

## **PNOZmulti project visualisation with PASvisu**

**PILZ**  
THE SPIRIT OF SAFETY

### **Product**

Type: GUI, OPC/UA  
Name: PNOZmulti, PASvisu  
Manufacturer: Pilz GmbH & Co. KG, Safe Automation

### **Document**

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## Document Revision History

Release	Date	Changes	Chapter
01	2017-02-03	Creation	all
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## Validity of Application Note

This present Application Note is valid until a new version of the document is published. This and other Application Notes can be downloaded in the latest version and for free from [www.pilz.com](http://www.pilz.com). For a simple search, use our [content document \(1002400\)](#) or the [direct search function](#) in the download area.

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February 2017

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## Abbreviations

PNOZ	Pilz E-STOP positive-guided (DE: <b>Pilz NOT-AUS-Zwangsgeführt</b> )
PAS	<b>Pilz Automation Suite</b> (Software-Plattform)
OPC UA	<b>Open Platform Communications Unified Architecture</b>

# 1. Useful documentation

Reading the documentation listed below is necessary for understanding this application note. The availability of the indicated tools and safe handling are also presupposed with the user.

## 1.1. Documentation from Pilz GmbH & Co. KG

No.	Description	Item No.
1	Pilz international homepage, download section	<a href="http://www.pilz.com">www.pilz.com</a>
2	Operating Manual PNOZ m B1	1003790-EN-xx
3	Operating Manual PNOZ m EF 8DI4DO	1002661-EN-xx
4		

## 1.2. Documentation from other sources of information

No.	Description	Item No.
1		
2		
3		
4		

## 2. Hardware configuration

### 2.1. Pilz products

No.	Descriptions	Order number	Version	Number
1	PNOZmulti m B1	772101	1.1	1
2	PNOZ m EF 8DI4DO	772142	1.0	2
3	PNOZmulti Configurator	-	10.3.0	1
4	PASvisu	-	1.3.0	1

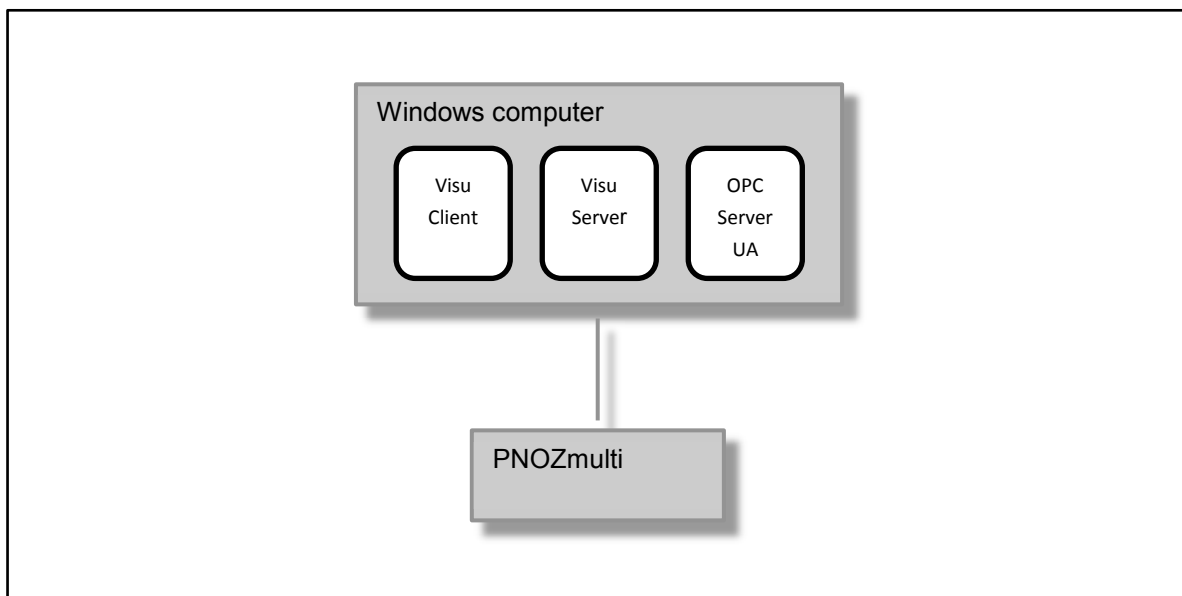
### 3. Application task

**Note**

Some software may not need installing because it is already installed. This also applies to some steps, which have already been done. In these cases, you simply can skip the related instructions and steps.

The example in this Application Note can be viewed as the simplest case of possible topologies:

- ▶ Device 1:  
A Windows PC is the visualisation machine and has the following functions:
  - PNOZmulti engineering environment,
  - PASvisu engineering environment,
  - Visu display device,
  - Visu Server,
  - OPC UA Server
- ▶ Device 2:  
A PNOZmulti is the PLC, which can be controlled and monitored using the visualisation PC.
- ▶ Connection:  
An Ethernet cable (RJ-45) is used to connect the two devices.



### 3.1. Create a PNOZmulti project

Create a hardware configuration:

- ▶ Open the PNOZmulti Configurator
- ▶ Drag the following modules from the left overview frame and drop them to the editor *Configured Hardware*
  - *Base Unit PNOZ m B1* (Base Units (PNOZmulti 2))
  - *Input/Output Module PNOZ m EF 8DI4DO* (in *Semiconductor Output Modules*)
  - *Input/Output Module PNOZ m EF 8DI4DO* (in *Semiconductor Output Modules*), optional
  - *I/Os transmitted via the integrated interface* (in *Virtual I/O Modules/Interfaces*)

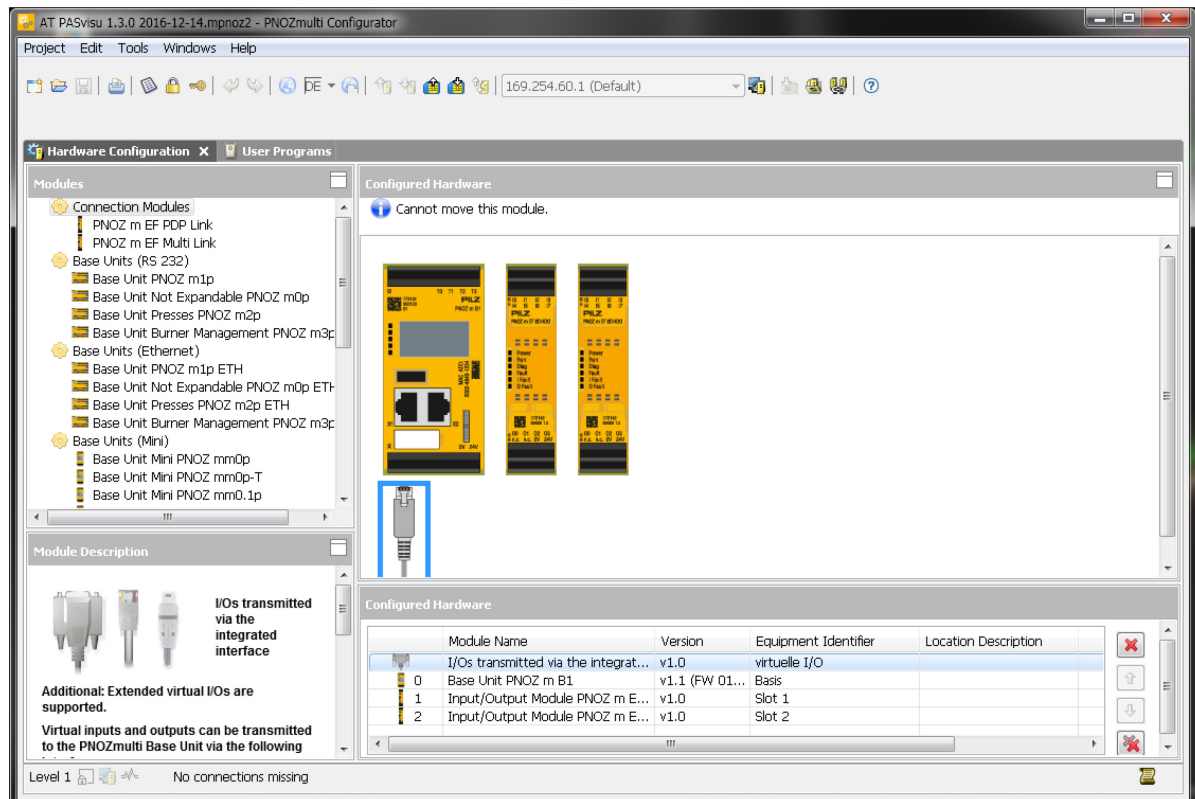


Fig. 1: PNOZmulti Configurator HW

Program:

