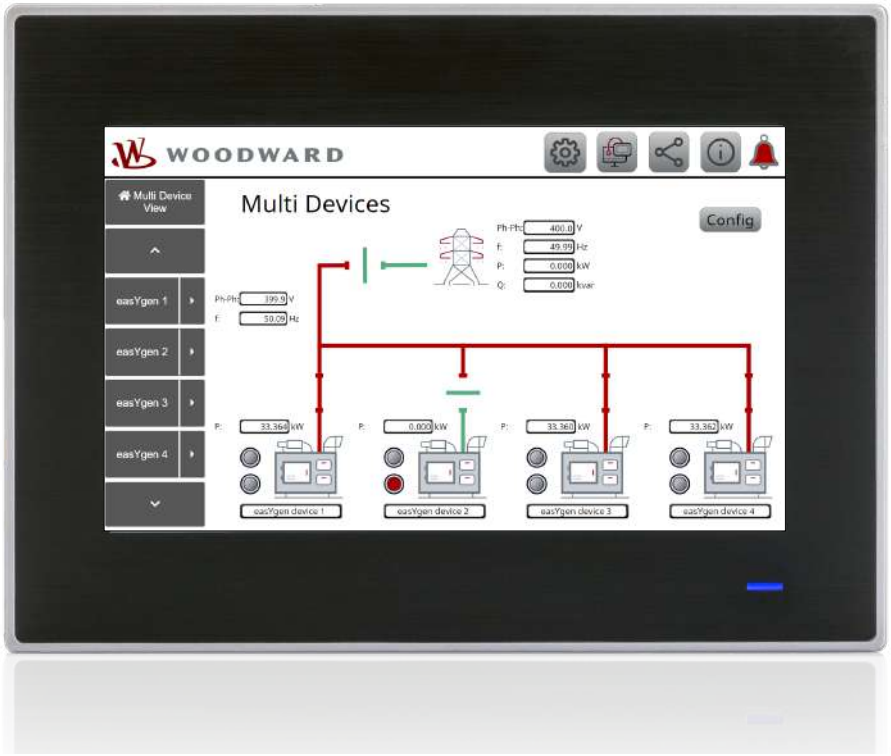
APPLICATION NOTE
#B37949_C, 12/2023



easYview

Customize your easYview-xx-yyy Rel. 2.1 or higher

Optional Supplementary Information

Alert boxes

The following alert boxes can be used in this publication:

“DANGER” indicates a hazardous situation which, if not avoided, will result in death or serious injury.

“WARNING” indicates a hazardous situation which, if not avoided, could result in death or serious injury.

“CAUTION”, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

“NOTICE” is used to address practices not related to personal injury.

“IMPORTANT” is used to address practices not related to personal injury.

Personnel

WARNING!
Hazards due to insufficiently qualified personnel!

If unqualified personnel perform work on or with the control unit hazards may arise which can cause serious injury and substantial damage to property.

- **Therefore, all work must only be carried out by appropriately qualified personnel.**

For further Product Support Options, Product Service Options, Returning Equipment for Repair, and/or Engineering Services please download application note #37573.

Documentation itself

Read this entire application note and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions.
Failure to follow instructions can cause personal injury and/or property damage!

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment.
Any such unauthorized modifications: constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage and invalidate product certifications or listings.

This publication may have been revised or updated since this copy was produced. If the cover of the publication states "Translation of the Original Instructions", the original source may have been updated since this translation was made.

The latest version of most publications is available on the publications page.

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If a specific publication is not there, please contact a customer service representative to get the latest copy.

1 Contents

2 General

This document contains instructions that enables you to customize the Many-2-One (mini-SCADA) visualization of your easYview-07-030, 10-060 or 15-150 Release 2.x

NOTICE **Please read the Technical Manual of the easYview (37945) before reading this document.**

The used integrated development environment (IDE) is the Atvise Toolset from Bachmann Visutec GmbH.

This document will give a short overview about the Atvise software tools. Additional some examples shall help to do small modifications without spending too much time in learning the IDE.

We still recommend participating in a Atvise training course and work with the existing Atvise help and training material available on the Atvise homepage.

3 Software Tools

3.1 Atvise Server

The Atvise Server is pre-installed on the easYview and already licensed. The Atvise Server is mainly responsible for sending and receiving data to external devices over OPC.
For Modbus connection to the easYgen-XT, the Atvise connect software must be used. The atvise connect software is a Modbus-to-OPC interface and is described under chapter 3.3.

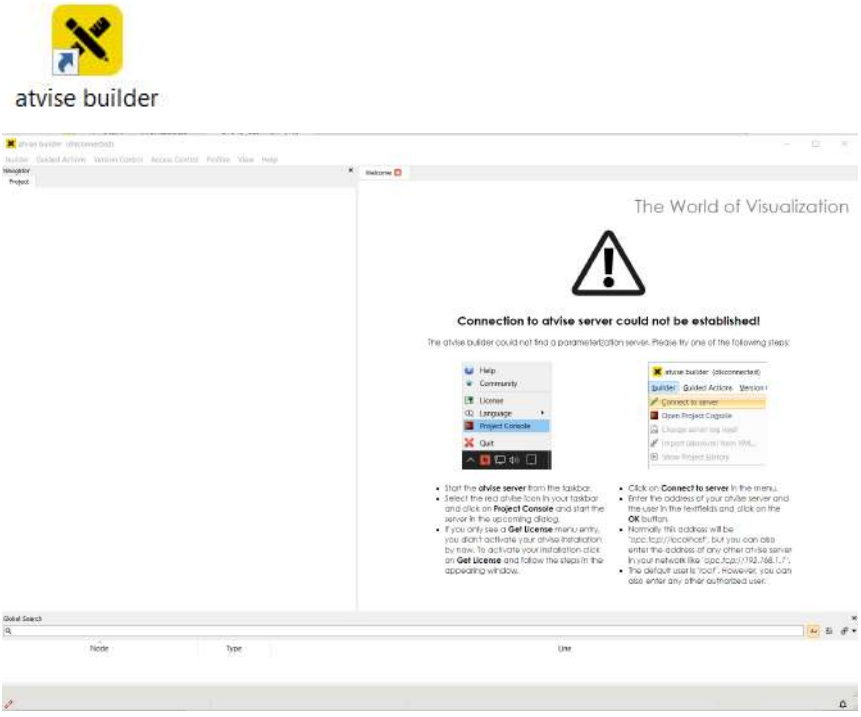
3.2 Ativse builder software

The Atvise builder software must be used to modify the existing mini-SCADA visualization.
The installation file can be downloaded direct from https://customer.atvise.com/ → atvise® download → atvise® → atvise® 3.9, or from the easYview documentation site, http://wwdmanuals.com/easYview. Run the installation file and follow the instruction of the installation wizard. For the installation, administrator rights are required.

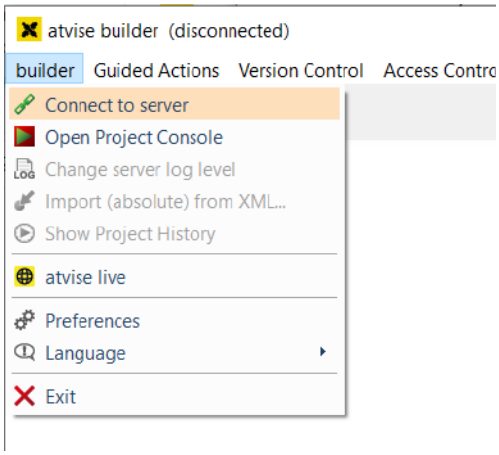
NOTICE

To avoid incompatibility issues, ensure the Atvise builder software version is 3.9.1

Open the atvise builder software

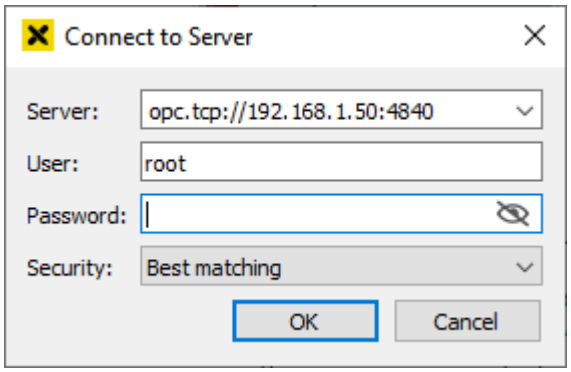


To connect to the easYview go to tab “builder” and select “Connect to server”.



To establish the connection, enter the following parameters and press “Ok”:

- Server: “opc.tcp://<IP address of easYview>:4840”
- User: “root”
- Password: no password needed
- Security: Best matching



After connected to the Atvise server, the Atvise builder tree is shown on the left as shown below.
The window on the left shows the content of the selected node in the tree.
This tree represents the whole content of the mini-SCADA visualization which is also saved in one file (nodes.db). More details about the nodes.db are described in File System (SFTP). Open a node (double click) in the atvise builder tree will open the content in the right window and can be directly modified.

How to use the atvise builder is explained below in the Example chapters.

