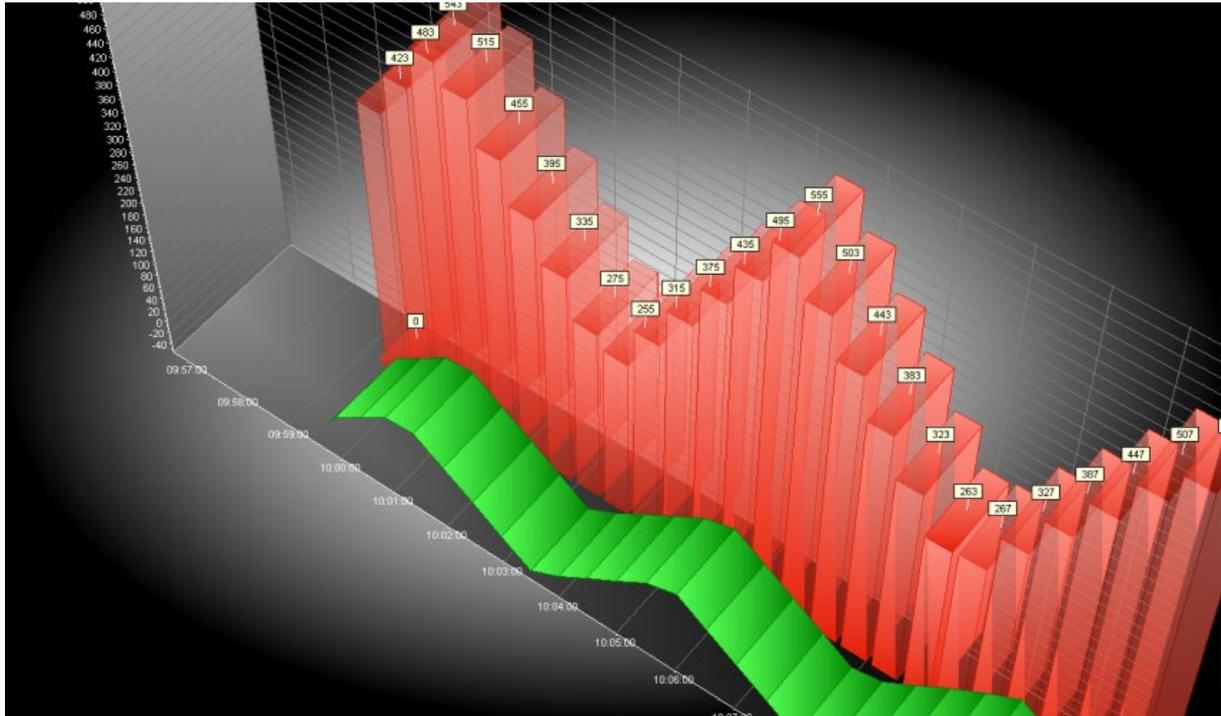


Fig. The Chart with Displayed Labels.

The highlighted button corresponds to the situation of displaying labels. The function is dependent on the context. If at the time you press the button  any variable is selected, the labels will be displayed or removed only for the graph corresponding to a selected variable - otherwise the labels will be displayed or removed on all the graphs.

For the graph (variable) for which names of states are defined in the variable definition database, when the option of displaying labels is turned on - the names of the variable states will be displayed in the labels.

2.21.5 Displaying Measurement Points

Squares representing measurement points may be displayed only within line and area charts. They are located in places corresponding to the point values.

 **To display measurement points**, use the button  from: AsTrend main window > **Graph** tab > **Graph** group.

Displaying points activates the fields for point shape/size/outline declaration:

- apply to charts with graphical markers of measurement points; select the shape the markers;

- apply to charts with graphical markers of measurement points; specify the size of markers;

 - apply to charts with graphical markers of measurement points; set the outliner for markers.

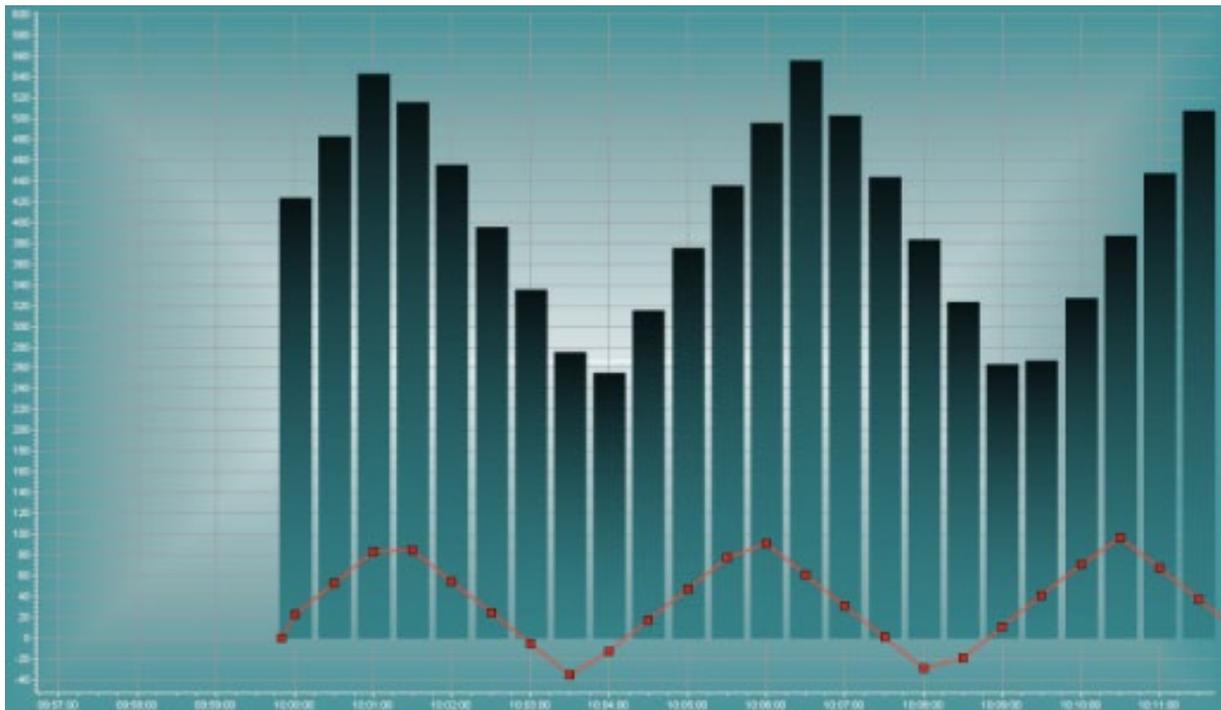


Fig. The Chart with Measurement Points Displayed.

The function is dependent on the context. If at the time you press the button  any variable is selected, the points will be displayed or removed only for the graph corresponding to a selected variable - otherwise the points will be displayed or removed on all the graphs.

2.21.6 Changing the Variable Range

This function applies to a selected variable.



To change the graph range (minimum and maximum):

- double-click in the fields: *Minimum* / *Maximum Value* fields in the legend.

The window '*Graph Options*' will be displayed with the possibility of changing *Display Range* and *Measurement Range*.

Fig. The Window '*Graph Options*' - the Tab '*Ranges*'.

- *Display Range* - display range is used for scalling the physical axis and the axis of individual graph on *Many OY Axes* chart (notice: you have to set the options *Minimal Displaying Range* and *Maximal Display Range* as the minimum and maximum in the physical OY axis settings: AsTrend main window > *Chart* tab > *Axes* group > '*Trend Axes Options*' window activated by the button  > *Physical OY Axis* tab). The range 0-0 means the absence of display range - then the physical axis range will be calculated based on the current values of the samples.

Notice: for scaling physical axis the display ranges of all the graphs are taken into account, for example: minimum can be set on the basis of the least one from minimal values defined for graphs and maximum on the basis of the highest one from maximal values. If not all of the graphs have ranges defined, the range is determined automatically.

- **Measurement Range** - measurement range is used for checking correctness of graph sample values; the values of samples that exceed the graph range by the number equal to the graph range are cut off. The range 0-1 for total value Asix system variable means that the variable is treated as a binary value.

The measurement range may also be used for scaling the physical axis (notice: you have to set the options **Minimal Measurement Range** and **Maximal Measurement Range** as the minimum and maximum in the physical OY axis settings: AsTrend main window > **Chart** tab > **Axes** group > '**Trend Axes Options**' window activated by the button  > **Physical OY Axis** tab).

Notice: for scaling physical axis the measurement ranges of all the graphs are taken into account, for example: minimum can be set on the basis of the least one from minimal values defined for graphs and maximum on the basis of the highest one from maximal values. If not all of the graphs have ranges defined, the range is determined automatically.

By default, the chart has a range determined on the basis of the variable definition database, e.g. 0-10000.

2.21.7 Replacing a Variable



To replace a variable (preserving attributes such as a colour etc.), use:

- the button  **Graph Data Source Options** from: AsTrend main window > **Graph** tab > **Graph Location** group;
- the command  **Graph Data Source Options** from local menu run in the legend.

Neither of the above listed option is available unless a database of variable definitions is opened and the variable is selected (clicking a *Name* field within the legend automatically selects the variable).

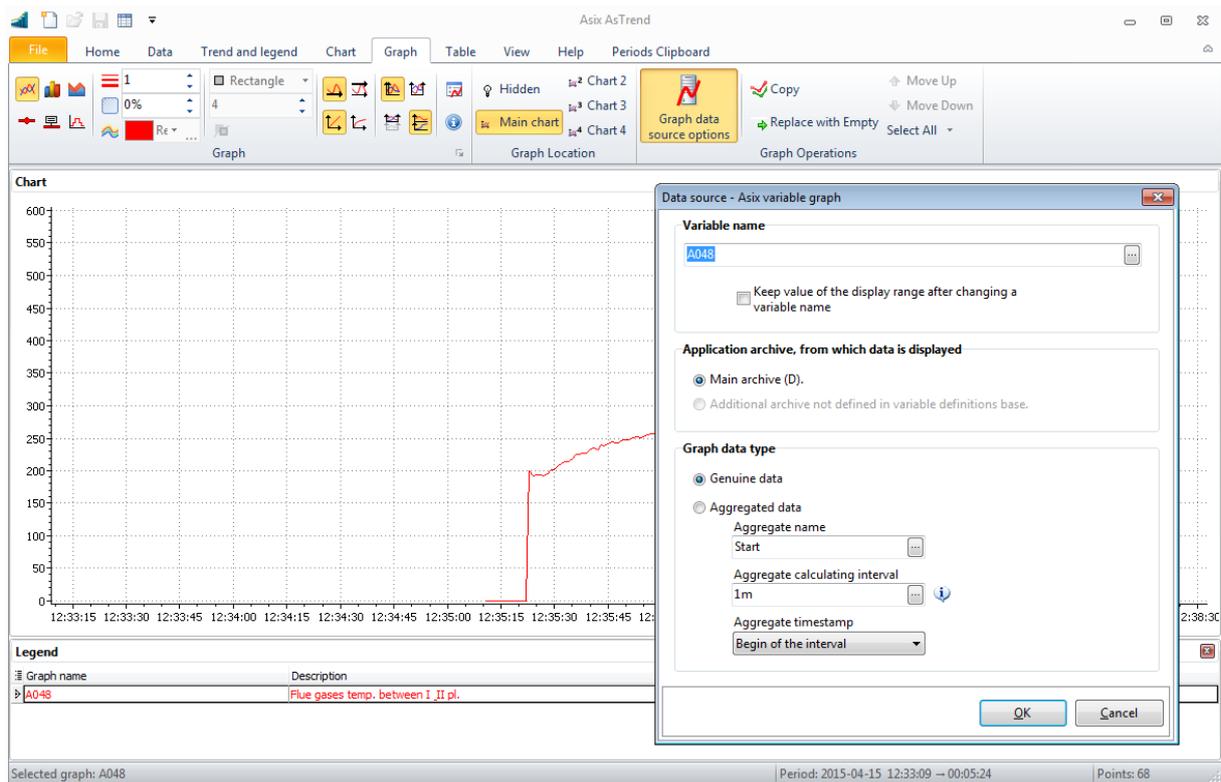


Fig. The Window for Replacing a Variable (It May Vary Depending on the Data Type).

2.21.8 Changing Interpolation

By default, linear interpolation is used. However, step-wise interpolation may also be used (in particular well suited for multi-state variables).

This function applies to a selected variable.



To change interpolation, use:

- the button  from: AsTrend main window > **Graph** tab > **Graph** group.

The differences between the methods of interpolation are illustrated in the following figure.

The function affects only the selected variable(s).



NOTICE:

When you add the Asix variables or external variables, AsTrend checks whether a variable has names of states defined - and, if so, step-wise interpolation is turned on automatically.

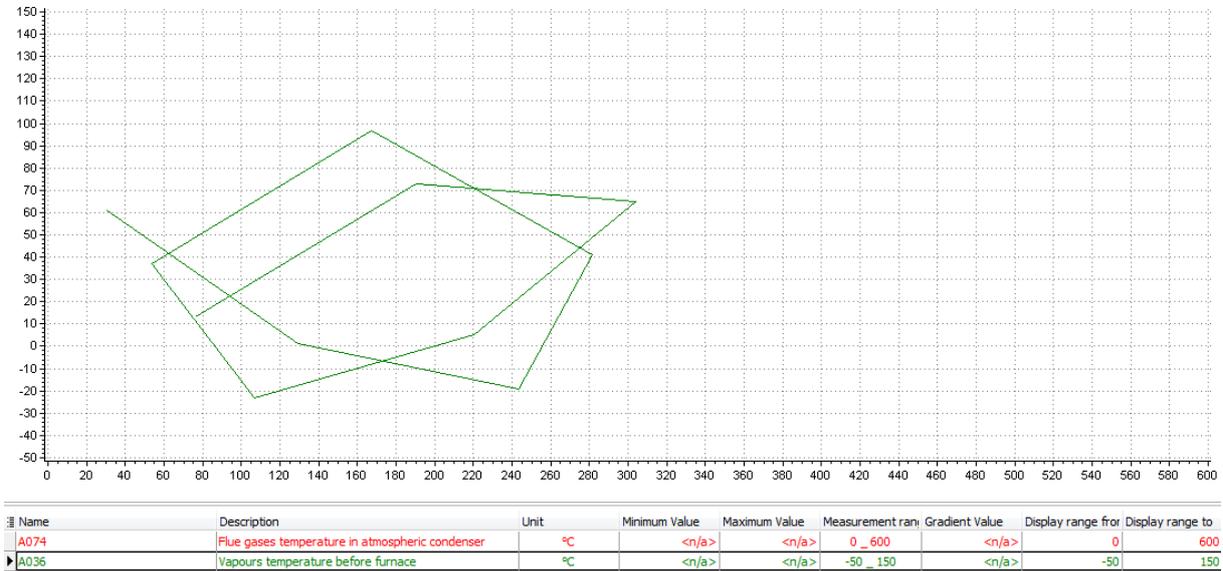


Fig. Linear and Step-Wise Interpolation.

2.21.9 Showing/Hiding a Variable Graph

By default, each variable graph is shown.

The function affects only the selected variable(s).



To show/hide a variable graph, use:

- the button from: AsTrend main window > **Graph** tab > **Graph Operations** group;
- the button from the legend context menu.

The highlighted button means a variable graph hidden.

2.21.10 Colour Change

The program automatically assigns colors to different variables according to a pre-defined sequence (red, green, yellow&ldots;). However, color of each variable may be changed manually.



Firstly select a variable, secondly change the colour using:

- the option *Use custom colour* from: AsTrend main window > **Graph** tab > **Graph** group > the window '*Graph Options*' run by the button  > **Appearance** tab > the option *Use Custom Color*.

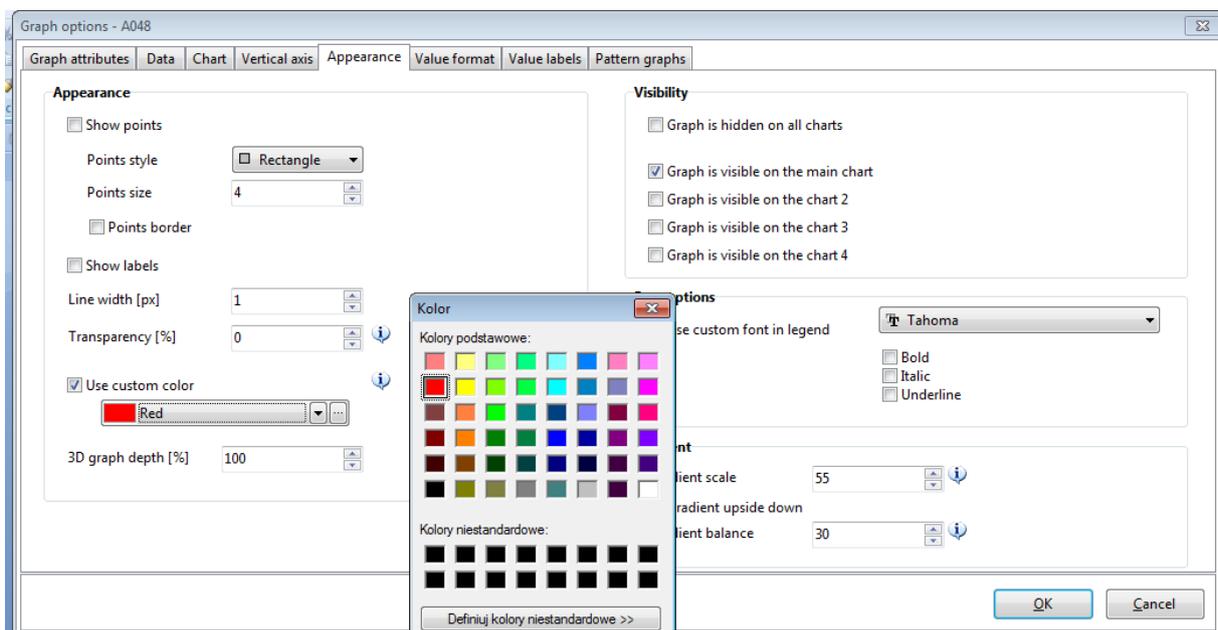


Fig. Graph Options - Defining a Custom Colour.



You can also:

- define own colour palette in: AsTrend main window > **Trend and Legend** tab > **Trend** group > the window '*Trend Options*' run by the button  > **Appearance** tab > *Use the Colour Palette from Trend Options* option > **Colour Palette** tab > *<trend own palette>*. Coloured squares correspond to the appropriate graphs - if you want to change the colour, double-click a suitable square.

2.22 Operations on Displayed Graphs

Once a trend is charted, usually some adjustments of the displayed graphs are necessary to optimize the view to the current needs.

Some operations may exclude some other operations. For example, if the data logging mode is activated, panning function is disabled.

2.22.1 Live Mode - Continuous Data Registration

Each trend may be switched over to the data logging mode.

 'Live mode' can be turned on/off by:

- the button  from: AsTrend main window > *Home* tab > *Time Move* group.

This mode is basically used to continuously monitor freshly acquired data. Charts are re-drawn every 2 seconds provided the new data has appeared.

While logging is suspended, trend is immobilized, but all regular trend operations become available.

2.22.2 Zooming

 Use the following method to zoom in a graph (horizontal zooming):

- Each trend fragment inside the chart area may be zoomed. Drag the mouse cursor (with mouse button pushed) from the left to right to select the to-be-zoomed rectangular area. As soon as the mouse button is released, the selected rectangle is zoomed. The upper left corner of the area can not coincide with the graph, because then click is treated as a selection.

 Use the following method to zoom out a graph (horizontal zooming):

- Selecting the area of chart from the right to left gives the reverse result (than described in the previous point) - the chart returns to the previous time period (operation can be repeated until you see the listed period remembered in the history of changes).

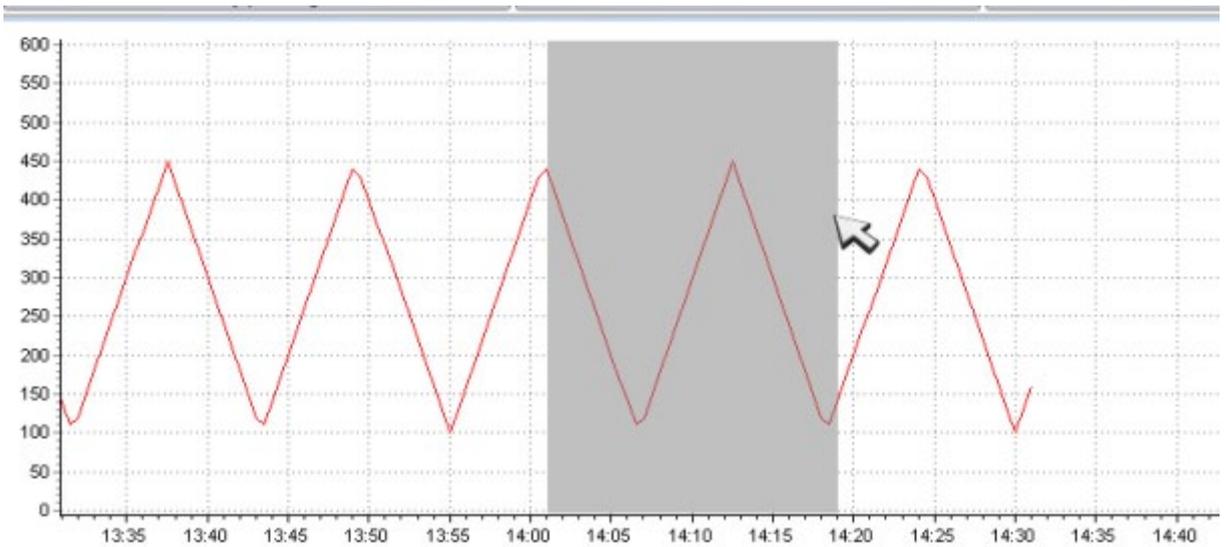


Fig. Zooming the Graph.



Horizontal/Vertical zooming:

- Zooming can also be performed by the option **Zoom / Zoom in** or **Zoom / Zoom out** from:

AsTrend > **Chart** tab > **Zoom** group.

Optionally, you can use the mouse scroll (when the **Zoom** button is pressed) to zoom in / zoom out the chart area.

After zooming operation performed by the above options you can restore the view before zooming using the option **Without Zoom**.

When the button **Zoom** (AsTrend > **Chart** tab > **Zoom** group) is unpressed the zooming by the buttons described above is disabled.

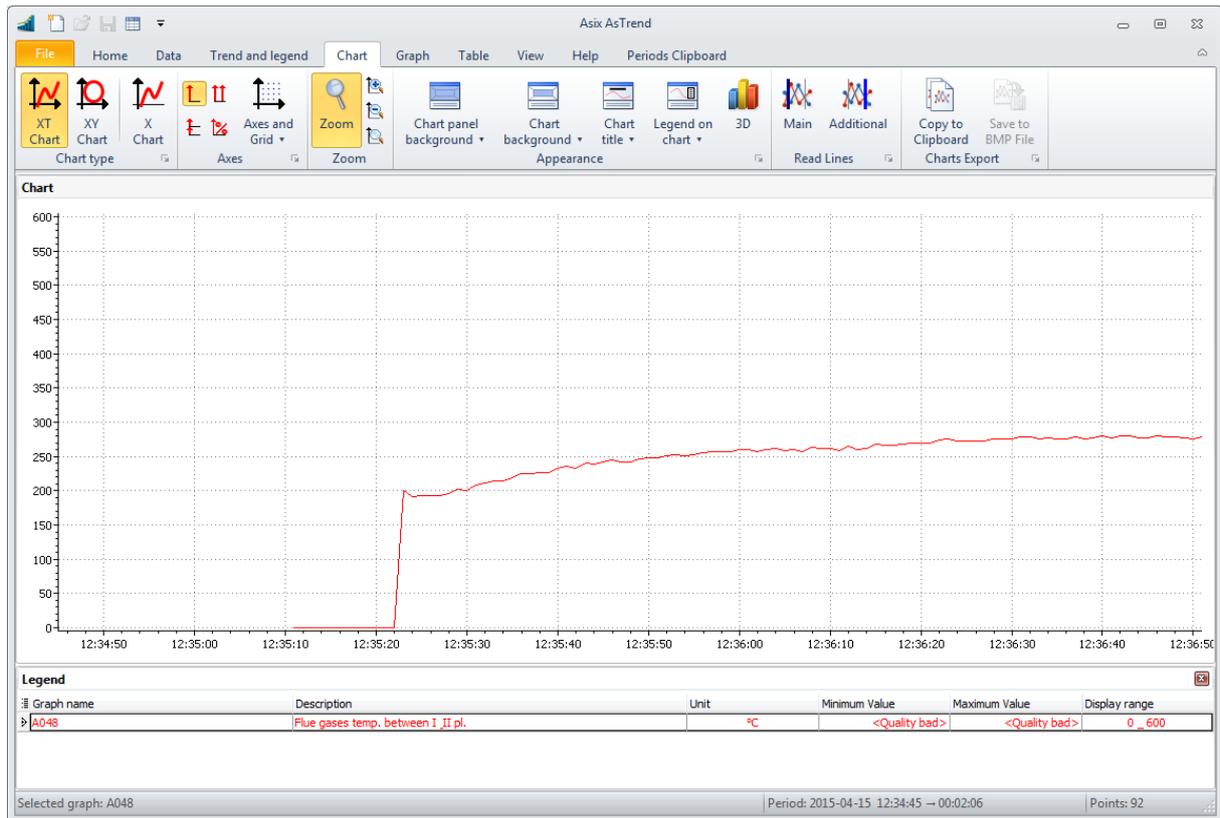


Fig. Zooming Options.

2.22.3 Panning

The charted fragment of the archived data may be moved forward or backward along the time axis.

 **To pan the chart, use the following buttons** from: AsTrend main window > **Home** tab > **Time Move** group:

 **Backward/Forward By Period** - move horizontally by one current period,

 **Backward/Forward** - move horizontally by quarter of the current period,

 **Decrease/Increase Period** - reduce / enlarge a period by the successive pre-defined AsTrend periods,

 **To the Beginning of Data** - move up to the beginning of data (when known, e.g. from external sources),

 **To the End of Data** - move up to the current time data or the end of external data,

2.22.4 Readout of Variable Values

 You can indicate with the mouse any graph point in order **to read out the variable value (value, time and status)**. The mouse cursor overlapping a displayed graph changes its shape from an arrow into a cross. If you click the mouse button while the mouse cursor is a cross, a small box pops up next to the cross. The value data of the indicated graph point is displayed within the box till you move the cursor.

The operation of reading out values has a side effect: the indicated variable becomes selected.

You can read larger blocks of data from the table of values.

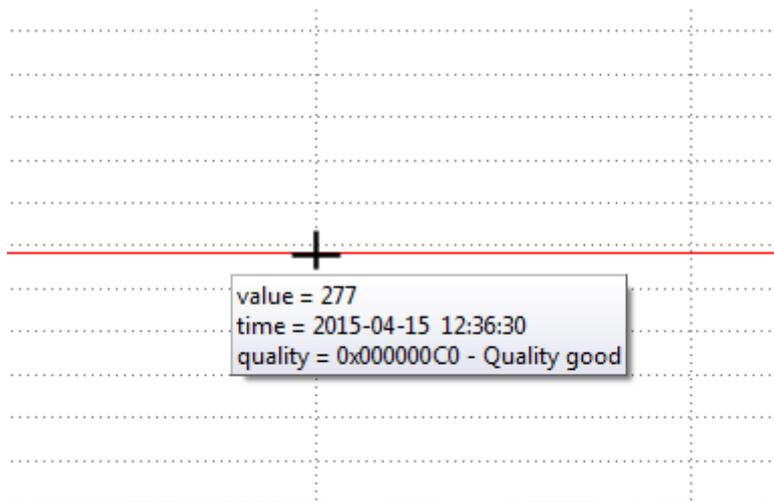


Fig. Value Readout.

2.22.5 Variable Selection

 Many operations can be performed only if some variable is selected. **You can select a variable** in two ways:

- point with the mouse the displayed graph of that variable (the mouse cursor should change its shape from an arrow into a cross) and click;

AsTrend

- click in the legend in the variable raw.

Name of that variable will appear in the status bar.

The operation of selecting a variable has a side effect: some ribbon buttons and some menu options become enabled.

2.22.6 Restoring Original Appearance of the Window

All modifications introduced to the trend window can always be restored to the initial state.



Restore original appearance of the trend window by the button *Reopen Trend File*

from: *File* menu.

2.22.7 Window Size/Position Block/Unblock

Window size/position block/unblock can be done only by administrator of AsTrend.

Working with blocked windows is dedicated to operator of AsTrend. In this mode you can not change the size and position of the window trend

To block the window size/position use the commands:

- *Window Size Block* - option used when creating trend files mainly for the Asix application. When the option is enabled, the window size is stored in trnx file. While opening the file, the window size is restored. The option enabled in: AsTrend > View tab > Window group.

- *Window Size and Position* - the option is in force when you blocked the window size (*Window Size Block*). The option enabled in: AsTrend > View tab > Window group > 'Trend Window Options' window run by the button .

If the options are set, the window size and position are stored in the file *.trnx. While opening the file, the position and size of a trend are restored.

* * *

If a trend file is opened by the operator action, the position can be declared as the parameter of the action:

- AstrendDisplay for Asix.Evo - see: *Asix.Evo_Operator_Actions.pdf/chm*;
- ASTREND for classical Asix - see: *Asix.pdf/chm*.

* * *

NOTICE: Window size and position are ignored - if the option of ignoring the window size is enabled in program options and the trend file is opened in AsTrend started without the Asix application.

2.23 3D Chart Handling

AsTrend gives you the opportunity of displaying graphs in 3D - there are two types of 3D charts:

1. 3D chart with the possibility of spatial manipulation of the chart area in three dimensions;
2. orthogonal chart.



3D with full spatial manipulation of the chart area in three dimensions:

3D is a recommended form of 3D chart presentation. TI allows manipulation of: rotation, elevation, perspective, zoom and depth.

To switch the chart to 3D version, use the button  from: AsTrend main window > **Chart** tab > **Appearance** group.

The full 3D type is activated and parameterized using the button  that starts the list of available parameters of the 3D view (AsTrend main window > **Chart** tab > **3D** group available

when  is pressed):

Rotation - rotate the chart area around the vertical axis;

Elevation - rotate the chart area around the horizontal axis;

Perspective - turn on perspective;

Zoom - specify the size of the chart area;

Depth - deepen perspective;

Select View - select pre-defined 3D view:

- **3D View Right;**
- **3D View Front;**
- **3D View Left;**

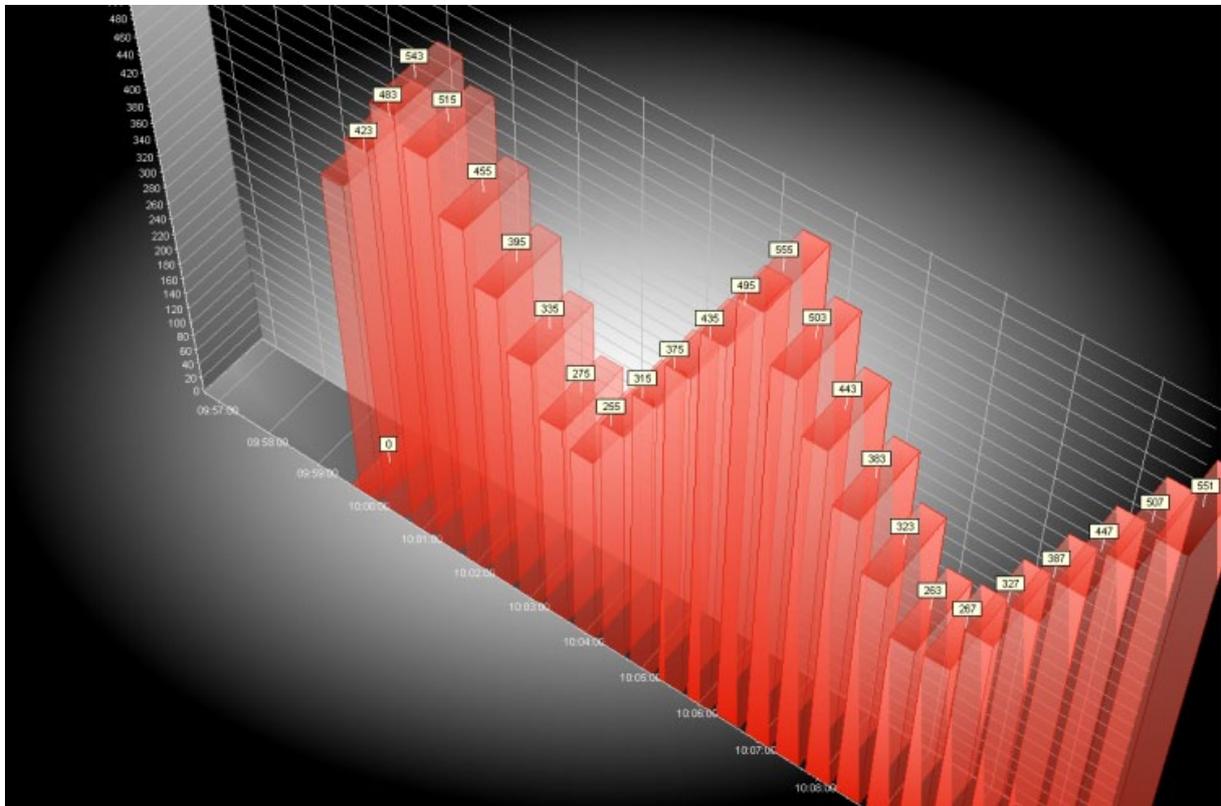


Fig. The Bar Chart in the Full 3D.



Orthogonal chart:

The orthogonal view is by far the simpler form for presentation of 3D charts. It only enables manipulation of angle and depth of the chart area.

It is not recommended to use this type to line charts. Much better visualize effects for line charts are obtained by using the full 3D variant.

To switch the chart to 3D version, use the button  from: AsTrend main window > **Chart** tab > Appearance group.