- ▶ I/O's of the I/O module
- ▶ Virtual I/Os (optional, recommended, necessary when you want to write variables from the PASvisu project)

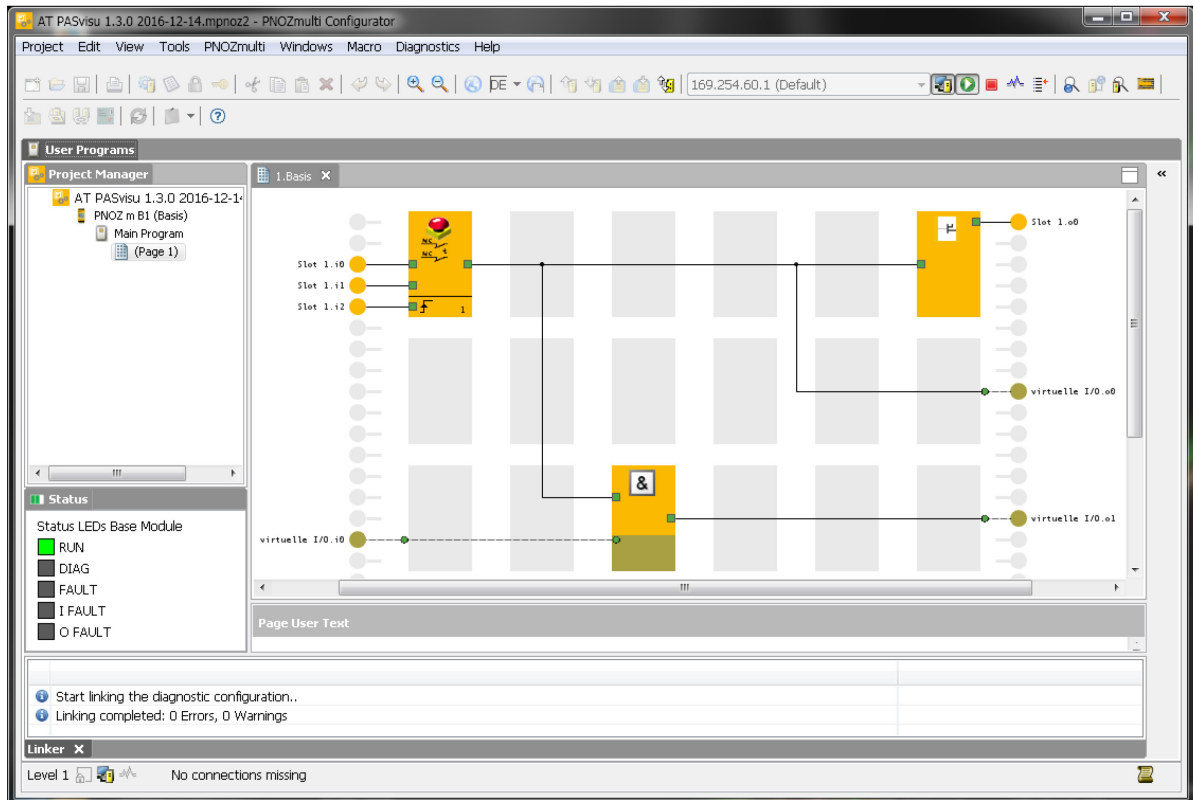


Fig. 2: PNOZmulti Configurator Program

### 3.2. Wiring of PNOZmulti Hardware

- ▶ To follow the example of this Application Note it is recommended to wire inputs I0, I1, and I2 of the I/O module PNOZ m EF 8DI4DO to switches.



### 3.3. Installation of OPC Server

- ▶ Extract *PVIS\_Installer\_2\_1\_0\_3000831B07.zip*
- ▶ Start *PVIS\_PC\_Installer\_v\_2\_1\_0\_Build15.exe* and install *OPC Server UA*

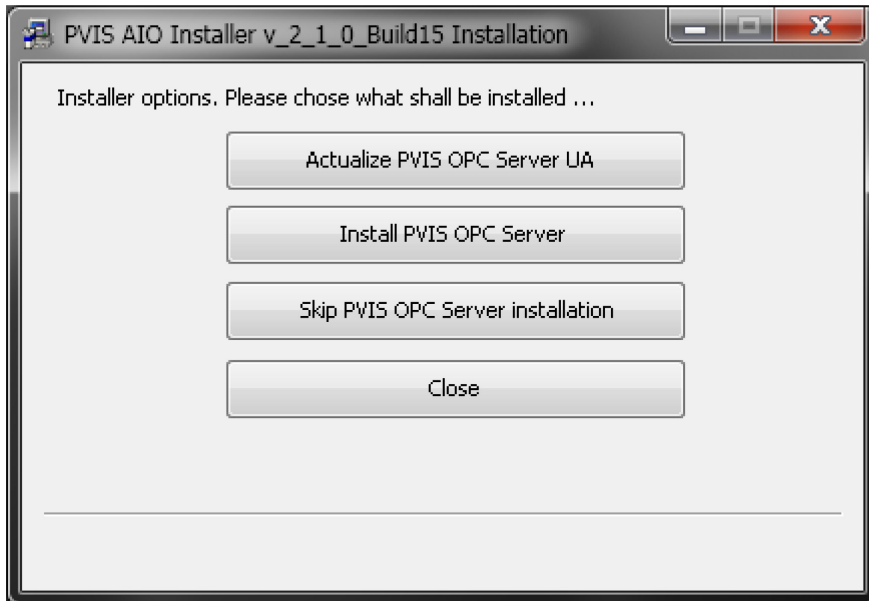


Fig. 3: Install PVIS Installer OPC

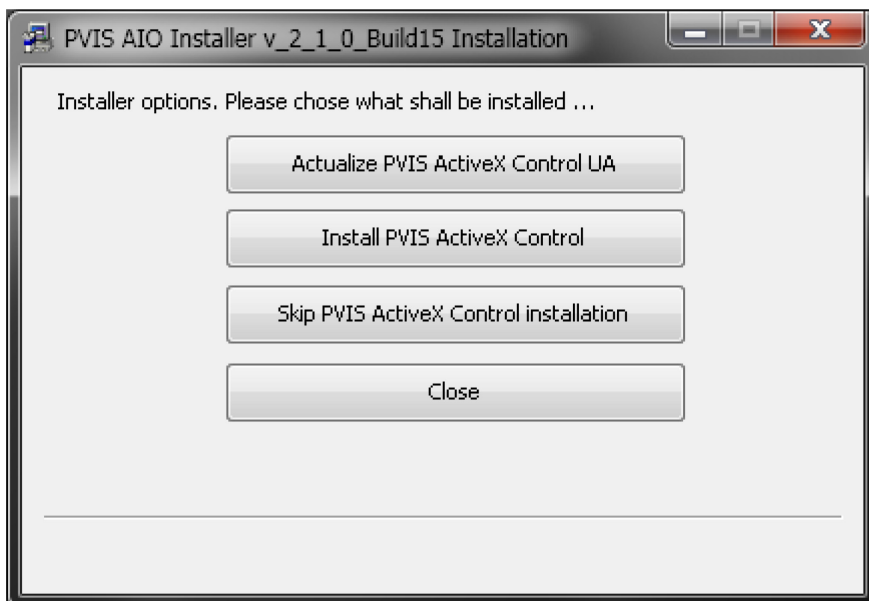


Fig. 4: Install PVIS Installer ActiveX

### 3.4. Installation of PVIS OPC Configurator

- ▶ Extract *PVIS\_OPC\_Configurator\_2\_0\_0\_3000955A01.zip*, start *OPC\_Config\_2.0.0.exe* and follow the instructions.