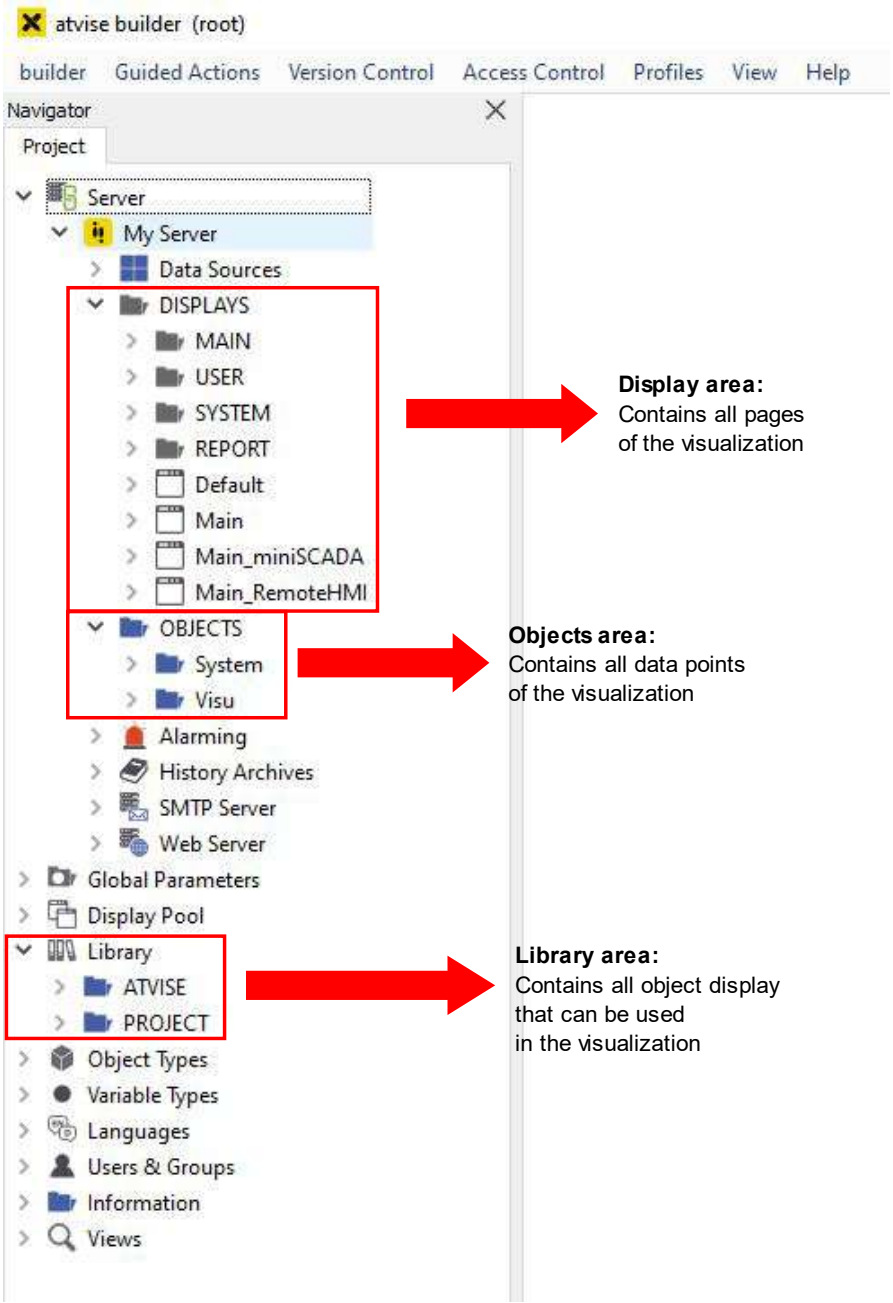


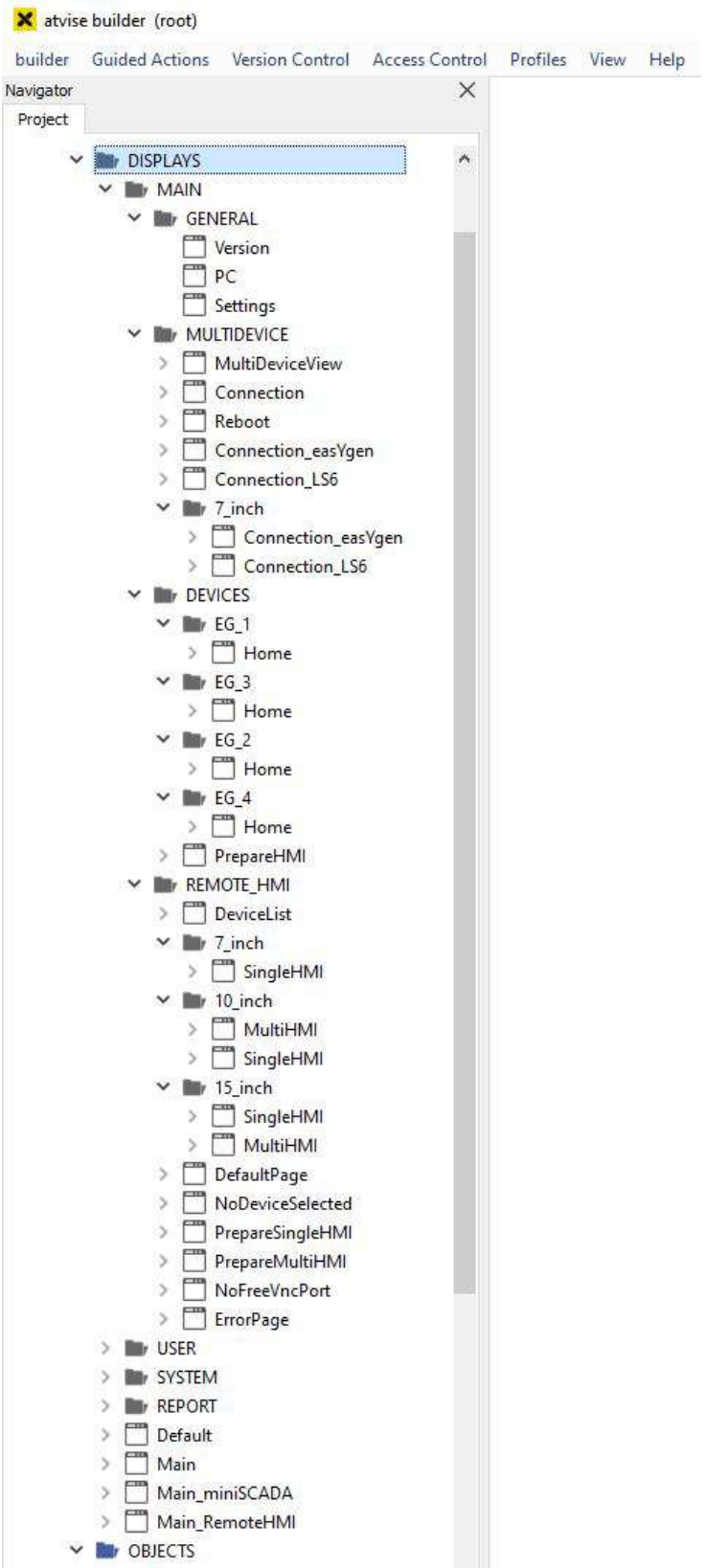
Figure 1 Atvise builder project tree with the most important areas

The following three areas are the most import parts in the atvise builder project tree.
There are some more areas which has different functionality. To fully understand how to work with the atvise builder we recommend participating in a training course from Bachmann Visutec GmbH and to use the atvise builder help and trainings material. In this document, only parts of the atvise builder are explained which are needed to understand the following example chapters.

Display area:

In this area all pages of the visualization are located. Each page can be individual filled with values, texts, colors, and other various display objects. A page is not automatically shown in the visualization, there must be also a reference created which allows to navigate to it. This can be through the navigation or any button

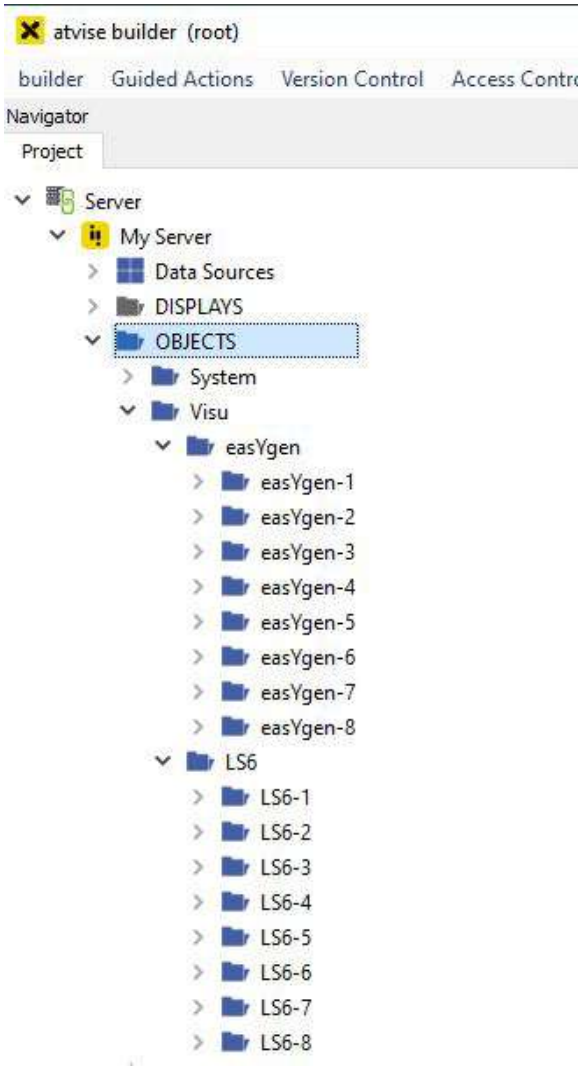
of any other page. The “Default” page defines the frame of the visualization. It is always shown around the actual pages.
Each page in this folder structure is somewhere used in the visualization. Some will be launched through the navigation, some through a button from the frame or from other pages.



Object area:

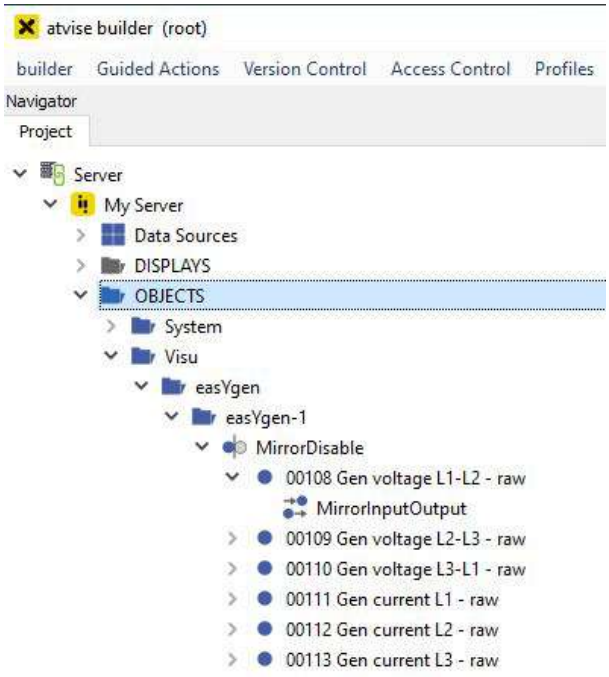
In the Object area are all available datapoint located. A datapoint is a node which saves data. Those data are mostly measurement values which are received via Modbus. But it can also be values which are created internally. For example, any configuration settings which need to be saved.

In the "**Visu**" folder are all datapoints located which save received Modbus values from 1-8 easYgens. The structure and the Modbus connections are also prepared for 1-8 LS6-XT devices. But no LS6 datapoint is create because LS6 devices are not used in the default visualization. Refer to Example: Add new datapoint from Modbus list for more information about how to add easYgen or LS6 datapoints.

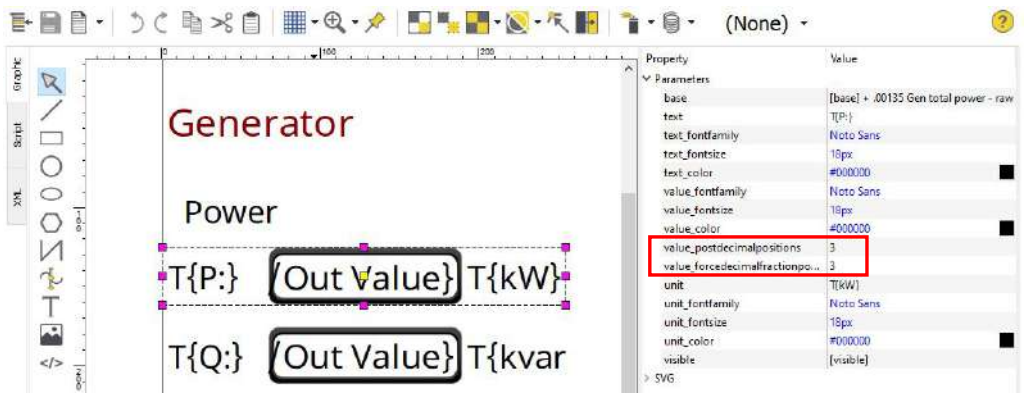


The used Modbus protocol for receiving easYgen data is 5016 and for LS6 data 5300. The nodes in the easYgen 1-4 folders are activated by default because they are used in the default visualization. All other data folder (easYgen 5-8 and LS6 1-8) are disabled by default. Refer to the easYview manual on how to enable additonal device connections.

In each easYgen folder there is the same list of datapoints which are sorted by database index.



Data points with the extension “- raw” are the main data points which have exact the value like transmitted from the easYgen-3000XT. These data point may needs to be formatted to match the easYgen data before transmitted via Modbus. To show the data formatted, use the parameter “value_postdecimalposition” and “value_forcedecimalfractionposition”. For details about the data format, refer to the easYgen manual→Protocol 5016.



The MirrorInputOutput subnode defines the reference to the according Modbus address.

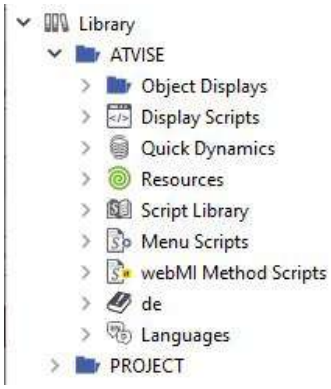
In the “**System**” folder are all datapoint located which are internally used or for saving configuration settings.

Library area:

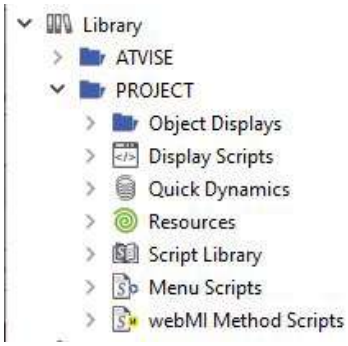
The Library area contains mostly visualization object (Object Displays) and scripts (Display scripts). Object Display are needed to show the value of a datapoint on a page. Therefore, an Object Display must be placed on a page and referenced to a datapoint. This can be a simple object which just shows a value as text or a more complex object like Gauge or Bar-graph. Each object can be modified and changed to the desired view and functionality. To add functionality to an object, JavaScript code can be added directly

to the objects. If there is functionality which want to be used in different kind of objects, a Display script can be created which can then be reused multiple times.

In the “ATVISE” folder all standard Atvise objects and scripts are located.
Note: Do not change here anything because with an update to a newer Atvise version this folder will be overridden, and all changes are lost.



The “PROJECT” folder is the place where to start modifying objects and scripts.
A common use-case would be to copy an object from the “Atvise” folder which is like what is needed and paste it into the “Project” folder where it can be modified to the appropriate needs.



3.3 Atvise Connect

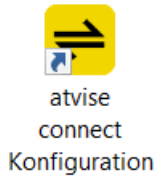
With the Atvise Connect software from Bachmann Visutec GmbH all Modbus connections to external devices like easYgen-XT, LS6-XT etc can be modified. The atvise connect software also converts the received Modbus data to OPC which can then be processed by the atvise server on the easYview.

For each external device at least one connection must be created. If different sample rates are needed multiple connections per device must be created because every connection has only one fix defined sample rate. This will be explained more in Example: Add a new device to the project.