The orthogonal type is activated and parameterized using the button  that starts the list of available **parameters** of the orthogonal view (AsTrend main window > **Chart** tab > **3D** group available when  is pressed):

Angle - specify the angle between the edge at the junction of left / bottom wall and the edge of the horizontal bottom wall;

Depth - specify the length of the edge at the junction of left / bottom wall; the longer the edge the greater sense of depth;

Select View select pre-defined 3D view:

- **Orthogonal Projection Right (default);**
- **Orthogonal Projection Left;**

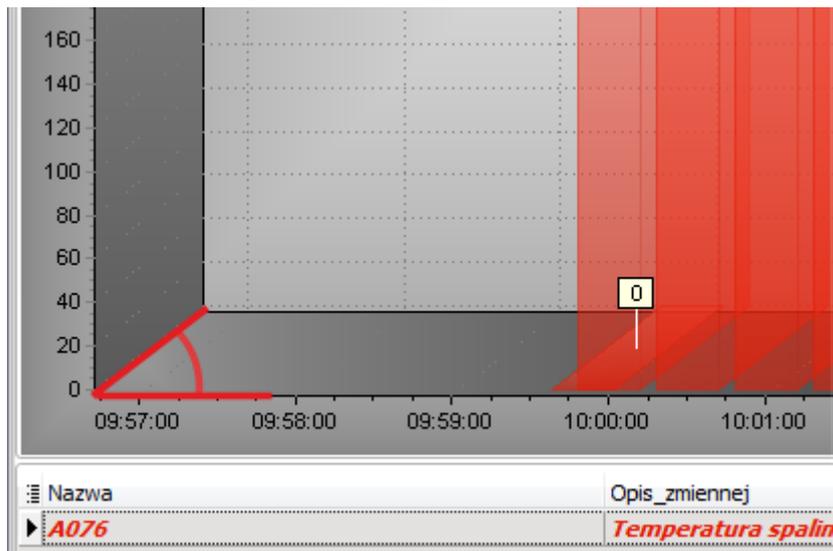


Fig. The Part of the Orthogonal Chart - Angle.

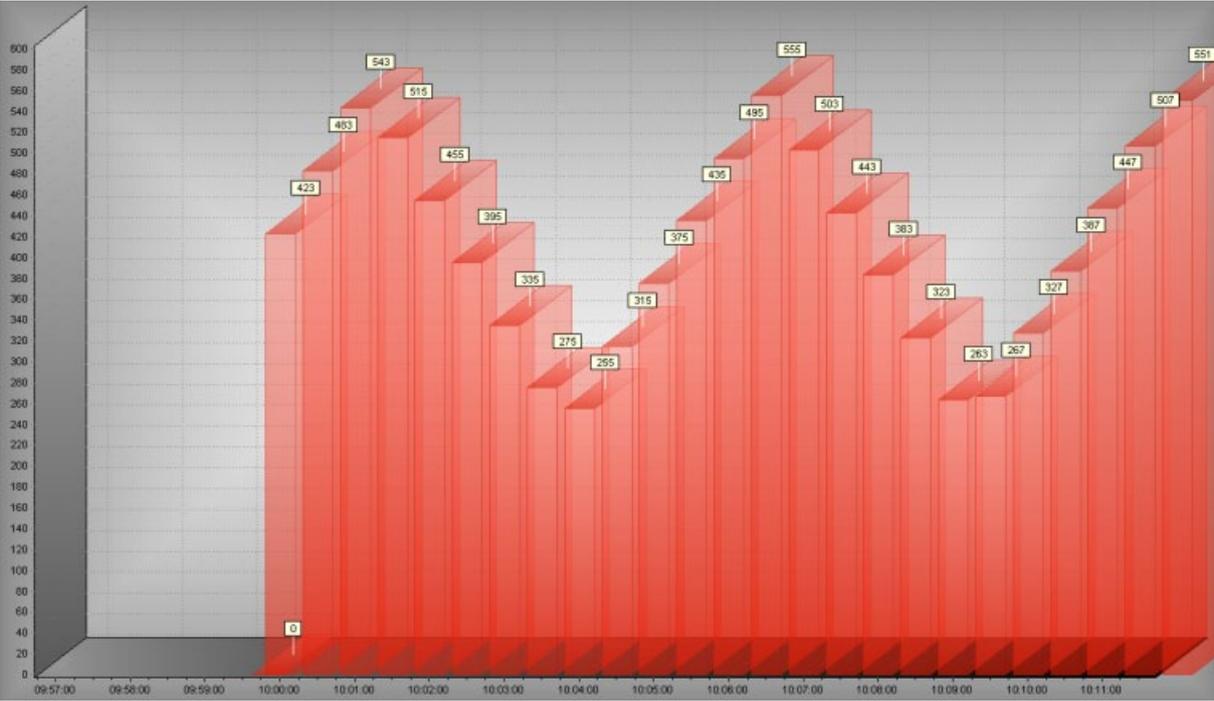


Fig. The Bar Chart in the Orthogonal 3D.

2.24 Program Options

 The window **"Program Options"** is run by the command **Program Options** from the **File** menu. The options included in the window allow you to make settings for AsTrend in the following areas (most of the options have already been discussed in previous chapters referred to particular aspects of using the AsTrend program):

- main window position;
- data servers;
- the type of the window used to open a trend file (system window or built-in with the possibility to view the file content);
- diagnostic information on the license of data server access, parameters passed from the Asix application (if you start AsTrend with your Asix application), communication with the data source (when AsTrend run in web browser);
- trend printout format;
- saving the current trend configuration and current legend configuration as default configuration for new trend files;
- colour palette;
- selection of available warnings;
- reading lines.

The window **"Program Options"** includes the following tabs described below.

* * *

 The tab **Windows** allows you to specify whether during the AsTrend operation without the Asix application the information on the AsTrend main window location and the window resize lock will be ignored.

There is also the possibility of declaring the automatic activation of the ribbon tab of AsTrend data table (of current data) and the ribbon tab of AsTrend period clipboard at the moment you open the current data table or the period clipboard. Additionally, if you check the option **Active Ribbon Tab on Window Open** the ribbon tab: **Table** (of current data) or **Period Clipboard** will be automatically active when the corresponding window will become active: **'Table'** or **'Period Clipboard'**.

The option **Show On-Screen Keyboard Button** allows to activate the icon running the screen keyboard on each form.

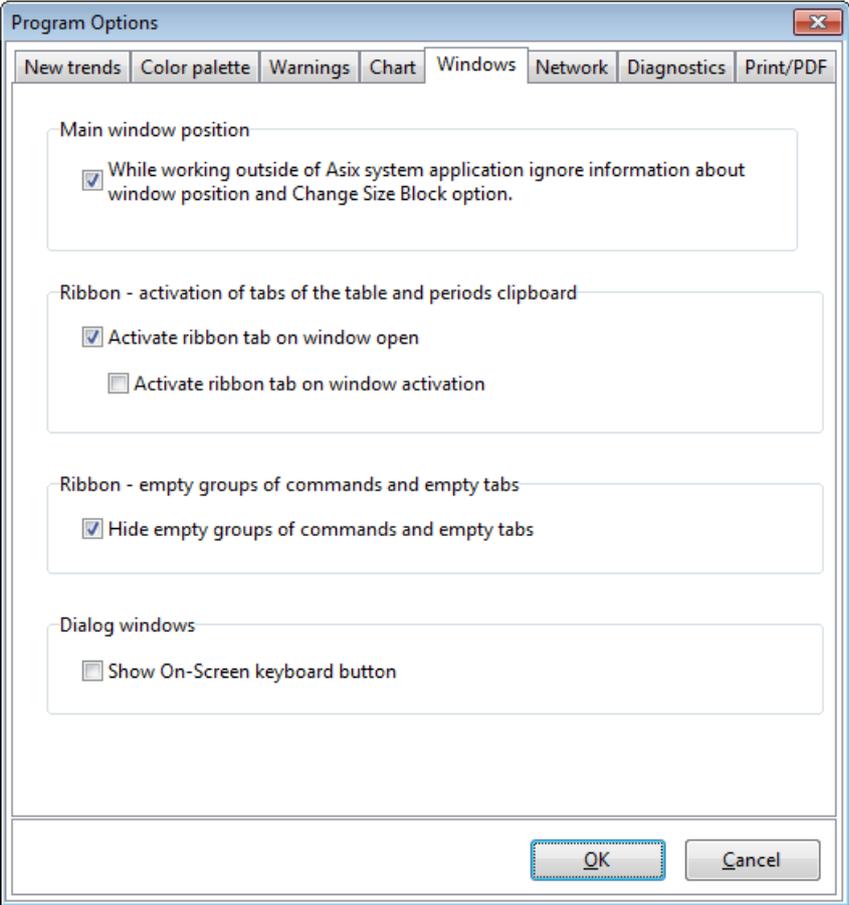


Fig. The Window 'Program Options' - the 'Windows' Tab.

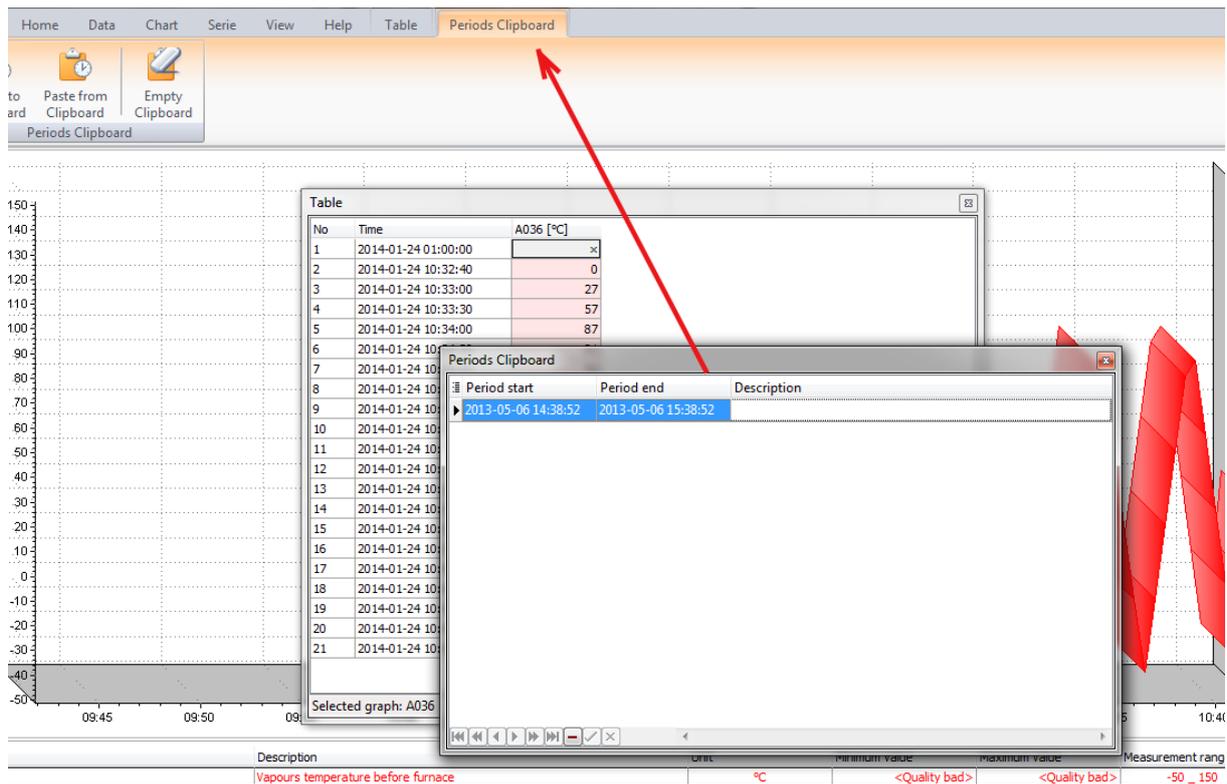


Fig. The 'Period Clipboard' Tab Activation While the 'Period Clipboard' Window Activation.



The tab **Network** allows you to declare the names of servers from which the data for displaying trend charts will be retrieved as well as the maximum timeout for the server and the maximum server response time.

If AsTrend was started without starting the Asix application and the Asix server uses only TCP/IP protocol or is located in a different subnet, you have to configure the TCP/IP connection to the server using the command: **Tools** menu > **Network Module - Options** from the Architect program.

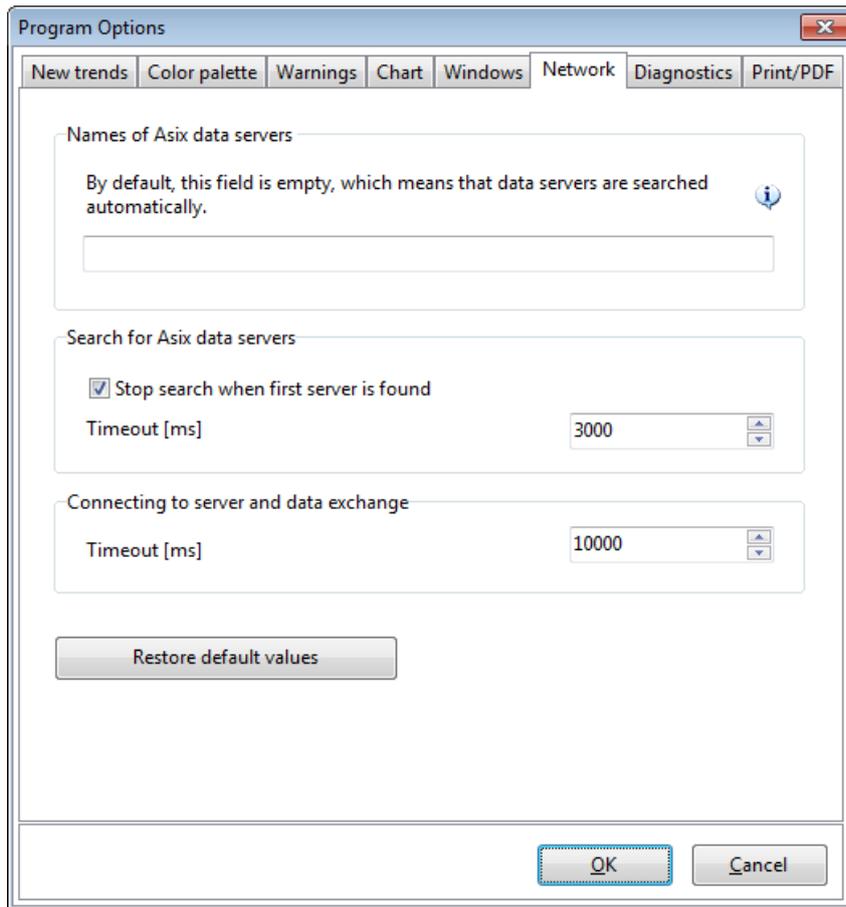


Fig. The Window 'Program Options' - the 'Network' Tab.

 The tab **Trend File Open Window** is available when starting AsTrend without an Asix application. It allows you to specify the type of dialog window used to open a trend file (with or without viewing the list of trend variables).

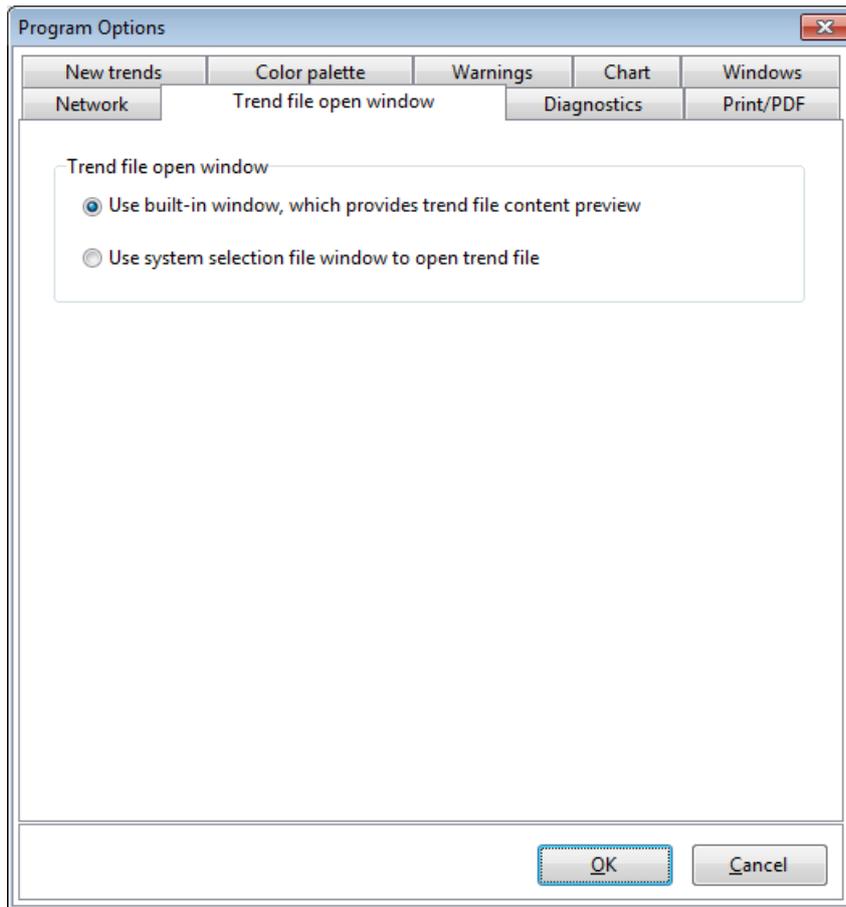


Fig. The Window 'Program Options' - the 'Trend File Open Window' Tab.



The tab **Diagnostics** provides information on the license of data server access.

When starting AsTrend with an Asix application, the tab *Diagnostics* additionally includes the data on parameters passed from the Asix application:

- *Don't Allow Writing Trend Files;*
- *Grant AsTrend Administrator Rights to Operator;*
- *Working Directory;*
- *Variable Definition Database;*

When starting AsTrend in a web browser, the tab *Diagnostics* additionally includes the following data:

- *data server addresses;*
- *variable definition database location;*
- *license server initialization status;*
- *license server connection status.*

Additionally, the tab *Diagnostics* includes the data on Aslink (if it is).

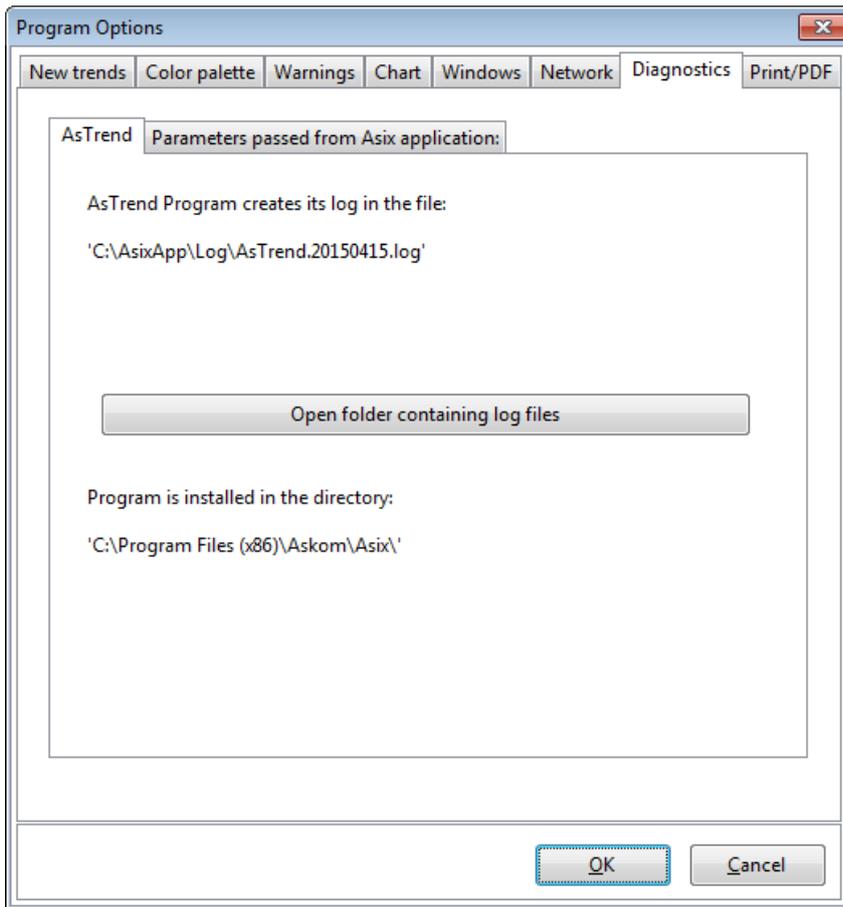


Fig. The Window 'Program Options' - the 'Diagnostics' Tab.

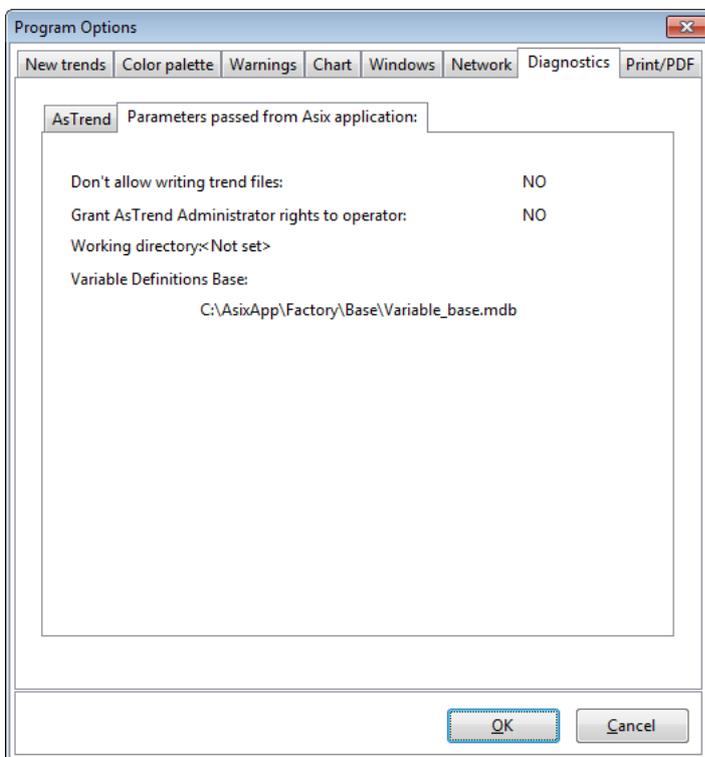


Fig. The Window 'Program Options' - the 'Diagnostics' Tab - Parameters Passed from the Asix Application.

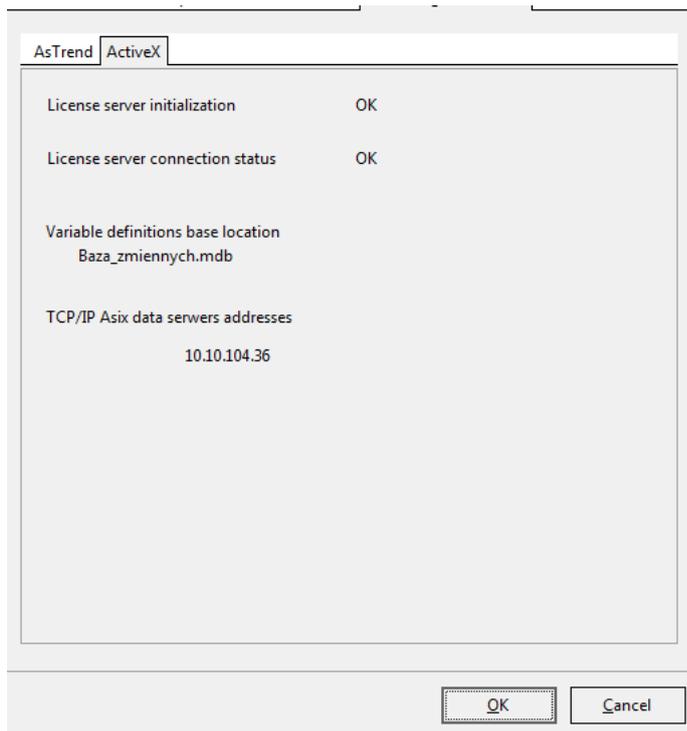


Fig. The Window 'Program Options' - the 'Diagnostics' Tab - Parameters Passed of Web AsTrend.



The tab **Print/PDF** allows you to specify the paper size when exporting to PDF.

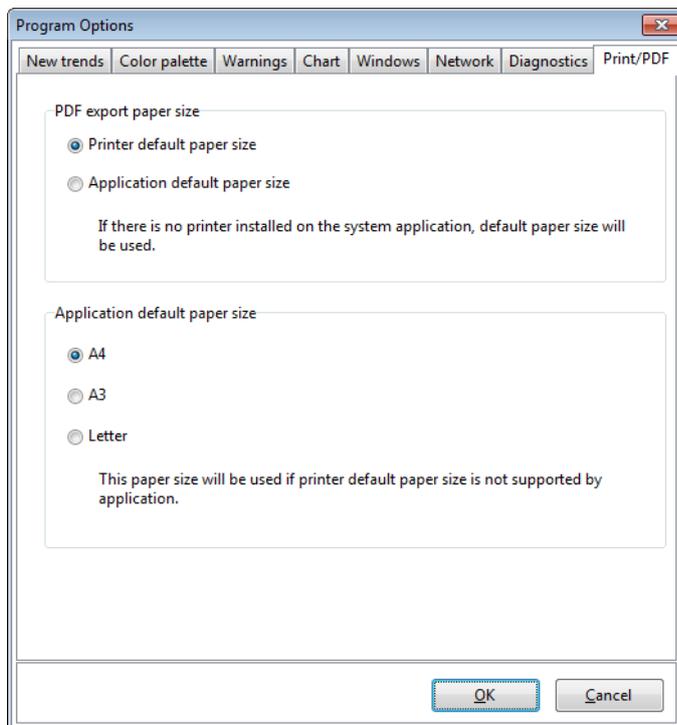


Fig. The Window 'Program Options' - the 'Print/PDF' Tab.

* * *



The tab **New Trends** allows you to set current trend options as default ones for newly created trend files. The mechanism works not only during the continuous operation of AsTrend. If AsTrend starts with the application - the further application restart (and thus AsTrend restart) will recall the default trend options.

To save individual trend options, you have to define these options, then press the button **Use Current Trend Options** from the window **'Program Options'** > **New Trend** tab. The message 'Current trend options have been stored for new trend files" will appear.

In a similar way, you can save the current layout of the legend as a default one for newly created trend files.

The option **Use Built-in Trend Options** will activate default built-in AsTrend options.

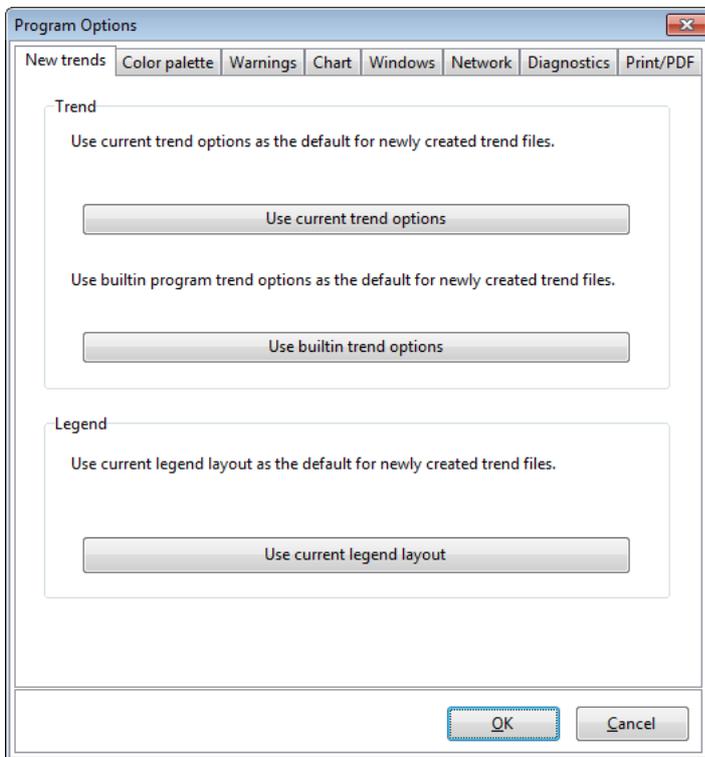


Fig. The Window 'Program Options' - the 'New Trends' Tab.

* * *



The tab **Colour Palette** allows you to compose a default colour palette, according to which the successive graphs will be added to the chart.

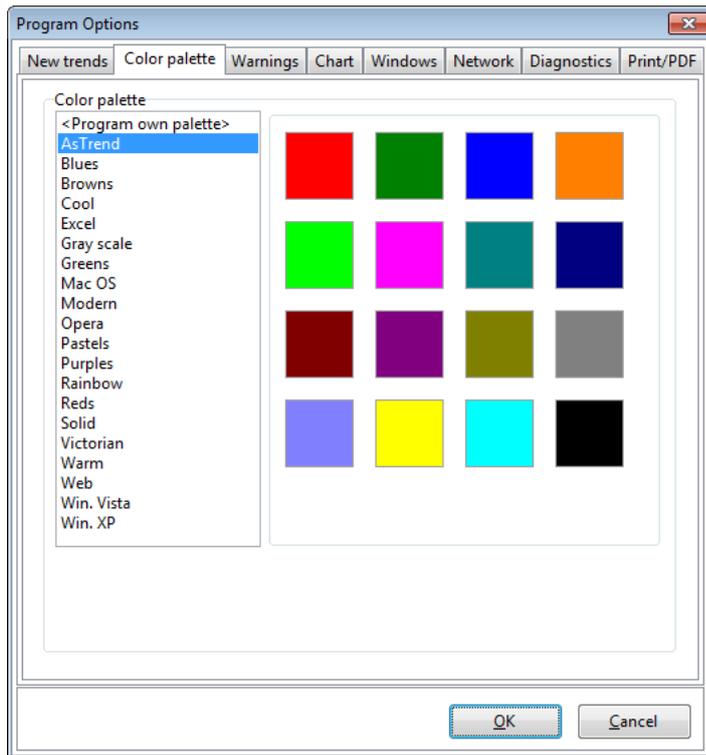


Fig. The Window 'Program Options' - the 'Colour Palette' Tab.



The tab **Warnings** includes the list of warnings possible to display - check the warning type you want to display during AsTrend operation.

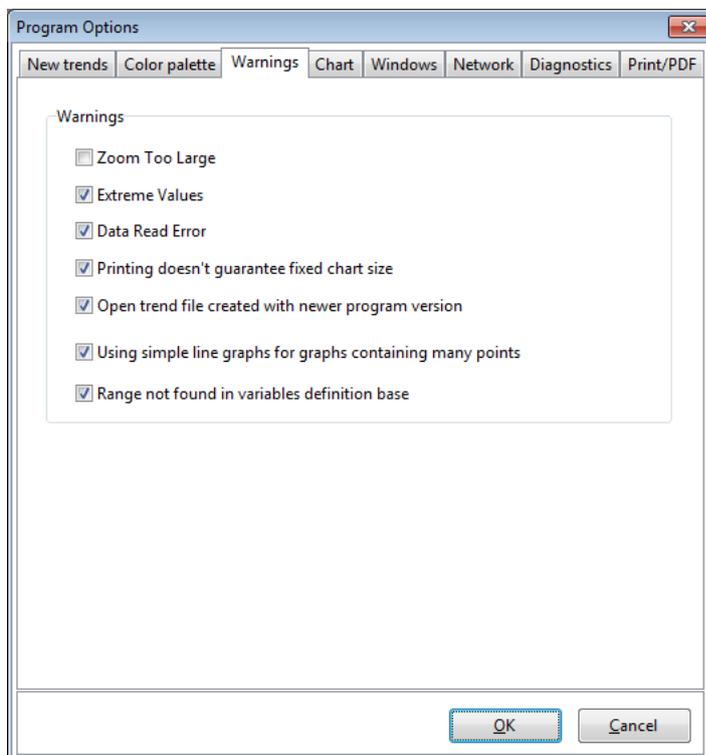


Fig. The Window 'Program Options' - the 'Warnings' Tab.



The tab **Chart** allows you to set the thickness and colour of reading lines (main and additional) as well as the height of vertical axis of binary chart.

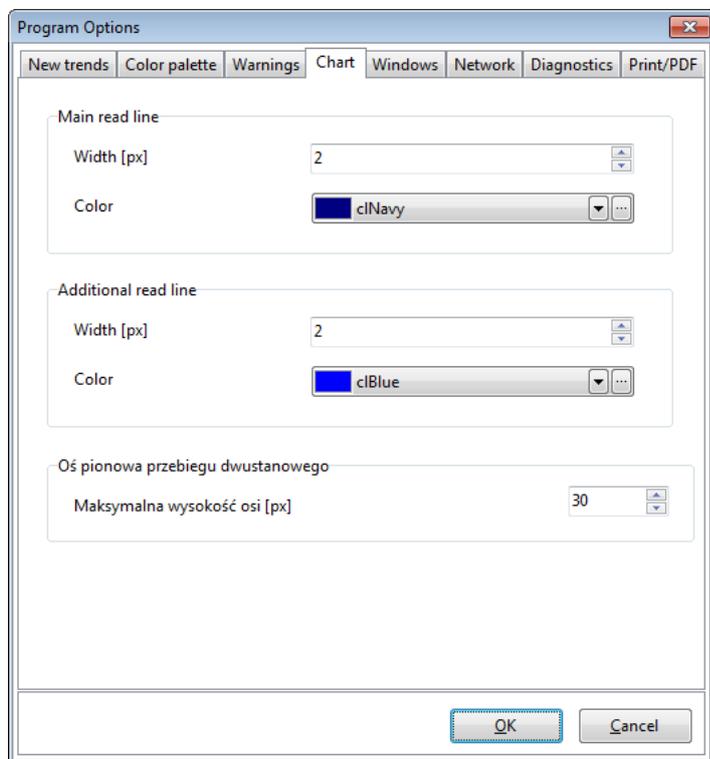


Fig. The Window 'Program Options' - the 'Chart' Tab.

2.25 Chart Options

2.25.1 Chart Type and Labels

 The tab **Type** (AsTrend main window > **Chart** tab > **Chart Type** group > the window **'Chart Options'** run by the button ) allows you to set:

- **Chart Type:**

- **Draw XT Chart;**
- **Draw XY Chart** - for XY chart the data is retrieved from the archive as uniform data. It is possible to create a chart XY for two types of OY axis: *One OY Axis* and *Many OY Axes*. If you choose *One OY Axis*, the data from first two graphs will be used to create an XY chart. These graphs can not include binary data.
- **Draw X Chart.**

- **Labels on XY Chart** - select the content of labels.