### 3.5. Configure the OPC Server project

Configuring OPC project properties:

- ▶ After starting the PVIS OPC Configurator, please create a new project.
- ▶ *OPC Project – Address*: Insert the IP of the PC, which hosts the OPC UA Server. If the PC is the same use “localhost”. Now press the blue arrow on the right next to the address text field. (Note: If the PASvisu Server is running on a different PC/PMI, it is important to use the IP-address of the OPC Server instead of the PC-Name)
- ▶ *Namespace - Enable navigation ...*: Check this box if you require access to process data of PNOZmulti program (optional, recommended, required when you want to write variables from the PASvisu project).

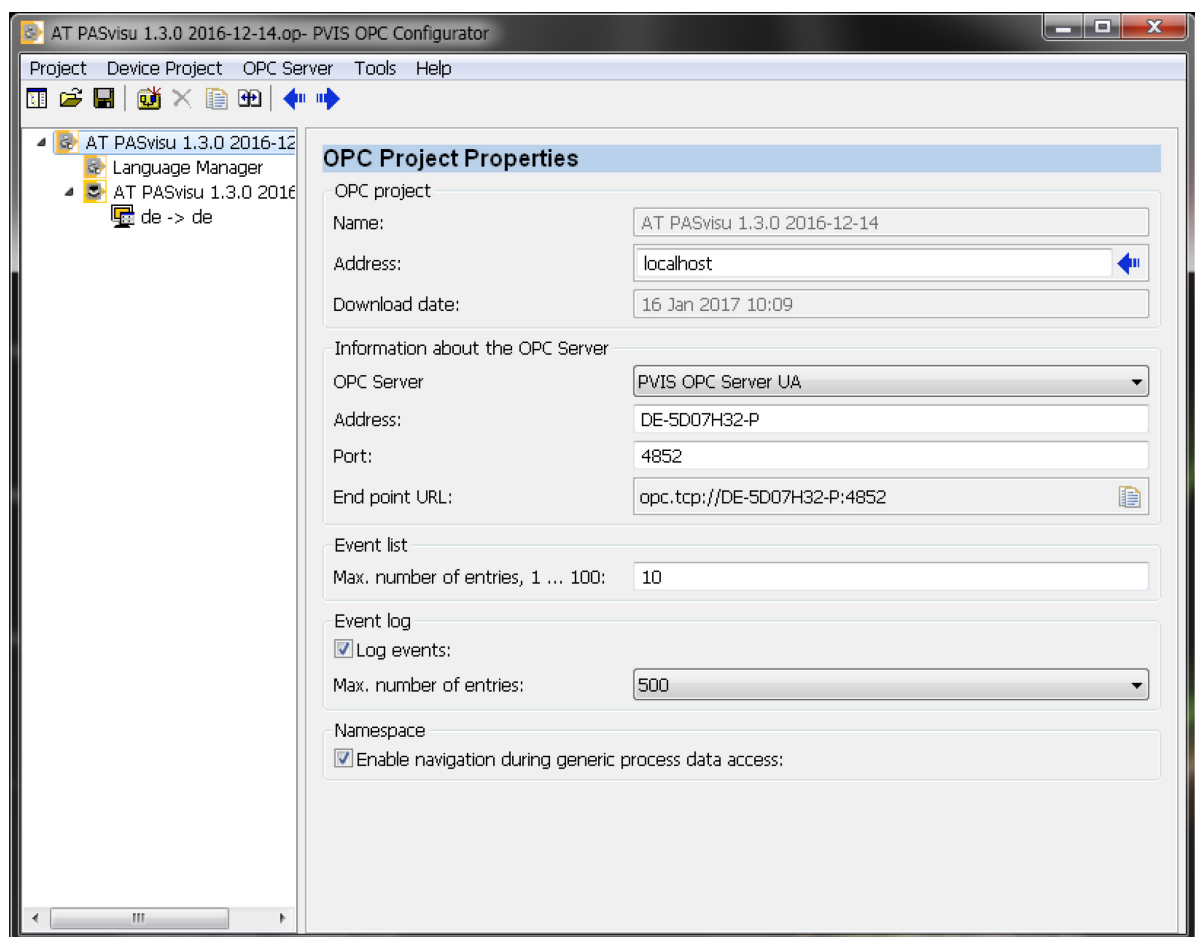


Fig. 5: Configure PVIS OPC Configurator - OPC-Project

Configure the device project:

- ▶ Press Device Project – Add in main menu
- ▶ Lower right hand side: Set the file type filter to “.mpnoz; .mpnoz2”
- ▶ Choose a PNOZmulti project and open it

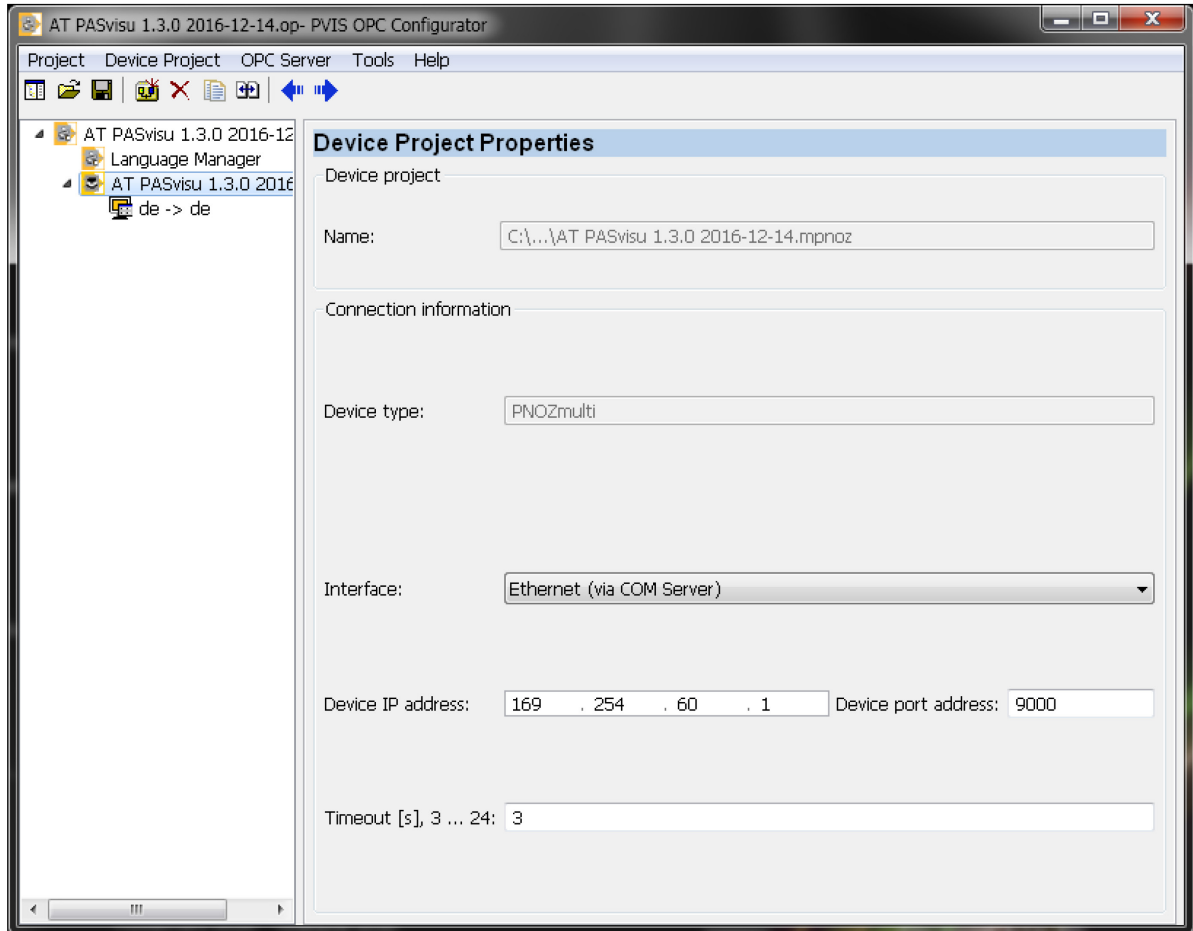


Fig. 6: PVIS OPC Configurator – integrate the device project

Proceed an OPC project configuration download to the PC, which hosts the OPC UA Server:

- ▶ Press *Download OPC project -> OPC Server ...* in the main menu *OPC Server*

### 3.6. Create a PASvisu project

- ▶ Press *New* in main menu *Project*
  - Add all necessary values to the screen *Create new project*. Values in *Project name*, *Project directory* and *Comment* are up to you. *Display unit* and *Page size* have to match the displaying device.