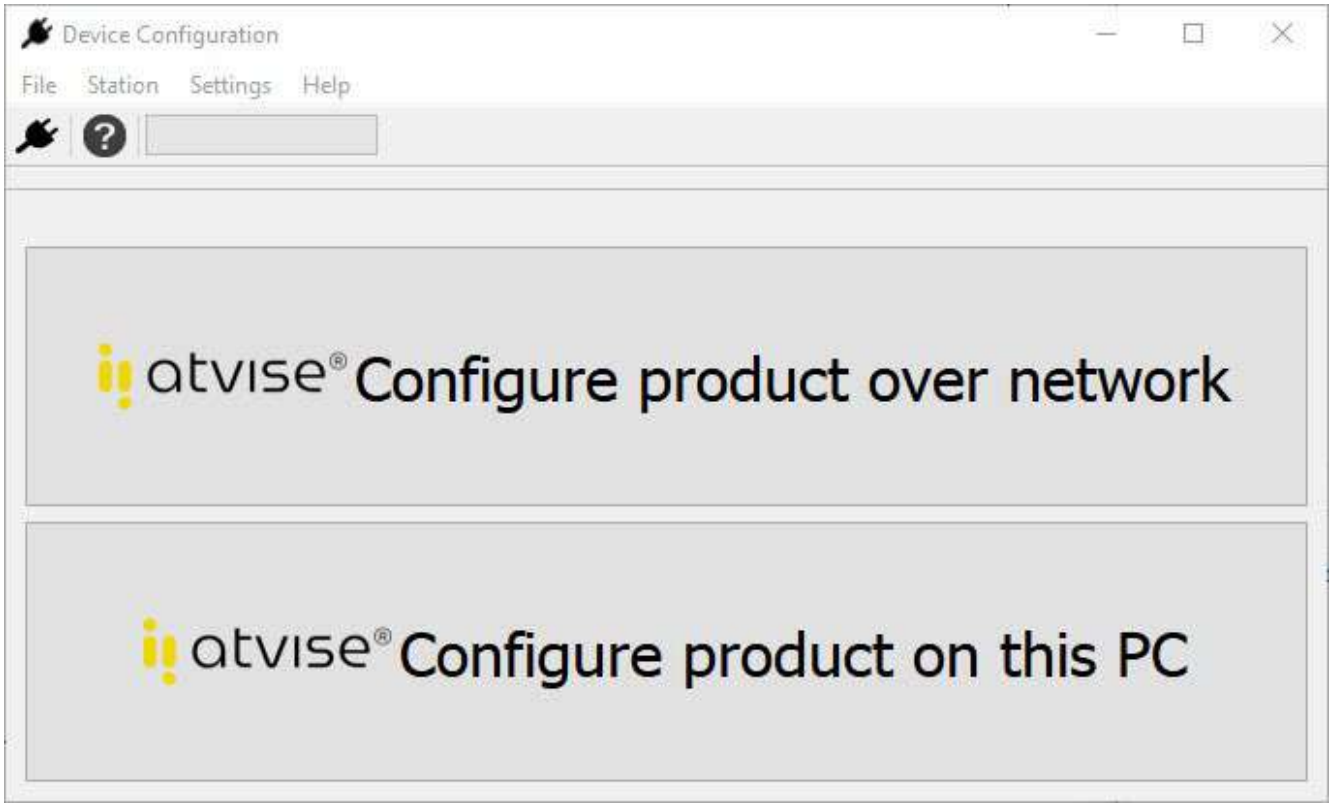
Installing Atvise connect software on your PC

Note: This software only needs to be installed for changes on device connections and/or Modbus variable lists.
The installation file can be downloaded direct from https://customer.atvise.com/ → atvise® download → atvise® connect → atvise® connect 2.6.7, or from the easYview documentation site, http://wwdmanuals.com/easYview.

Note: To install Atvise connect on your PC you need Administrator rights.

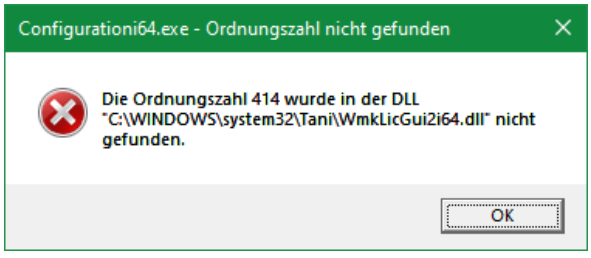


After launching it the following window is shown.



Troubleshooting

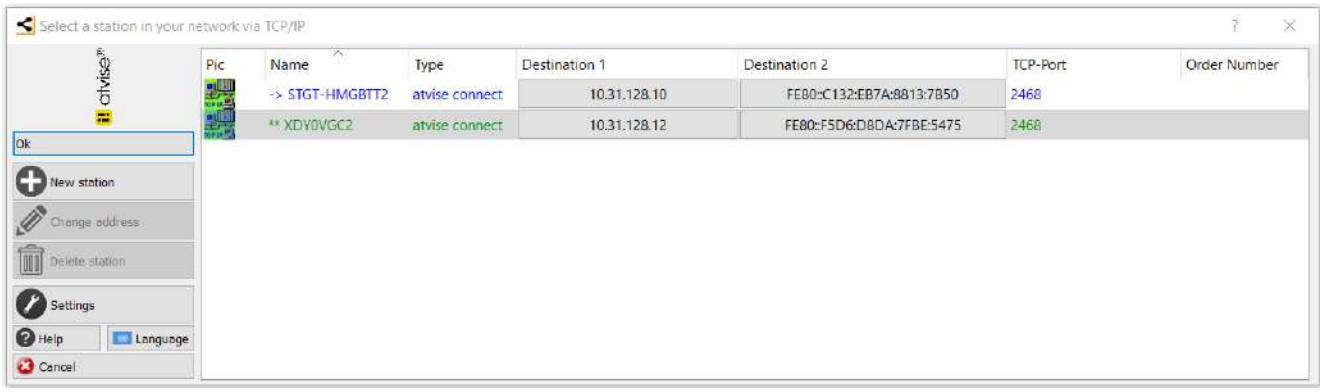
If the error message „The ordinal number 414 could not be found in DLL“ pops-up instead when starting the software.



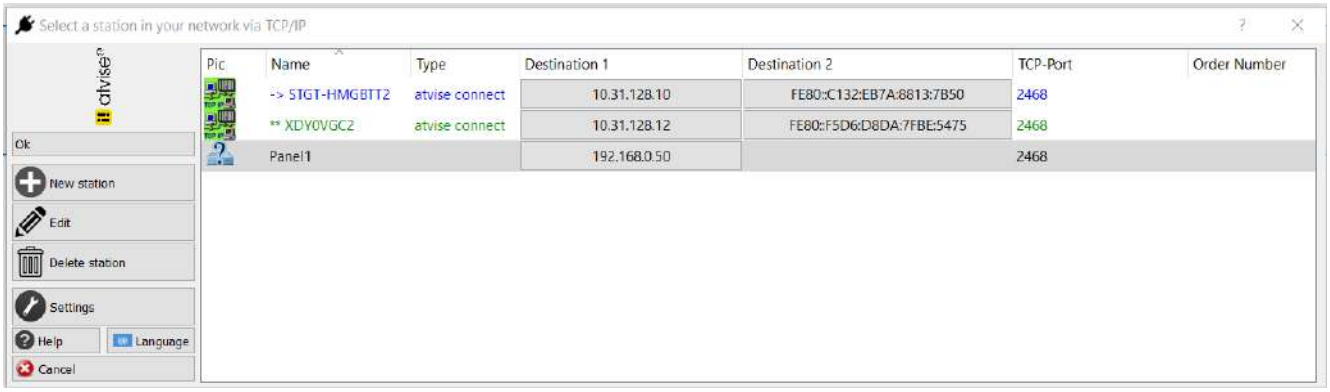
Delete folder "C:\WINDOWS\System32\Tani“, uninstall the software, restart the PC, and install it again.

First time start

When starting atvise connect, select “Configure product over network”.
A list of available stations is shown. If atvise connect is started the first time, the list of stations is empty.



Define the easYview as a station and set its IP address by clicking the “New station” button, here the easYview is named “Panel1”.



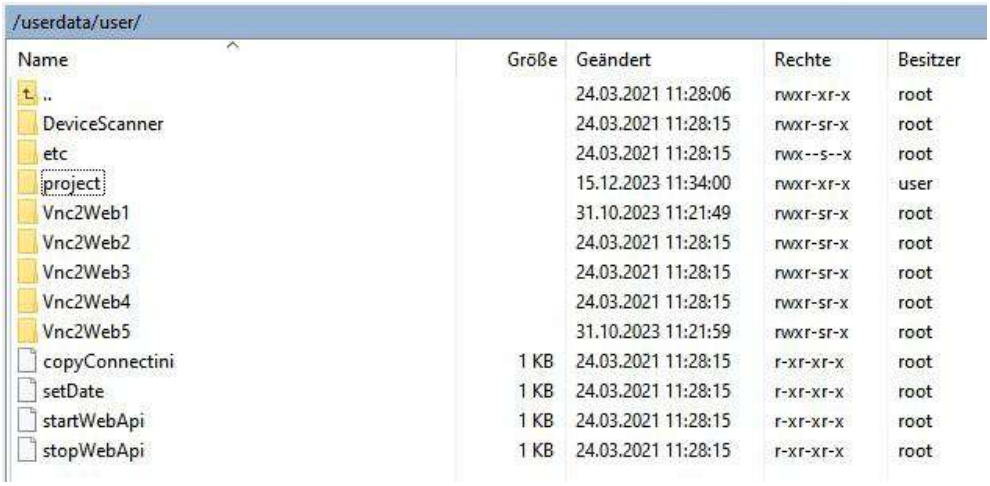
How to use the Atvise connect software is explained in Example: Add a new device to the project.

3.4 File System (SFTP)

It is possible to connect to the easYview via SFTP client.
On the file system there are some areas which are free accessible.

The default username and password are:
Username: user
Password: user

We highly recommend changing the default password to have a better protection and to avoid unintending changes. How to change the password is described in the easYview manual, see http://wwdmanuals.com/easYview.



Under /home/user there are three important files located which can be used as ssh commands.

1. **copyConnectini**: is used to create a copy of the DeviceConfig.ini file from the restricted area to the /home/user folder. The DeviceConfig.ini file contains all connections to external devices. The original file is still in restricted area. This command is needed if the connections to external devices are changed with the atvise connect tool, see Example: Add a new device to the project.
2. **startWebApi**: starts the atvise server and the visualization. This is needed after the application was updated (nodes.db)
3. **stopWebApi**: is used to stop the atvise server and the visualization. This is needed before updating the application (nodes.db).

To run one of the commands, follow these instructions:

1. Open the command window (cmd)
2. Establish a ssh connection:
    a. Enter the command 'ssh user@<ip-address>' (replace <ip-address> by the IP address of the easYview)
    b. Enter the default password “user” (if not changed).
3. Enter “./” followed by the command to use.
    a. Example: user@tcp71wn10pa:~$ ./copyConnectini
    → this will copy the file ‘DeviceConfig.ini’ to the folder /home/user folder.

In the /home/user/project folder are additional files which can be used/updated.

1. **atserver_std.log**: is the server log file. This may be helpful to look at in case of troubleshooting.
2. **atserver.ini**: This file contains server parameter. For more information refer to the atvise help.
3. **Symbol.png**: Is the logo in the upper left corner of the Remote HMI screen.
4. **Logo.png**: Is the logo in the upper left corner of the visualization. This can be replaced by a customized logo. Therefore, refer to personalization application note under http://wwdmanuals.com/easYview
5. **nodes.db**: This is a database file which has the whole application of the visualization included. If this file gets deleted a new empty nodes.db is generated after boot up. The nodes.db can be replaced by another nodes.db to update/change the mini-SCADA visualization. Before replacing the node.db the server and the application must be stopped, like described above (stopWebApi) and started afterwards (startWebApi).

6. **TempDeviceConfig.ini**: This file is needed if there was a change made in the connection page (changed IP address of an easYgen, for instance). The TempDeviceConfig.ini has the same structure like the DeviceConfig.ini (which is the actual config file). But the TempDeviceConfig.ini has some variable names (for IP, Slave ID, enable flag) inside. When a reboot is triggered over the connection page the variables in the TempDeviceConfig.ini gets replaced with the actual values and the original DeviceConfig.ini gets replaced. The DeviceConfig.ini is not free accessible but can be copied to the free accessible area like described above.
7. **VncSettings.json**: Saves the settings for the VNC connection. This file must not be changed.
8. **Connection.json**: Saves the settings of the easYgen connections. This file must not be changed.
9. **Configuration.json**: Saves the settings of the EasYview (Ip address, Brightness, etc.).
10. **GetSettings.json**: Has same information about the Device. This file may gets deleted and created internally. This file must not be changed.
11. **ModeSettings.json**: Saves the application mode settings including the Auto Connection.
12. **index.html**: Start page which is shown during boot up. This file must not be changed.