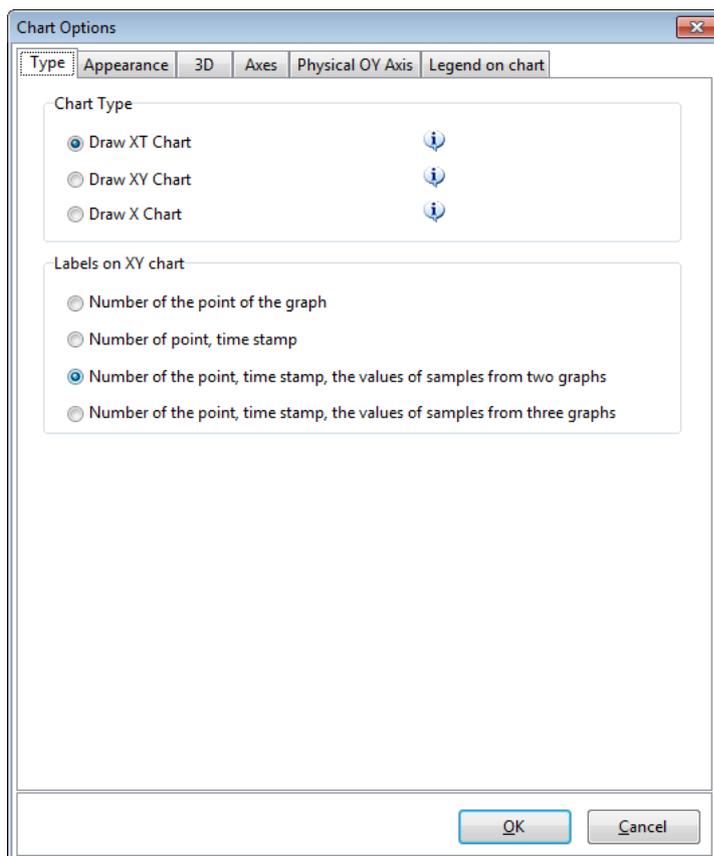


Fig. 'Chart Options' - 'Type' Tab.

2.25.2 Chart Appearance



The tab **Appearance** (AsTrend main window > **Chart** tab > **Chart Type** group > the window **'Chart Options'** run by the button ) allows you to set:

- **Background Colours** - specify the colour and gradient for a chart background and a chart panel area background.
- **Chart Title** - specify visibility of the chart title and the color of chart title.
- **Chart in 3D Mode** - enable 3D view.
- **Margins**: distance between the label of a maximum graph value and the top edge of the chart area as well as the distance between the label of a minimum graph value and the bottom edge of the chart.
- **Show Chart Even Outside Axis** - drawing graphs outside the chart area.

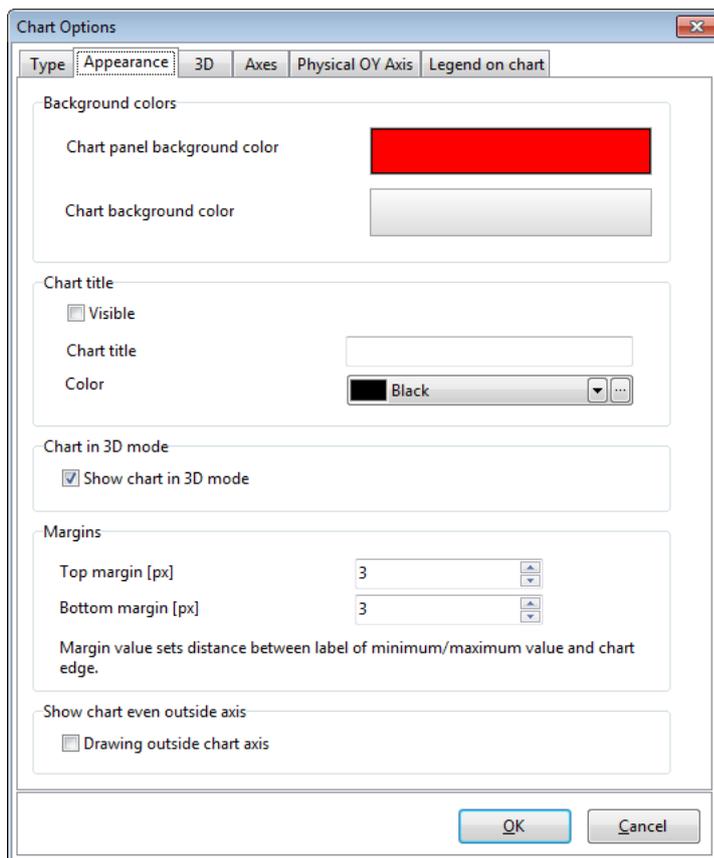


Fig. 'Chart Options' - 'Appearance' Tab.

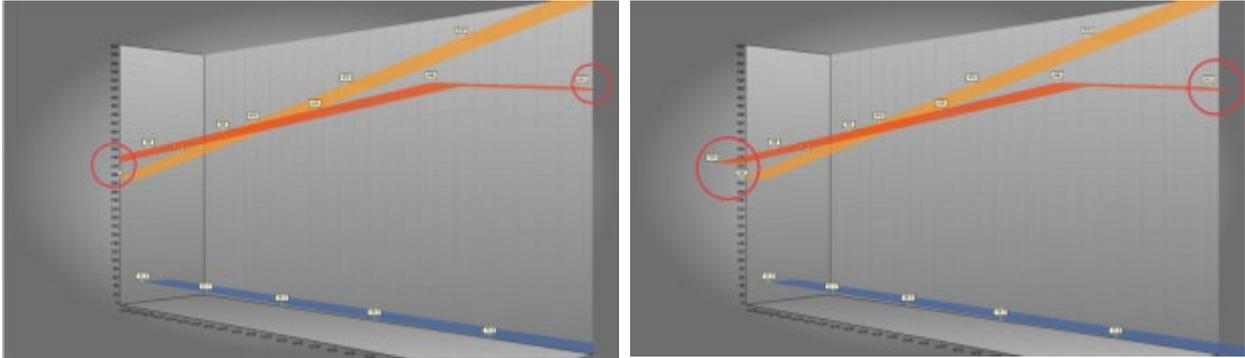


Fig. Example of Before and After Enabling the Drawing Outside the Axes.

2.25.3 Chart Axes

2.25.3.1 Axes Type and Appearance



The tab **Axes** (AsTrend main window > **Chart** tab > **Axes** group > the window '**Chart Options**' run by the button ) includes:

- **Vertical Axis Type:**

- **Vertical Axis - Physical**
- **Vertical Axis - 0-100%**
- **Many Vertical Axes**
- **Many Vertical Axes - Stack**

- **Axes:**

- **Axes Visible** - switch on the axes: OX and OY.
- colour box - declare the axes colour (this is also the label text colour for both axes).

- **Grid** - switch on the grid on the chart and declare the grid format: dotted or solid line as well as the grid colour.

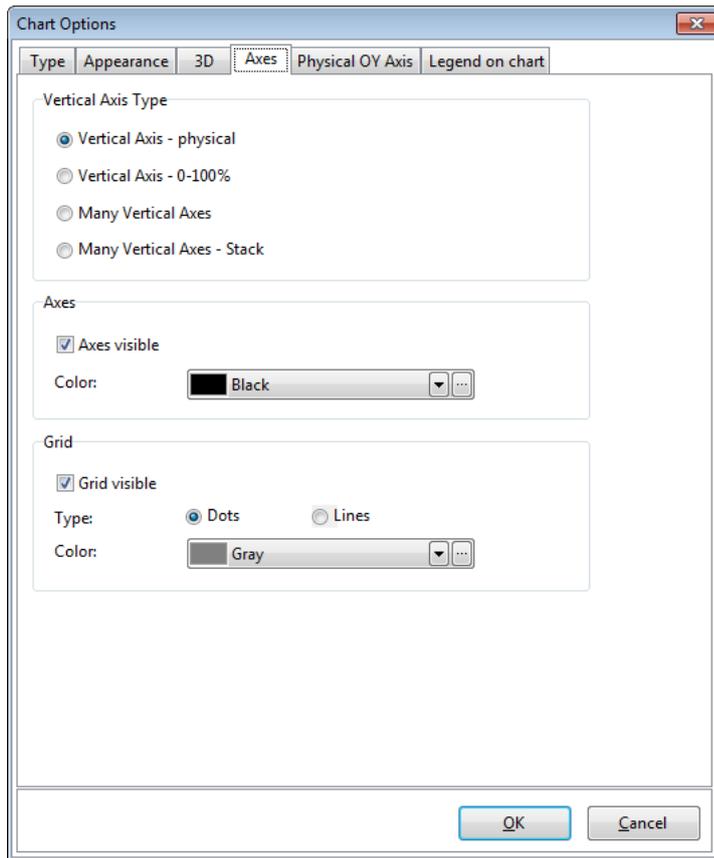


Fig. 'Chart Options' - 'Axes' Type.

2.25.3.2 Physical OY Axis



The physical OY axis options are set in:

AsTrend main window > **Chart** tab > **Axes** group > the window '**Chart Options**' run by the button  > **Physical OY Axis** tab.

Each trend when opened has the axis set in the range consistent with the display range of all graphs. The minimum is the lowest value of minima and the maximum is the highest value of maxima.

You can specify the minimum and maximum:

- on the basis of the display range,
- on the basis of the measurement range,
- on the basis of the lowest/highest,
- as given arbitrary by the user.

Manually set range will be in force until the next change.

The range calculation consists in determination of the lowest value of minima and the highest value of maxima for all graphs.

In addition, the window allows you to modify the way the labels describing the OY axis are displayed. By editing the default format, you can specify: the number of decimal positions, the number of outputted positions, the character that separates the integers from decimals.

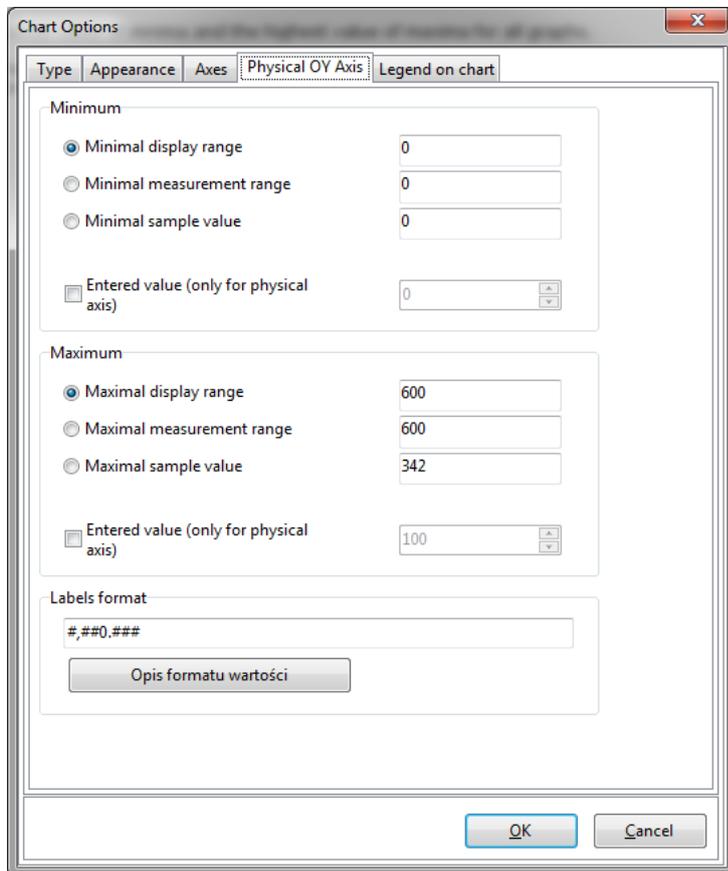


Fig. 'Chart Options' - 'Physical OY Axis' Type.

2.25.4 Chart Legend



Options of the legend displayed in the chart area are set in the following window:

AsTrend > **Chart** tab > **Appearance** group > '**Chart Options**' window > **Legend on Chart** tab

Legend Visible - display the legend in the chart area;

Legend Placement - set the legend in the specified location on the chart area:

- **Left,**
- **Right,**
- **Top,**
- **Bottom,**
- **Floating Vertical,**
- **Floating Horizontal;**

Background Color - legend background color;

Border Color - legend border color;

Show Symbols - display a coloured sample of the graph.

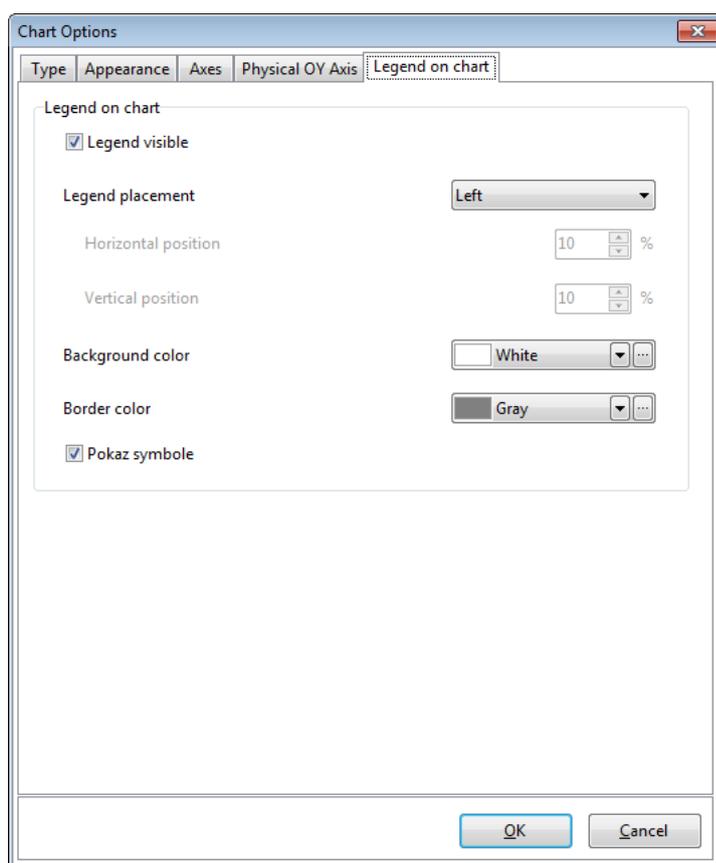


Fig. 'Chart Options' - 'Legend on Chart' Tab.

2.25.3 3D

 To switch the chart to 3D version, use the button  from:

AsTrend main window > **Chart** tab > **Appearance** group.

The tab **3D** (AsTrend main window > **Chart** tab > **Appearance** group > the window **'Chart Options'** run by the button ) - **available when the button**  **is pressed** - includes the following options:

- use orthogonal mode with the possibility to define: angle and depth of the chart;
- 3D with full spatial manipulation of the chart area in three dimensions with the possibility to define
 - rotation,
 - elevation,
 - perspective,
 - zoom,
 - depth.
- **3D Chart - Colours of Walls** - click in the fields: **Left Wall**, **Right Wall** or **Bottom Wall** to edit the colour.

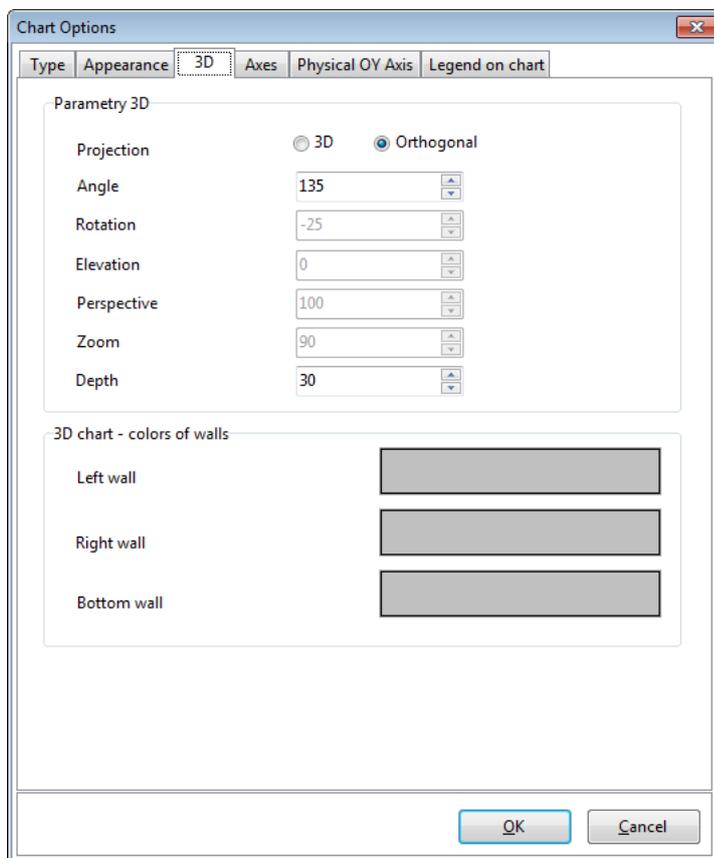


Fig. 'Chart Options' - '3D' Tab.

2.26 Trend Options

2.26.1 Trend Period Options



To define trend period options, use:

AsTrend main window > *Home* tab > *Period* group > the window '*Period Options*' run by the button .

The *Time Format* tab sets:

Time Format for XT Charts - time format for main and additional axis; there is the possibility to use a predefined format or to create its own format. Predefined formats:

- yy-mm-dd hh:mm:ss
- yy-mm-dd hh:mm
- yy-mm-dd hh
- yy-mm-dd
- yy-mm
- mm-dd hh:mm:ss
- mm-dd hh:mm
- mm-dd hh
- mm-dd
- dd hh:mm:ss
- dd hh:mm
- dd hh
- hh:mm:ss
- hh:mm
- mm:ss

A custom format requires to specify the format in the field *Main Time Axis* or *Additional Time Axis*. The string yy*mm*dd will output the date separated by '*' instead of '-'.

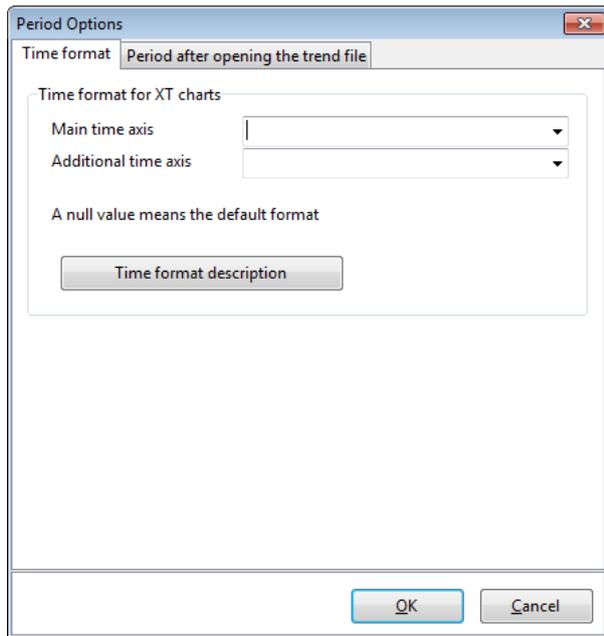


Fig. 'Period Options' Window - 'Time Format' Tab.

The **Period After Opening the Trend File** tab allows you to freely adjust the time period that will be loaded at trend opening.

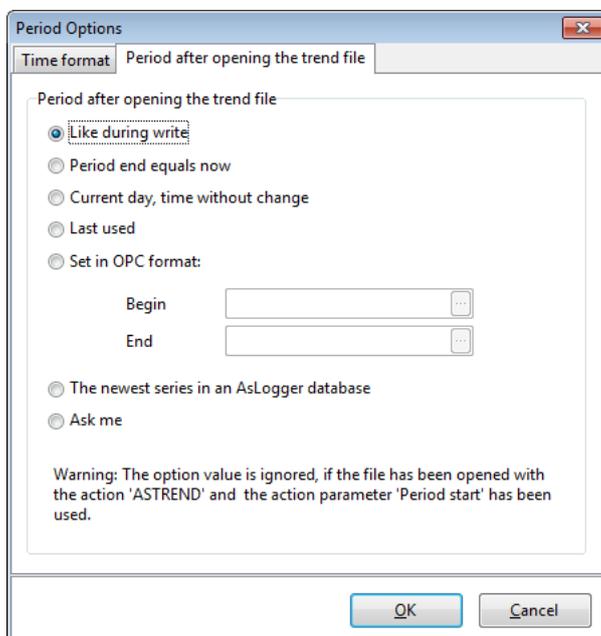


Fig. Trend Period Options.

There are the following variants of the period loaded during trend opening available:

- *Like during write,*
- *Period end equals now,*
- *Current day, time without change,*
- *Last used,*
- *Set in OPC format* - the use of OPC format makes it possible to define very precisely the time interval for which you want the data graphs to be charted at trend opening. Both the beginning and end of the period is defined with the use of the editor run by the button *******. The time can be absolute one or relative one referring to the current second, minute, hour etc.
- *The newest series in an AsLogger database;*
- *Ask me.*

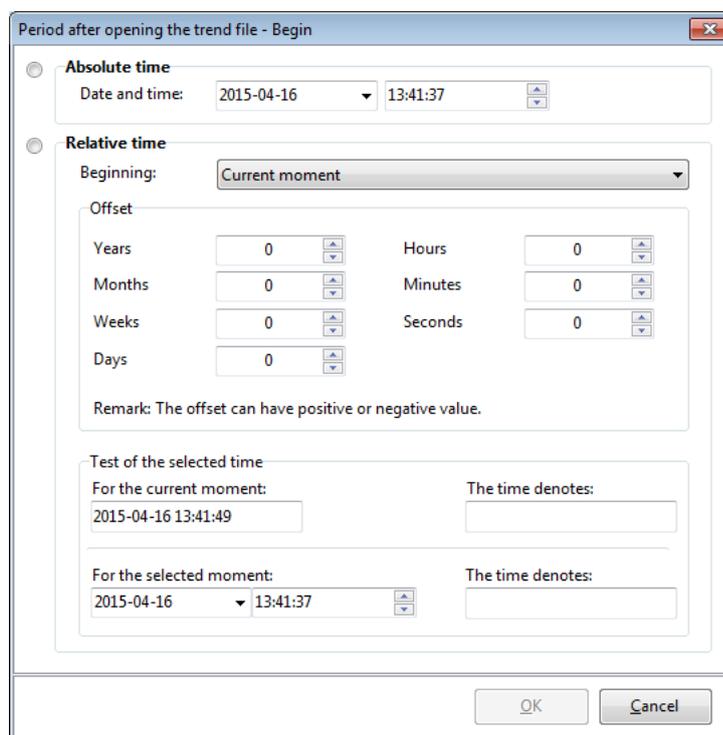


Fig. OPC Time Editor.

2.26.2 Trend Input Data Options



Trend input data options can be defined in:

AsTrend main window > **Data** tab > **Input Data** group > the window '**Trend Input Data Options**' run by the button .

* * *



The tab **Data** allows you to set: data type, sampling period for uniform data as well as round mode of the period beginning for aggregated data:

- **Data Type** (see: [2.14 Selecting the Data Type \(Genuine/Aggregated Data\)](#));
- **Uniform Data - Sampling Period** - the option specifies the length of intervals between points on the chart. If there is the aggregator enabled in the Asix application, then using the interval being multiplication of one minute may considerably improve speed of data collection.
- **Round Mode of the Period Beginning for Aggregated Data** - rounding to a multiple of the aggregation interval causes, if necessary, the beginning of the data reading period will be shifted so as to be always at the same time. For example, for 15-minute aggregation interval and the period from 0:22:00 to 1:22:0 the period beginning will be withdrawn to 0:15:00. No aggregation causes the aggregated data will be slower displayed - it because they usually will be calculated instead of retrieving from the server and the time stamps of aggregated samples will change when time period shifting or in live mode.

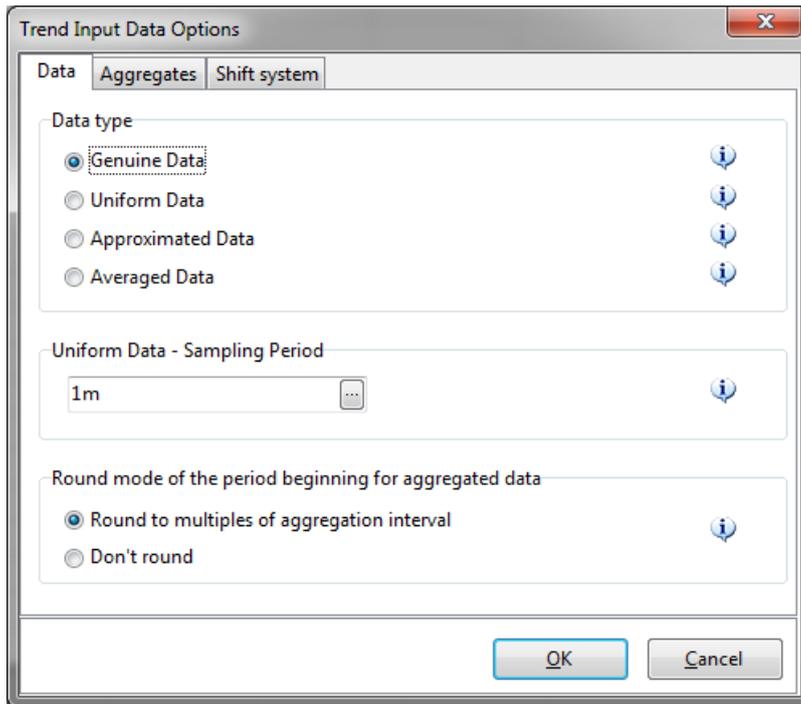


Fig. Trend Input Data Options - Shift Period.

* * *



The tab **Aggregates** allows you to set quality thresholds for aggregated data displayed by AsTrend:

- **Quality Thresholds for Data:**

Good Quality Threshold - an aggregated data has a good quality if the number of good samples in the interval is equal to or exceeds the given threshold of good quality.

Bad Quality Threshold - an aggregated data has a bad quality if the number of bad samples in the interval is equal to or exceeds the given threshold of bad quality.

- **Quality Threshold for Calculated Attributes:**

Good Quality Threshold - an aggregated data has a good quality if the number of good samples in the interval is equal to or exceeds the given threshold of good quality.

Bad Quality Threshold - an aggregated data has a bad quality if the number of bad samples in the interval is equal to or exceeds the given threshold of bad quality.

Trend Input Data Options

Data Aggregates Shift system

Quality thresholds for data

Good quality threshold 80

Bad quality threshold 0

Quality thresholds for calculated attributes

Good quality threshold 80

Bad quality threshold 0

OK Cancel

Fig. Trend Input Data Options - Aggregates.



The tab **Shift System** allows you to configure shift system. Configuration of the shift system affects the interpretation of OPC interval of 'Shift' aggregate calculation:

- **Configuration of a shift system:**

- **The beginning of the first shift,**
- **The length of the shift.**

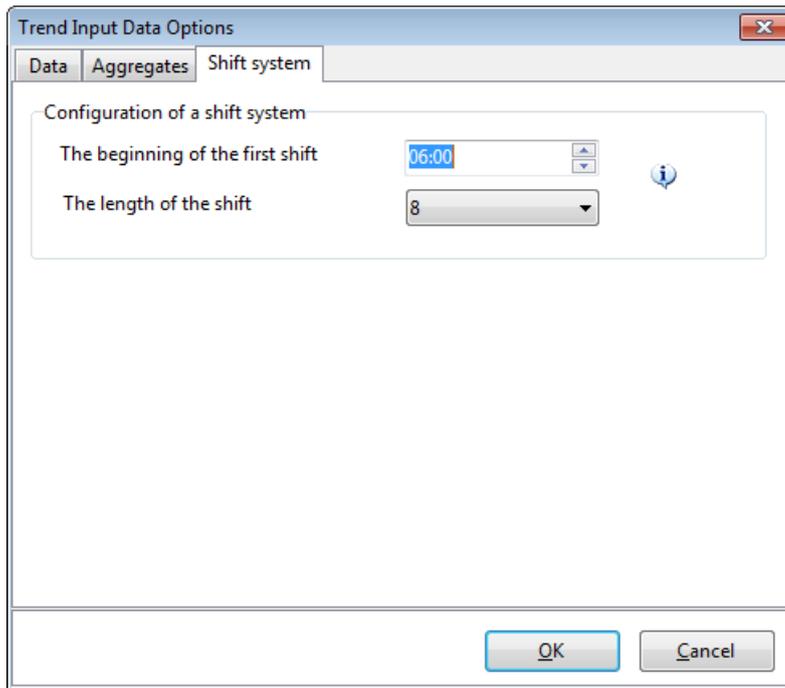


Fig. Trend Input Data Options - Shift System.

2.26.3 Trend Appearance Options

2.26.3.1 Appearance



The tab **Appearance** (AsTrend main window > **Trend and Legend** tab > **Trend** group > the window '**Trend Options**' run by the button  > **Chart** tab) includes:

- **Graph Colour Palette** - define colours of graphs with the use of:
 - variable colour palette built in the AsTrend program;
 - colour palette defined in trend options (one of several pre-defined palettes) or a palette defined by the user.

- **Variable Custom Colours** - use own colours for variables. If the option is enabled, the newly added graph will remember its colour. Changing the order of graphs in the legend will not change their colours.

- **Trend Font.**

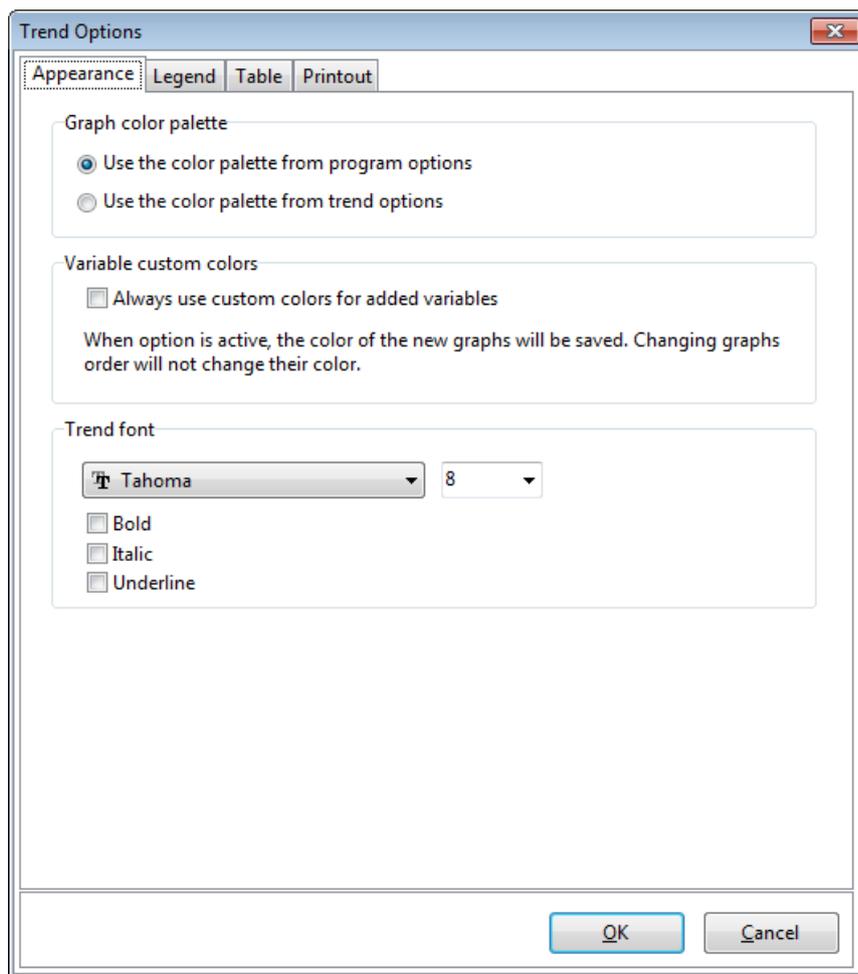


Fig. Trend Options - Appearance.

2.26.3.2 Legend

 The tab **Legend** (AsTrend main window > **Trend and Legend** tab > **Trend** group > the window **'Trend Options'** run by the button  > **Legend** tab) includes:

- **Legend Background Colour** - select a colour from the standard palette or compose your own one.
- **Legend Column Width** - set automatic fitting of the width of legend columns.
- **Column Headers** - enable the option of displaying shortened names of calculated attributes.
- **Height of the Legend on the Screen** - enable the option of automatic legend height calculation depending on the number of graphs or defining the legend height individually by the user with the use of division belt or direct declaration of the number of visible graphs in the legend.