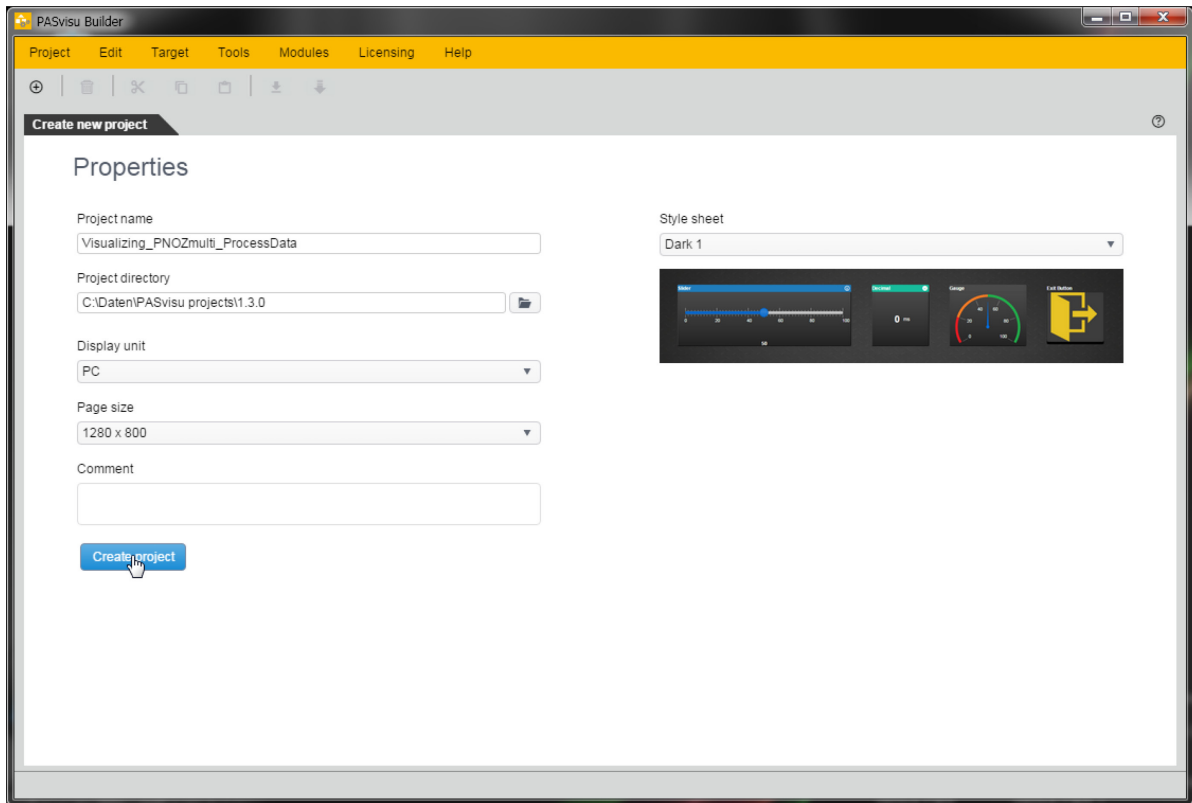


Fig. 7: PASvisu-Create new project

- ▶ Press *Button Data Source Editor* in the button bar (you will be automatically navigated to that page when creating a new project)

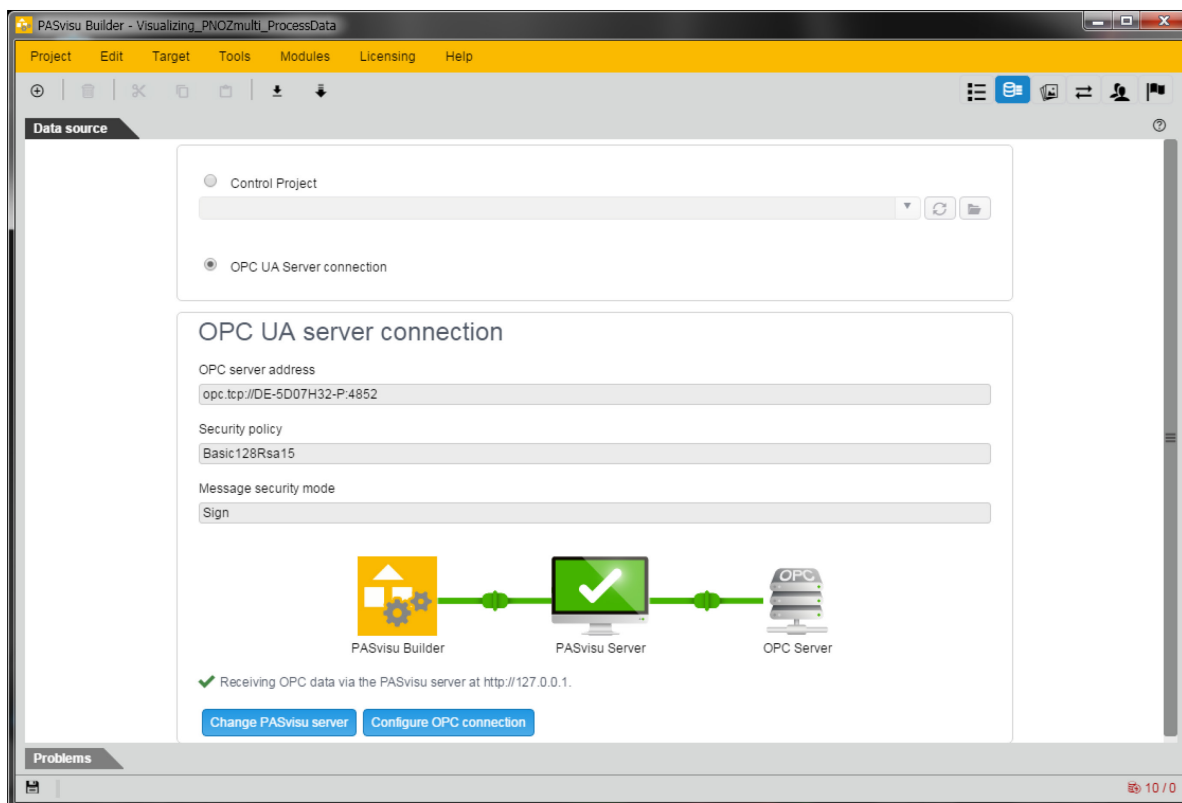


Fig. 8: Configure Data Source

- ▶ Here you have to configure your OPC UA server. Click on the button *Configure OPC connection* and type in the OPC server you want to connect to. Then configure the security policy and security mode.

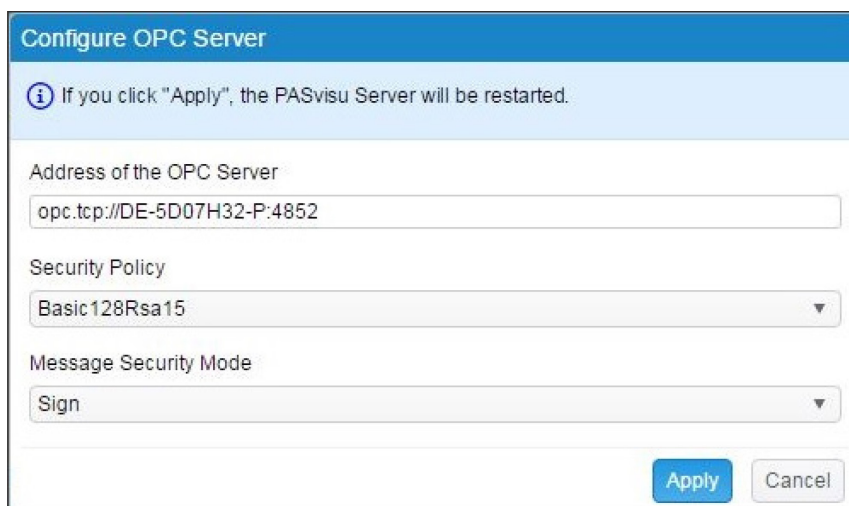


Fig. 9: Configure OPC UA connection

(In your PVIS OPC Configurator, at *End point URL* you can find the address of your OPC server)

- ▶ It may take some time until the connection is established.
- ▶ You will get the message e.g. “Bad certificates” because they are not yet trusted.