/userdata/user/project/

Name	Größe	Geändert	Rechte	Besitzer
..		24.03.2021 11:28:15	rwxr-sr-x	root
database		24.03.2021 11:29:45	rwxr-xr-x	user
lost+found		24.03.2021 11:28:15	rwx------	user
trunk		07.12.2023 08:34:01	rwxr-xr-x	user
atserver.ini	1 KB	24.03.2021 11:28:15	rw-r--r--	user
atserver_cnv.log	86 KB	13.12.2023 14:22:54	rw-r--r--	user
atserver_std.log	810 KB	13.12.2023 14:23:06	rw-r--r--	user
Configuration.json	1 KB	21.11.2023 10:45:57	rw-r--r--	user
Connection.json	2 KB	08.12.2023 15:03:31	rw-r--r--	user
GetSettings.json	1 KB	13.12.2023 14:34:01	rw-r--r--	root
hardwarecode.txt	1 KB	24.03.2021 11:29:29	rw-r--r--	user
index.html	3 KB	12.10.2023 08:39:55	rw-r--r--	user
Logo.png	18 KB	02.10.2023 11:15:09	rw-rw-rw-	user
ModeSettings.json	1 KB	12.12.2023 15:24:09	rw-r--r--	user
nodes.db	30,356 KB	15.12.2023 11:33:57	rw-r--r--	user
Symbol.png	36 KB	02.10.2023 11:15:09	rw-r--r--	user
TempDeviceConfig.ini	15 KB	13.12.2023 14:22:21	rw-r--r--	user
VncSettings.json	1 KB	12.12.2023 15:24:09	rw-r--r--	user

4 Example: Add a new page

The following steps will show how to create a new page to the visualization, add a value to it and include it to the navigation.

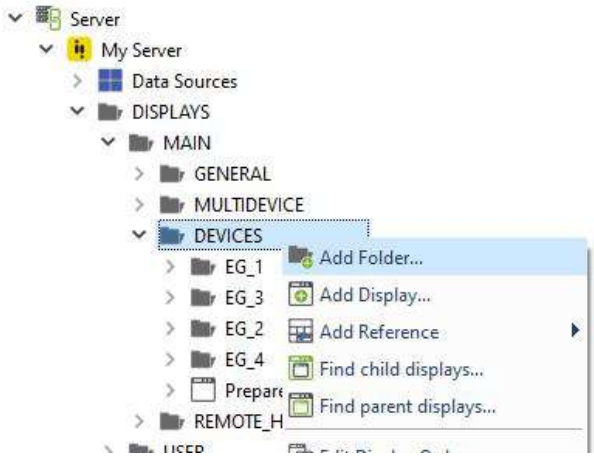
Note: If creating any node, please consider the naming restrictions of atvise (not allowed are “?”, “.” and “/”)

4.1 Create a new page

Step 1:

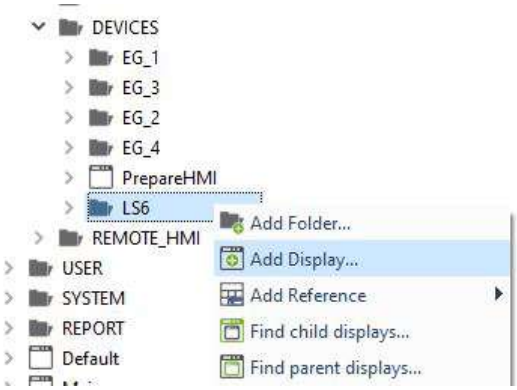
Create the folder structure for the new page if needed.
Here we right click on the folder “DISPLAY\Main\Devices” and select “Add Folder”.

We will name the folder “LS6”.



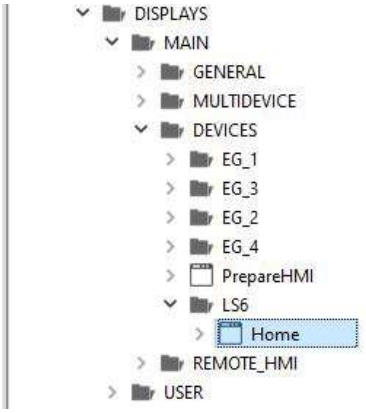
Step 2:

Create a new Display (page) by right click on the appropriate folder. Here right click on “LS6” and select “Add Display” and enter the name of the page. Here we name it “Home”.

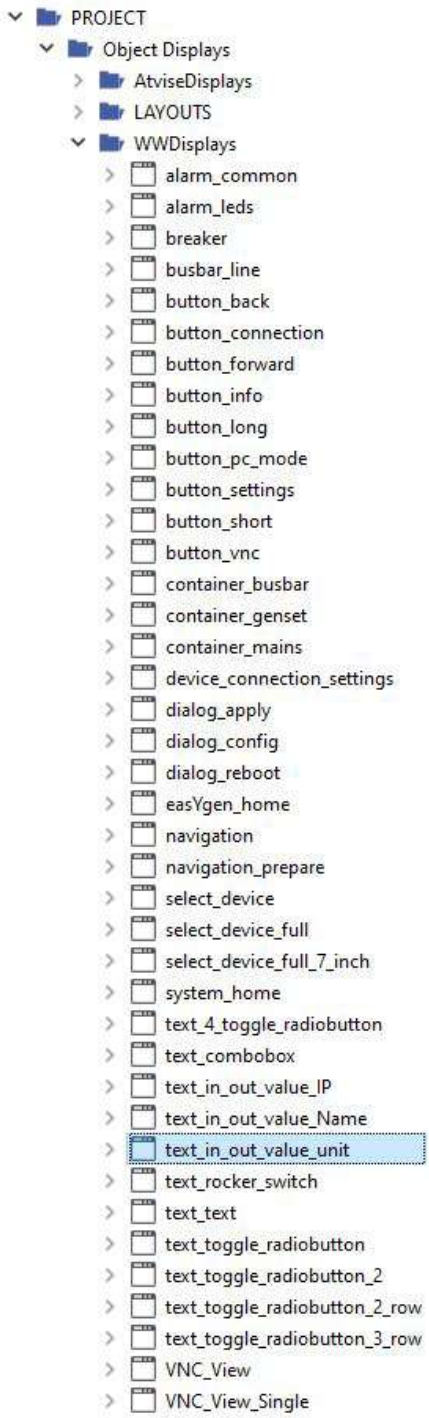


4.2 Add a value to a page

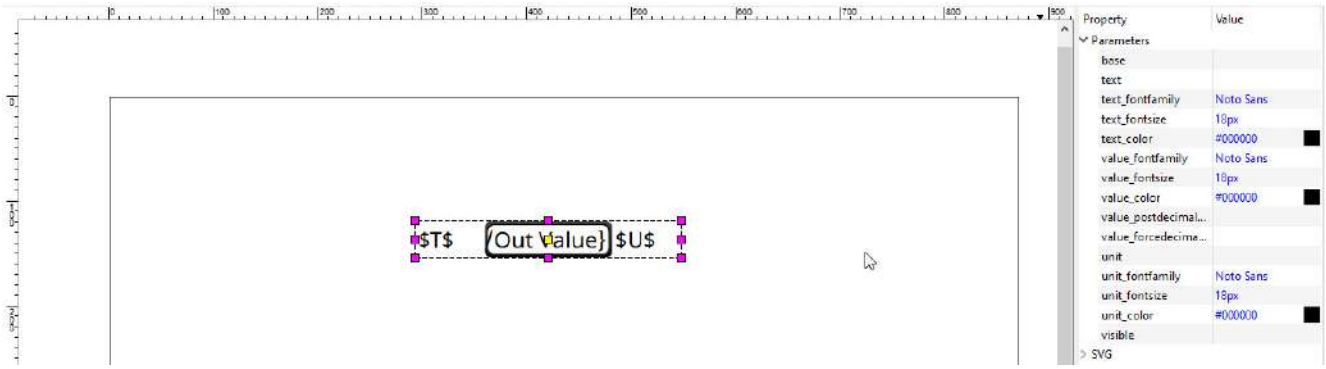
Double click on the just created page.



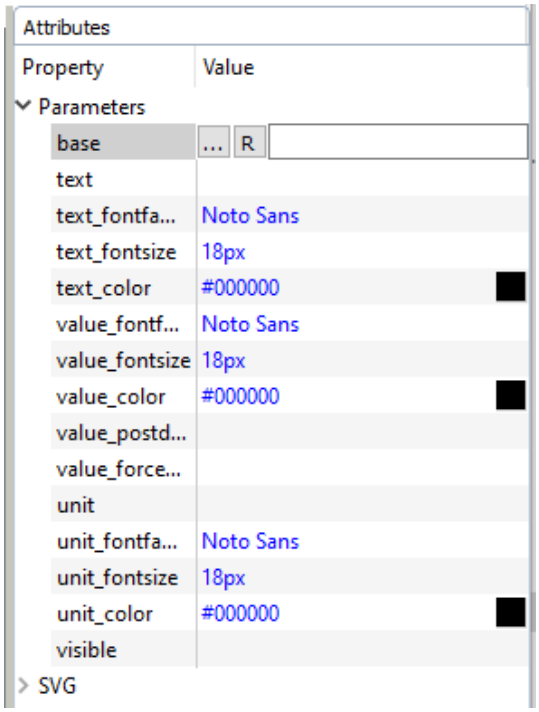
Now we want to place a new datapoint on the page.
Drag and Drop a new “text_in_out_value_unit” object into the new page. The object can be found at “PROJECT\Object Displays\WWDisplays\”.

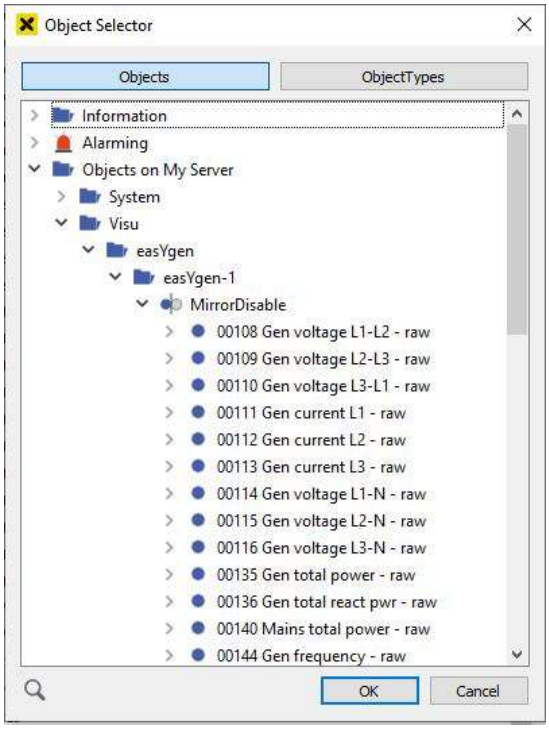


If the Object Display is placed and selected the Attribute window is shown to right.



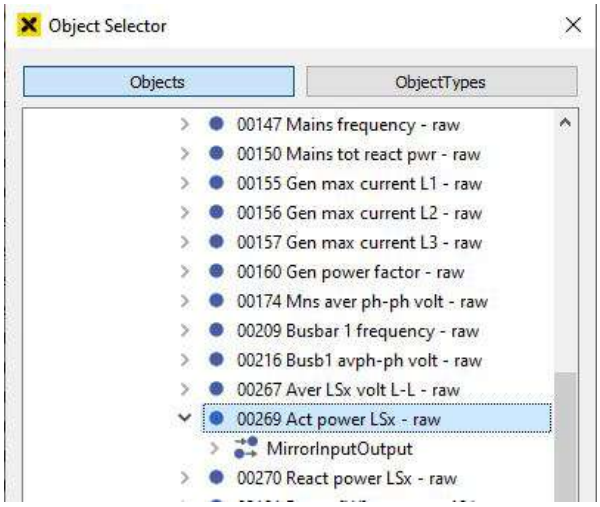
Enter the needed attributes for “base”, “text” and “unit”. To enter the “base” (reference to the datapoint) click on the three dots to select a datapoint from a list.