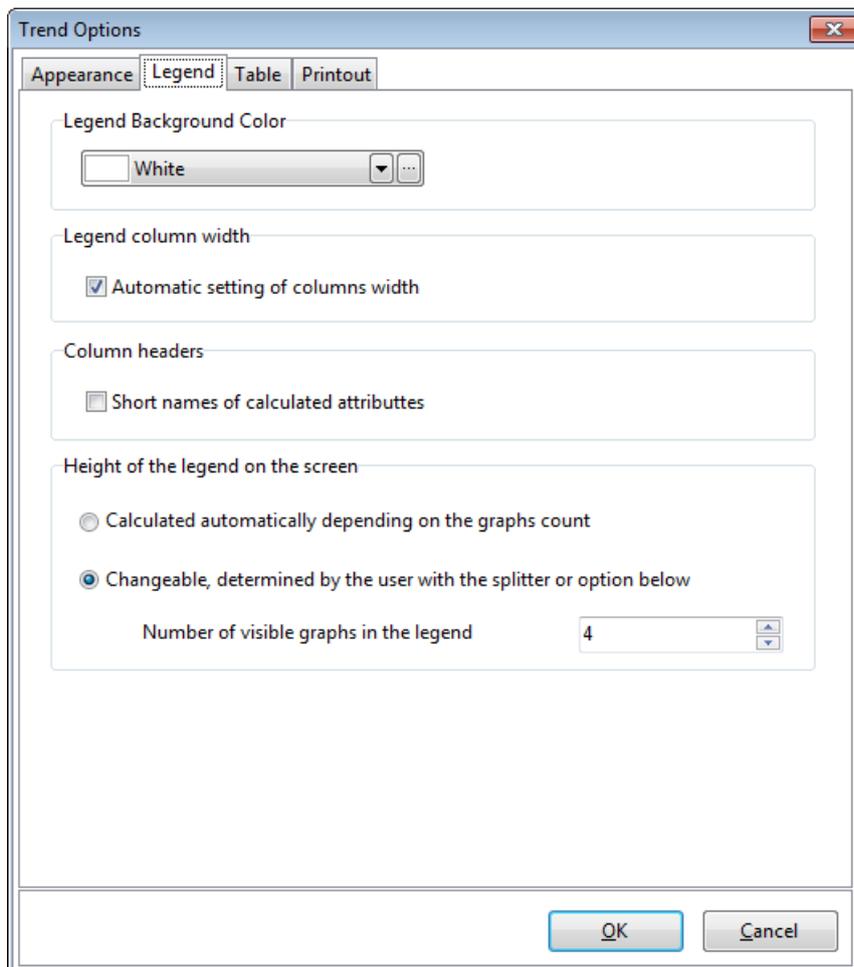


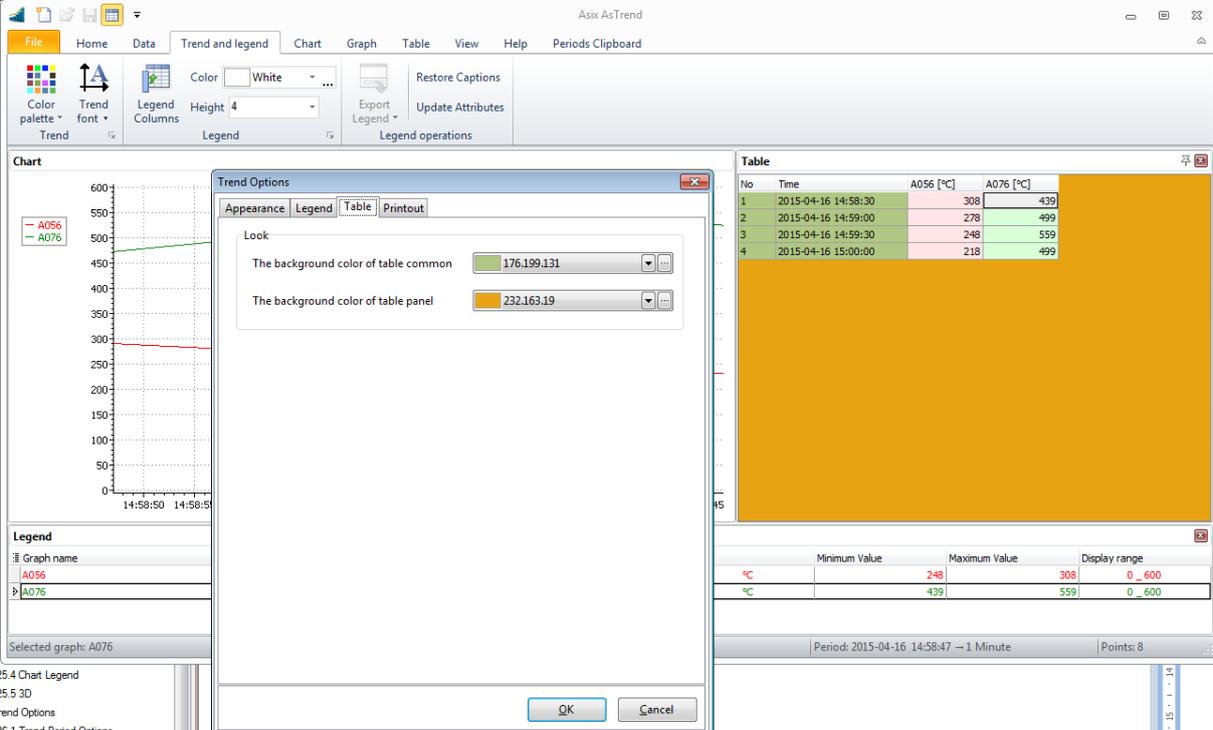
Fig. Trend Options - Legend.

2.26.3.3 Table

 The tab **Table** (AsTrend main window > **Trend and Legend** tab > **Trend** group > the window '**Trend Options**' run by the button  > **Table** tab) includes:

- **The background Color of Table Common Columns** - allows you to select a color from the standard colors or compose your own custom color that will be displayed in the background of the table columns that are common to the presented graphs.

- **The background Color of Table Panel** - allows you to select a color from the standard colors or compose your own custom color that will be displayed in the background of the table panel.



The screenshot shows the 'Trend Options' dialog box with the 'Table' tab selected. The dialog has three tabs: 'Appearance', 'Legend', and 'Table'. The 'Table' tab is active, showing two color selection options:

- The background color of table common: 176.199.131
- The background color of table panel: 232.163.19

The background of the table in the main window is highlighted in orange. The table data is as follows:

No	Time	A056 [°C]	A076 [°C]
1	2015-04-16 14:58:30	308	439
2	2015-04-16 14:59:00	278	499
3	2015-04-16 14:59:30	248	559
4	2015-04-16 15:00:00	218	499

Below the table, there is a summary table with columns for 'Minimum Value', 'Maximum Value', and 'Display range'.

	Minimum Value	Maximum Value	Display range
°C	248	308	0_600
°C	439	559	0_600

At the bottom of the dialog, there are 'OK' and 'Cancel' buttons. The main window shows a chart with two data series (A056 and A076) and a legend. The legend shows 'A056' and 'A076' with corresponding color swatches. The selected graph is 'A076'.

Fig. Trend Options - Table.

2.26.3.4 Printout



The tab **Printout** (AsTrend main window > **Trend and Legend** tab > **Trend** group > the window '**Trend Options**' run by the button  > **Printout** tab) includes:

Information

- **Title** - define the title content of the printout.
- **Header** - define the header content of the printout.
- **Footer** - define the footer content of the printout.
- **Print Trend File Name** - enclose the trend file name to the printout.

Legend Layout

- **Print Legend**
- **Fixed Chart Arrangement**
- **Legend on Separate Page** - when the option is enabled, the legend is printed on a separate page.
- **Two Column Legend** - when the option is enabled, the legend is divided into two columns on the printout.

Colors of Chart and Legend Backgrounds

- **Change Legend and Chart Background Colors to White**

The screenshot shows the 'Trend Options' dialog box with the 'Printout' tab selected. The dialog has a title bar with 'Trend Options' and a close button. Below the title bar are four tabs: 'Appearance', 'Legend', 'Table', and 'Printout'. The 'Printout' tab is active and contains the following sections:

- Information:** A text box with the message "These options are meaningful for prints on a printer and for an export to a PDF/BMP". Below it are three input fields for 'Title', 'Header', and 'Footer'. A checkbox labeled 'Print the file name' is checked.
- Legend layout:** A section with four options: 'Print legend' (checked), 'Fixed Chart Arrangement' (checked), 'Legend on separate page' (unchecked), and 'Two column legend' (unchecked). An information icon is present next to 'Fixed Chart Arrangement'.
- Colors of chart and legend backgrounds:** A section with one checked option: 'Change legend and chart background colors to white'. Below this is a text box explaining: "In case of the background color change into white all the white graphs are changed into black. While printing on a black and white printer, background of the chart and legend are always white."

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Fig. Trend Options - Printout.

2.26.3.5 Color Palette

 The tab **Colour Palette** (AsTrend main window > **Trend and Legend** tab > **Trend** group > the window '**Trend Options**' run by the button  > **Color Palette** tab) includes:

- predefined color palettes

or

- possibility of customer palette creation using the option **<Trend Own Palette>** and defining the color of coloured squares.

The tab available when the option *Use the Colour Palette from Trend Options* from the Appearance tab is selected.

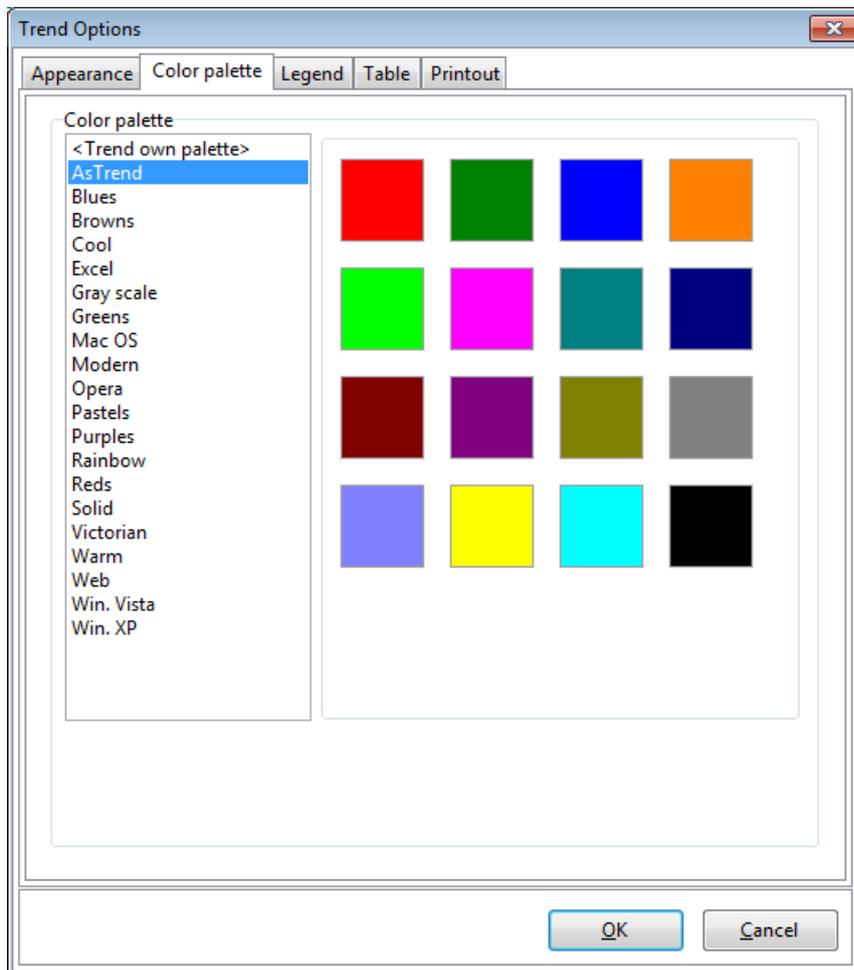


Fig. Trend Options - Colour Palette.

2.26.4 Trend Window Options



Trend window options are defined in:

AsTrend main window > **View** tab > **Window** group > the window '**Trend Window Options**' run by the button .

Trend window options includes: window size and position, window size block and storing window layout.

- **Window Size Block** - option used when creating trend files mainly for the Asix application. When the option is enabled, the window size and position are stored in trnx file. While opening the file, the window size and position are restored.

- **Window Size and Position** - the option is in force when you blocked the window size (**Window Size Block**).

NOTICE: Window size and position are ignored - if the option of ignoring the window size is enabled in program options and the trend file is opened in AsTrend started without the Asix application.

- **Storing Window Layout** - if the option is enabled, the window size and position are stored in the trend file and restored while trend opening.

Trend Window Options

Size Block

Window Size Block
Option is used mainly in trend files created for Asix applications. 

Window size and position

Upper left corner X: 

Upper left corner Y: 

Width: 

Height: 

This parameter is valid only when window size block is active. Change of position will be visible if ignoring window position isn't set active in program options

Storing windows layout

Storing windows layout
If the option is enabled then the layout of the windows will be remembered in the trend file and restored when the file is open.

Fig. Trend Window Options.

2.27 Graph Options



The graph options are specified using:

AsTrend main window > **Graph** tab > **Graph** group > the window '**Graph Options**' run by the button .

NOTICE: Tabs of the window may vary slightly depending on the data types of graphs (see: [1.8 Data Types of Graphs](#)).

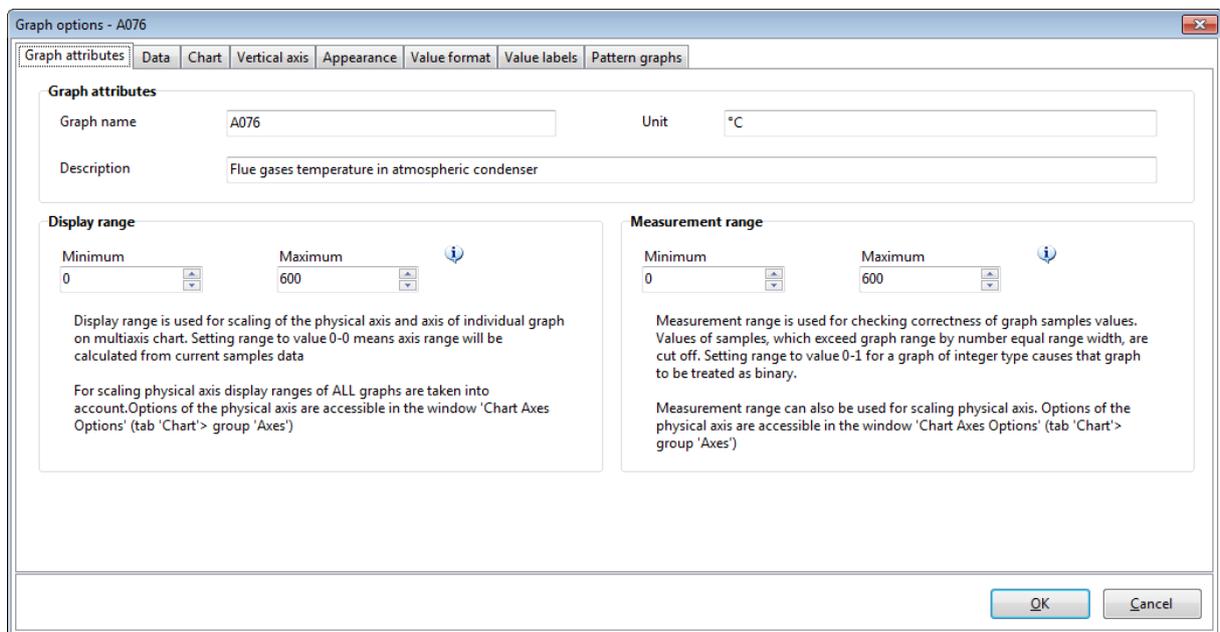
* * *



The tab **Graph Attributes** allows you to specify:

- **Graph Attributes**
 - **Graph Name**,
 - **Unit**,
 - **Description**.
- **Display Range**,
- **Measurement Range**;

NOTICE: The tab is not available for the bits of a status variable as well as for alarms.



Graph options - A076

Graph attributes | Data | Chart | Vertical axis | Appearance | Value format | Value labels | Pattern graphs

Graph attributes

Graph name: A076 Unit: °C

Description: Flue gases temperature in atmospheric condenser

Display range

Minimum: 0 Maximum: 600

Display range is used for scaling of the physical axis and axis of individual graph on multiaxis chart. Setting range to value 0-0 means axis range will be calculated from current samples data

For scaling physical axis display ranges of ALL graphs are taken into account. Options of the physical axis are accessible in the window 'Chart Axes Options' (tab 'Chart' > group 'Axes')

Measurement range

Minimum: 0 Maximum: 600

Measurement range is used for checking correctness of graph samples values. Values of samples, which exceed graph range by number equal range width, are cut off. Setting range to value 0-1 for a graph of integer type causes that graph to be treated as binary.

Measurement range can also be used for scaling physical axis. Options of the physical axis are accessible in the window 'Chart Axes Options' (tab 'Chart' > group 'Axes')

OK Cancel

Fig. Graph Options - Attributes.

- **Display Range** - display range is used for scaling the physical axis and the axis of individual graph on *Many OY Axes* chart (notice: you have to set the options **Minimal Displaying Range** and **Maximal Display Range** as the minimum and maximum in the physical OY axis settings: AsTrend main window > **Chart** tab > **Axes** group > '**Trend Axes Options**' window activated by the button  > **Physical OY Axis** tab). The range 0-0 means the absence of display range - then the physical axis range will be calculated based on the current values of the samples.

Notice: for scaling physical axis the display ranges of all the graphs are taken into account, for example: minimum can be set on the basis of the least one from minimal values defined for graphs and maximum on the basis of the highest one from maximal values. If not all of the graphs have ranges defined, the range is determined automatically.

- **Measurement Range** - measurement range is used for checking correctness of graph sample values; the values of samples that exceed the graph range by the number equal to the graph range are cut off. The range 0-1 for total value Asix system variable means that the variable is treated as a binary value.

The measurement range may also be used for scaling the physical axis (notice: you have to set the options **Minimal Measurement Range** and **Maximal Measurement Range** as the minimum and maximum in the physical OY axis settings: AsTrend main window > **Chart** tab > **Axes** group > '**Trend Axes Options**' window activated by the button  > **Physical OY Axis** tab).

Notice: for scaling physical axis the measurement ranges of all the graphs are taken into account, for example: minimum can be set on the basis of the least one from minimal values defined for graphs and maximum on the basis of the highest one from maximal values. If not all of the graphs have ranges defined, the range is determined automatically.

* * *



The tab **Data** allows you to:

- enable the additional time axis connected with the specified variable; if one or more graphs use the additional period of time: the second axis of time is displayed above the chart, possibility of editing additional period appears in the period editor;
- select the graph data type;
- select the type of aggregation function used to calculate raw data;
- declare the way the data (points) with uncertain quality are treated (as points with good quality or as points with bad quality).

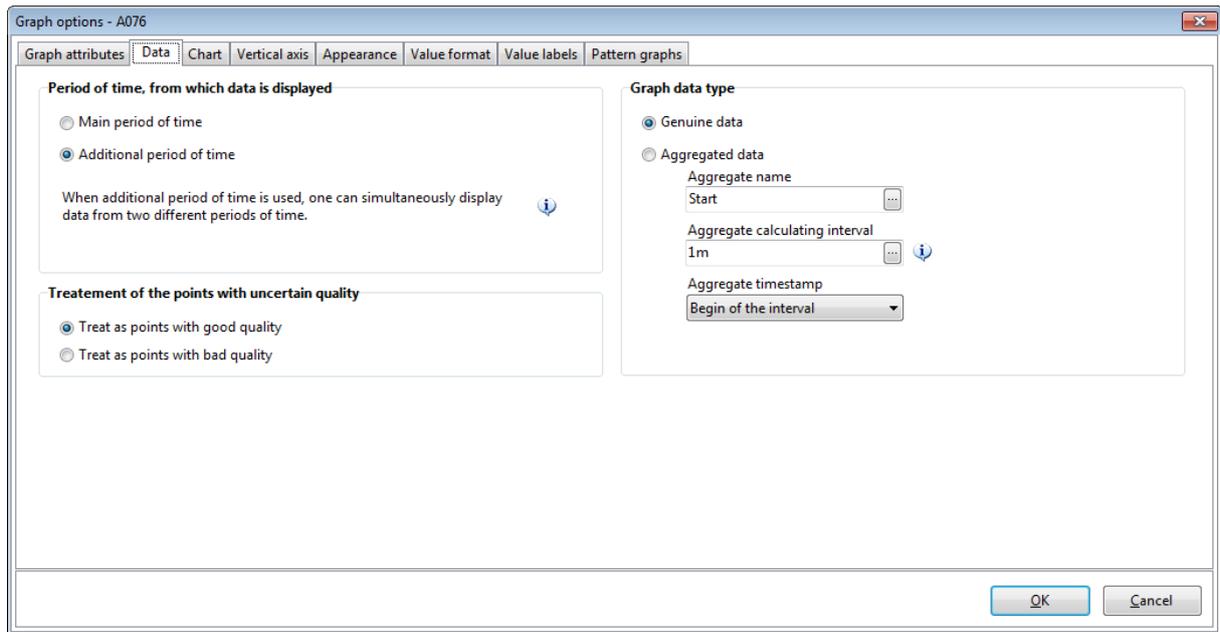


Fig. Graph Options - Data.

A time period for the additional time axis is set by the button



which runs the window *'Period'* (AsTrend main window > *Home* tab > *Period* group).

The period beginning of the additional time axis is defined in the OPC format (see: [2.15.6 OPC Time Editor](#)).

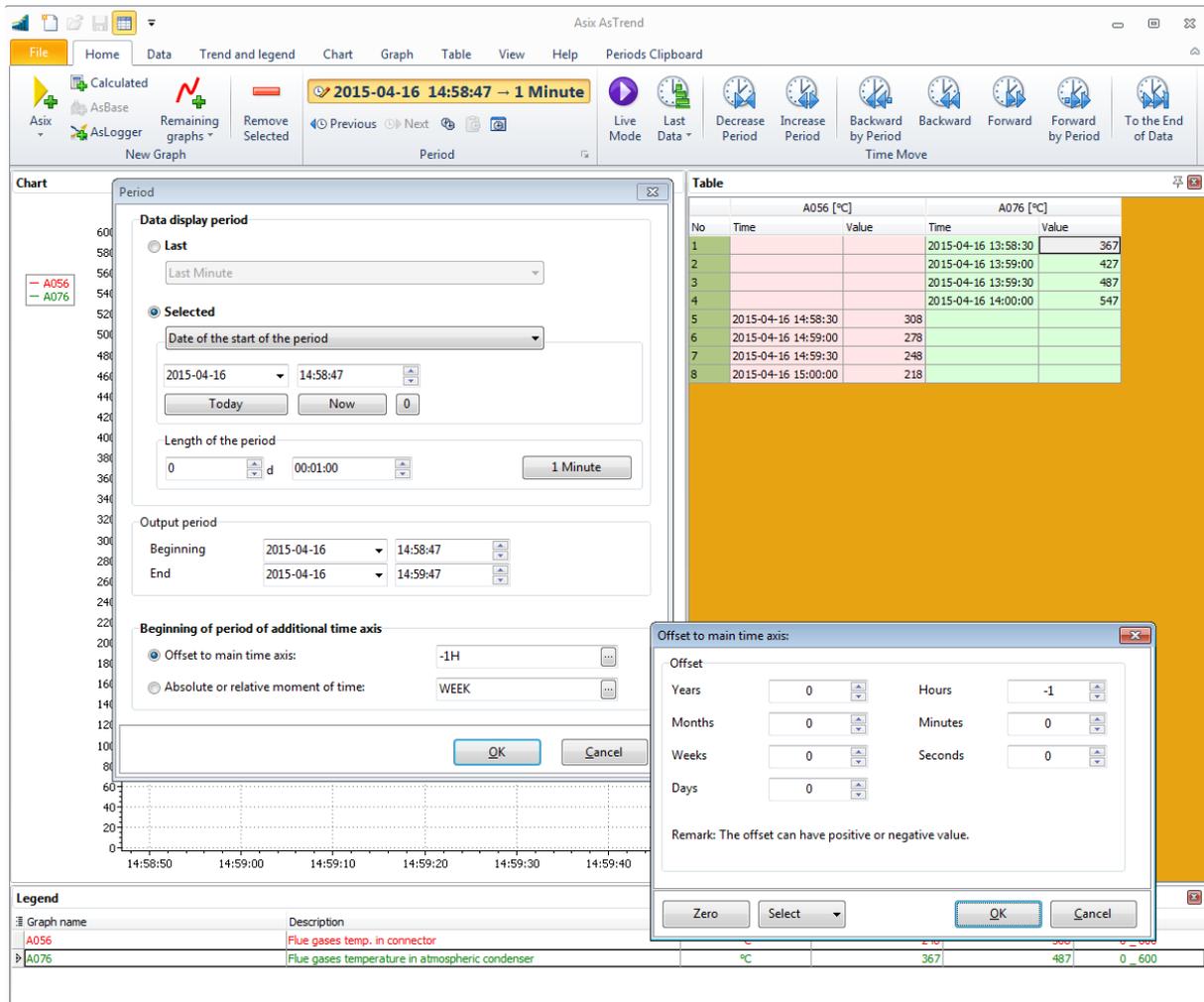


Fig. The Window with the Option for Defining the Additional Time Axis.

To compare graphs of the same variable from two different time periods, add the variable to the chart twice, assign the additional time axis to one of the graphs and declare a time period for the additional OX axis. When only one graph uses the additional time period, the additional OX axis is drawn in the colour of the graph.



The tab **Chart** enables:

- chart type selection: line, bar or area;
- setting stairs interpolation (with the possibility of reverse charting - the option **Interpolate with Value on the Left From the Point**) - for line and area charts;
- setting the width and offset of bar - for bar charts;
- setting the base line position for area charts;

- setting graph limit lines.

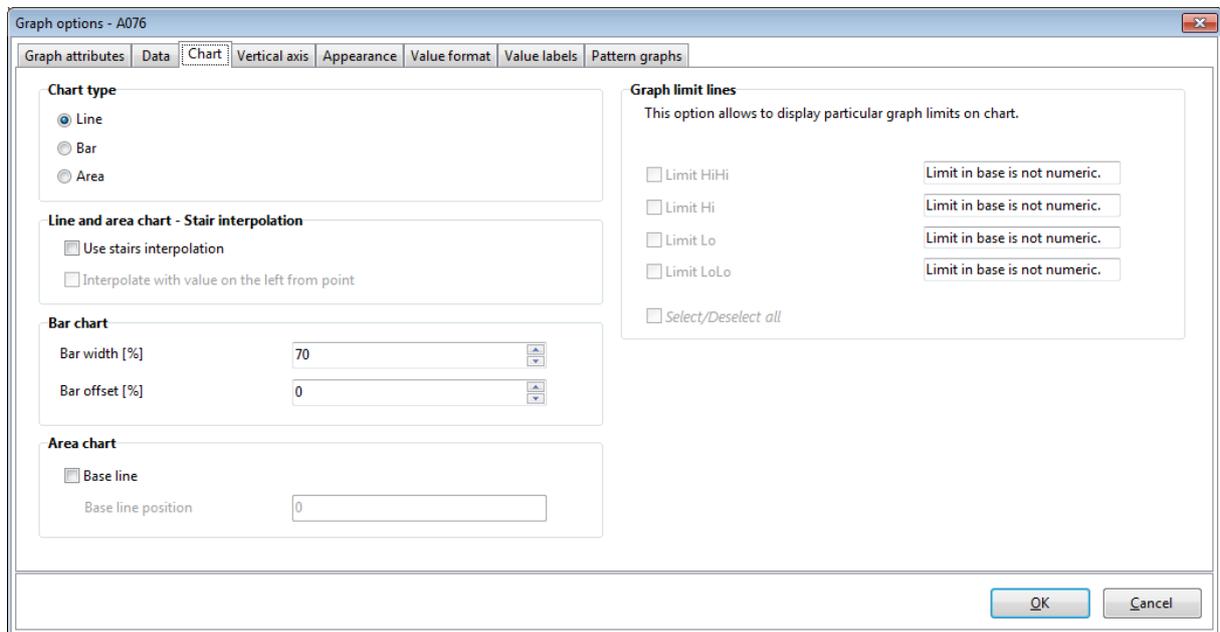


Fig. Graph Options - Chart.

The option **For All Grpahs** allows you to apply settings for all graphs displayed on the chart.



The way the vertical axis is displayed on the chart, you can define on the tab **Vertical Axis** (for charts with many OY axes) - the parameters are set for one selected variable or for all the variables simultaneously:

- **Vertical Axis Position - Chart with Many OY Axes:**

- **On the Left Side of the Chart** - axis can be positioned on the left side of the chart;

- **On the Right Side of the Chart** - axis can be positioned on the right side of the chart;

- **Vertical Axis Position Chart with Many OY Axes - Stack:**

- **Axis Always on the Left Side** - axes can be positioned always on the left side of the chart, separately for each graph;

- **Axis on the Left or Right Side** - axes can be positioned on the left or right side of the chart; graphs of variables adjacent in the legend can be charted two on a single chart - then one graph will have the axis on the left side and the

second graph on the right side. For example, if 8 graphs have the option checked, it will be 4 charts (one above the other).

- **Axis Scale Type:**

- **Linear**,

- **Logarithmic** - axis can be logarithmic only when the minimum and maximum is greater or equal to zero..

- **Inverted Vertical Axis** - option has a sens only for charts with the proportional axis or with many OY axes,

- **Labels Format** (charts with the proportional axis or with many OY axes).

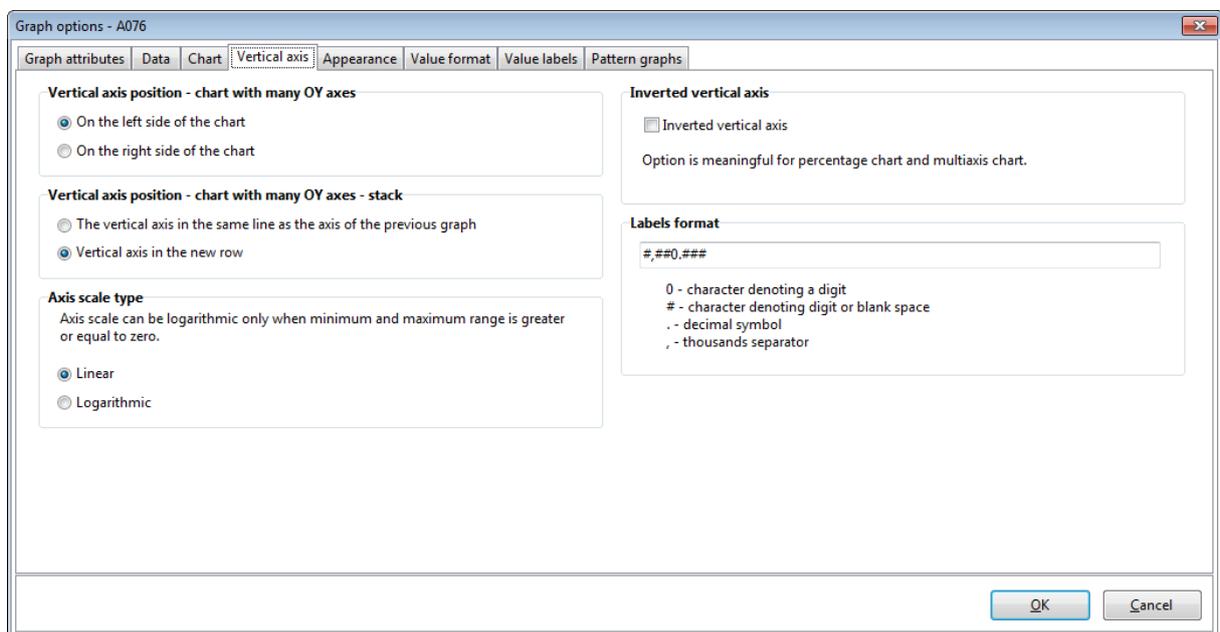


Fig. Graph Options - Vertical Axis.



The tab **Graph Options** includes:

- **Appearance** - show points, labels; set line width; set transparency; hide graph on the chart; use custom colour for a graph; set 3D graph depth;

- **Gradient** - set gradient scale (it darkens or lightens the gradient); set gradient balance (it shifts the balance up or down).

- **Font Options** - set custom font in the legend.

- **Visibility** - hide graphs on all charts or indicate those charts on which graphs are to be visible.

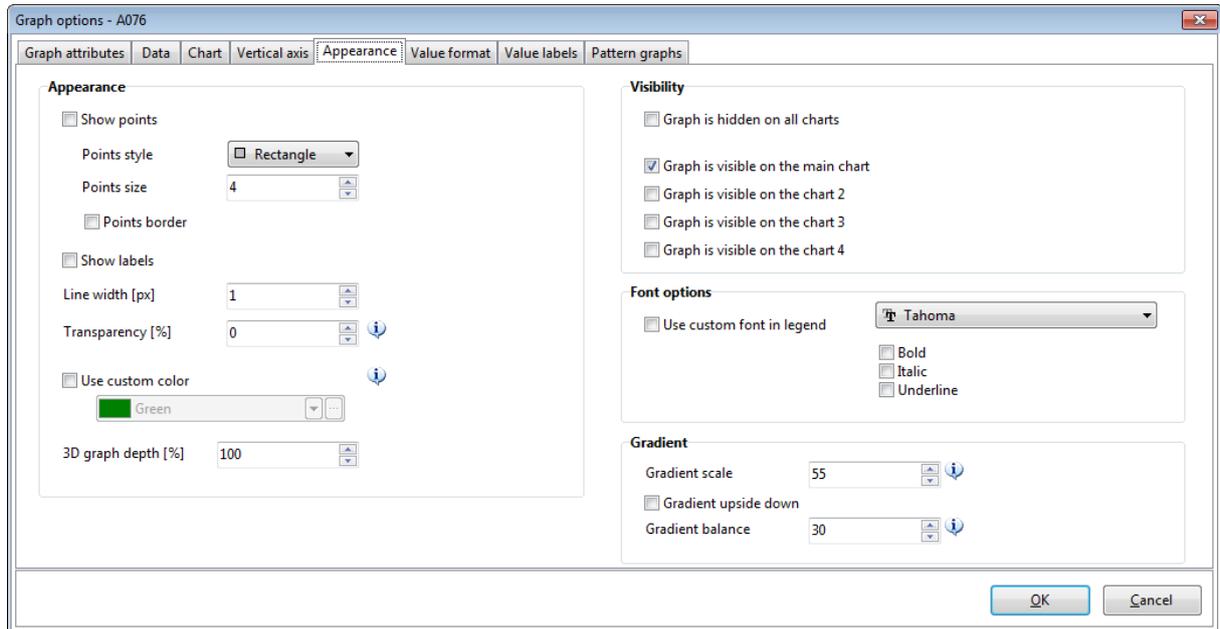


Fig. Graph Options - Appearance.

* * *



The tab **Value Format** includes:

- **Values Format** - set values format as calculated on the basis of display range or as the custom one.

- **Display Aggregate Total as Time** - data aggregated by the function 'Total' is displayed using the time format: d h:mm:ss

- **Measure Period of the Graph** - is used to calculate aggregates Total(value divisor) and Gradient(value multiplier).

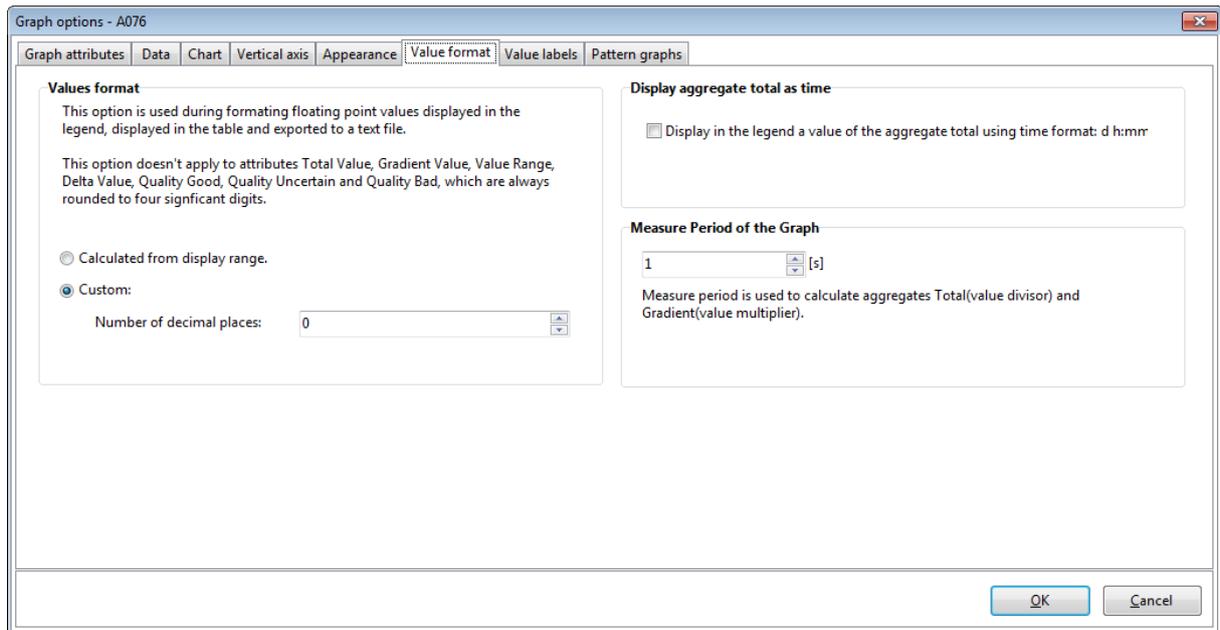


Fig. Graph Options - Value Format.