### 3.7. Copy Certificates

- ▶ Now it is time to copy the certificates to achieve the correct connection between OPC server and PASvisu server.  
You have two options to exchange the certificates
- ▶ Copy from rejected to trusted:
  - In the folder *C:\ProgramData\Pilz\PASvisu Builder\pki\rejected* there should be the certificate of the PVIS OPC server. Copy this file to the trusted folder of the PASvisu Builder (*C:\ProgramData\Pilz\PASvisu Builder\pki\trusted*)
  - Now you will find the certificate of PASvisu in the PVIS OPC server folder *C:\ProgramData\Pilz\PVISOPCServerUA\pki\rejected*  
Copy the certificate into the trusted folder of the PVIS OPC (*C:\ProgramData\Pilz\PVISOPCServerUA\pki\trusted*) server and the connection should be good.  
It is important to keep the correct order, first on PASvisu Builder side and second on OPC server side.
- ▶ Second option: Copy from own or trusted:  
*cert\_Pilz\_PVIS\_OPC\_Server\_UA.der*  
has to be copied from  
*C:\ProgramData\Pilz\PVISOPCServerUA\pki\own\*  
to  
*C:\ProgramData\Pilz\PASvisu Builder\PKI\trusted\.*

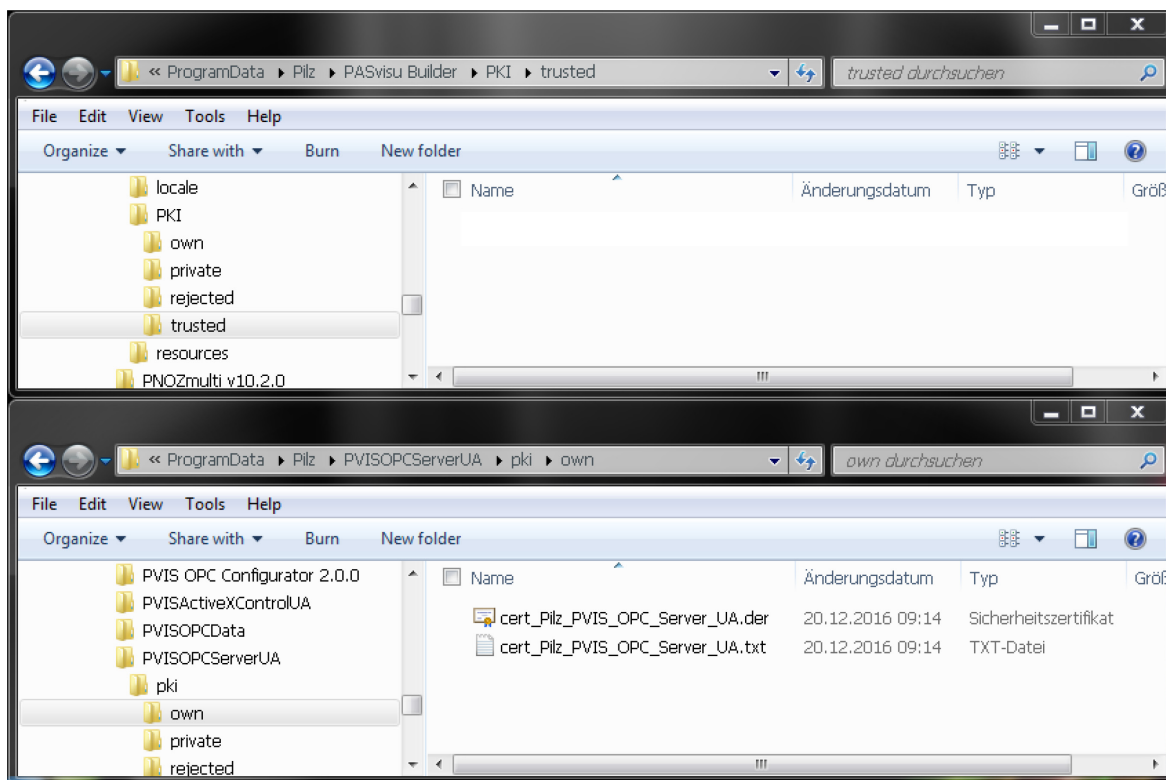


Fig. 10: Explorer – Copy certificates

This has to be done also the other way round. Copy the certificate of the PASvisu Builder  
*cert\_Pilz\_PASvisu\_OPC\_UA.der*  
from  
*C:\ProgramData\Pilz\PASvisu Builder\pki\own*  
to  
*C:\ProgramData\Pilz\PVISOPCServerUA\pki\trusted*

After exchanging the certificates, you should be able to connect to the PVIS OPC server.

- ▶ Press Button *Variable Editor* in button bar
  - In *Data Source tree* navigate to the node with the OPC Item, which shall be visualised
    - in *Generic* you can among others, find these groups of items:
      - I=Inputs, O=Outputs, Ivirtual=virtual Inputs, Ovirtual= virtual Outputs
    - Note: Input of first module right from Base Module does start with 1. Further modules have 1+n.
    - Note: Numbers which have a prefix “-“ (e. g. -1.0) are intended for modules left from Base Module.

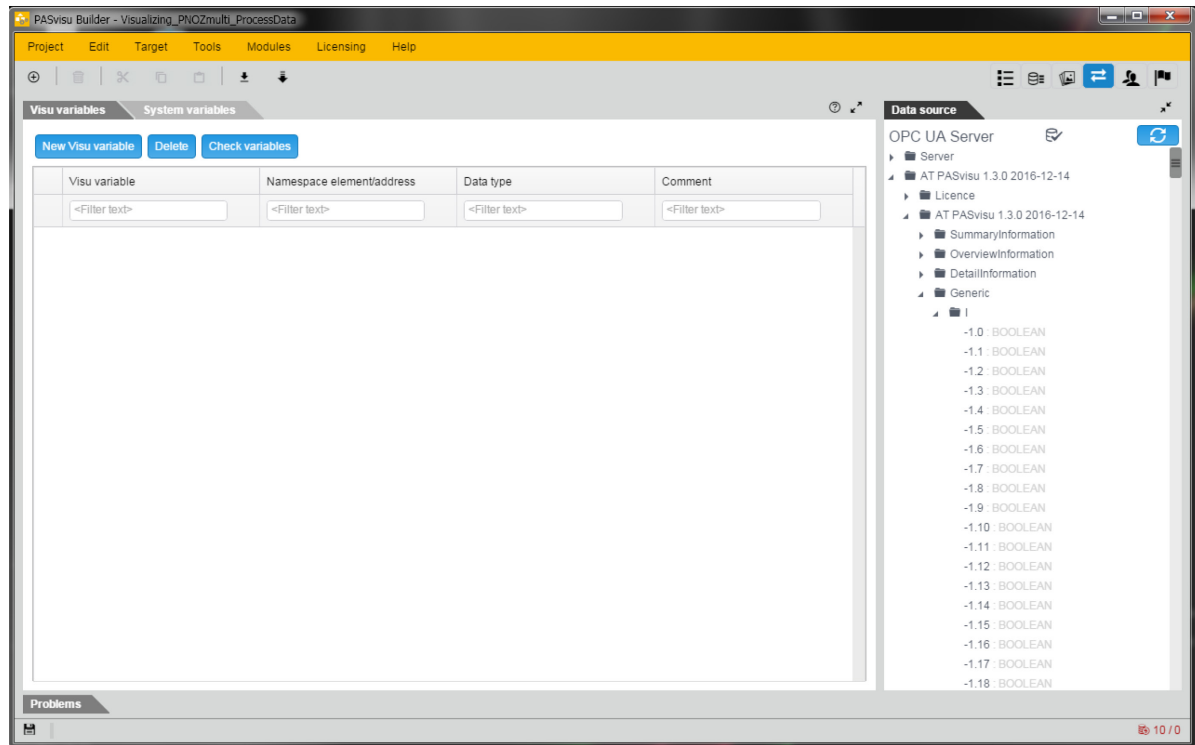


Fig. 11: PASvisu data source connect with Visu variables 1

- in *DetailInformation* you will find the diagnostic items  
There you will find the timestamp, priority, description, ... for the events.  
You also find the actions and remedies.