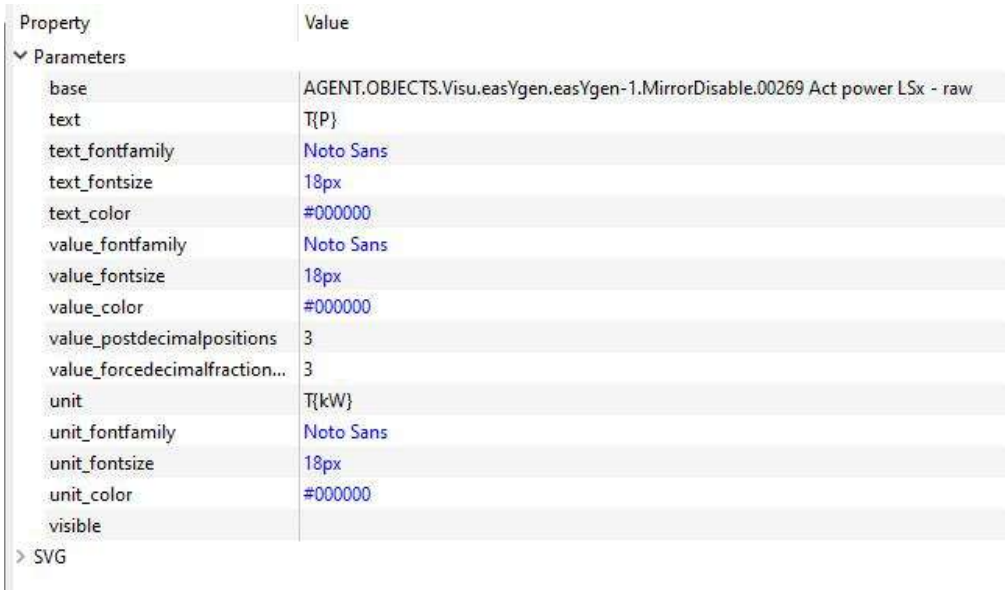


Here we choose the datapoint “00269 Act power LSx”.

Refer to Example: Add new datapoint from Modbus list how to add a new Modbus value to the project.



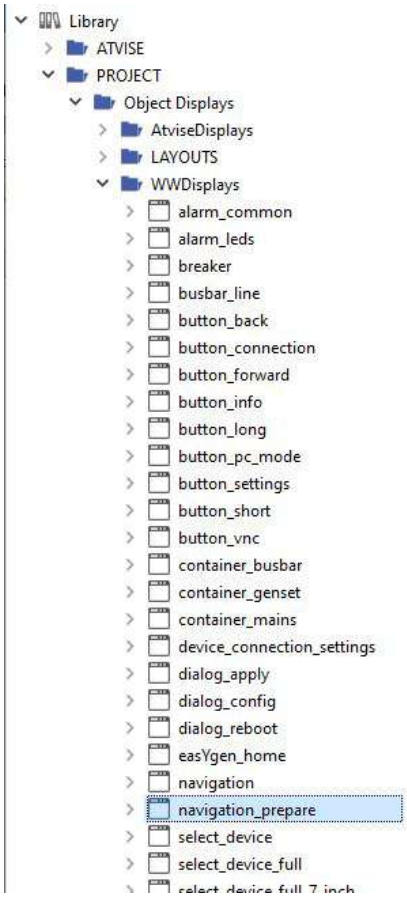
At “text” and “unit” we entered here: “P” and “kW”. For the formatting we enter to “value_postdecimalposition” the value 3 and for “value_forcedecimalfractionposition” also the value 3. This will divide the value by 1000 and show 3 decimal positions after the comma.
Finally, the attributes look like this.

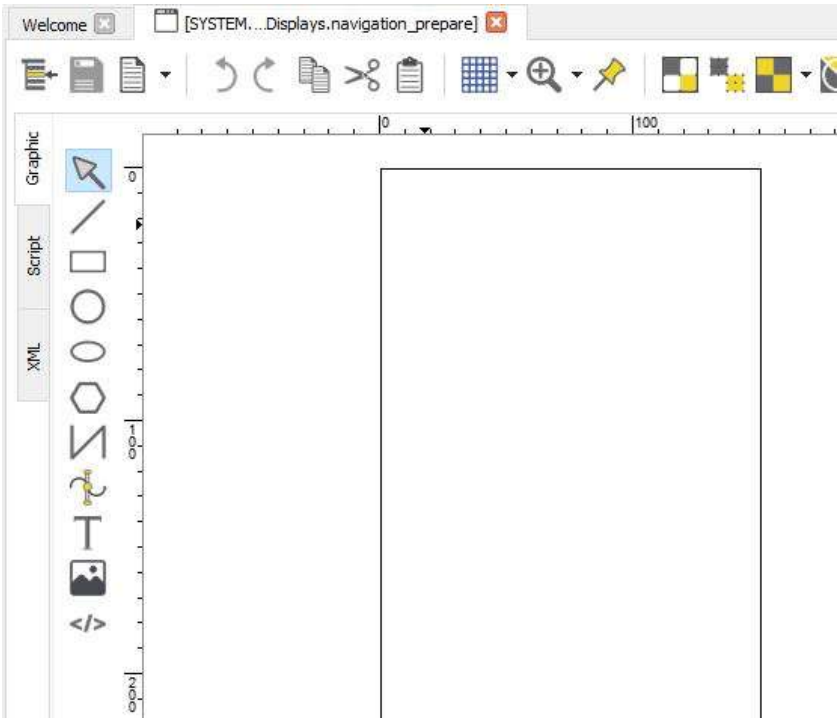


Save the “Home” page.

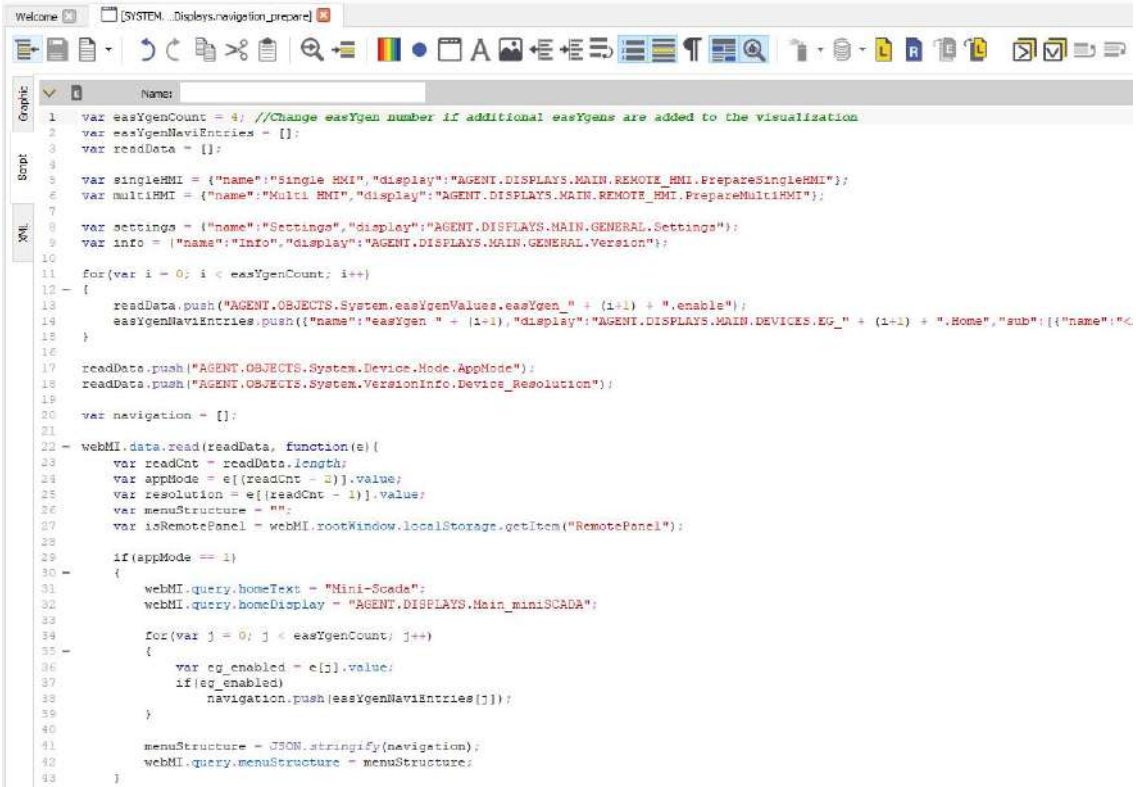
4.3 Add a page to the navigation

Open (double click) the “navigation_prepare” object which is located under: “Library\PROJECT\Object Displays\WWDisplays\navigation_prepare”.





Open the “Code Editor” by selecting the “Script” tab on the left.



In the Editor the new Page needs to be added.

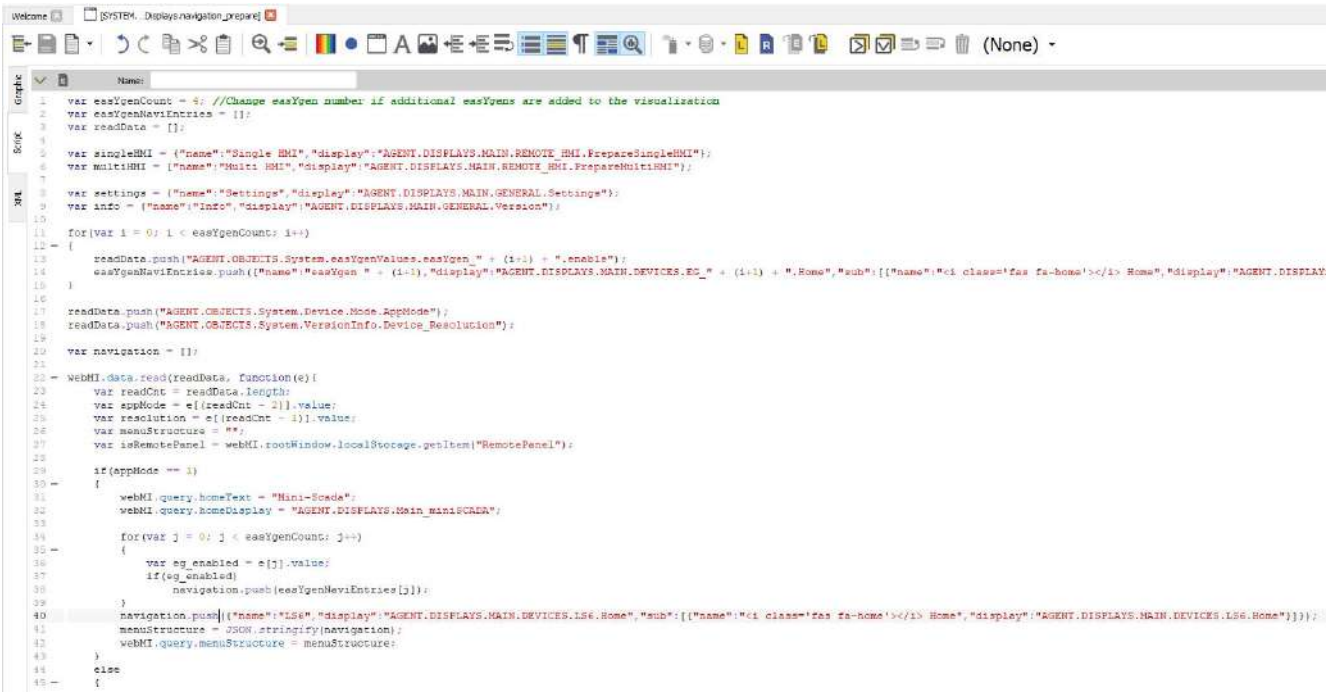
Copy the following codeline below the line 4 (“var easYgen 4 = …”).

Add in line 40 the following line:

“navigation.push({"name":"LS6","display":"AGENT.DISPLAYS.MAIN.DEVICES.LS6.Home","sub":[{"name":" Home","display":"AGENT.DISPLAYS.MAIN.DEVICES.LS6.Home"}]});”.

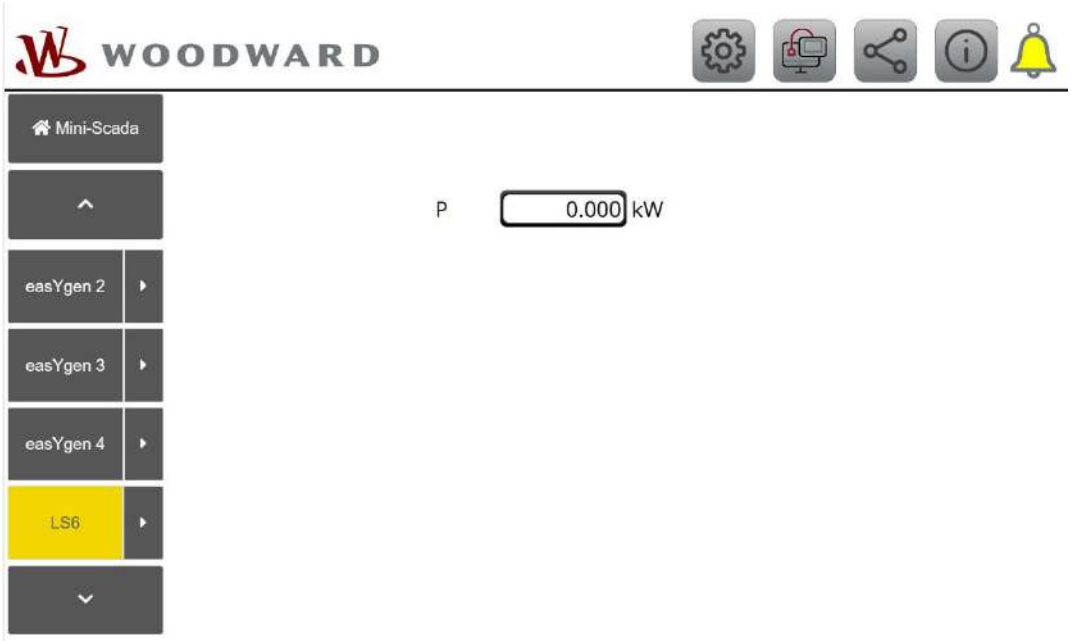
This defines how the button in the navigation is named and which page shall be launched if the button is pressed. For more information about the JSON structure for navigation, refer to the atvise help.