* * *



The tab **Value Labels** includes the editor to define text labels of values. These labels are used instead of numeric values:

- on the chart: hints and point labels;
- in the legend: **Sample Value of Read Line 1/2** columns;
- on the vertical axis in case of *'Proportional Axis'* and *'Many OY Axes'* charts; for physical axis the labels are displayed only if they are the same for all the graphs;

For floating-point values the labels corresponding to the rounded integer values are displayed.

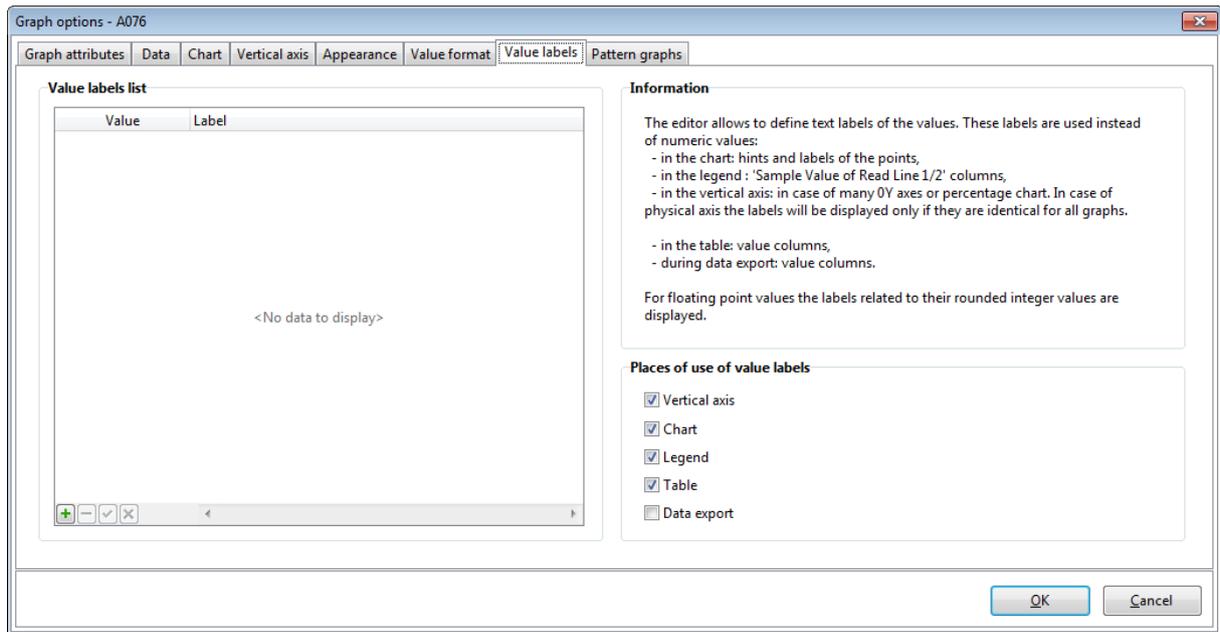


Fig. Graph Options - Value Labels.

* * *



The tab **Pattern Graphs** allows you to add one or two pattern graphs to the chart for the displayed analysed graph. Adding two pattern graphs gives the effect of 'band chart' - useful to show the operator the expected shape of the graph.

Pattern graphs can be added from:

- Asix application: pattern graphs are defined using the PEdit program and stored in an SQL archive; *see more information: PatternTrends.CHM/PDF*
- external sources: pattern graphs are defined in text files, spreadsheets or database; the format of patterns is the same as for external data; see information on external data format pressing the button **Add Pattern Graph from External Source** - the dialog window will appear.

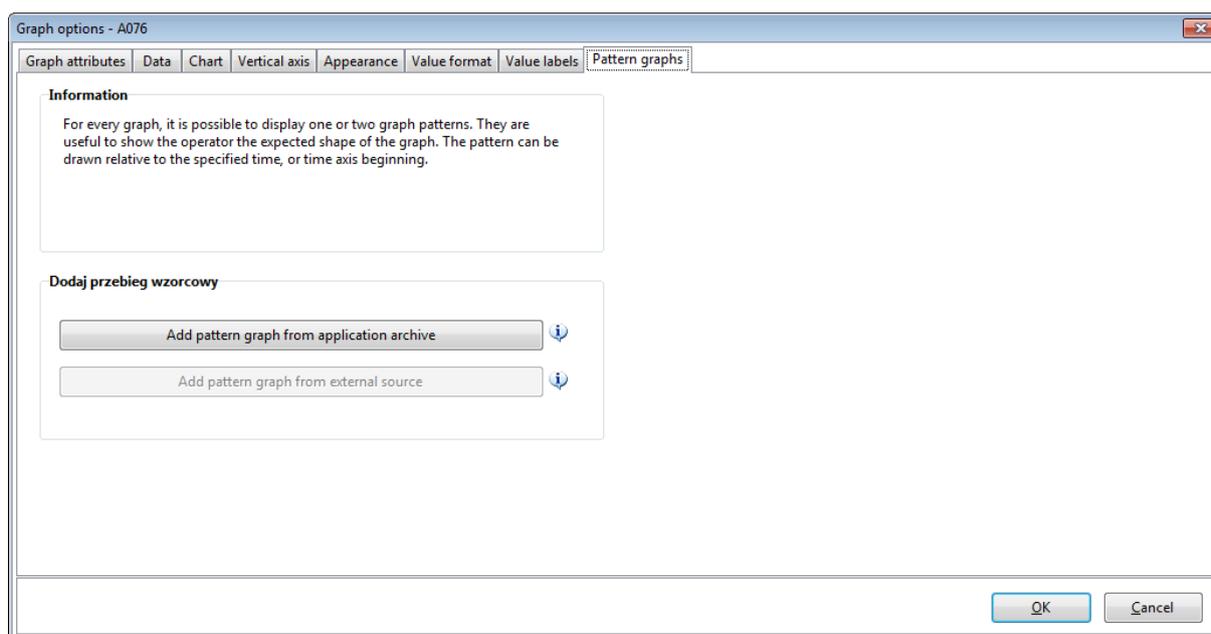


Fig. Graph Options - Pattern Graphs.

2.27.1 Graph Data Source Options

 Options allow you to select graph data type (including an aggregate used to convert raw data), select an archive from which data are read or replace a graph variable.

AsTrend > **Graph** tab > **Graph Operations** group > **Graph Data Source Options** button > **Data Source - Asix Variable Graph** window

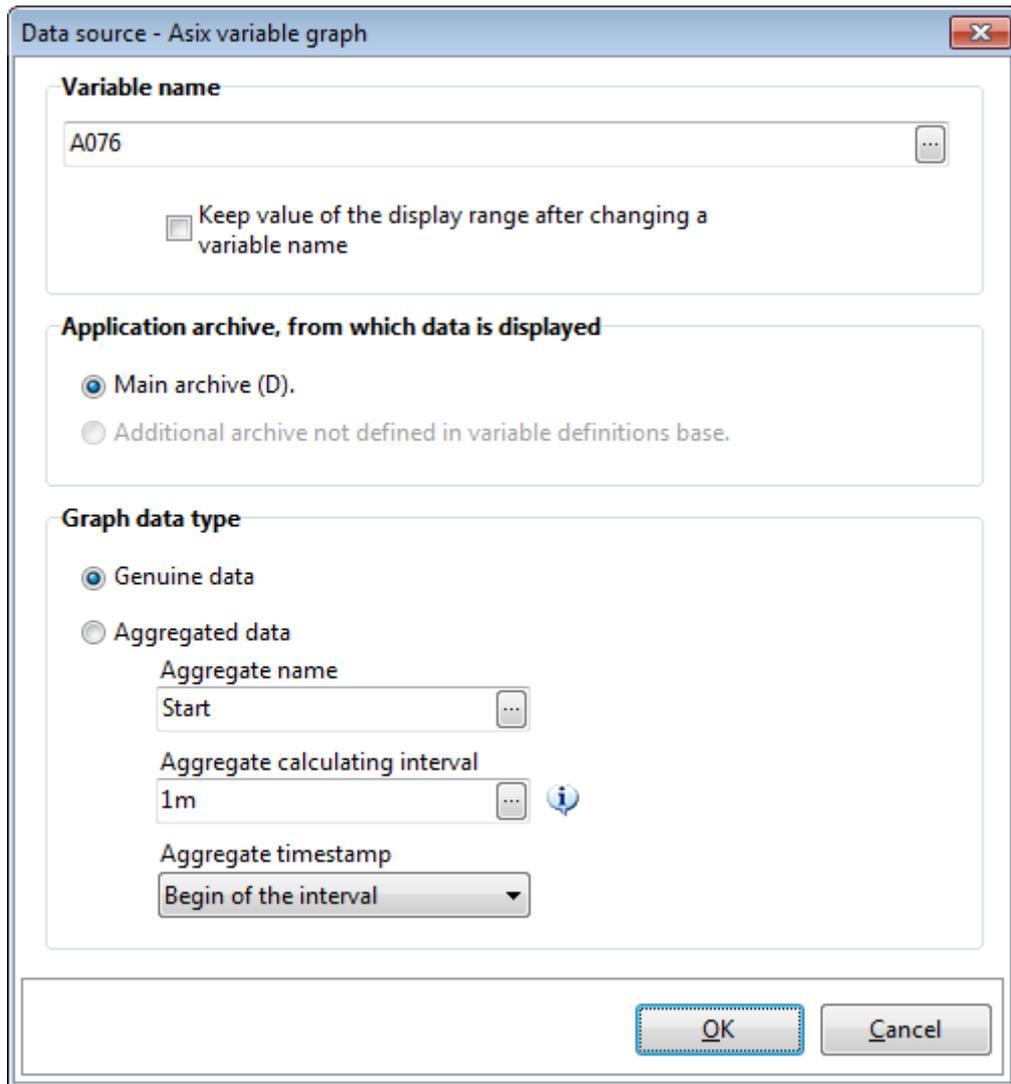


Fig. Graph Data Source Options.

2.28 Data Export Options



The data export options are set in:

AsTrend > **Data** tab > **Export of Data** group > **'Data Export Options'** window run by the button .

Fig. Data Export Options.

The window allows you to set the following parameters to export data to the clipboard or text file:

- **Header** - can declare one or two-line header and set unit and aggregate at names of the variables;
- **Genuine Data** - samples arranged according to the timeline or one after the other; can declare a common time column for the genuine data;
- **Quality Columns** - the ability to add the quality column and declare its format;
- **Uniform data** - can declare the common time column for uniform data.

2.29 Reading the Trend Definition



To read trend definition:

- use the button **Open**  from **File** menu to read a stored trend/report definition. The read definition replaces the so-far used one.

The trend definition contains:

- names of the charted variables
- trend period
- curve attributes (colors, chart types, labels etc.)
- window attributes (window appearance)
- print-out parameters (title, header, footer).

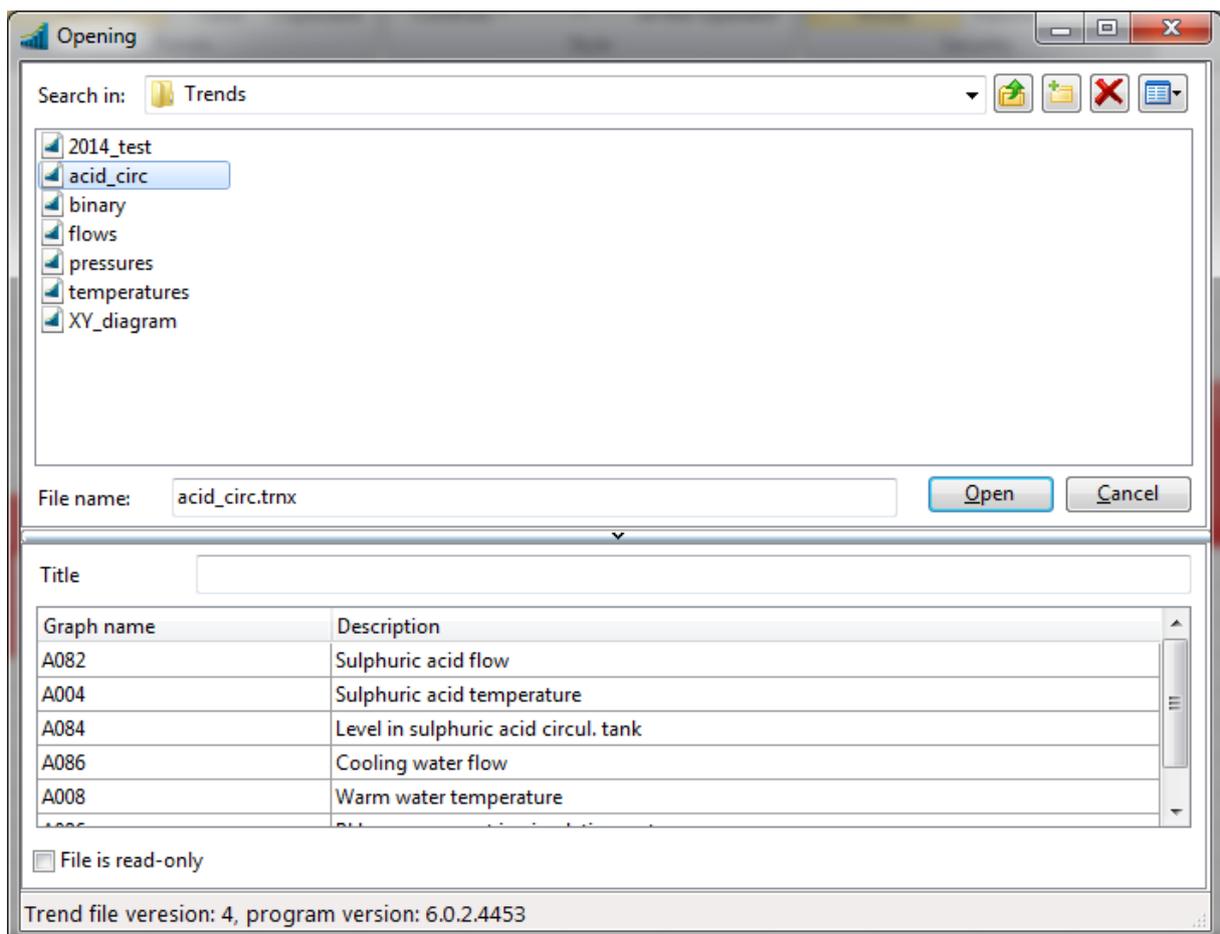


Fig. The Window for Trend Definition Reading.

The period displayed on the screen may be modified in relation to a period stored in a trend definition. If you set the mode with asking the user for the to-be-displayed period - each time a new trend definition is open, the dialog window will be displayed.

Trend definitions are stored in XML files. Trend definition may be read-in automatically during the program startup if name of such a file will appear as argument of the program calling command.

There is a parameter that allows you to specify the type of window to open AsTrend trend/report files (with or without an option to preview the contents of a trend/report). This parameter is available only for AsTrend run without an Asix application:

AsTrend > *'Program Options'* window > *Trend File Open Window* tab



For AsTrend started with the classical Asix application in the 'administrator or operator' mode:

The window 'Opening' displays as well - but - please note that the user with operator privilege can read trend files only if the directory for trend definition files is declared in the operator action opening AsTrend - it is because the operator can open the files only from a given directory and its subdirectories.

For classical Asix application you can set the option starting AsTrend with the Asix application, including indication of a directory with trend definition files (without using the operator action ASTREND):

Architekt > *Start Parameters* > *Programs* > *AsTrend* > *Start AsTrend*

In the operator window it is not possible to go to any directory in the field *Search in*: as well as to delete the file of *read-only* type.

Both the administrator and operator do not have the ability to delete files when write lock was imposed on these files (the option set in the Architect module: *Fields and Computers* > *Start Parameters* > *Programs* > *AsTrend* > ***Do not allow saving any files***).

2.30 Printing Trends



The trend displayed in the AsTrend window can be printed. There are some functions run from a **File** menu related to printing trends:

- **Print Preview** ;
- **Print** .

Printouts include:

- chart area;
- legend;
- title,
- header,
- footer.

All these parameters are visible in print preview and can be set in the trend parameter window:

AsTrend main window > **Trend and Legend** tab > **Trend** group > the window '**Trend Options**' run by the button  > **Printout** tab.

Print Trend File Name - print the file name in the footer of a trend; by default, the option enabled.

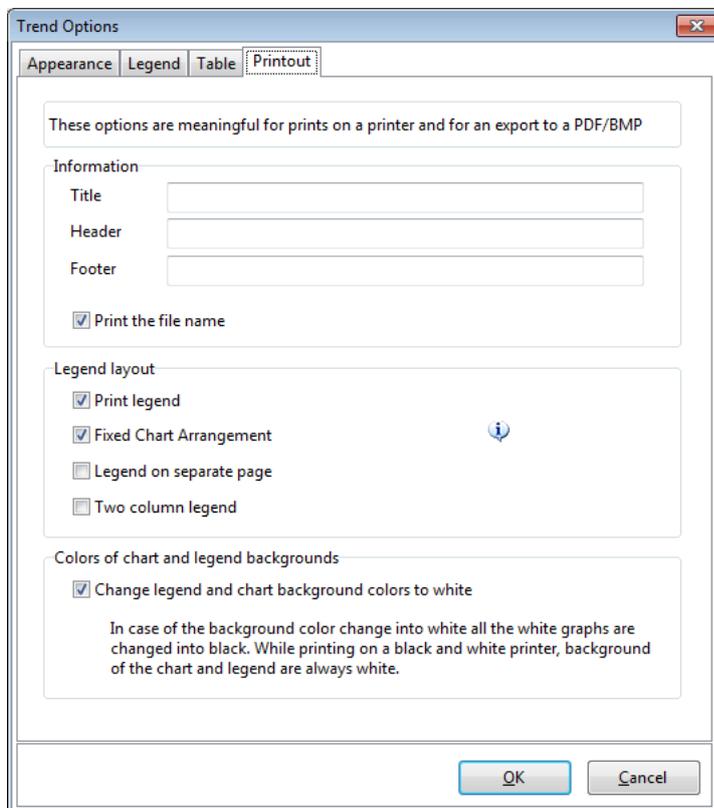


Fig. Trend Options - Printout.

2.30.1 Print Preview

 To pre-view printout on the screen before printing, use:

- the command **Print Preview**  from the **File** menu.

Depending on the selected printer, the printout will be black&white or colored. In the former case all colors will be automatically translated into a gray scale. Buttons in the preview window make possible to scale the printout in several different ways (fit to window, 100% size as on the printer, fit to page width etc.), to configure some printer options, as well as to start printing.

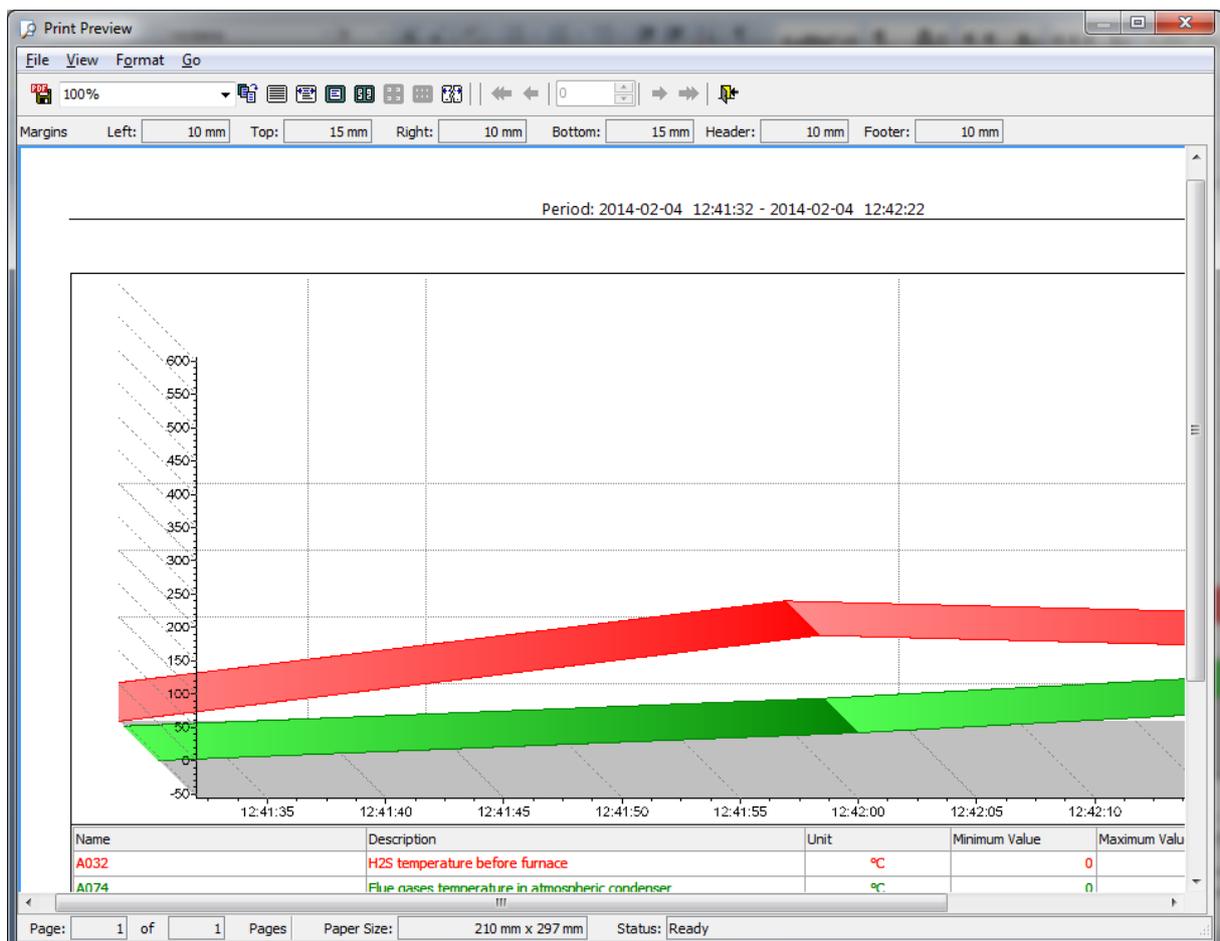


Fig. Print Preview.

2.30.2 Printing



To start printing, use:

- the command **Print**  from the **File** menu.

In the **operator mode** - after the command is called, the simplified window of printer selection opens.

2.30.3 Printing Trends with More than 8 Graphs

In the case when more than 8 graphs are to be printed in one trend, the option **Two Column Legend** should be set:

AsTrend main window > **trend and Legend** tab > **Trend** group > the window **'Trend Options'** run by the button  > **Printout** tab

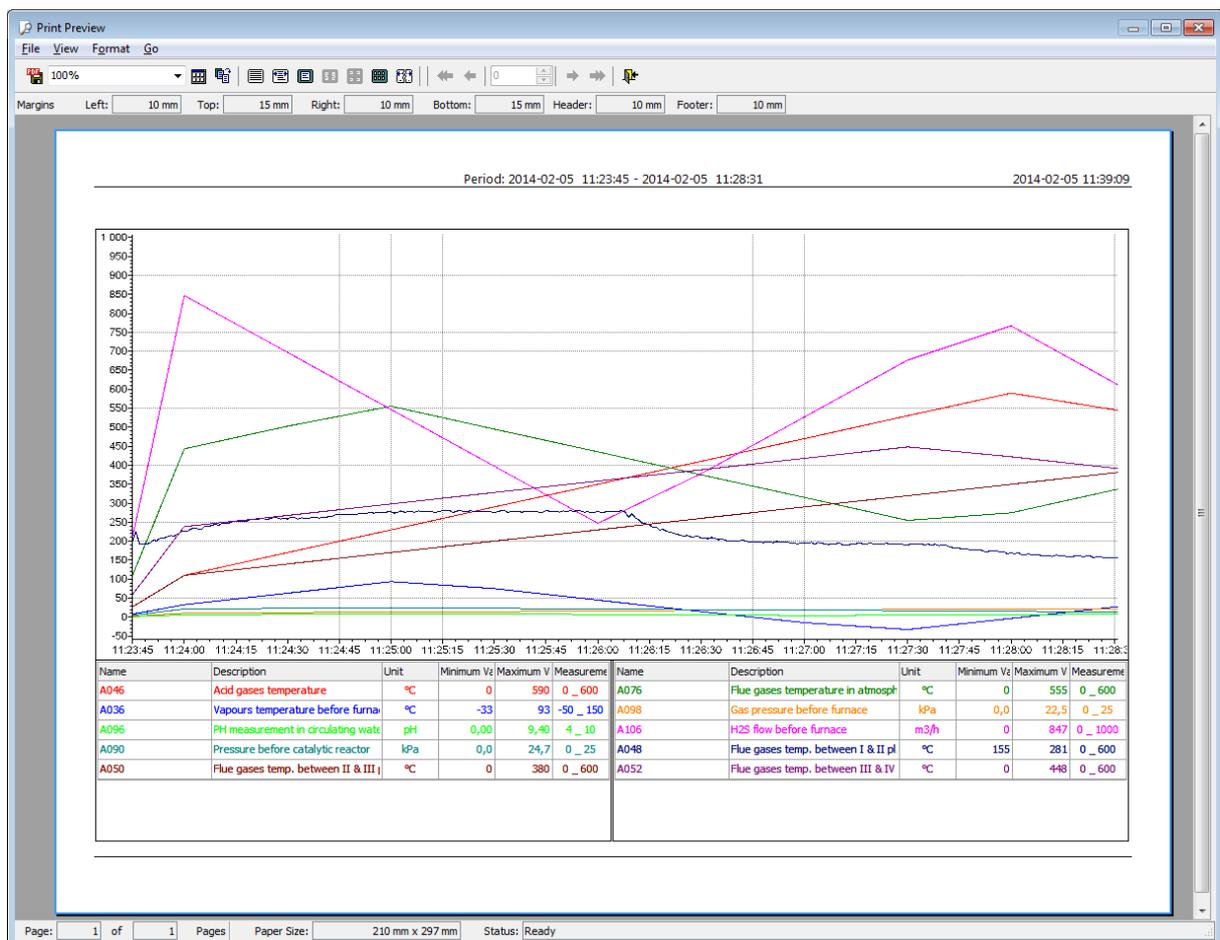


Fig. Print Printout.

When printing a chart of more than 8 graphs with the one column legend, the following message will display:

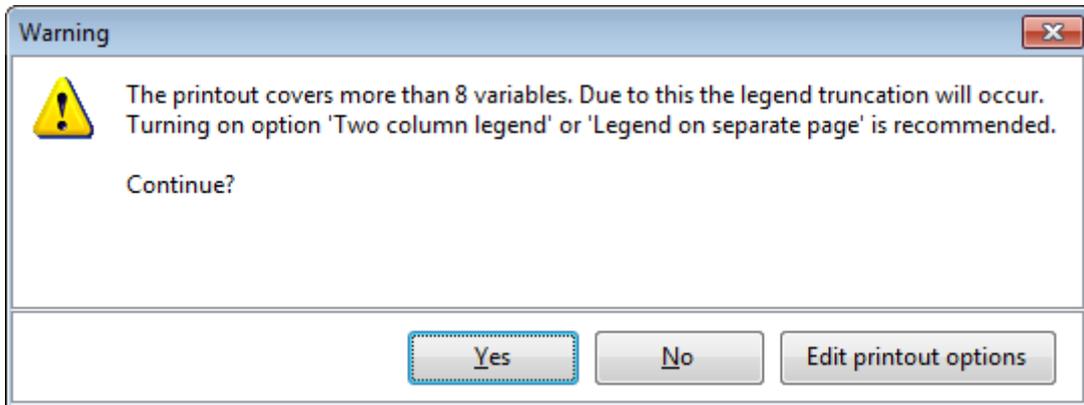


Fig. Warning When Printing a Chart of 8 Graphs with the One Column Legend.

2.31 Closing a Displayed Trend / Creating a New Trend



To close the currently displayed trend, use:

- one the commands *New...* from the *File* menu;

It removes from the screen an old trend and displays a blank area of a trend to be edited.

.

2.32 Saving the Trend Definition

 A trend definition can be saved using:

- the button **Save**  and **Save As...**  from the **File** menu.

The save function works differently in the Operator mode than in Administrator or Full modes (AsTrend run without an Asix application).

When AsTrend is started without the Asix application, TRNX files are stored in the user's document directory.

In Operator Mode (see: [1.4 Privilege System of AsTrend Run with an Asix Application](#))

Trends qualified by an Administrator as read-only can not be modified by Operators. An attempt to do so will generate warning message:

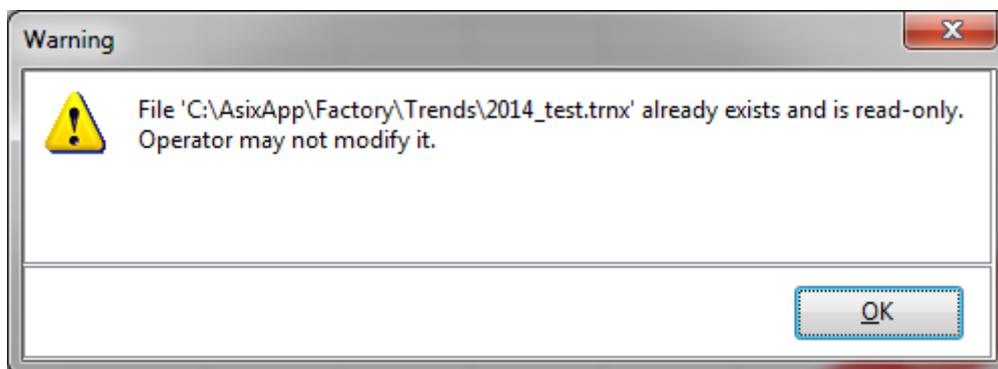


Fig. The Error When Trying to Write a Read-Only Trend By the Operator.

However, Operator may save the trend under a new filename or save a new trend.

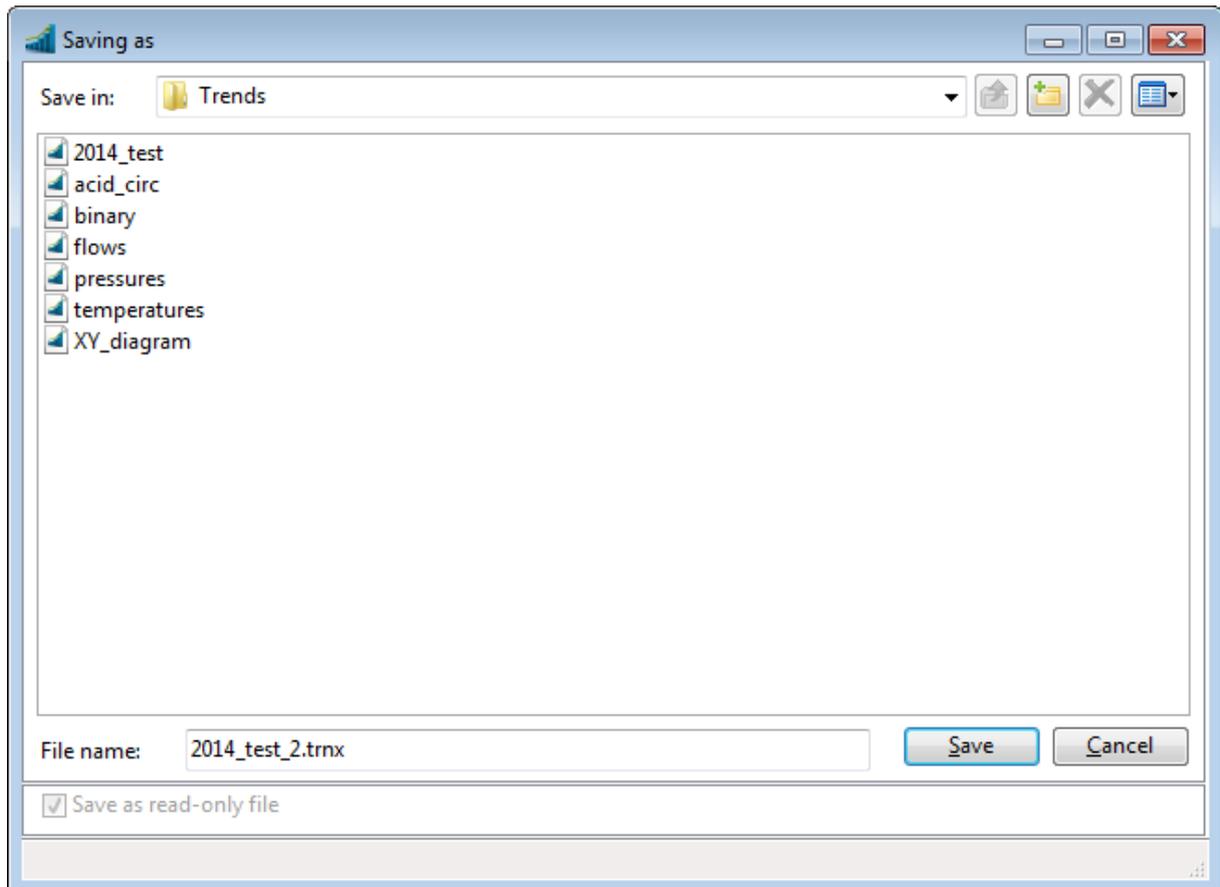


Fig. The Window 'Saving As' for the Operator.

Trends are stored in TRNX files.

i When AsTrend is started with the Asix application, it should be called from the application menu instead of from the Windows system bar. AsTrend run from the tray has limits on the file operations: the Operator can not save files, because there is no directory declared, where the file could be saved.

The Operator has the ability to save a new trend or modified trend under a new name - only if AsTrend has been run with a working directory for storing trend files - there is a directory declared in:

- operator action of opening AsTrend from an Asix application window;
- the option **Work Directory** in: Architekt program > *Fields and Computers* > *Start Parameters* > *Programs\AsTrend* tab.

In Administrator Mode (see: [1.4 Privilege System of AsTrend Run with an Asix Application](#))

The administrator can create new trends with *Read_only* status.