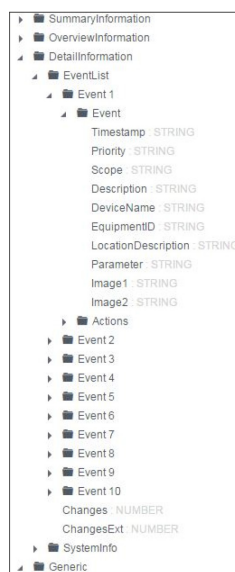


Fig. 12: Part of variable tree from the OPC UA server

- Right click this item and chose *New variable*

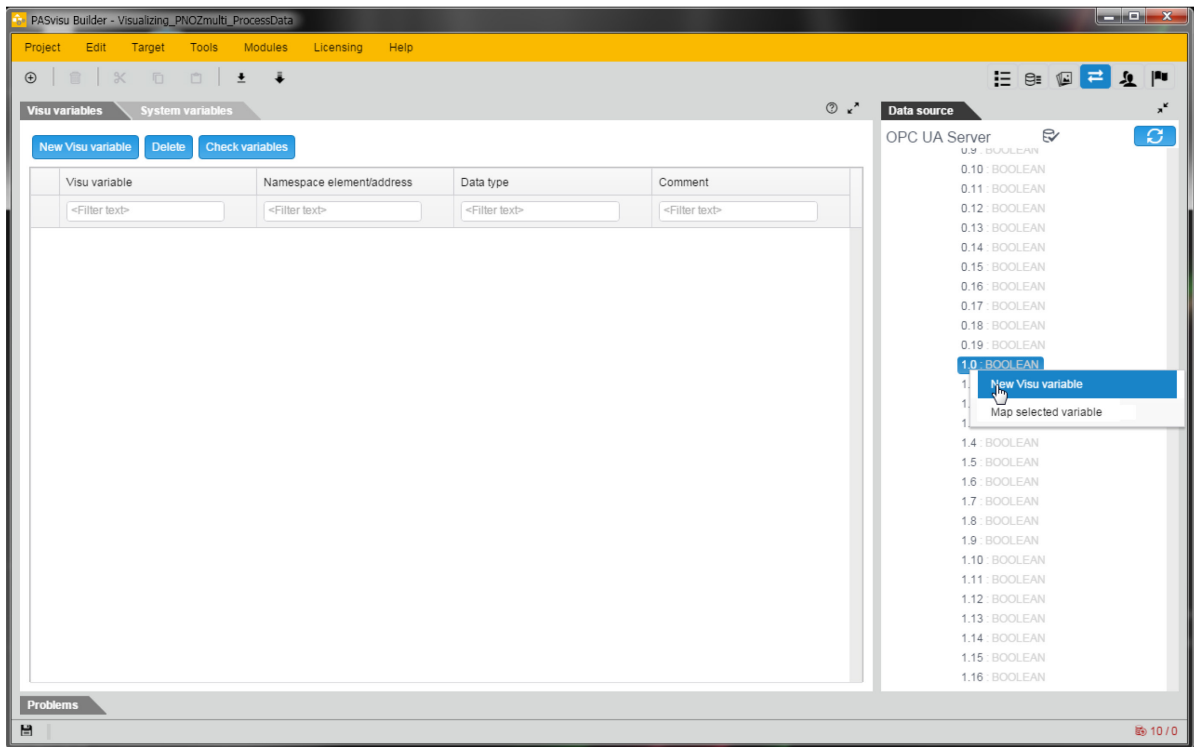


Fig. 13: PASvisu data source connect with Visu variables 2

- With clicking into the Visu variables column the name of the Visu variable can be changed. That enhances the possibility to better find it again (optional, recommended)

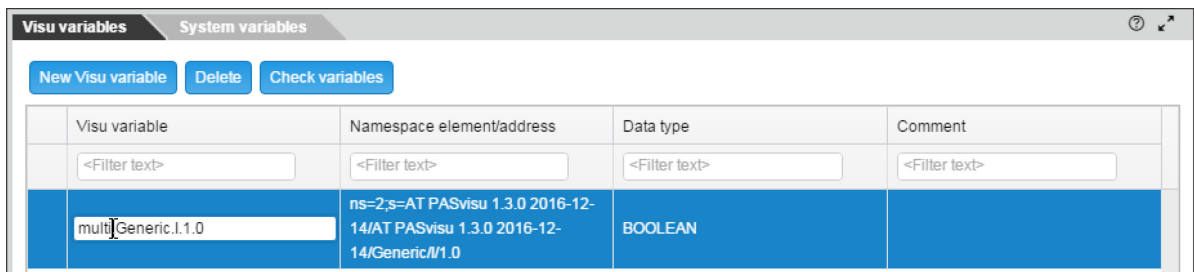


Fig. 14: PASvisu data source connect with Visu variables 3



- Create Visu variables for all OPC Items, which shall be visualised or controlled by Visu elements (here for the example: I1.0, I1.1, I1.2, O1.0; Ivirtual0.0, Ovirtual0.0, Ovirtual0.1)

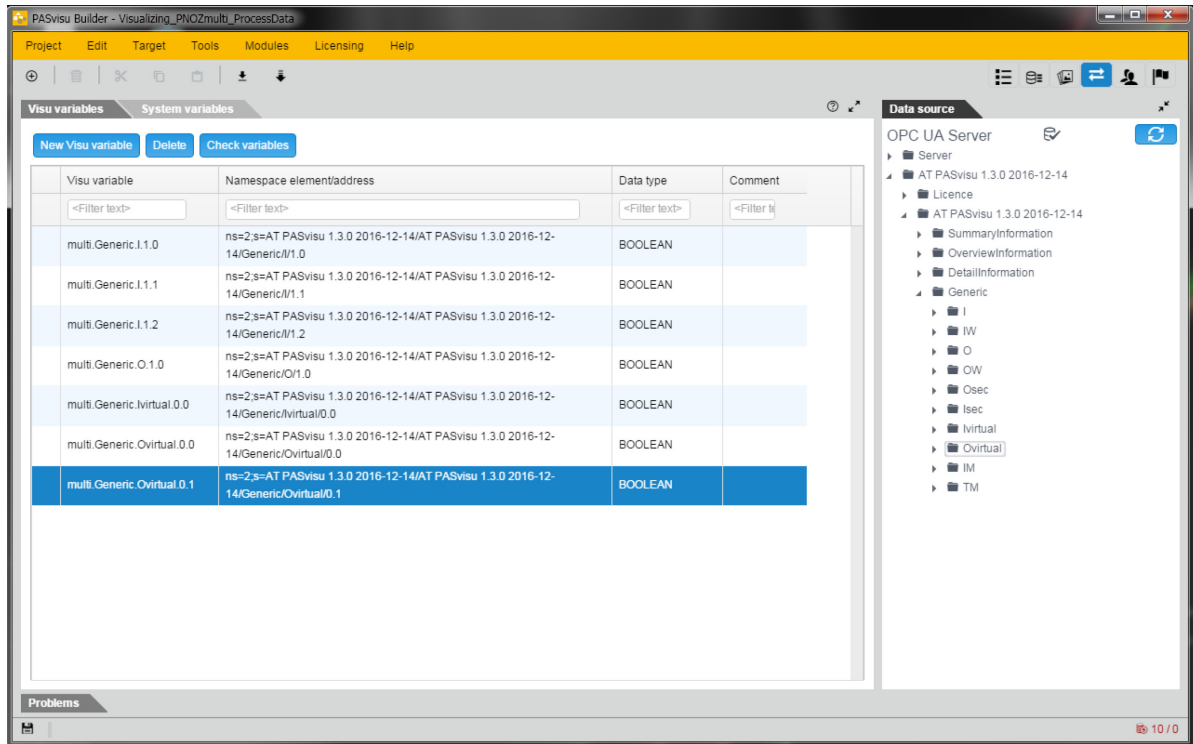


Fig. 15: PASvisu data source connect with Visu variables 4

- ▶ Press Button *Page Editor* in button bar
- ▶ Click the *Tiles* Tab on the right of *Page Editor*
  - Drag & drop a *Boolean status display* tile into the *page area* and change the size by dragging the blue border