The code in the Editor should look now like this:



Save the Code Editor. Since the changes effect the Visualization frame, a simple navigating between pages is not enough to see the changes. The Visualization needs to be fully reloaded. Power cycle the easYview to refresh the Visualization or press the Woodward Logo. If working on the PC a refresh with F5 is also possible.

The navigation has now an additional Button for “LS6”.
After pressing the “LS6” button, the new created page is shown.



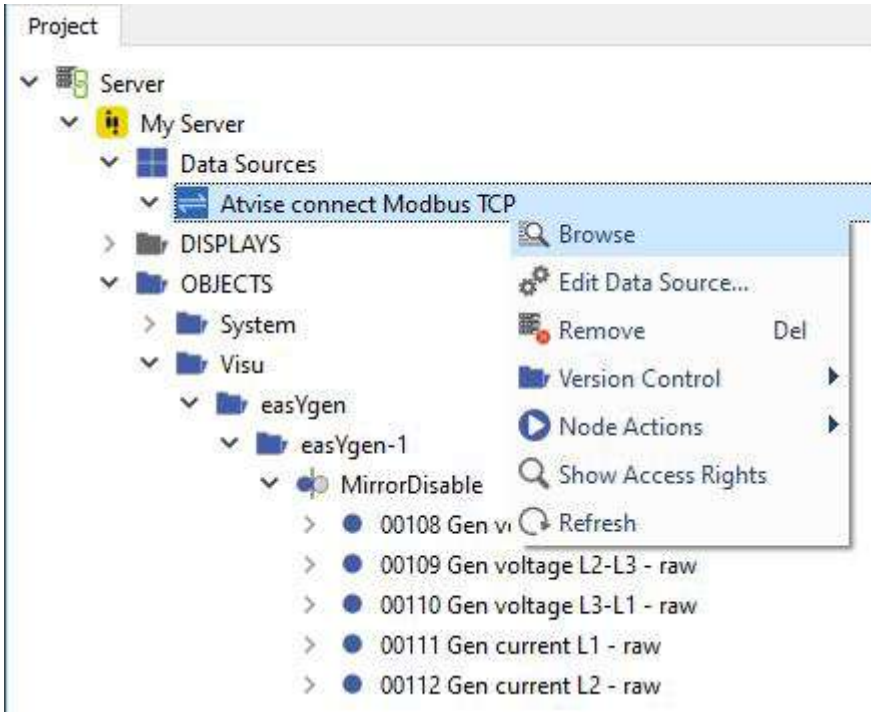
5 Example: Add new datapoint from Modbus list

In this example we want to add a new easYgen Modbus value to the project.

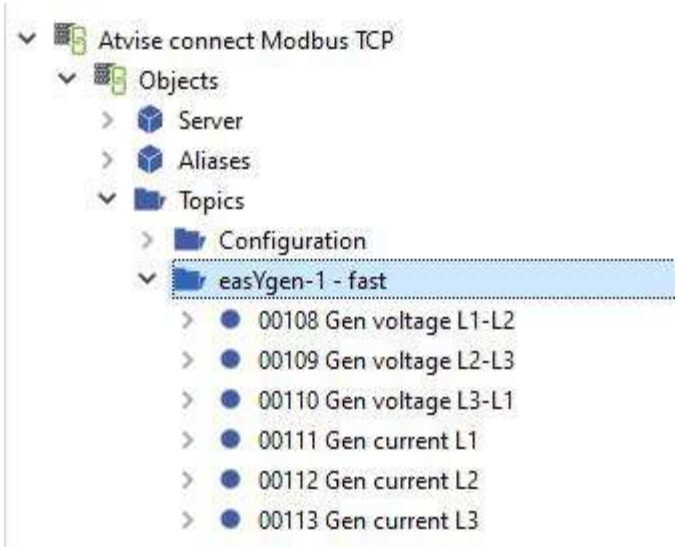
In the easYview there are 16 predefined connection (8 for easYgen-XT devices and 8 for LS6-XT devices). By default, only the connections for easYgen 1-4 are enabled because they are used in the visualization. In this example we show how to add a new Modbus datapoint from the easYgen-1 connection. The steps are the same for adding a datapoint from another easYgen or from a LS6 device. Disable connections must be enabled first over the Connection Settings Page (refer to Technical Manual of the easYview) before the steps of this example can be done.

Step 1:

Right click on Server\My Server\Atvise connect Modbus TCP.

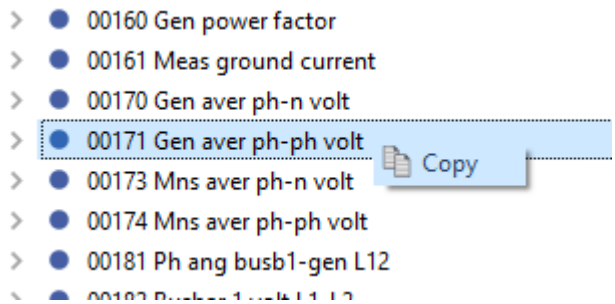


Select “Browse” and navigate the Modbus list of easYgen – 1 fast. This list shows all Modbus values from the 5016 Protocol.

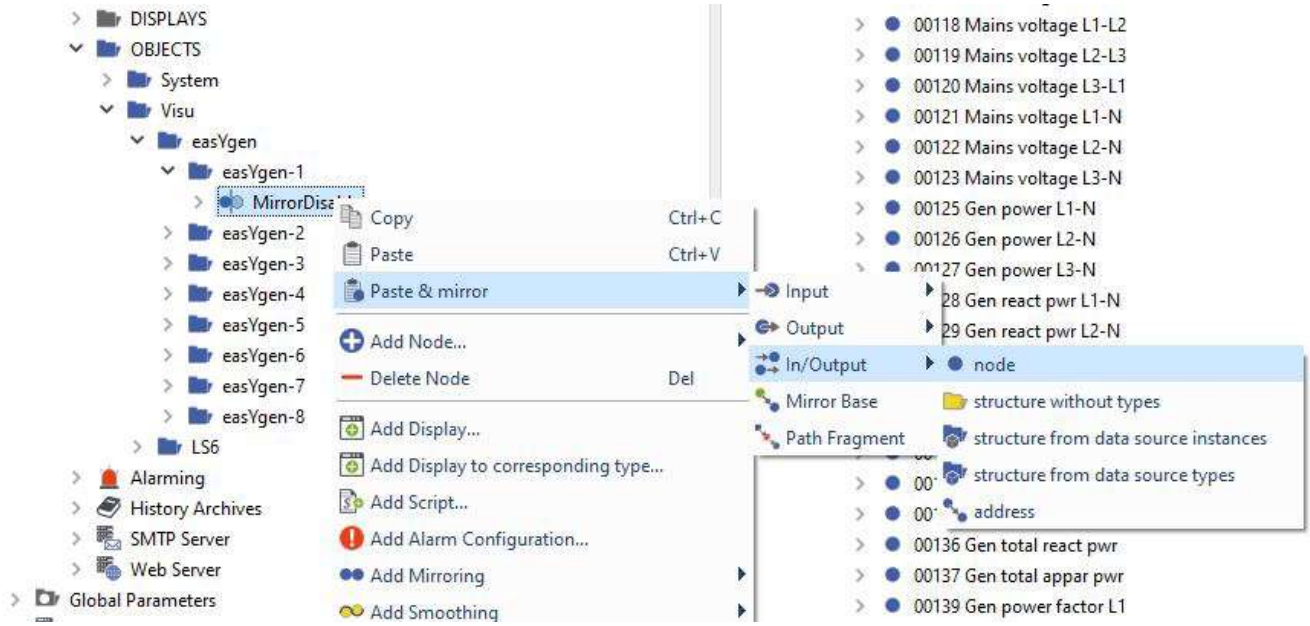


In this example we want to add the Generator average voltage.

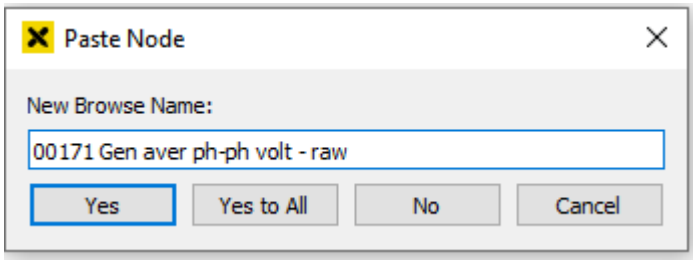
Right click on “00171 Gen aver ph-ph volt” and select “Copy”.



Right click on OBJECTS\Visu\easYgen\easYgen-1\MirrorDisable.
Select Paste & Mirror → In/Output → node

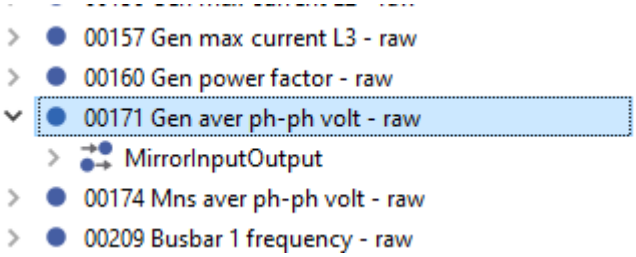


Enter a name for the new datapoint. In this example, we take the same name from the Modbus list and add the extension “- raw” because it is the raw Modbus value without formatting.



Step 2:

Now we have created a new datapoint which refers to an easYgen Modbus value.



This datapoint has the raw Modbus value without formatting. For a nice value representation, we need to adjust the format parameters, refer to Example: Adjust the existing easYgen page (***Step 3)***.

Step 3:

Repeat **Step 1** and **Step 2** for easYgen 2 – 4 if needed.

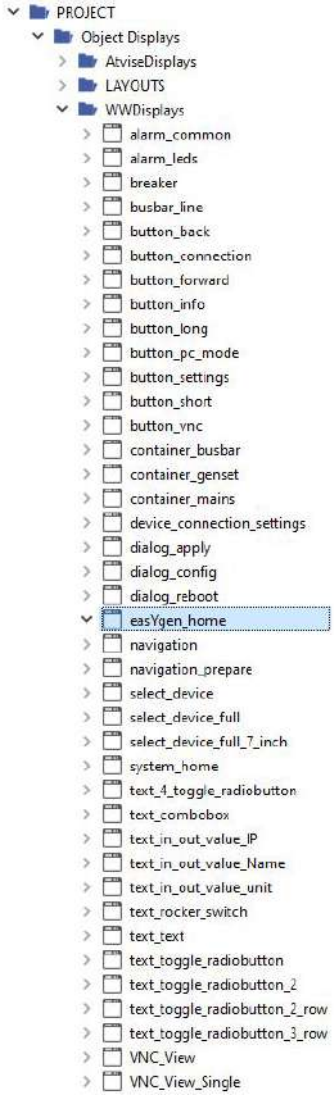
6 Example: Adjust the existing easYgen page

This example will show how to add an additional datapoint to the existing easYgen home page.