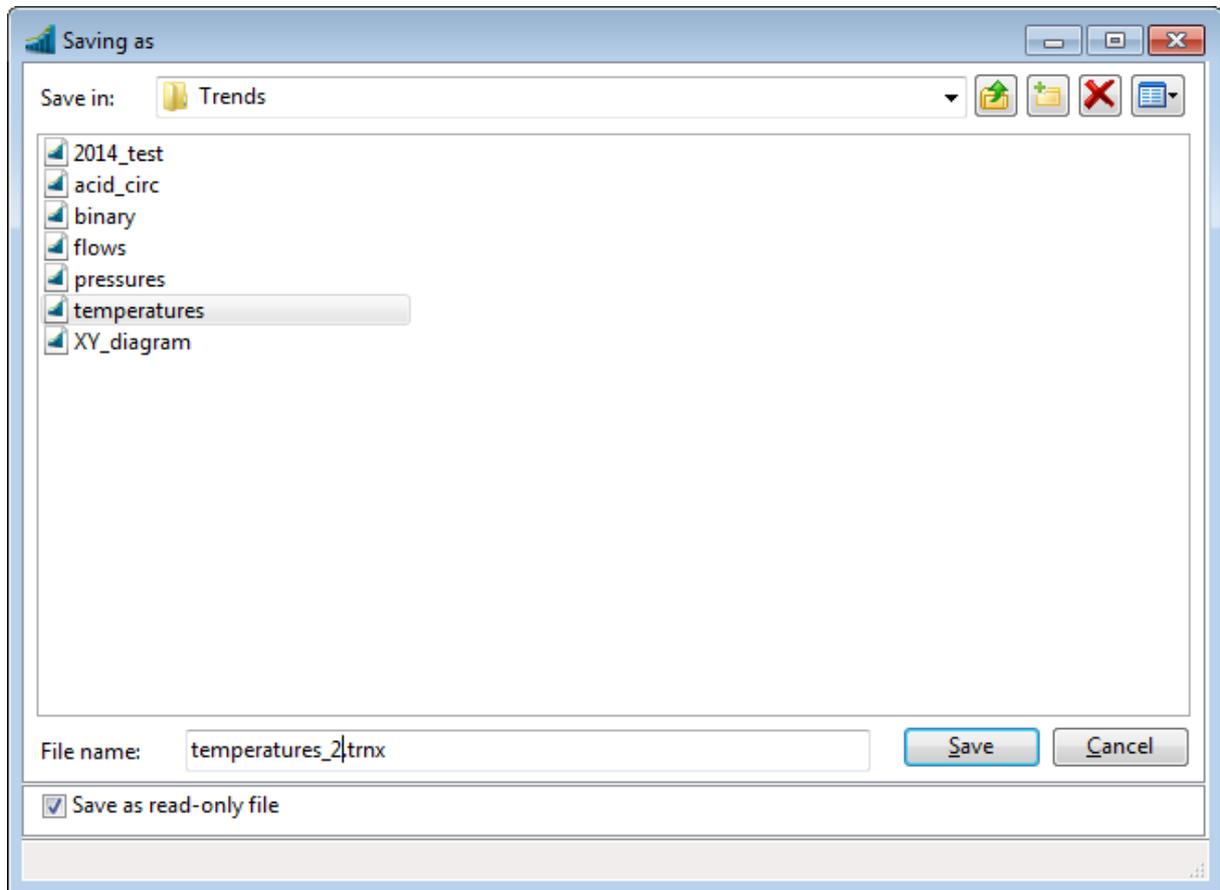


Fig. The Window 'Saving As' for the Operator.

Administrator may also modify each existing trend definition regardless of its status. Each attempt to overwrite any existing trend file will generate the following warning message:

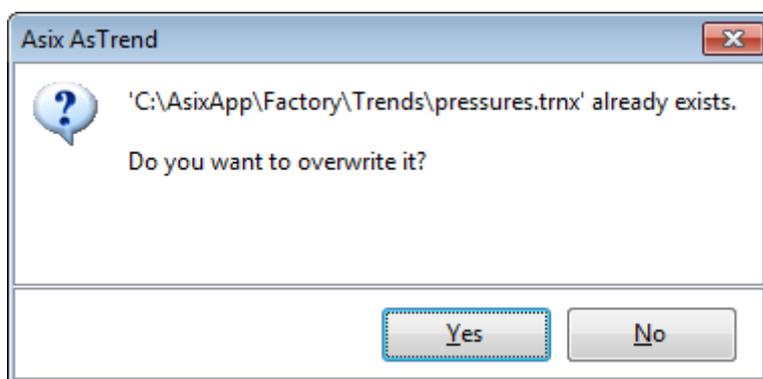


Fig. The Error When Trying to Modify an Existing Trend File by the Administrator.

If the to-be-overwritten file is *read-only*, another warning message will follow:

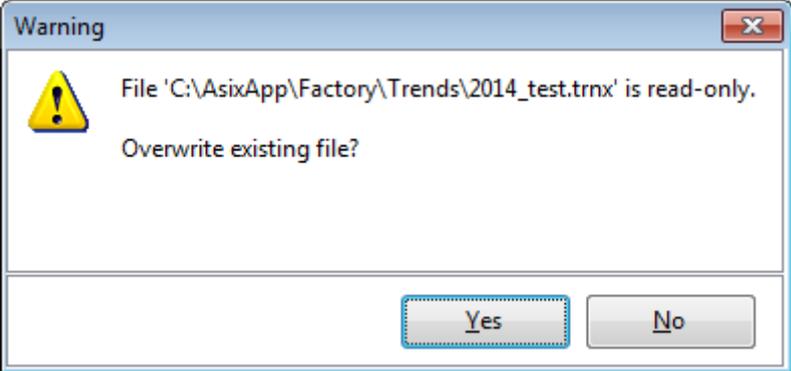


Fig. The Message When Trying to Modify an Existing Trend File with the Status Read_Only by the Administrator.

The *read_only* status means that the trend definition is a pattern trend that should not be modified.

2.33 Exporting the Trend / Graph / Historical Data Table

AsTrend allows you to export:

- whole trend (the chart with the legend and printout informations) to **PDF**, **BMP** file,
- chart with the legend to **BMP** file / **Clipboard**,
- only the legend to **Clipboard**, **text**, **HTML** or **XLSX** file,
- data of selected graph/graphs to **CSV** file, **Clipboard**,
- historical data table to **Clipboard**, **text**, **HTML** or **XLSX** file,
- report to **text**, **HTML**, **XLSX** file.

* * *

 **The whole trend export** (chart, legend and printout data) to **PDF file** is performed with the use of: **Export To PDF**  from the **File** menu.

The additional information (title, header, footer, print trend file name as well as legend layout) are set in:

AsTrend main window > **Trend and Legend** tab > **Trend** group > the window '**Trend Options**' run by the button  > **Printout** tab.

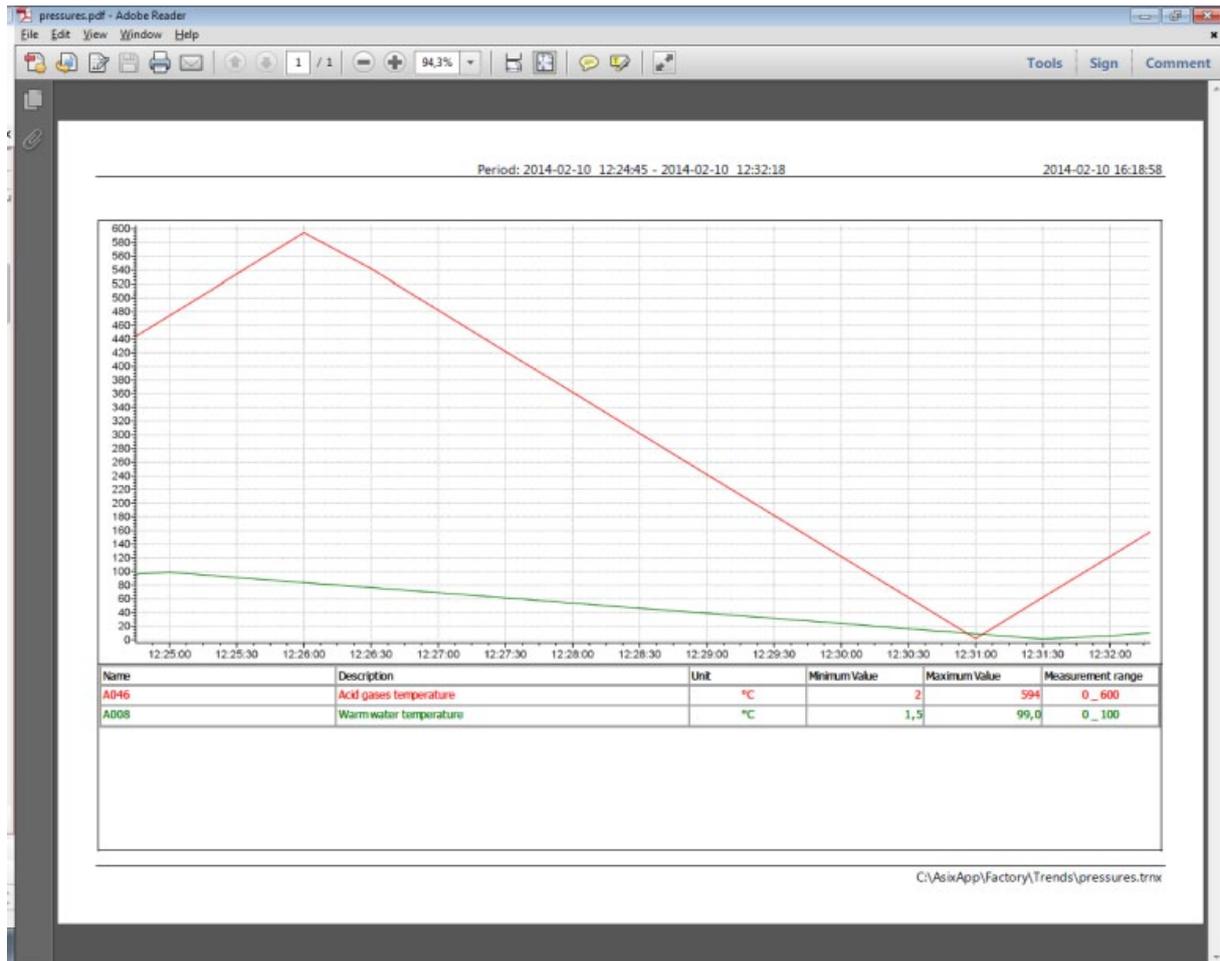


Fig. The Trend Exported to PDF File.

 The chart export with the legend to clipboard / BMP file is performed with the use of: **Copy to Clipboard**  , **Save to BMP File**  from:

AsTrend main window > **Chart** tab > **Chart Export** group.

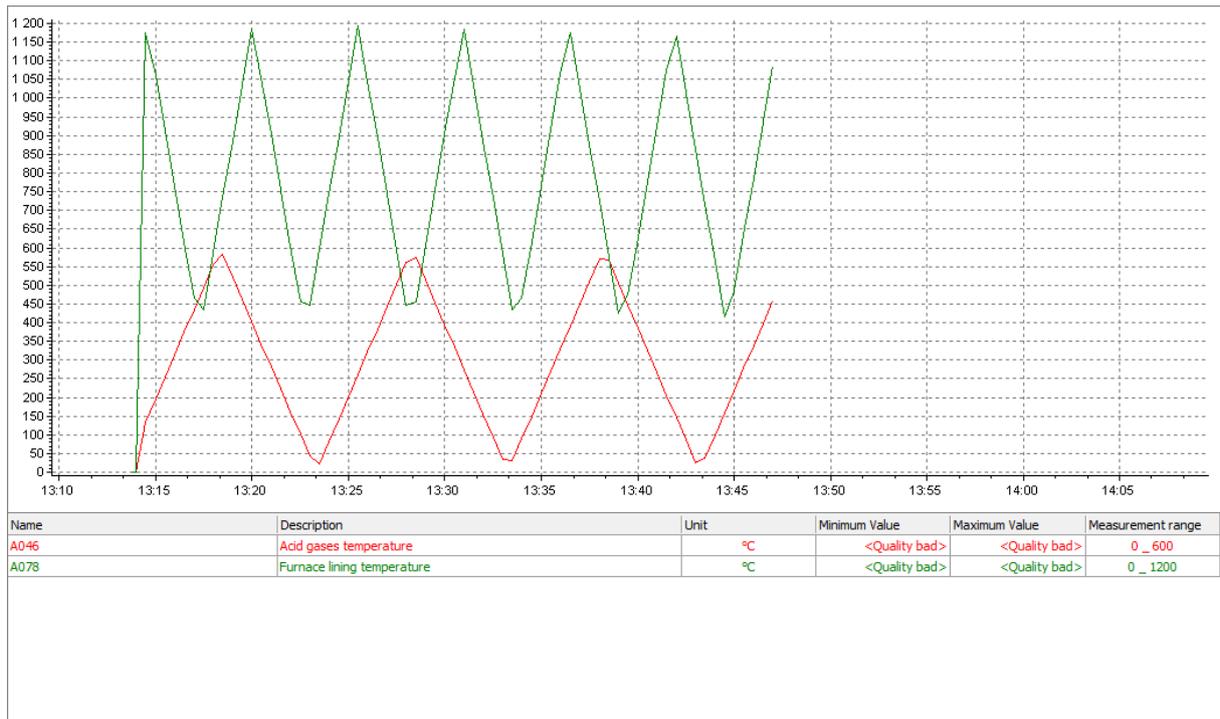


Fig. The Chart Exported to BMP File.



The legend export to clipboard / text, HTML, XLS file is performed with the use of: **Copy to Clipboard**, **Export to Text File**, **Export to HTML File**, **Export to XLSX File** from:

AsTrend main window > **Trend and Legend** tab > **Legend Operations** group > the button **Export Legend**  (the drop-down list allows you to select the format you want the legend to be exported to)

Name	Description	Unit	Minimum Value	Maximum Value	Measurement range
A046	Acid gases temperature	°C	<Quality bad>	<Quality bad>	0_600
A078	Furnace lining temperature	°C	<Quality bad>	<Quality bad>	0_1200

Fig. The Legend Exported to HTML File.

Name	Description	Unit	Minimum Value	Maximum Value	Measurement range
A046	Acid gases temperature	°C	<Quality bad>	<Quality bad>	0_600
A078	Furnace lining temperature	°C	<Quality bad>	<Quality bad>	0_1200

Fig. The Legend Exported to XLS File.

The selected graph/graphs export to CSV file, Clipboard is performed with the use of: **Copy to Clipboard** , **Export to CSV** from:

AsTrend main window > **Data** tab > **Export of Data** group.

The window 'Data Export Options' allows you to specify the data export parameters. The window is available from:

AsTrend main window > **Data** tab > **Export of Data** group > the window '**Data Export Options**' run by the button .

The data export parameters:

- **Header** - declare one or two line header and place units / aggregates near variable names;
- **Genuine Data** - arrange samples of each graph according to its own timeline or a common timeline;
- **Quality Columns** - add quality columns and set their format;
- **Uniform Data** - declare common time column for uniform data.

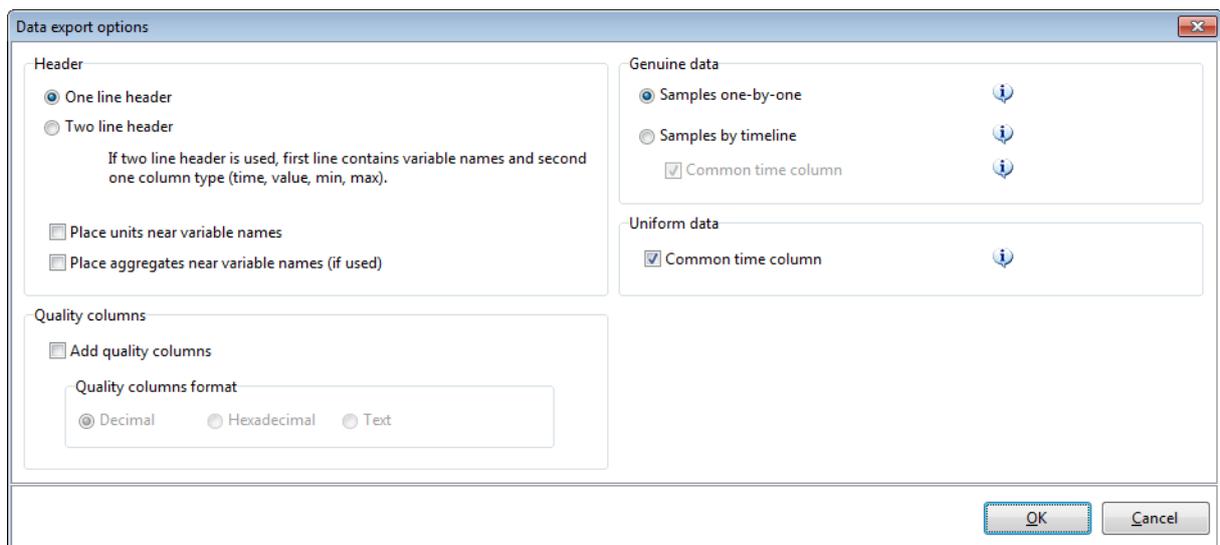


Fig. Data Report Options.

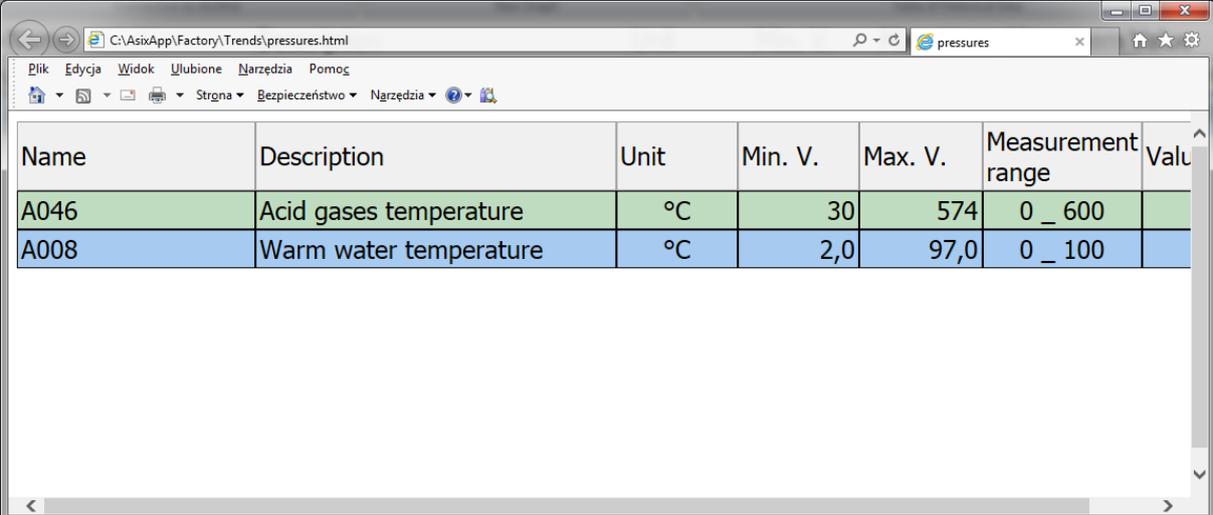
	A	B	C	D
1	A046 - Time	A046	A078 - Time	A078
2	2014-02-14 01:00		2014-02-14 01:00	
3	2014-02-14 13:13	0	2014-02-14 13:13	0
4	2014-02-14 13:14	0	2014-02-14 13:14	0
5	2014-02-14 13:14	134	2014-02-14 13:14	1175
6	2014-02-14 13:15	194	2014-02-14 13:15	1065
7	2014-02-14 13:15	254	2014-02-14 13:15	915
8	2014-02-14 13:16	314	2014-02-14 13:16	765
9	2014-02-14 13:16	374	2014-02-14 13:16	615
10	2014-02-14 13:17	434	2014-02-14 13:17	465
11	2014-02-14 13:17	494	2014-02-14 13:17	435
12	2014-02-14 13:18	554	2014-02-14 13:18	585
13	2014-02-14 13:18	582	2014-02-14 13:18	735
14	2014-02-14 13:19	522	2014-02-14 13:19	885
15	2014-02-14 13:19	482	2014-02-14 13:19	685

Fig. The Data Exported to the CSV Format (Samples One-by-One).

* * *

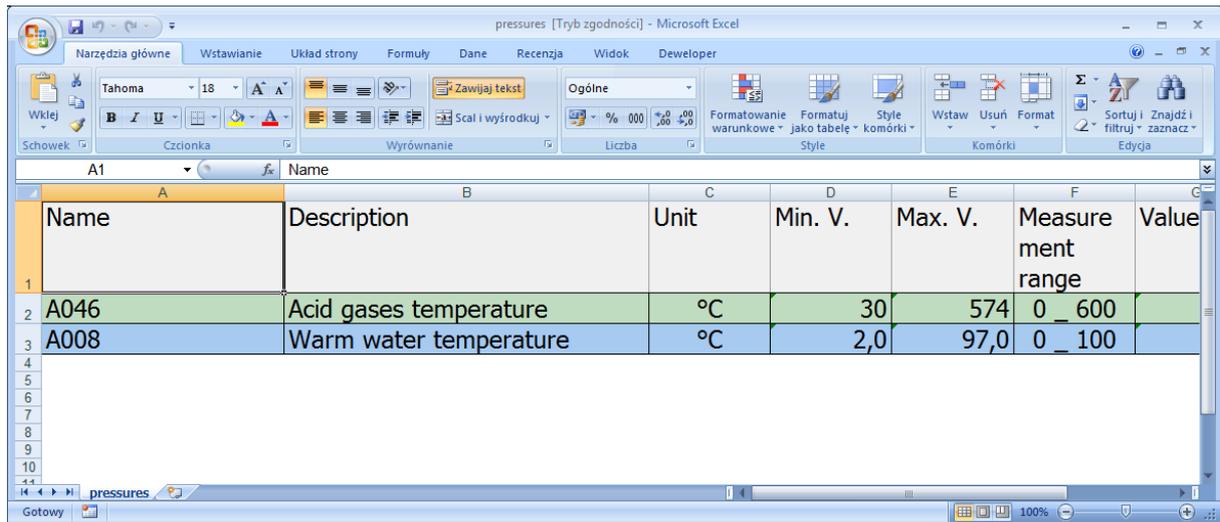
 The historical data table export to Clipboard, text, HTML or XLSX file is performed with the use of: *Copy to Clipboard*, *Export to Text File*, *Export to HTML File*, *Export to XLSX File* from:

AsTrend main window > table view of historical data > *Home* tab > *Table of Historical Data* group > the button *Table Export*



Name	Description	Unit	Min. V.	Max. V.	Measurement range	Value
A046	Acid gases temperature	°C	30	574	0_600	
A008	Warm water temperature	°C	2,0	97,0	0_100	

Fig. The Historical Data Table Exported to a HTML File.



Name	Description	Unit	Min. V.	Max. V.	Measurement range	Value
A046	Acid gases temperature	°C	30	574	0_600	
A008	Warm water temperature	°C	2,0	97,0	0_100	

Fig. The Historical Data Table Exported to an XLS File.



To export an AsTrend report to a text, HTML or XLSX file, use the commands: **Export to Text File**, **Export to HTML File**, **Export to XLSX File** from:

AsTrend main window > view of report > **Report** tab > **Report Operations** group > the button **Export**



Export to .txt, .csv files or a clipboard is realized in the form of values separated by separator characters (but, tab delimiters are used for the clipboard). The data are arranged in columns containing successively: time, variable value. Each variable has its time/value columns - except in the case of uniform data (constant time interval between successive samples) - for which it is possible to set a common column of time. Time is exported in the system format ('2008-02-20 16:48:22'). Additionally, for alarm graphs and external values the time column contains milliseconds.

2.34 Context Menus

You can right-click the chart area, legend, table of values and clipboard window to display a context menu.

The chart area context menu options include:

- **New Graphs - Asix - Raw Data** - add a new raw variable to the chart,
- **Graph Options** - run the window 'Graph Options',
- **Graph Data Source Options** - run the window 'Data Source - Asix Variable Graph',
- **Graph Attributes** - display a variable card with all attributes declared,
- **Graph Location** - move the selected variable to the chart 1,2,3 or 4.
- **Select All Graphs** - select all the graphs in the chart,
- **Remove Selected Graphs** - remove a selected variable from the chart,
- **Chart Parameters** - run the window 'Chart Options',
- **Trend Parameters** - run the window 'Trend Options'.

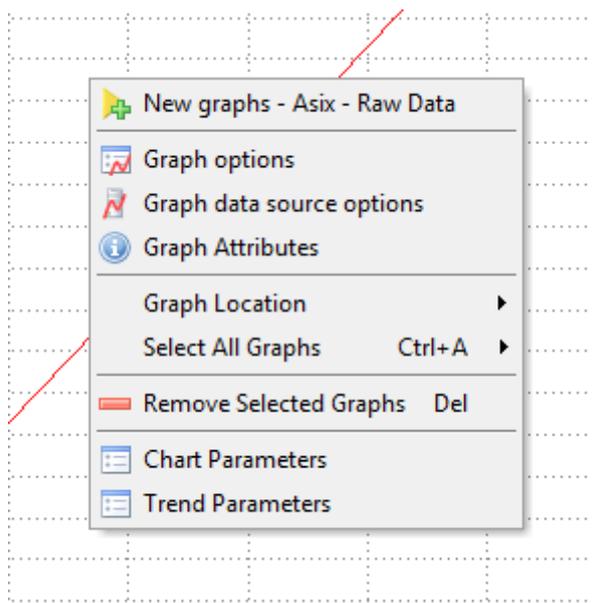


Fig. The Chart Area Context Menu.

The legend context menu options include:

- **New Graph - Asix - Raw Data** - add a new raw variable to the chart/legend,
- **Copy** - copy a selected variable raw and then paste a copied variable raw,
- **Remove Selected** - remove a selected variable from the chart/legend,
- **Replace with Empty** - remove a selected variable from the chart/legend and enter an empty raw to the legend instead,
- **Hidden** - hide a graph,
- **Graph Location** - move the selected variable to the chart 1,2,3 or 4.
- **Select All** - select all the graphs in the chart/legend,
- **Move Up** - move one variable line up,
- **Move Down** - move one variable line down,
- **Graph Options** - run the window 'Graph Options',

- **Graph Data Source Options** - run the window 'Data Source - Asix Variable Graph',
- **Graph Attributes** - display a variable card with all attributes declared,
- **Points** - enable displaying measurement points on the chart,
- **Labels** - enable displaying labels of measurement points on the chart,
- **Legend Columns** - run the window 'Legend Column Selection',
- **Legend Options** - set legend options;

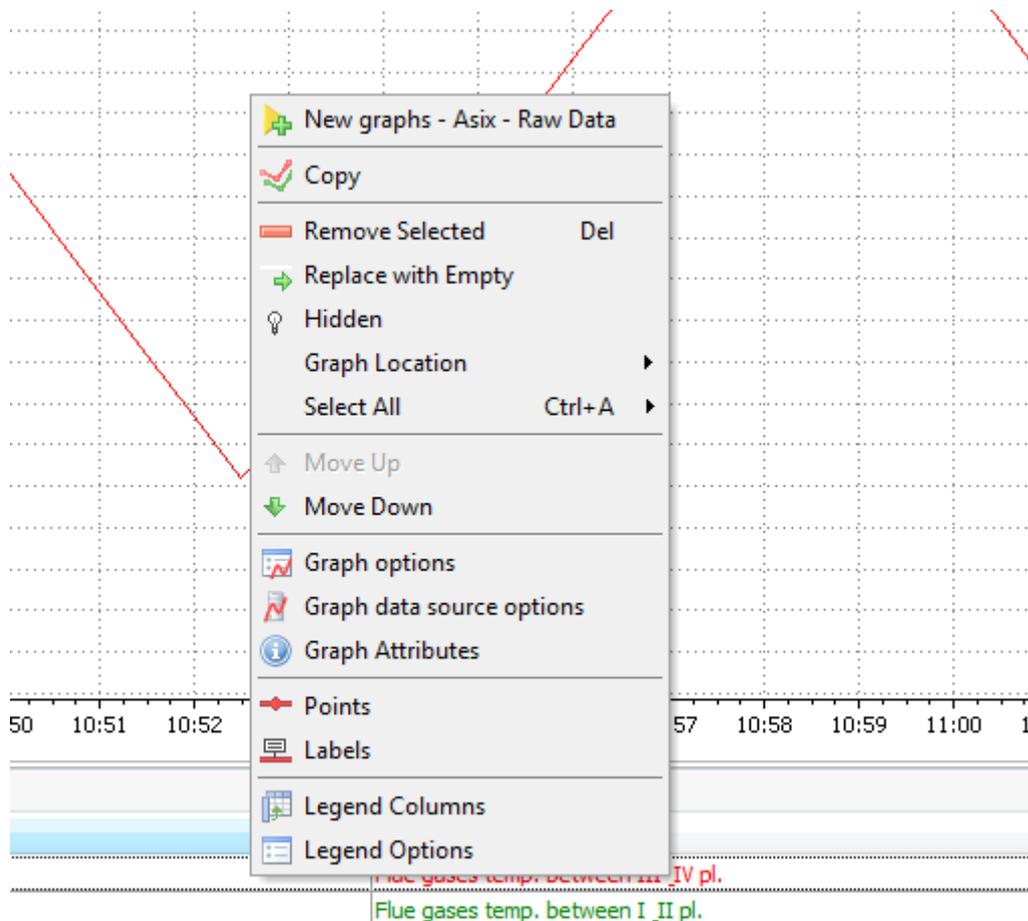


Fig. The Legend Context Menu.

The legend caption context menu options include:

- **Show Description** - display the window with the attribute description,
- **Change Caption** - change the text of the caption,
- **Select Legend Columns** - select the legend columns to be displayed,
- **Legend Options** - run the window with the legend option parameterization,

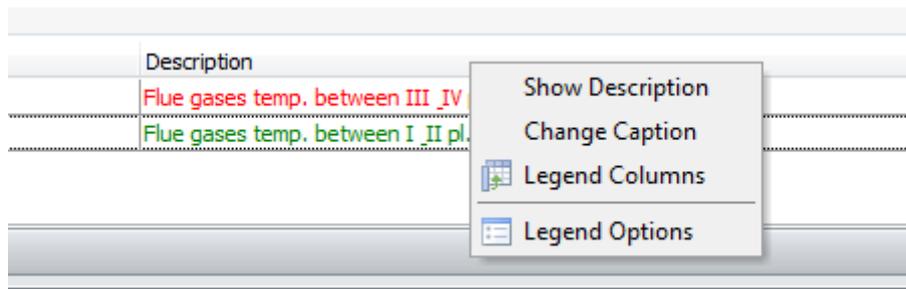


Fig. The Legend Caption Context Menu.

The context menu options for the table of current values include:

- **Single Time Column** - display a single time column,
- **Quality Columns** - display a quality column,
- **No Cursor Binding** - activate the option thanks to which changing the active raw in the table will not change the read line position,
- **Bind Cursor to Main Read Line** - activate the option thanks to which changing the active raw in the table will change the main read line position,
- **Bind Cursor to Additional Read Line** - activate the option thanks to which changing the active raw in the table will change the additional read line position,
- **Samples by Timeline** - range the samples by timeline,
- **Samples One by One** - range the samples one by one,
- **Data Table** - close the table of current values;

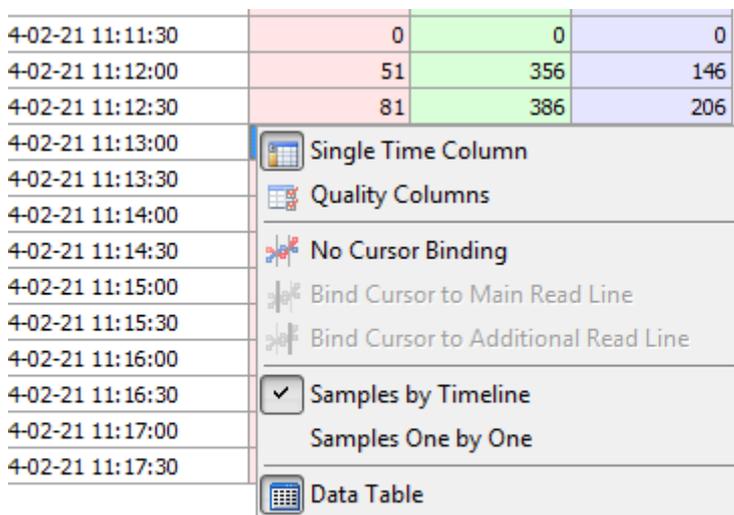


Fig. The Context Menu for the Table of Current Values.

The context menu options of period clipboard include:

- **Copy to Clipboard** - copy a current time period to the clipboard,
- **Paste form Clipboard** - paste a time period from the clipboard,
- **Empty Clipboard** - delete all the time periods saved in the clipboard,
- **Periods Clipboard** - close the period clipboard window.

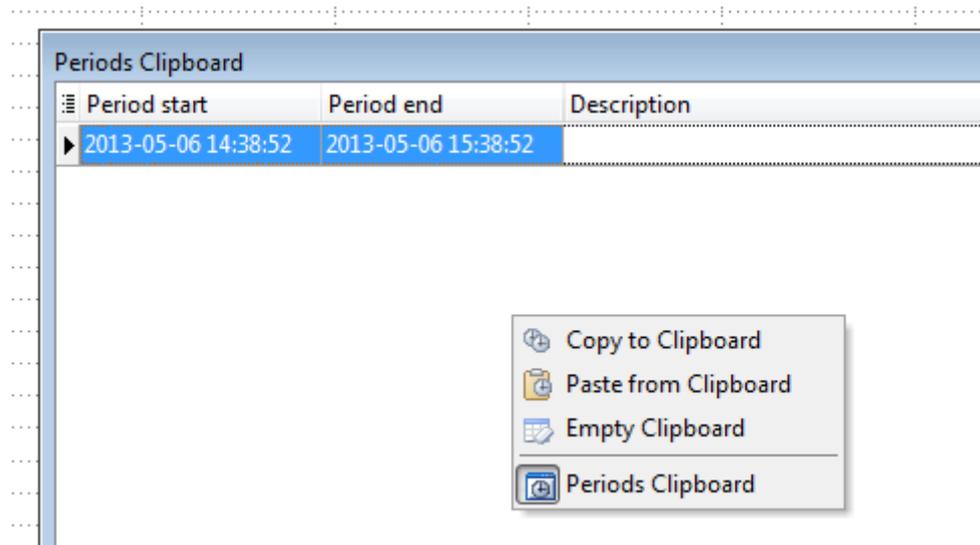


Fig. The Period Clipboard Context Menu.