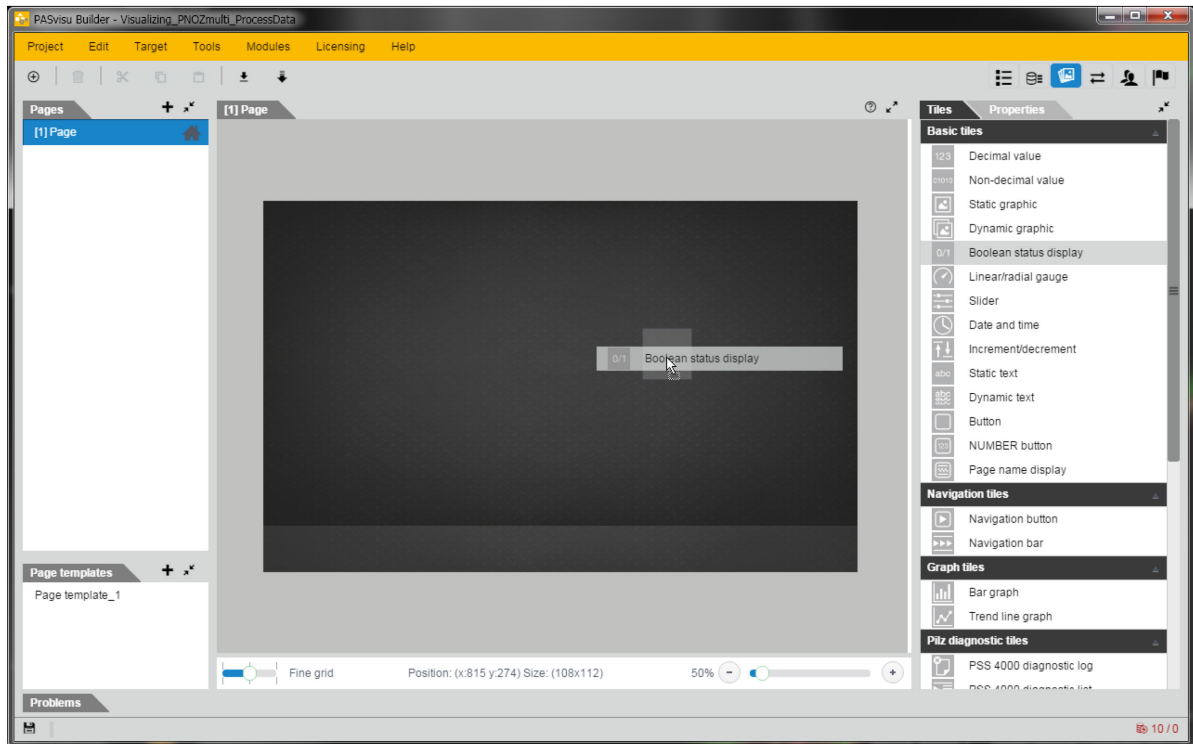



Fig. 16: PASvisu edit page 1

- ▶ Click the Properties Tab right of *Page Editor*
  - Chose or enter a variable in Data item field
  - Using the fields *Graphic for TRUE* and *Graphic for FALSE* alternative graphics can be chosen, just click the  icon and choose a picture, or choose a picture from library or import a picture from a directory

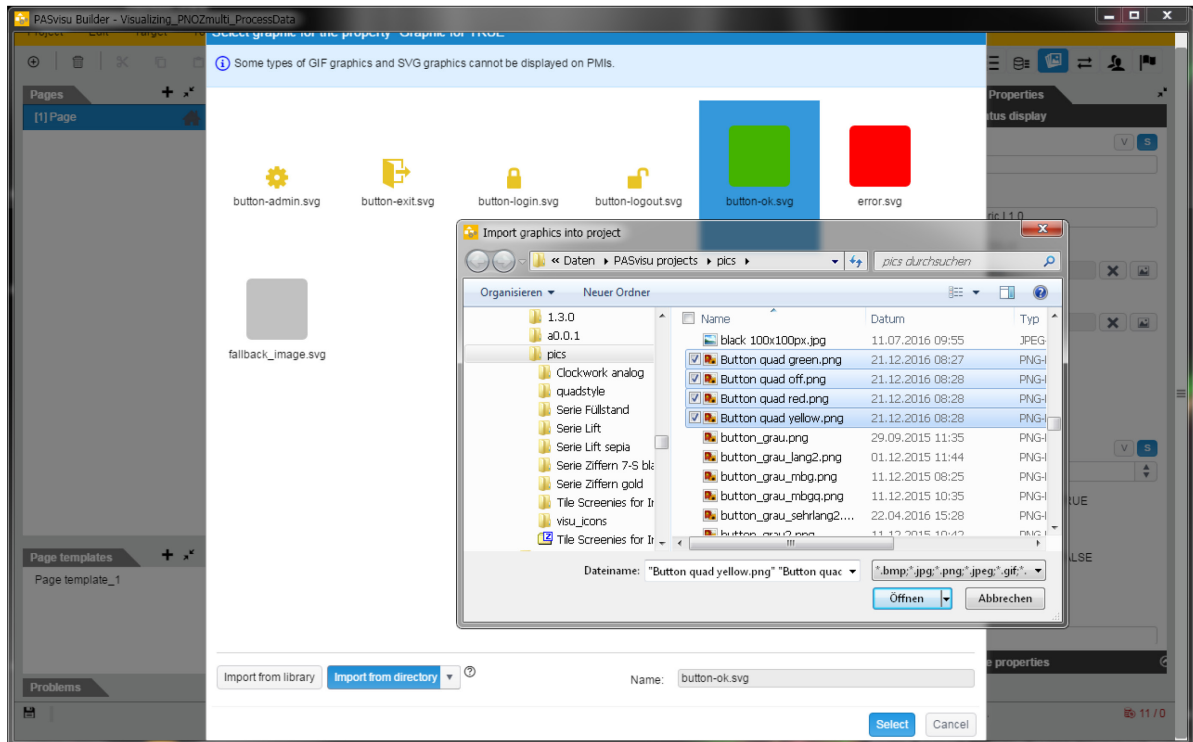


Fig. 17: PASvisu picture import from directory

- Uncheck the *Show border* and *Show tile background* checkboxes; this improves the look of the graphics (optional, recommended)

- ▶ Click the tile in the Page Editor
  - Press *Ctrl+C* and *Ctrl+V* to copy and paste the tile
  - Drag & Drop the *new created* tile to the position where it is to be displayed
- ▶ Click the *Properties* Tab right of *Page Editor* while the tile is still marked
  - Chose a new Variable in field Data item (...I.1.1)
  - Repeat the last steps until all tiles for Inputs, Outputs and virtual In- and Outputs have been placed and configured