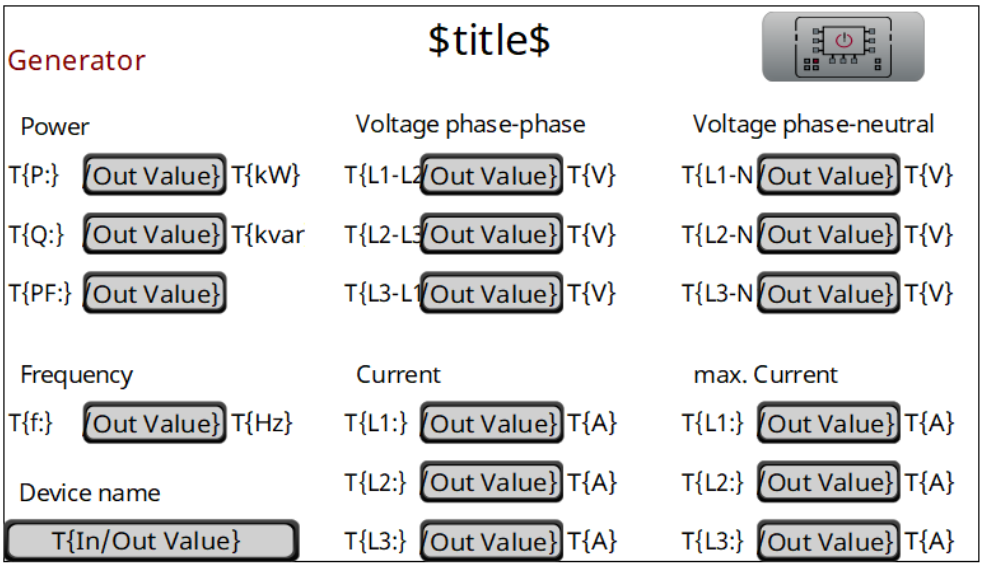
Pre-Information:
There are four easYgen home pages available (1-4). To avoid the maintenance effort of four pages, there is an object display created under Library\PROJECT\Object Display\WWDisplays\easYgen_home. The object display contains all values which are shown on the easYgen home page with relative addresses. This object display is added to each easYgen home page. To distinguish between the four easYgens only a few parameters must be adjusted. That way a change in the object display will automatically update all four easYgen home pages (Object Orientated Programming).

Step 1:

Open (double click) the object display “easYgen_home” from Library\PROJECT\Object Display\WWDisplays\easYgen_home.

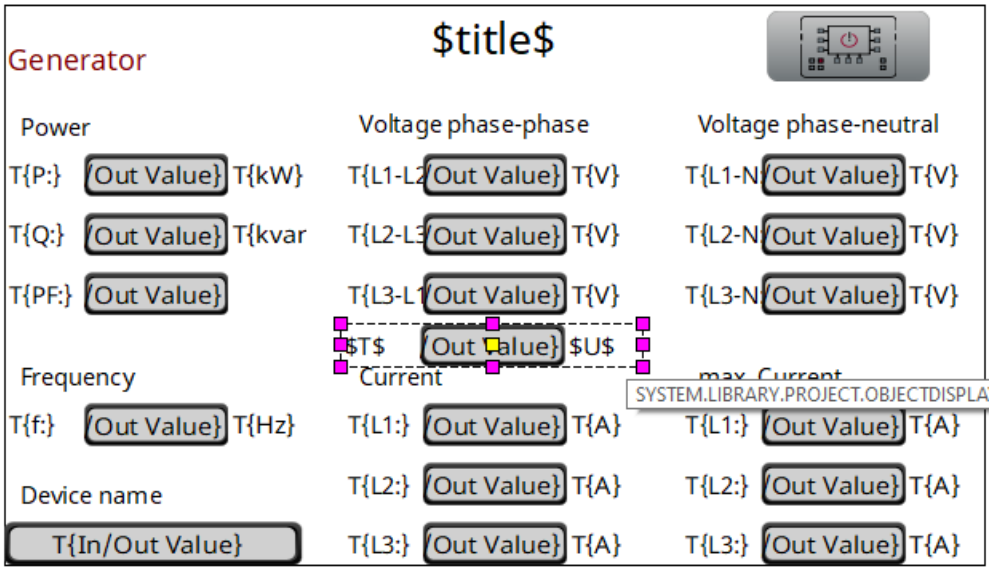


It opens the Object Display for editing, see below.



Step 2:

Add an object display which shall show the new value to the easYgen_home object display.
In this example we choose the object “text_in_out_value_unit”. It can be found under “PROJECT\Object Displays\WWDisplays\ text_in_out_value_unit”. This object display shows a text followed by the actual value and units. This is already used multiple time in the easYgen_home object.
Drag and drop the object to the desired place of the eaYgen_home object, see below.

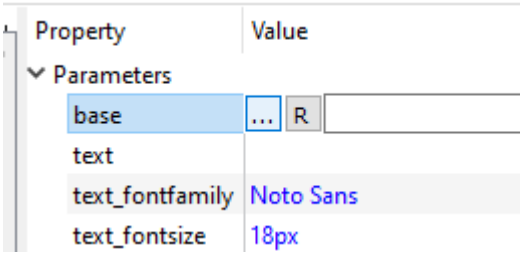


Step 3:

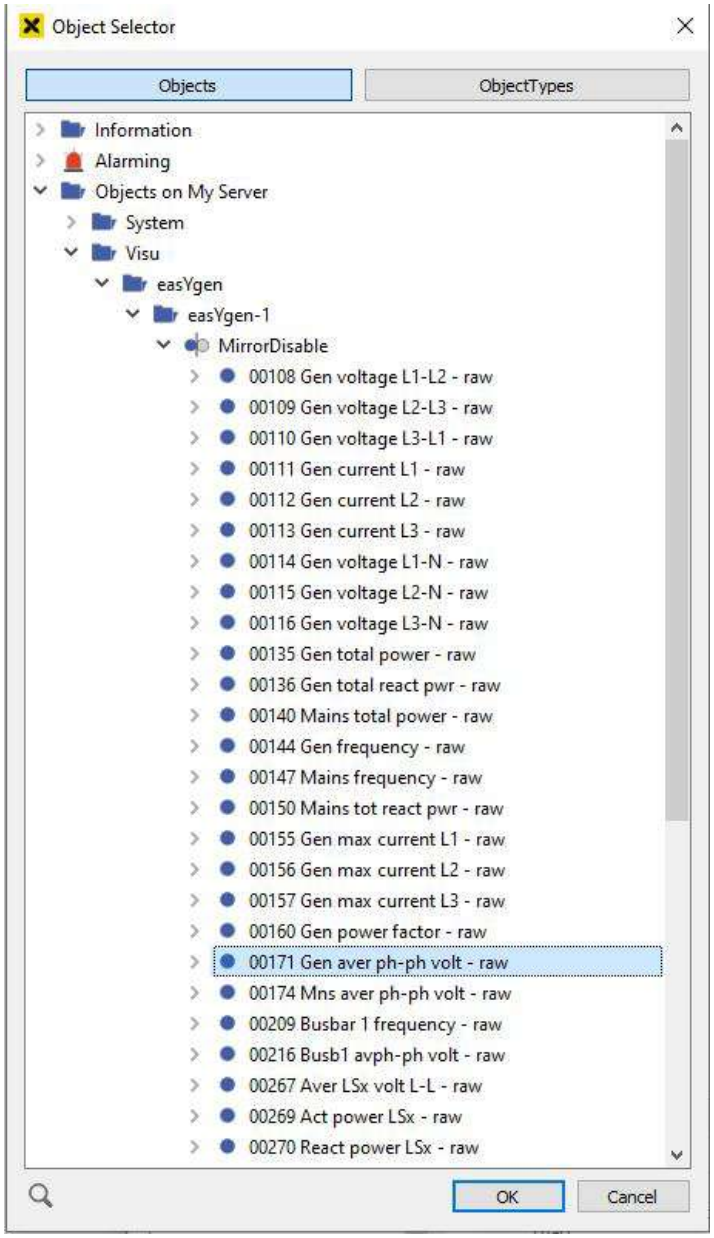
If the new Object is selected the properties are shown in the “Property” view.

Under “base” we must define the reference to the datapoint:

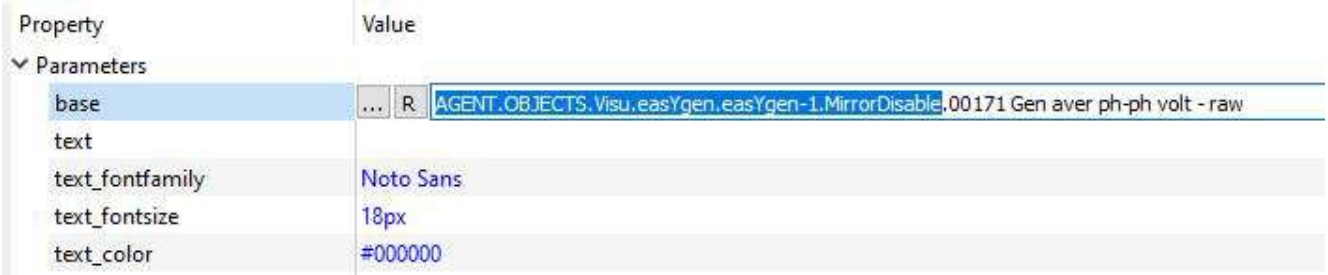
Press the three “…” to open the Object Selector.



Choose the new created datapoint “0071 Gen aver ph-ph volt” of Example: Add new datapoint from Modbus list.



We need a relative address because we have four easYgens. Delete the part “AGENT.OBJECTS.Visu.easYgens.Fast.easYgen-1.MirrorDisable” of the reference.



Press R and select “base”. This defines a relative reference. The “base” parameter is already defined in the single easYgen home pages where the easYgen_home object is added. It is the first part of the full path of the datapoint which depends on easYgen 1- 4.

Under “text” we type “Avg”.
Under “unit” we type ”V”.

For the same format representation like in the easYgen-XT need to divide the value by 10 with one decimal position. Therefore, under “value_postdecimalpositions” and “value_forcedecimalfractionpostion” we type “1”.

The attributes look then like:

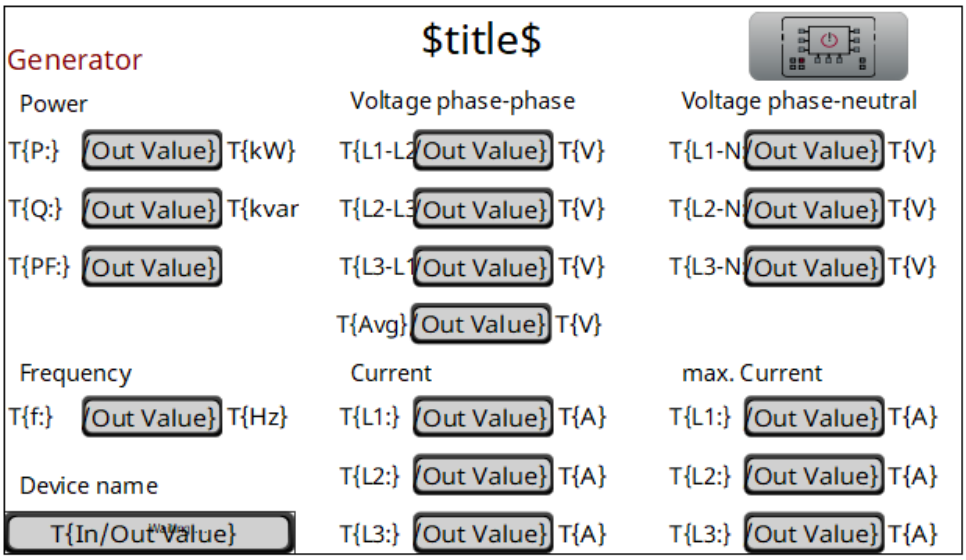
Property	Value
Parameters	
base	[base] + .00171 Gen aver ph-ph volt - raw
text	T{Avg}
text_fontfamily	Noto Sans
text_fontsize	18px
text_color	#000000
value_fontfamily	Noto Sans
value_fontsize	18px
value_color	#000000
value_postdecimalpositions	1
value_forcedecimalfraction...	1
unit	T{V}
unit_fontfamily	Noto Sans
unit_fontsize	18px
unit_color	#000000
visible	[visible]
SVG	

Note: The “[”, “]” and “+” at the base parameter will be added automatically.
Note: The “T{ }” at the text parameter (text, unit) will be added automatically.

Step 4:

The last step is then just to move the objects around for better appearance, see below.
Save everything. After refreshing the easYview, by switching between pages, the new datapoint is shown on each easYgen home page.

Note: If there is an easYgen home page open in the atvise Builder, it will not refresh it automatically. Opened pages in the atvise builder needs to be closed and re-open to see effecting changes.



7 Example: Add a new device to the project

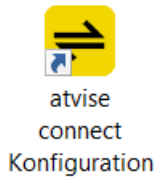
7.1 Create a new connection

To create a new connection to an external device the atvise connect must be used.

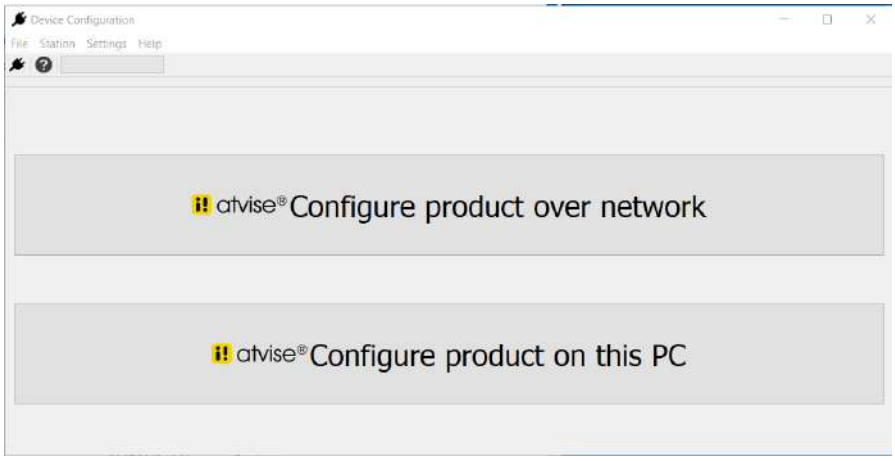
Note: Make sure the easYview is connected to the same network as the PC where atvise connect is installed.