2.35 Period Clipboard

Periods Clipboard is a very useful tool that helps to analyze trends. It is particularly handy if a user wants to compare the analyzed trend with another one (perhaps somehow related) without storing the first one. Clipboard is a kind of cache memory, in which various interesting periods may be stored to be later used. Clipboard capacity is limited by the system memory only.

Clipboard contents may be browsed in the Periods Clipboard window shown below. Each stored period is described with: *Period Start*, *Period End*, *Main Read Line*, *Additional Read Line* and *Description* parameters.

 **Period Clipboard is run by the button**  from:

AsTrend main window > *Home* tab > *Period* group

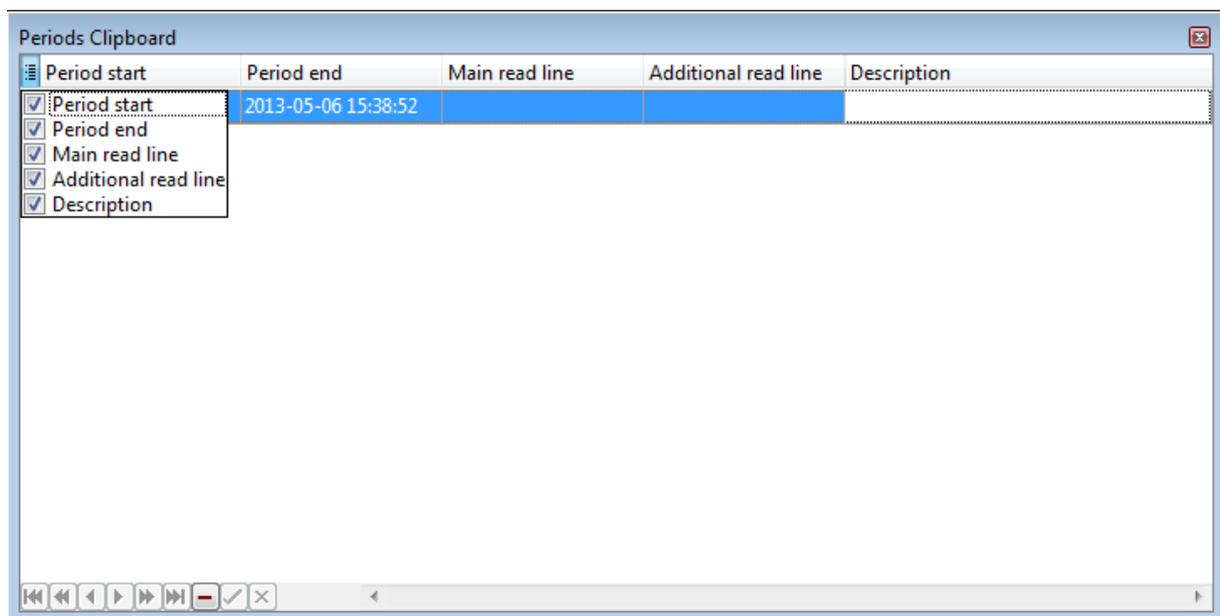


Fig. Period Clipboard.

2.35.1 Clipboard Functions

 **Run *Period Clipboard***

Use:

AsTrend main window > *Home* tab > *Period* group > the button 

or

AsTrend main window > **View** tab > **Panels** group > the button 

The period clipboard window is always displayed on top. Its closure does not delete the contents of the clipboard. Storage capacity is not limited. In the case of large contents one can enlarge the window or move along its content using the slider.

Save a time period

An interesting period is saved when you click on the button **Copy to Clipboard**  from:

AsTrend main window > **Home** tab > **Period** group

The second way is to use the command **Copy to Clipboard**  from the context tab **Period Clipboard** displayed in the main AsTrend window when the clipboard window is opened.

Paste a time period from the clipboard

An interesting period is pasting to the chart when you click on the button **Paste from Clipboard**  from:

AsTrend main window > **Home** tab > **Period** group

The command inserts the last saved time period or the period selected in the period clipboard window (in the second case the period clipboard has to be opened at the moment of pasting operation).

The second way to paste a time period from the clipboard is to double-click on an interesting period in the period clipboard window.

The third way to paste a time period from the clipboard is to use the command **Paste from Clipboard**  from the context tab **Period Clipboard** displayed in the main AsTrend window when the clipboard window is opened.

Delete a time period from the clipboard

The period can be removed from the clipboard window by pressing the button  or **Delete** key, after the period to be deleted has been previously selected in the window.

Empty the period clipboard

Clear the entire Period Clipboard contents using the button **Empty Clipboard**  from the context tab **Period Clipboard** displayed in the main AsTrend window when the clipboard window is opened.

Edit the period description

You can edit the description field of a selected time period by click in the field. After entering the description text, press **Enter** key.

Other fields can not be modified.

Anchor the period clipboard window in the trend window

The clipboard window can be anchored in the trend window. That means fitting into the chart area, in such a way that instead of chart area the clipboard window is visible. The chart area is then covered by the clipboard, but you can switch over two views using the tabs **Chart/Period Clipboard**.

You can anchor the clipboard window by dragging the window into the chart area.

You can back to independent shape of the clipboard window by dragging the **Period Clipboard** tab over the legend area.

You can back to independent shape of the clipboard window placed over the chart area by dragging the **Period Clipboard** tab over the chart area while pressing **Ctrl** key.

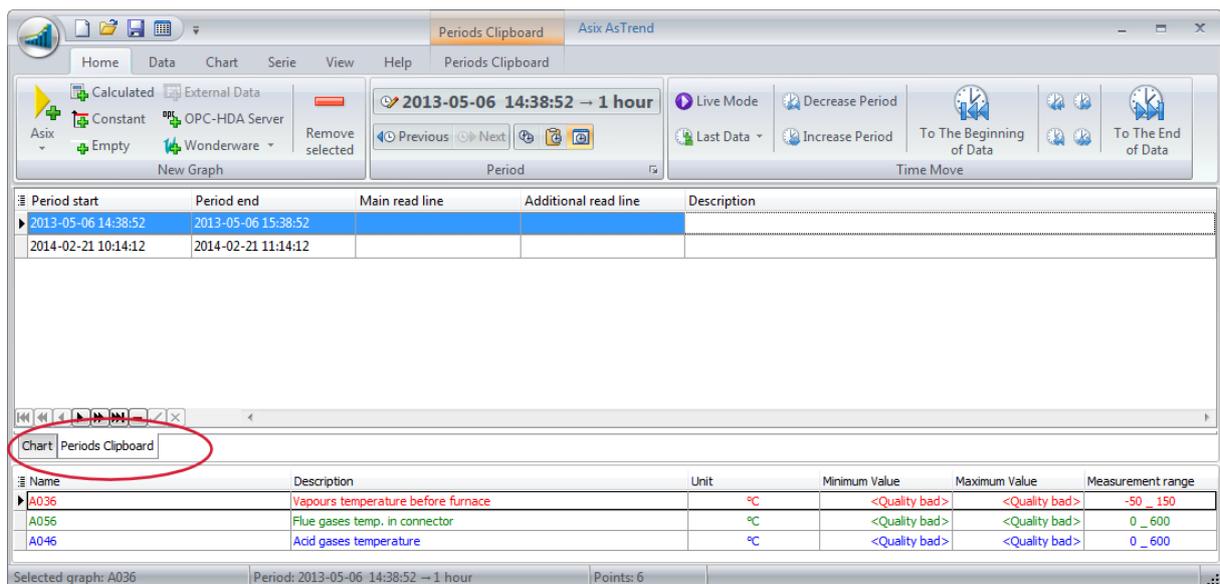


Fig. The Anchored Period Clipboard Window.

2.36 0-100% Percent Scale

To facilitate comparing of variables of different value ranges, all variables may be charted at the chart vertical axis expressed in percents. 0% corresponds to the lowest value of the variable, 100% - to the highest value. The appropriate range should be set individually or retrieved from database of variable definitions. Otherwise the axis percents will correspond to the range of displayed values.



To enable the percent scale, use:

- the button  from:

AsTrend main window > *Chart* tab > *Axes* group

In this mode:

- the variable selection results in charting the value axis appropriate for the specified variable in the colour of the variable on the right side of the chart;
- the proportional / percent axis is drawn on the left side of the chart;
- reading values by the read line or mouse cursor indicates genuine data, not percent values;
- when more than a single curve is charted with percent axis turned on, the regular axis for the selected curve is displayed in the color of that curve;
- double-click outside the chart area removes the regular axis from the chart area;

2.37 Handling the Table of Current Data



The table of current data is a collection of coordinates of points charted within the chart area. The table is activated with the use of the button **Data Table**  from:

AsTrend main window > **View** tab > **Panels** group

All measurement points corresponding to variables of the chart are displayed in table lines. If the number of rows exceeds the number possible to display in the window, the right side slider appears sampling method.

If the sampling method available with a fixed sampling period has been chosen, the number of measurement points is the same for each variable.

After opening the table of current values in the AsTrend main window, the additional context tab with commands is available:

- **Single Time Column**  - switch on table view mode with one common time column and many value columns.
- **Quality Columns**  - switch on table view mode with quality columns;
- **No Binding**  - change of active row in the table will not change the position of read line;
- **To Main Read Line**  - change of active row in the table will result in changing the position of main read line; the option is relevant only if the main read line is active;
- **To Additional Read Line**  - change of active row in the table will result in changing the position of additional read line; the option is relevant if the additional read line is active.
- **Samples by Timeline**  - activates a variant in which all the samples of graphs are arranged according to the time axis;
- **Samples One by One**  - activates a variant in which all the sample of graphs are arranged one after the other;
- **Data**  - display informations on data types in the table and how the data is displayed;
- **The Background Color of Table Common Columns**  ... - set the color for *No.* and single *Time* columns;
- **The Background Color of Table Panel**  ... - set the color for the table panel;

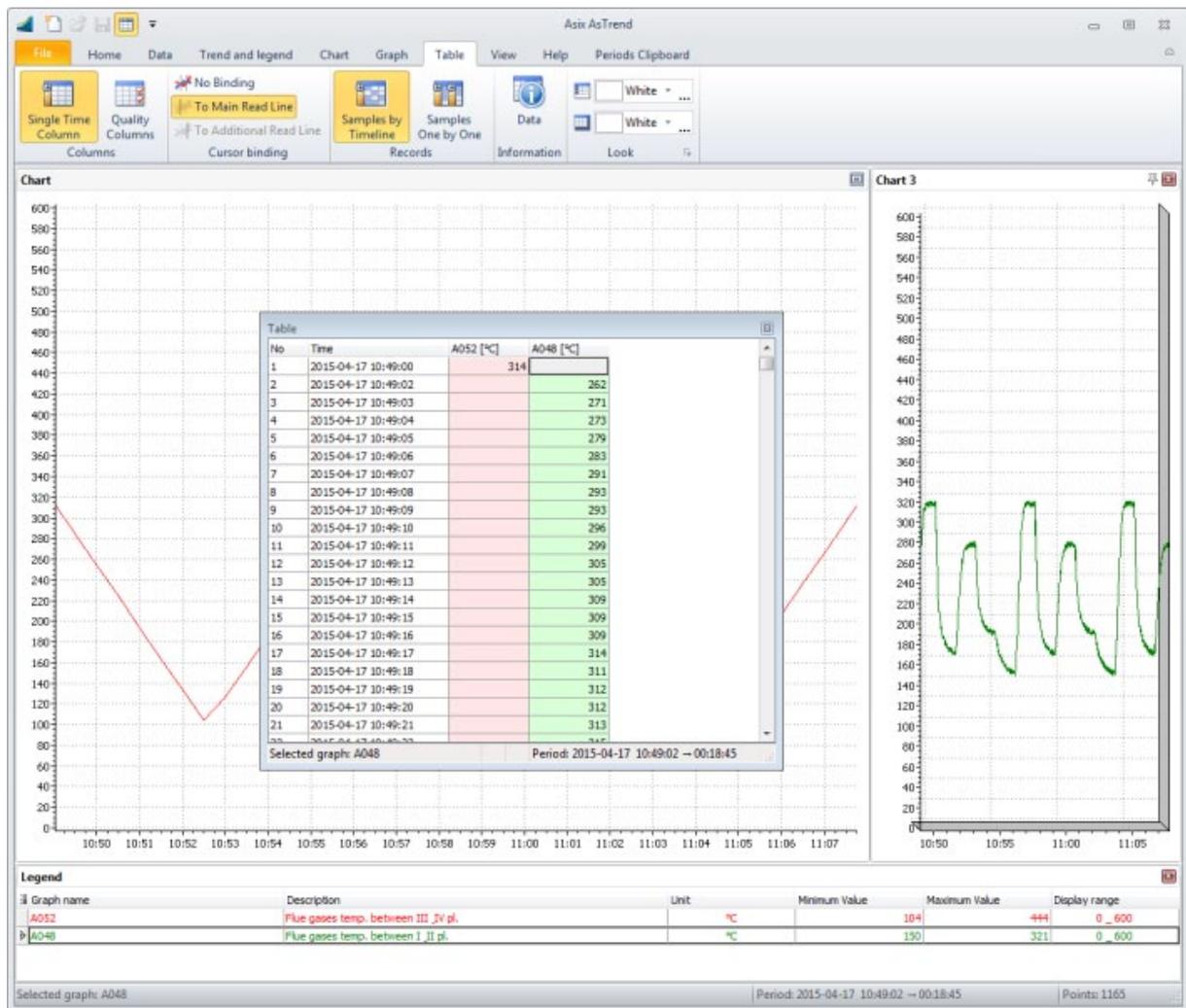


Fig. The Table of Current Values.

Shifting the read line in the chart area causes the selection of corresponding row in the table of current values (with possible additional moving the window slider, so that a selected row is always visible). Adequately, changing the position of selected row causes a corresponding change in the position of read line.

The table of current values can be saved to a CSV file with the use of the command **Export to CSV**  from:

AsTrend main window > **Data** tab > **Export of Data** group

* * *

The table can be docked in the trend window. That means fitting into the chart area, in such a way that instead of chart area the table of current values is visible. The chart area is then covered by the table, but you can switch over two views using the tabs **Chart/Table** Clipboard.

You can dock the table by dragging the table into the chart area.

You can back to independent shape of the table by dragging the **Table** tab over the legend area.

You can back to independent shape of the table placed over the chart area by dragging the **Table** tab over the chart area while pressing **Ctrl** key.

You can reset the composition of panels by the command **Reset Panel Composition**  from:

AsTrend > **View** tab > **Panels** group.

* * *

Window layout is stored in AsTrend automatically when you exit the program - but there is also the possibility to save the window state for the trend file by the command **Storing Window Layout** from:

AsTrend > **View** tab > **Window** group > **'Trend Window Options'** window run by the button .

2.38 Handling the Table of Historical Data

 The mode of historical data table is run by the command **Historical Data Table Mode**  from **File** menu.

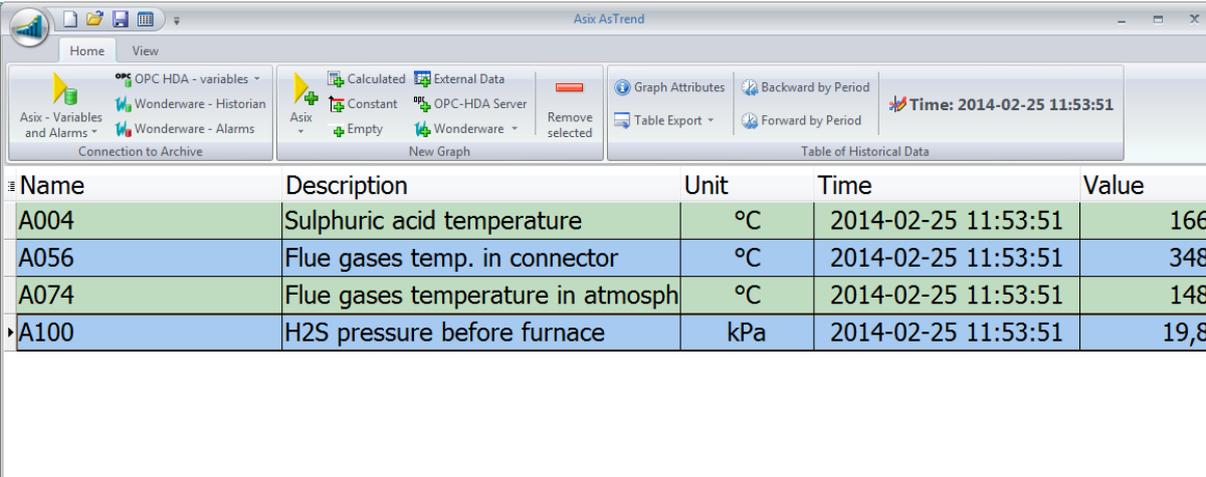
You can back to the standard view by the same command **Historical Data Table Mode**  from context tab **View** of historical data table mode.

The mode of AsTrend operation is saved in a *.trnx file by the administrator. When the file is opened by the operator, AsTrend will be run in the table view with all the variables and columns defined.

 To create the file with the table of historical data defined, you have to log in as the AsTrend administrator, activate the mode of historical data table, open the variable definition database and add variables. Use empty rows for more transparency. You can change the sequence of variables by drag-and-drop operation. The administrator selects columns to be displayed in the table with the use of the button .

 To export the table of historical data to clipboard, text/HTML/XLS file, you have to use the commands: **Copt to Clipboard**, **Export to Text File**, **Export o HTML File**, **Export to XLSX File** from:

AsTrend main window > **Home** tab > **Table of Historical Data** group in historical data table mode.



Name	Description	Unit	Time	Value
A004	Sulphuric acid temperature	°C	2014-02-25 11:53:51	166
A056	Flue gases temp. in connector	°C	2014-02-25 11:53:51	348
A074	Flue gases temperature in atmosph	°C	2014-02-25 11:53:51	148
A100	H2S pressure before furnace	kPa	2014-02-25 11:53:51	19,8

Fig. The Table of Historical Data - Home Tab.

 **To change view options**, you have to use the context tab **View** from AsTrend main window in historical data table mode. The tab allows you to specify the colours of the table and the table font size.

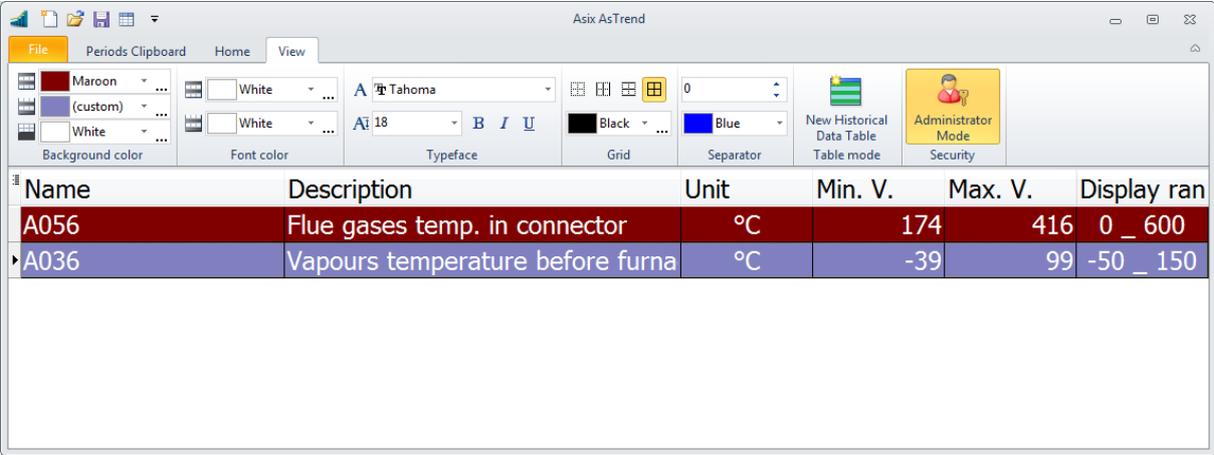


Fig. The Table of Historical Data - View Tab.

2.39 Handling the Report Mode / Report Options

2.39.1 Running the New Report Window

 To switch AsTrend to the report mode, use one of the following commands from the **File** menu:

 **New Report** - run window of a new report;

 **New Report - From the Current Trend** - run window of a new report based on the data from the current trend.

It will display the window in one of the two following forms (depending on the command used), with the **Report** tab added.

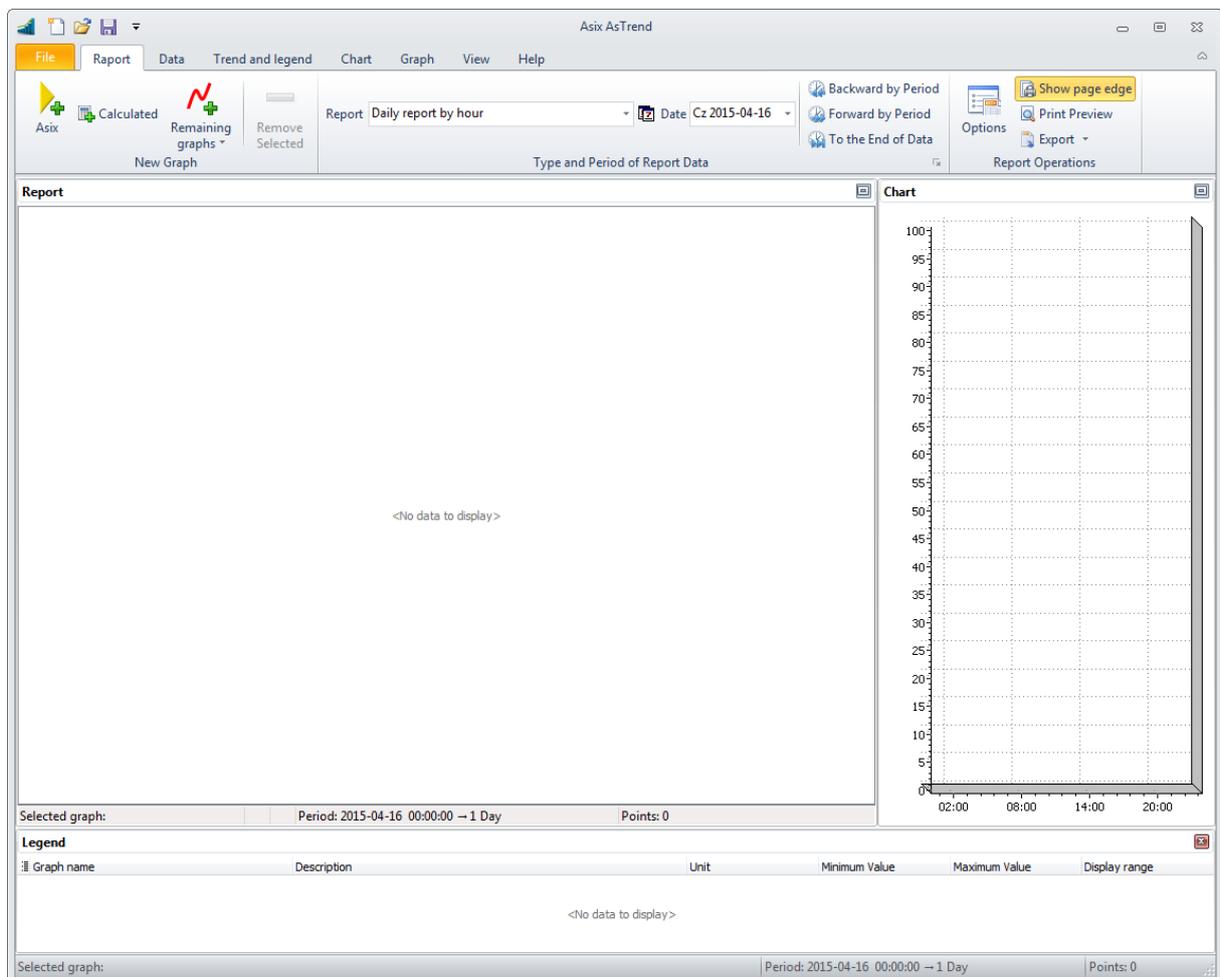


Fig. AsTrend - the Empty Report Window.

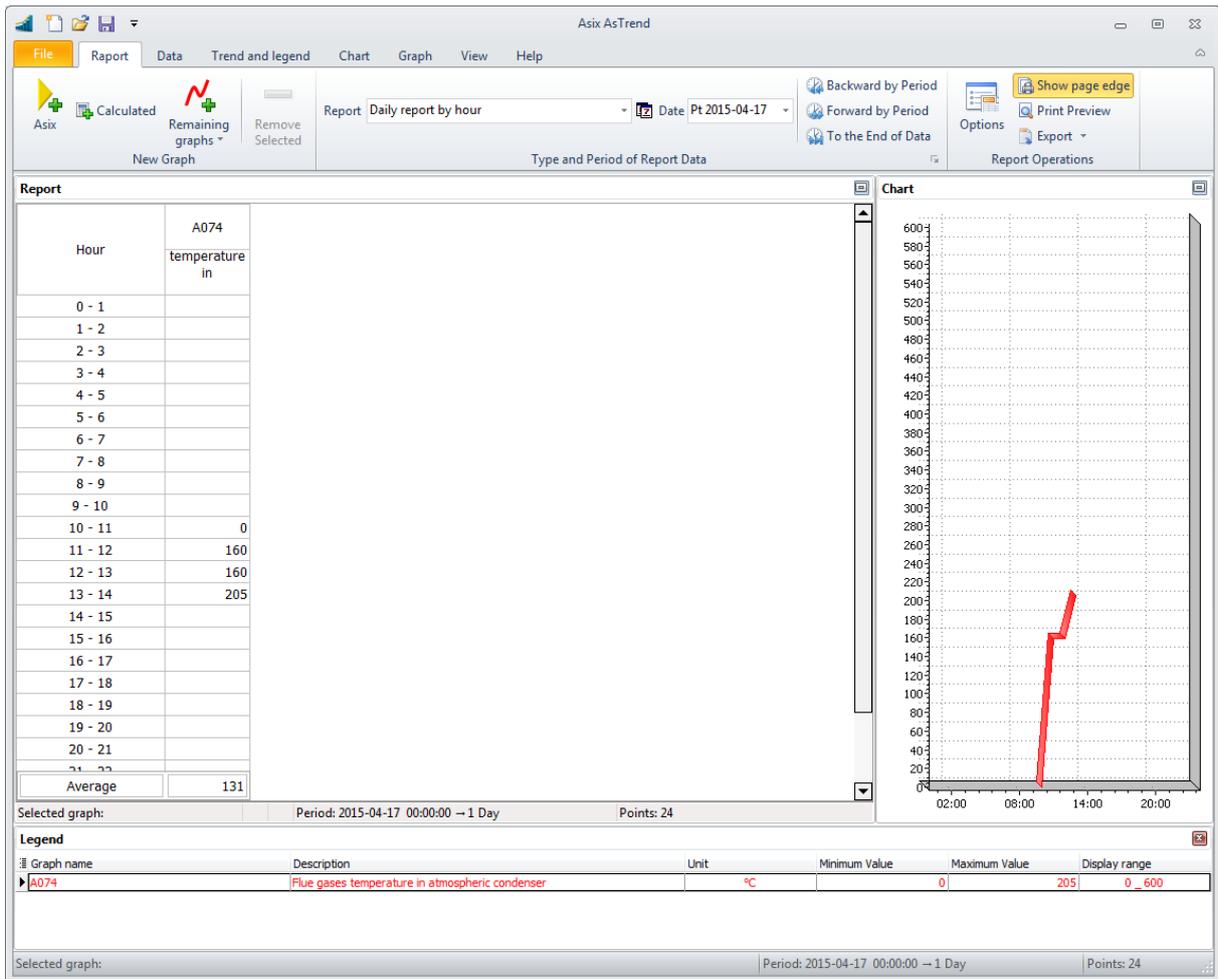


Fig. AsTrend - the Report Window Created on the Basis of the Current Data.

2.39.2 Adding/Removing Variables to/from the Report

Before reading the values of variables, based on which the report will be built, it should be indicated the database of variable definitions - see: [2.12 Selecting Variable Definition Database from the Asix System / OPC Server](#).

 **To add the graph data of the variable to the report**, use the commands from the **Report** tab > **New Graph** group:

 **Asix** - add a graph of aggregated data from Asix application,

 **Calculated** - open the window that allows adding variable calculated on the basis of other variables with use of a given expression;

 **Remaining Graphs**

 **External Data** - add a variable data from external files;

 **OPC-HDA Server** - add a variable data from OPC-HDA server; the option available with extended license of Asix HASP key;

* * *

 **To remove the graph data of the variable**, use the command from the **Report** tab > **New Graph** group:

 **Remove Selected** - clear the currently selected variable.

The following figure shows the 'raw' report, which should be parameterized by the needs.

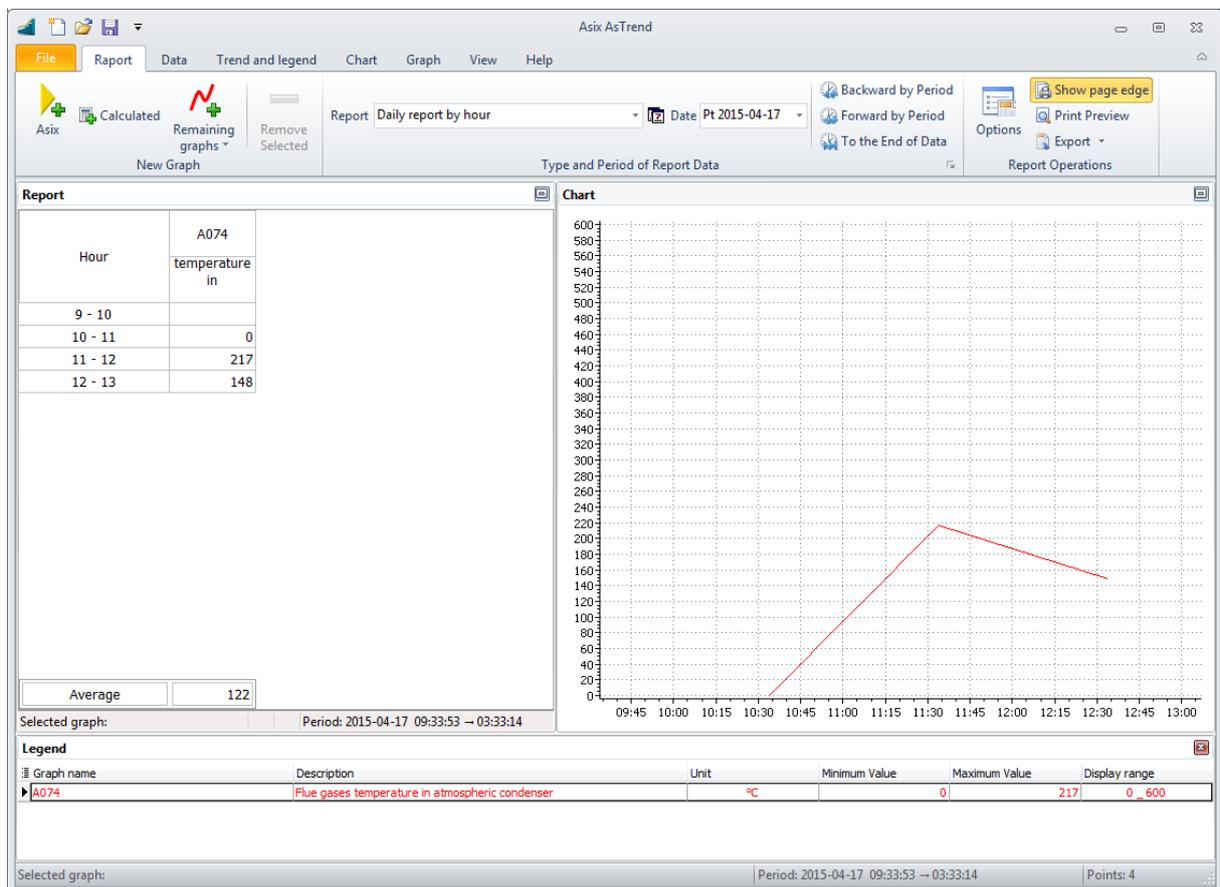


Fig. AsTrend - a Simple Not Parameterized Report.

2.39.3 The Report Parameterization / Report Options

The report parameterization in AsTrend includes the type and data period as well as the set of parameters that affect the aesthetics of the report.

It is essential to determine what type of report you want to have to deal with - for example, whether it will be a daily report by hours, a shift report by hours or maybe some other report defined according to your own needs.



To determine the type and report data period, you should use the following commands from the **Report** tab > **Type and Period of Report Data** group:

Report

- select the report type; available types:

Annual report by month
 Annual report by week
 Annual report by day
 Quarterly report by month
 Quarterly report by day
 Monthly report by day
 Monthly report by hour
 Weekly report by day
 Weekly report by hour
 Daily report by hour
 Shift report by hour

Unrestricted report - choosing this type displays additional fields: **Date** and **Time**.

Depending on the report type the following additional fields are displayed:

Year , Quarter , Month , Date

Time

Shift , Length ... , Interval ...



Backward by Period - move backward by a period;



Forward by Period - move forward by a current period;



To the End of Data - move to the end of a data (the last data).



To determine the report appearance, you should use the following commands from the window **'Report Options'** run by the button **Options** from **Report** tab > **Report Operations** group.

The window **'Report Options'** includes the parameters grouped on three tabs.

1. **Appearance** tab:

Font

- **Font Name**

Content

- **Text Size**
- **Odd Rows** (text and background color)
- **Even Rows** (text and background color)

Labels of Summary Rows

- **Summary Label 1**
- **Summary Label 2**
- **Summary Label 3**
- **Summary Label 4**
- **Summary Label 5**

Header

- **The Height of the Header Row**
- **Text Size and Color** (and bold option)
- **Background Color**

Summary

- **Text Size and Color** (and bold option)
- **Background Color**

Grid Lines

- **Lines**
- **Color**

Report options

Appearance | Page layout | Page appearance

Font
Font name: Tahoma

Content
Text size: 10
Odd rows: Text color: Black, Background color: White
Even rows: Text color: Black, Background color: White

Labels of summary rows
Summary label 1: Average
Summary label 2:
Summary label 3:
Summary label 4:
Summary label 5:

Header
The height of the header row: 2
Text size and color: 10, Black, Bold
Background color: White

Summary
Text size and color: 10, Black, Bold
Background color: White

Grid lines
Lines: Both
Color: Silver

OK Cancel

Fig. The 'Report Options' Window - 'Appearance' Tab.

2. **Page Layout** tab:

Paper

- **Orientation**
- **Size**
- **Center Report on the Page**

Margins

- **Header Height**
- **Margins** (left and right)
- **Footer Height**

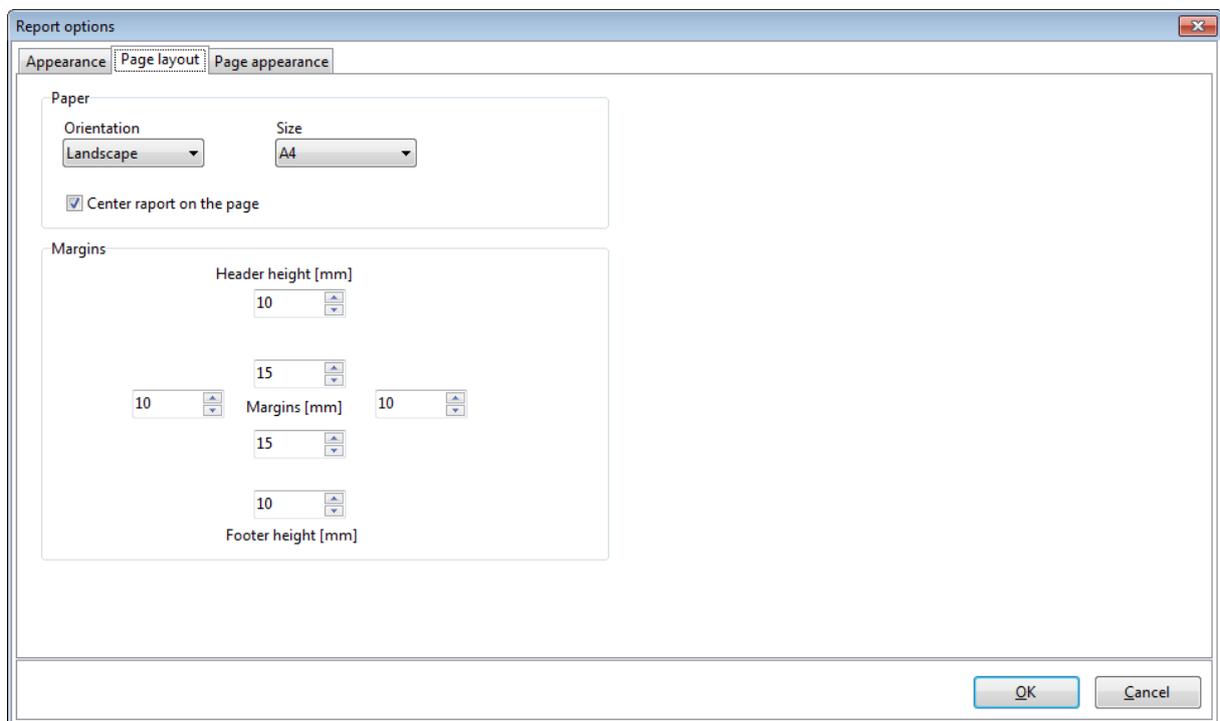


Fig. The 'Report Options' Window - 'Page Layout' Tab.

3. **Page Appearance** tab:

Report Title

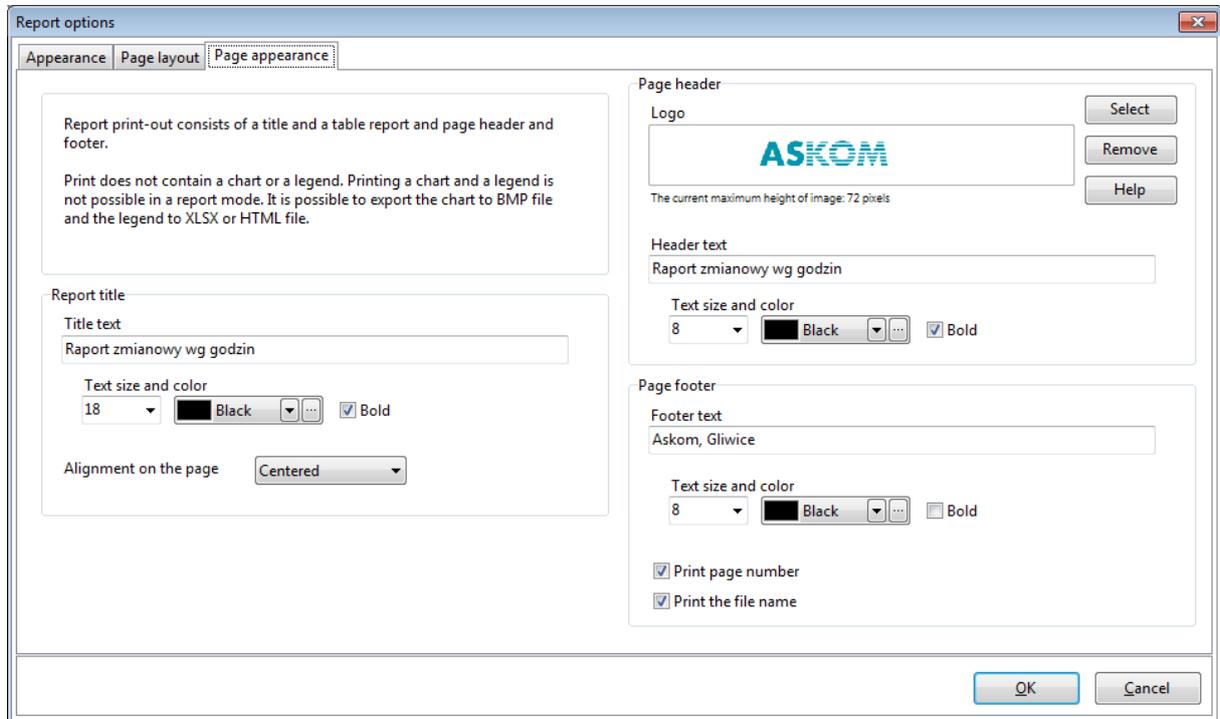
- **Title Text**
- **Text Size and Color** (and bold option)
- **Alignment on the Page**

Page Header

- **Logo** - BMP file loaded by the button **Select** and removed by the button **Remove**
- **Header Text**
- **Text Size and Color** (and bold option)

Page Footer

- **Footer Text**
- **Text Size and Color** (and bold option)
- **Print Page Number**
- **Print the File Name**



 To preview the report, you should use the command **Print Preview**  from the **Report** tab > **Report Operations** group.

 To preview the right edge of the report page, you should use the command **Show Page Edge**  from the **Report** tab > **Report Operations** group.

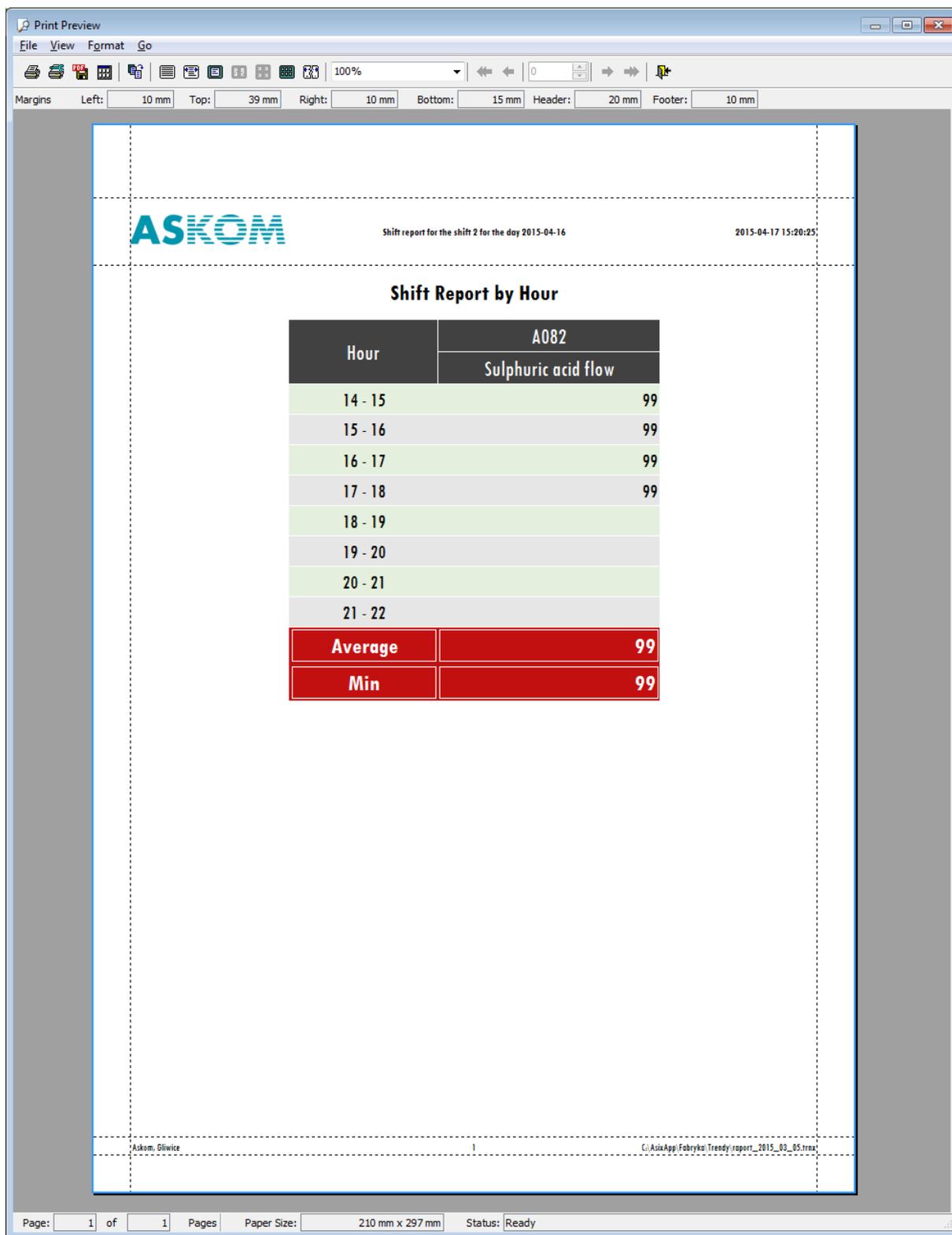


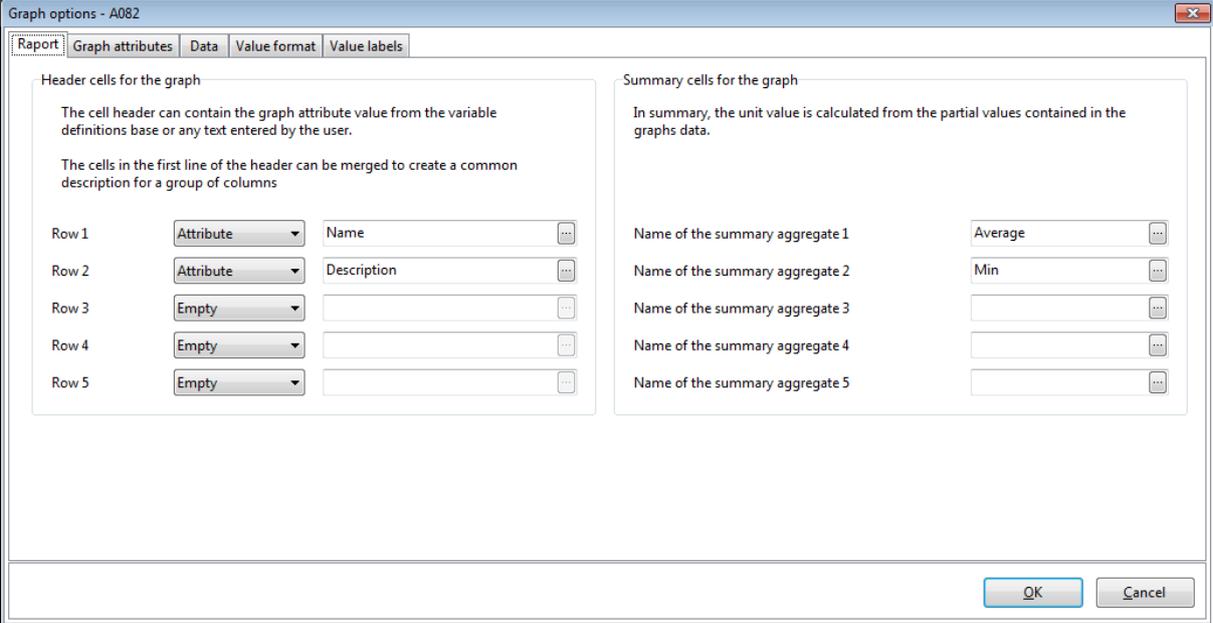
Fig. The Report Preview.

2.39.4 Exporting the Report

 To export the AsTrend report, you should use the command **Export**  from the **Report** tab > **Report Operations** group. It allows to export report to one of the following formats: text file, HTML, XLSX.

2.39.5 Adding New Summarizing Aggregates to the Report

 To add new summarizing aggregates to the report, run the window **'Graph Options'** by double mouse right button click in the report table, and then go to the **Report** tab. There are fields for declaration of max 5 aggregates summarizing table rows in the report.



Graph options - A082

Report | Graph attributes | Data | Value format | Value labels

Header cells for the graph

The cell header can contain the graph attribute value from the variable definitions base or any text entered by the user.

The cells in the first line of the header can be merged to create a common description for a group of columns

Row 1	Attribute	Name
Row 2	Attribute	Description
Row 3	Empty	
Row 4	Empty	
Row 5	Empty	

Summary cells for the graph

In summary, the unit value is calculated from the partial values contained in the graphs data.

Name of the summary aggregate 1	Average
Name of the summary aggregate 2	Min
Name of the summary aggregate 3	
Name of the summary aggregate 4	
Name of the summary aggregate 5	

OK Cancel

Fig. The 'Graph Options' Window - 'Report' Tab.

2.40 Changing the Color Palette

There is the possibility in AsTrend to define a default colour palette. Successive curves added to the trend will be assigned successive colors from the palette. The palette can be defined in the program options or in trend options.



Define your own color palette in trend options

Use the tab *Color Palette* from:

AsTrend main window > *Trend and Legend* tab > *Trend* group > the window '*Trend Options*' run by the button .

The tab *Color Palette* is available when the option *Use the color palette from trend options* is set on the tab *Appearance*.

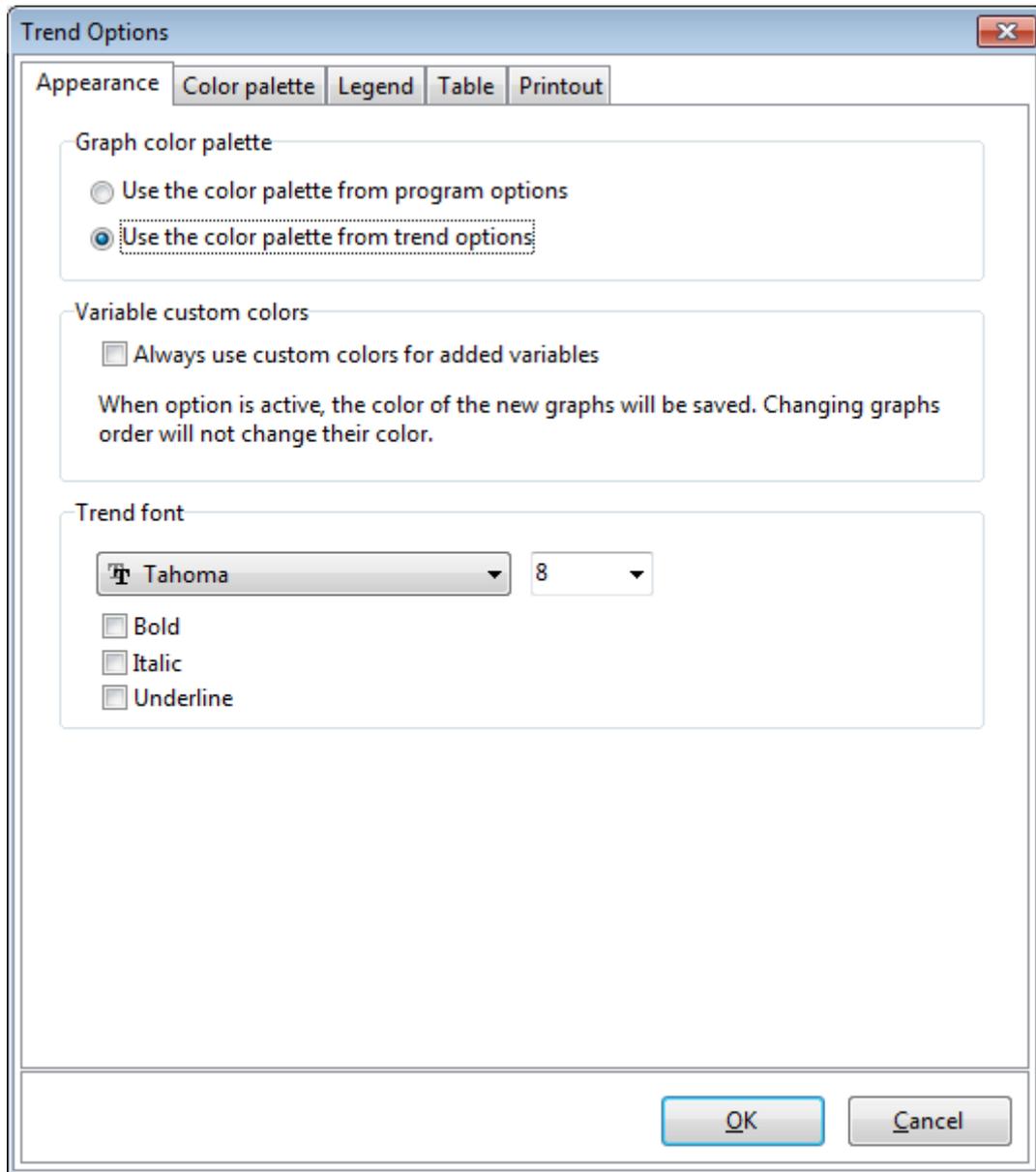


Fig. The Window 'Trend Options' - Appearance.

The **Color Palette** tab allows you to:

- select a predefined color palette
- or
- create own palette.

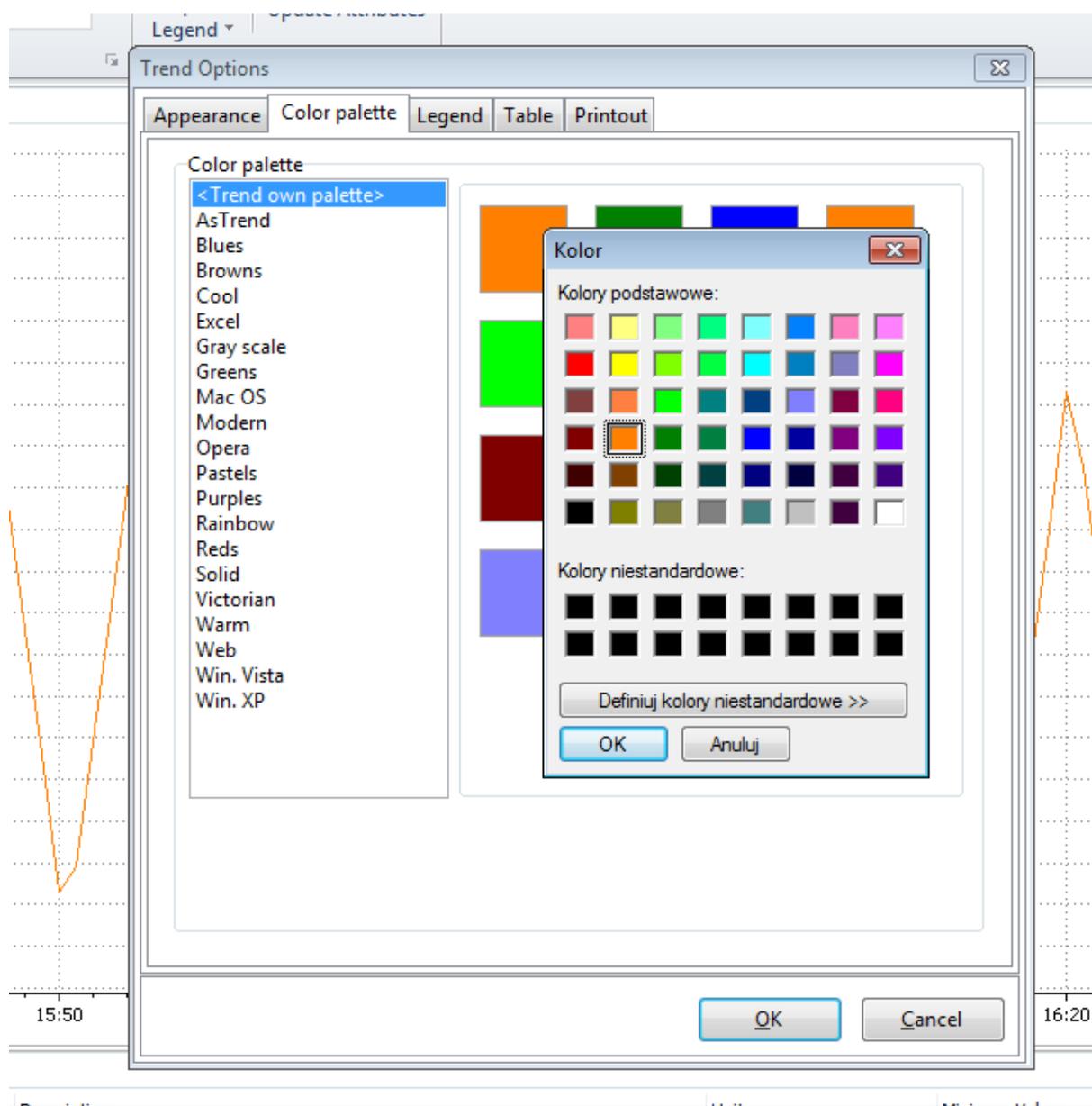


Fig. The Window 'Trend Options' - Color Palette.



Define your own color palette in program options

Use the tab **Color Palette** from:

File menu > **Program Options** command > **Program Options** window.

The **Color Palette** tab allows you to:

- select a predefined color palette

or

- create own palette.

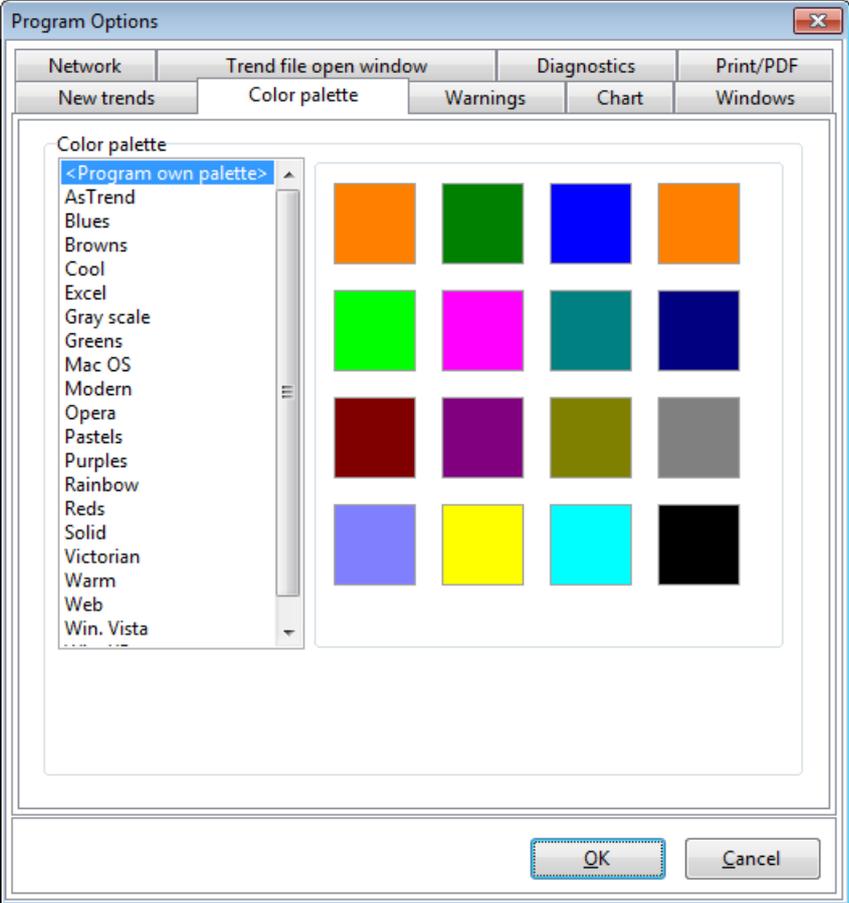


Fig. The Window 'Program Options' - Color Palette.

2.41 Operation of Multiple Graph Mechanism

 **To display/hide an additional chart panel (up to 4)**, use the commands , ,  from: AsTrend > **View** tab > **Panels** group.

The chart number 1 is the main chart and is also visible.

* * *

 **To add the graph to a given chart**, you should select the graph in the legend and use the command **Graph Location** from the context menu.

The second way is to drag the selected graph and drop it to the target chart panel.

While adding a new graph to the trend, the graph is added to the active chart panel.

* * *

 **To copy the graph to a given chart**, drag (while pressing the **Ctrl** key) the selected graph and drop it to the target chart panel.

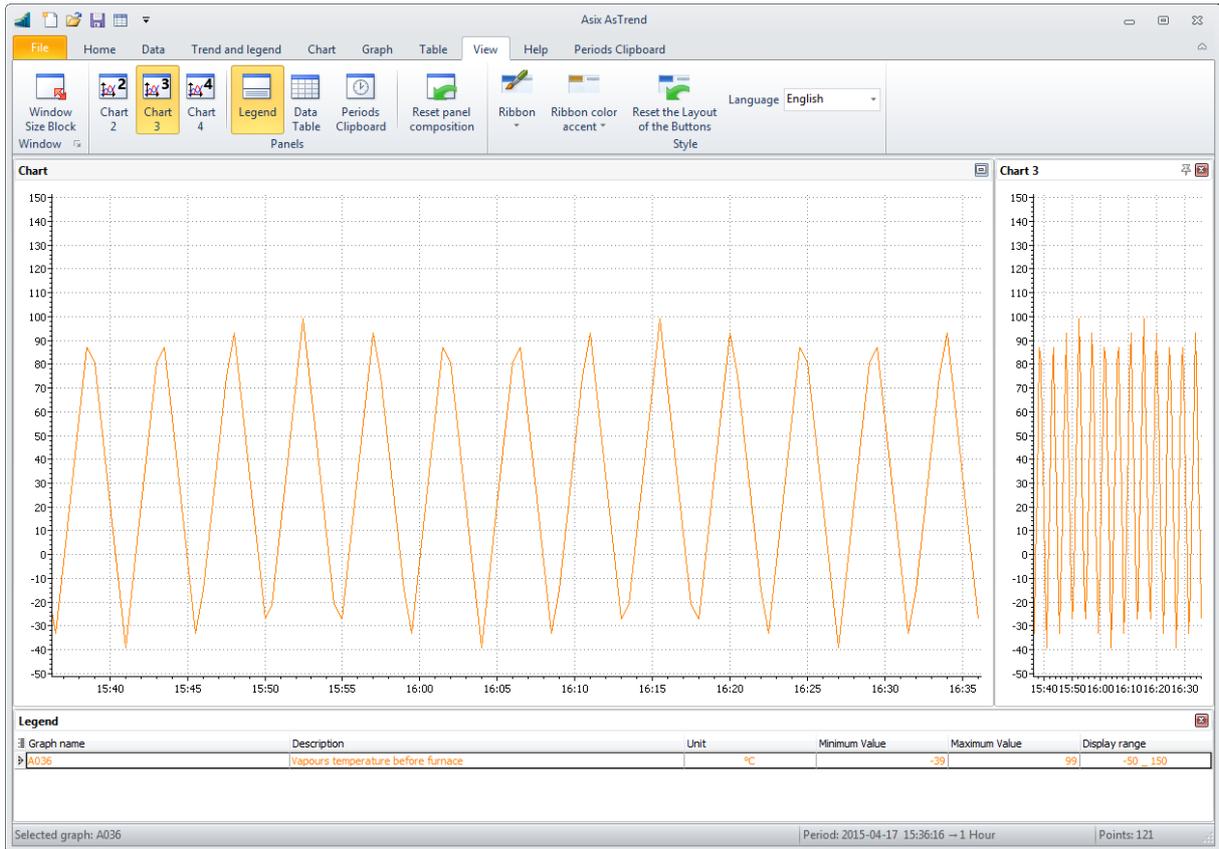


Fig. AsTrend - Multiple Chart View.

Docking the chart window

The chart window can be docked in the trend window - over, under or in the place of the other chart panel. In the last variant - the current chart panel is covered by the docked panel - and you can switch between the chart panels using tabs *Chart*, *Chart 2*...

You can dock the chart panel by dragging it into the other chart area and fit it into the virtual scheme of arrows.

You can back to independent shape of the chart panel by dragging the chart tab over the chart area.

You can reset the composition of panels by the command **Reset Panel Composition**  from:

AsTrend > **View** tab > **Panels** group.

Window layout is stored in AsTrend automatically when you exit the program - but there is also the possibility to save the window state for the trend file by the command **Storing Window Layout** from:

AsTrend > **View** tab > **Window** group > **'Trend Window Options'** window run by the button .

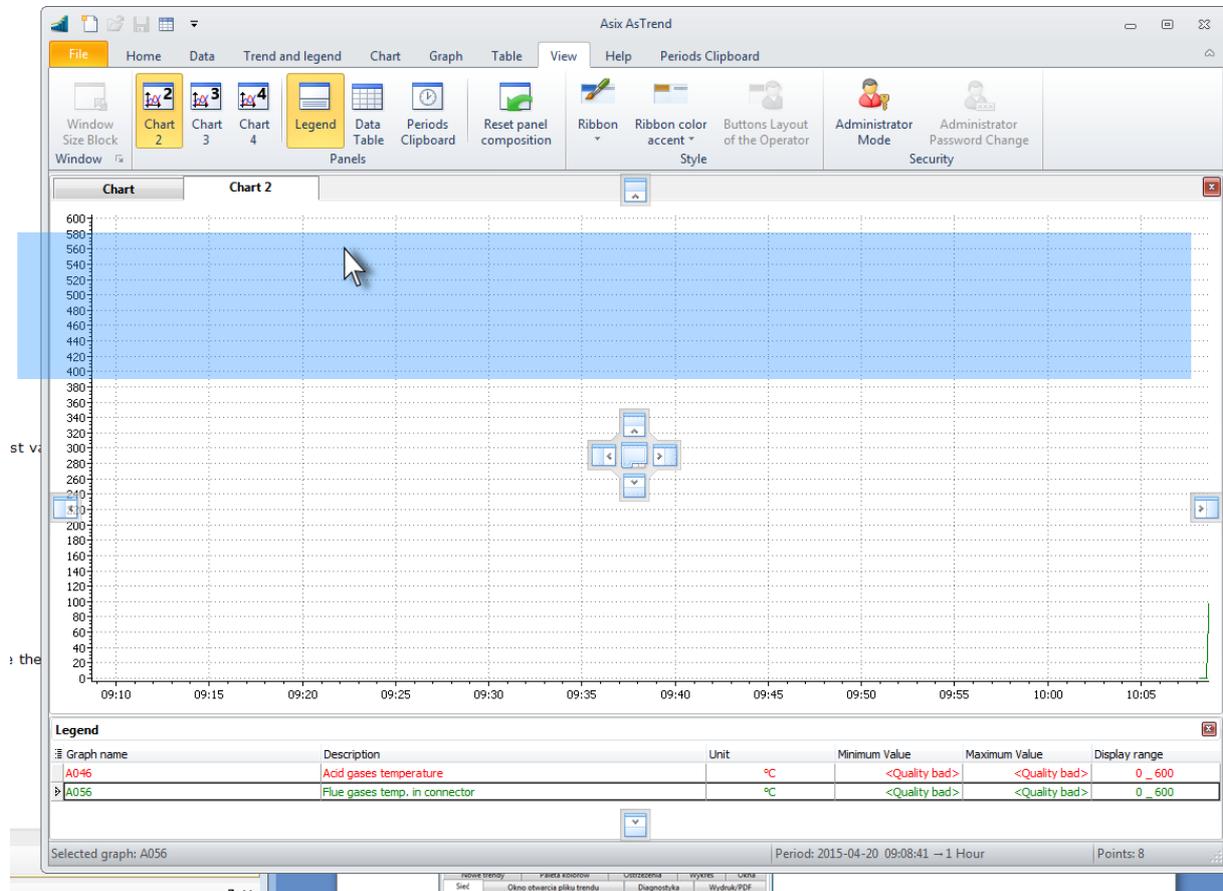


Fig. Docking the Chart Panel.

2.42 Changing the Language of the Program



To change the language of the program **AsTrend**, use the button *Language* from **AsTrend** > *View* tab > *Style* group, provided **AsTrend** run independently of the **Asix** application.

2.43 Declaration of Network Parameters



The window *'Program Options'* (run from *File* menu) > *Network* tab allows you to set the following parameters:

- *Names of Asix Data Servers* - data server names from which data will be collected to display trend charts;
- *Stop Search When First Server is Found* - maximum time to wait for the server report;
- *Connecting to Server and Data Exchange* - maximum time for the server response.

Program Options

New trends | Color palette | Warnings | Chart | Windows | **Network** | Diagnostics | Print/PDF

Names of Asix data servers

By default, this field is empty, which means that data servers are searched automatically.

Search for Asix data servers

Stop search when first server is found

Timeout [ms] 3000

Connecting to server and data exchange

Timeout [ms] 10000

Restore default values

OK Cancel

Fig. AsTrend - Network Parameters.

2.44 Aslink Network Module Setup

The Aslink network module is responsible for retrieving archive data. No module configuration is necessary to operate the AsTrend program – the system may correctly operate at default network module settings. However, the network protocols and the station name parameters must be set up.

- In case the AsTrend program is to operate in conjunction with the Asix system application, values of both parameters are retrieved from the application configuration (XML) file.

The network protocol parameter value is set up on:

Architect > Fields and Computers > Network module > TCP/IP Communication and NetBIOS Communication tab

The station name parameter values is set up on:

Architect > Fields and Computers > Network module > TCP/IP Communication and NetBIOS Communication tab

- In case the AsTrend program is to operate alone, the following lines should be inserted into the ASLINK.INI file (the file should reside within the directory, from which the AsTrend program is run):

```
[ASLINK]
NAME=ASIXTREND
ADAPTER=TCPIP
```

Instructions how to prepare the configuration file for a stand alone workstation and for a networked workstation are given in subsequent chapters below.