Step 1:

Open atvise connect,

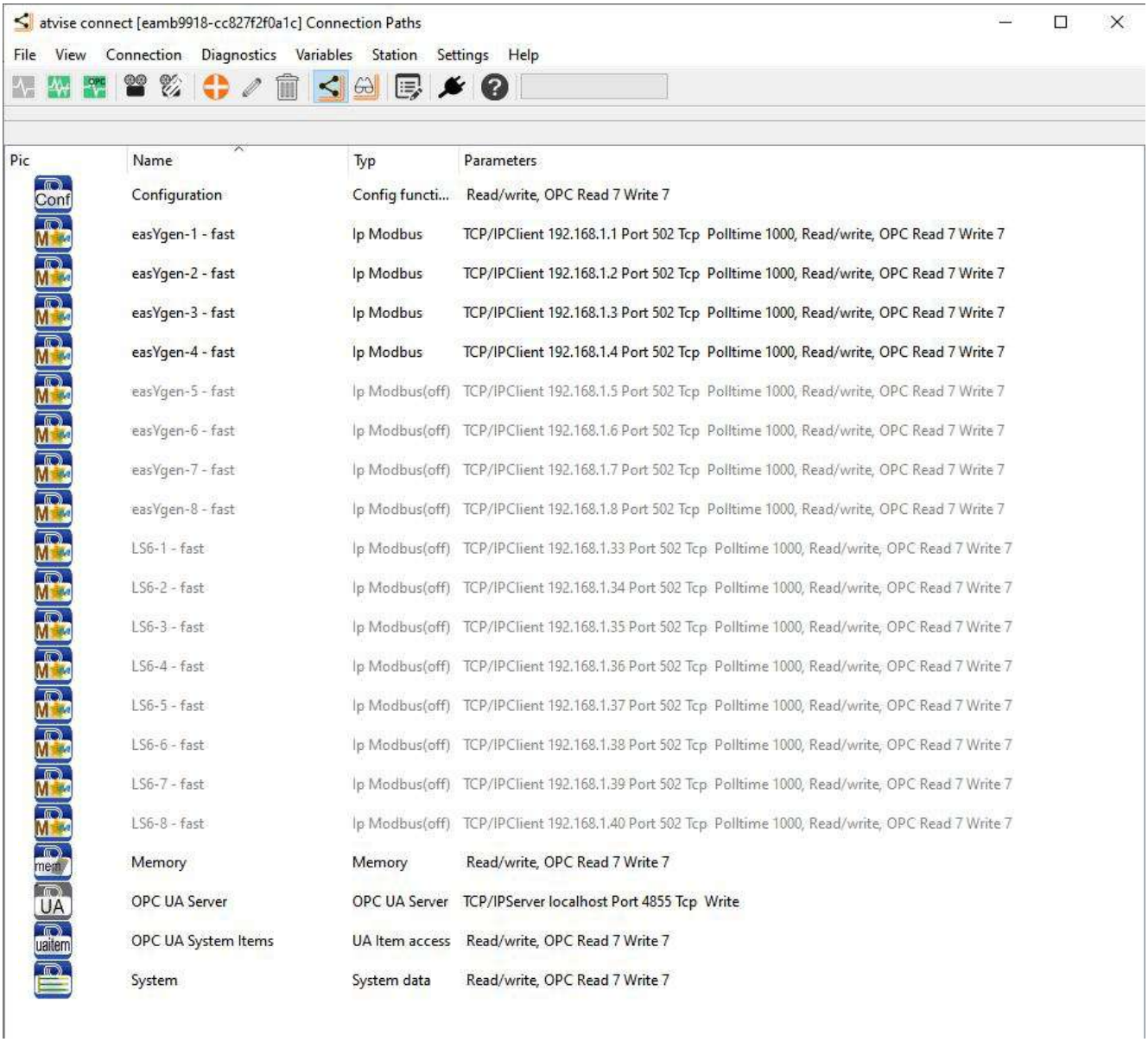


Select ‘Configure product over network’.



To connect to the easYview, double click on the row which represents the easYview, here it is “Panel1”.

After connected all existing connections are shown.

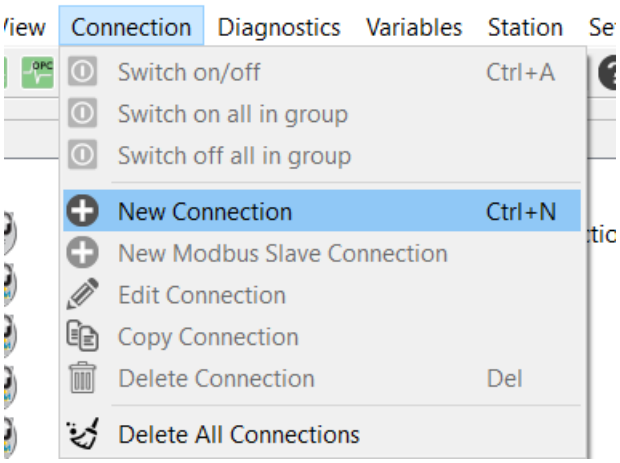


If the connection view is not shown, click on the connection icon.

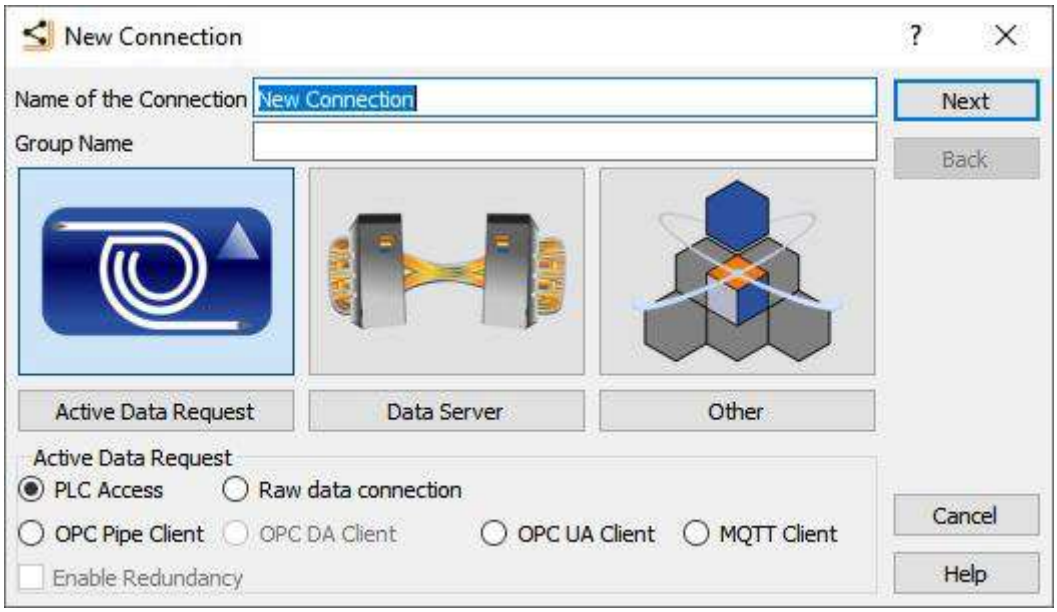
The connection view shows all available easYgen and LS6 connections. Enabled connections are shown in black and disabled connections are shown in gray.

To add a new connection for any external device click the plus icon or use the Connection tab and select “New connection”:

…or…



…and follow the instruction of the New Connection Wizard, refer to the Atvise help for more information.

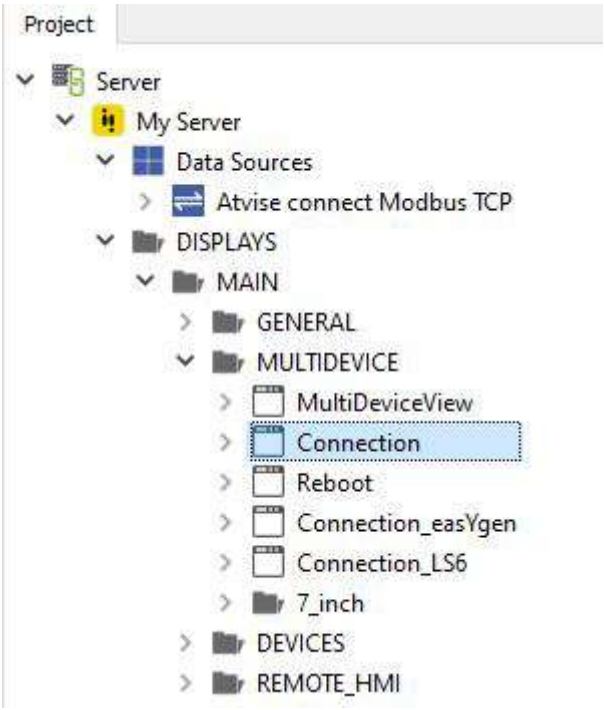


7.2 Avoid connection override

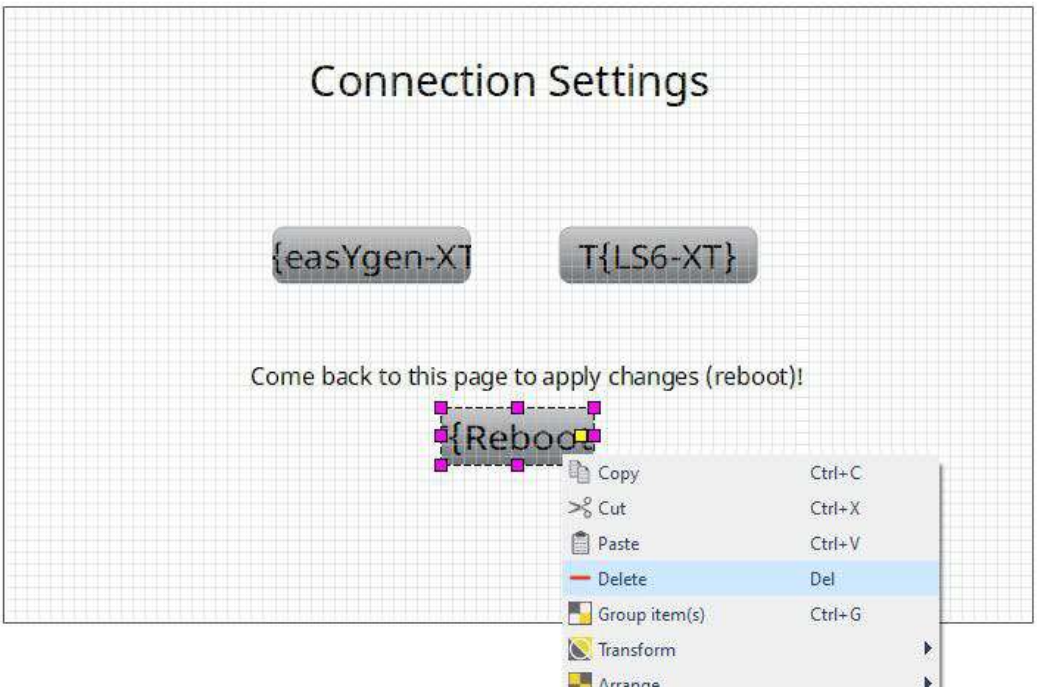
If there was a new connection added to the project, the DeviceConfig.ini file has changed (it includes all connections). That means it doesn´t match with the TempDeviceConifg.ini anymore. If now a reboot is triggered from the “Connection Page”, the DeviceConifg.ini gets replaced by the TempDeviceConfig.ini (like described in File System (SFTP)). This will lead to lose the new created LS6 connection.
To avoid an override through an accidently triggered reboot, it is recommended to delete the reboot button from the Connection Page.

Note: All future changes to the connections must be done by atvise connect (also means IP address changes, Slave ID, etc).

Open the Connection Page by double click on DISPLAY\MAIN\MULTIDEVICES\Connection.



Select the Reboot button, right click and select “Delete Item”. The description text on the left side of the button can be deleted the same way.



Now it is still possible to show the Connection Page with the actual connection settings (at least for the easYgens) but they cannot be changed anymore.

Of course, it is possible to adjust the Connection Page for the new created connection. But this is not described in this document. Contact your local support for more information.

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