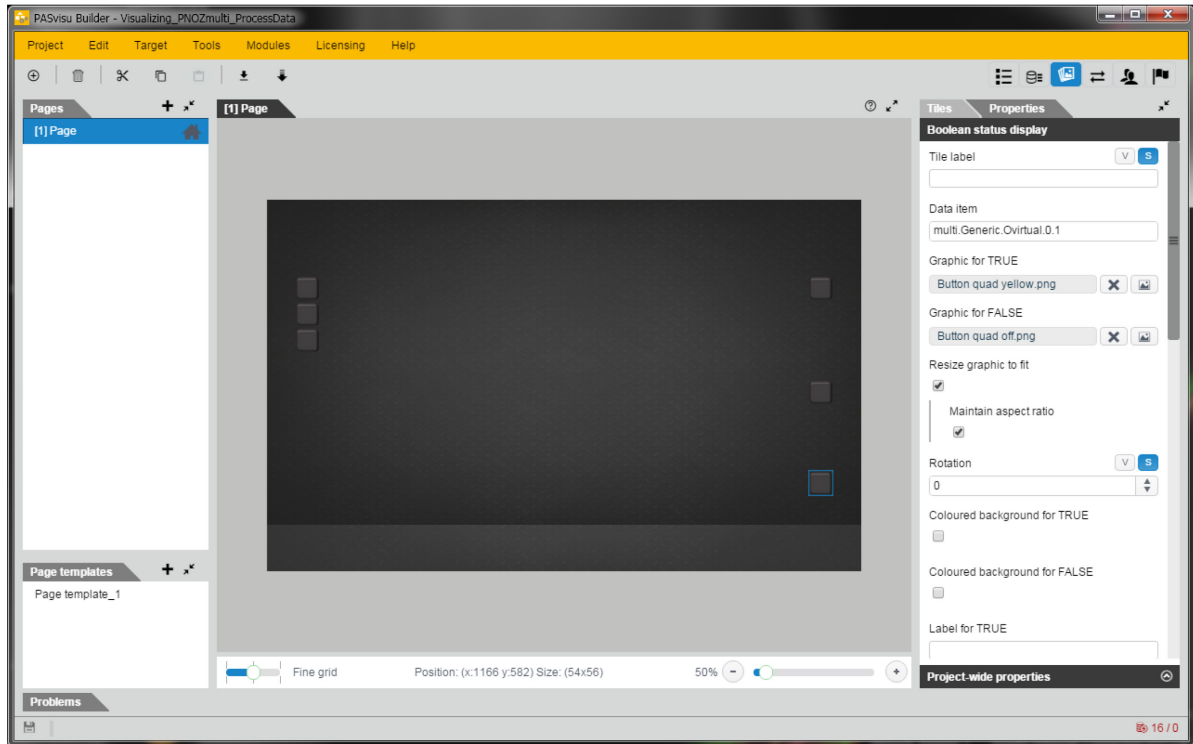



Fig. 18: PASvisu edit page 2

- ▶ Click the *Tiles* Tab right of *Page Editor*
  - Drag & drop a *Pushbutton* tile into the page area and change the size by dragging the blue border
- ▶ Click the *Properties* Tab right of *Page Editor* while the tile is still marked
  - Chose a new Variable in field *Data item* (...Ivirtual.1.1)
  - Using the fields *Graphic for operated* and *Graphic for not operated* alternative graphics can be chosen (optional), just click the  icon and choose a picture or choose a picture from library or import a picture from a directory
  - Uncheck the *Show border* and *Show tile background* checkboxes; this improves the look of the graphics (optional, recommended)

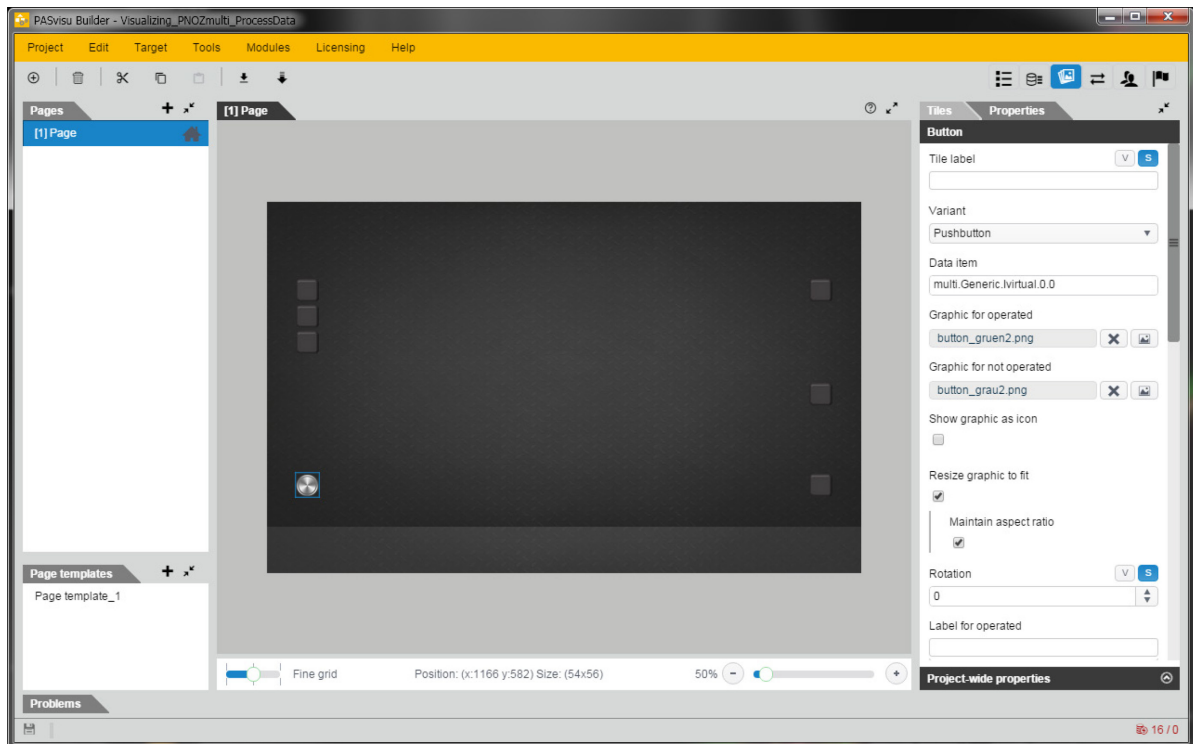


Fig. 19: PASvisu edit page 3

- ▶ Click the *Tiles* Tab right of *Page Editor*
  - Drag & drop a *Static Graphic* tile into the page area and change the size by dragging the blue border
- ▶ Click the *Properties* Tab right of *Page Editor* while the tile is still marked
  - Chose a picture in *Graphic field* (to follow the example of this Application Note, use a screenshot of the program in PNOZmulti Configurator)

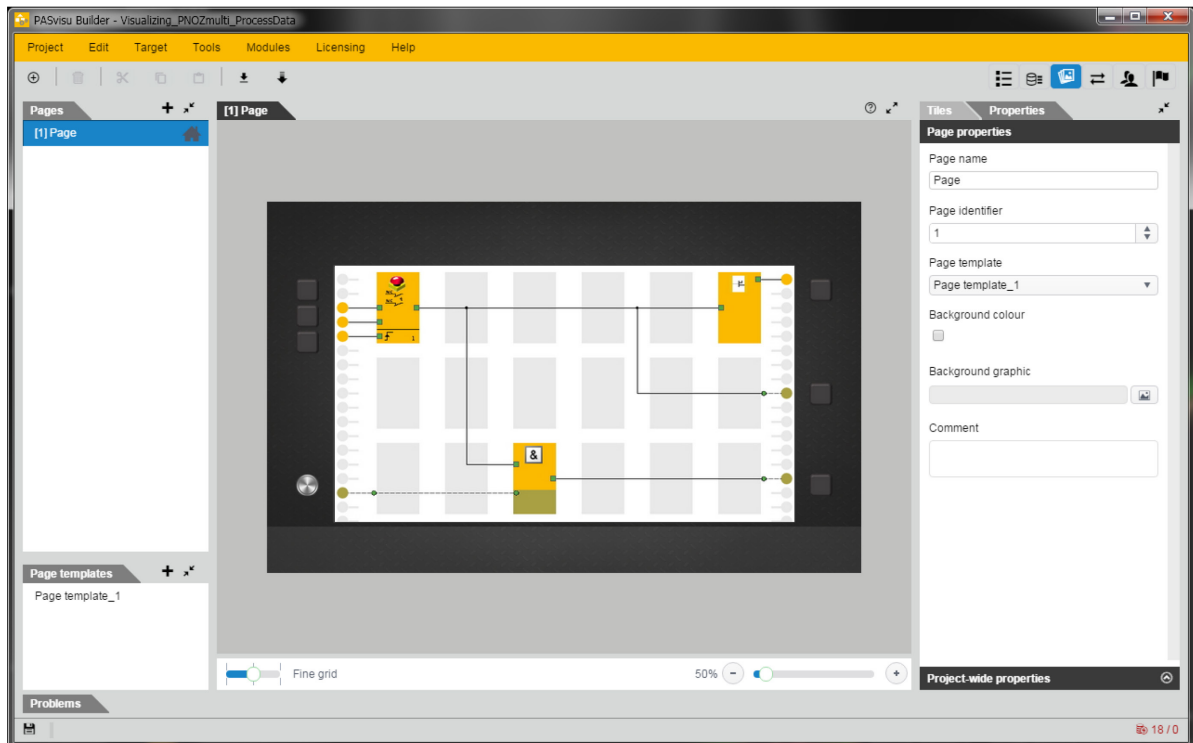


Fig. 20: PASvisu edit page 4

### 3.8. Download the Visu project

- ▶ Press *Target - Download* in main menu. Project download view opens
  - Press the *Download* button in *PASvisu Server information* area

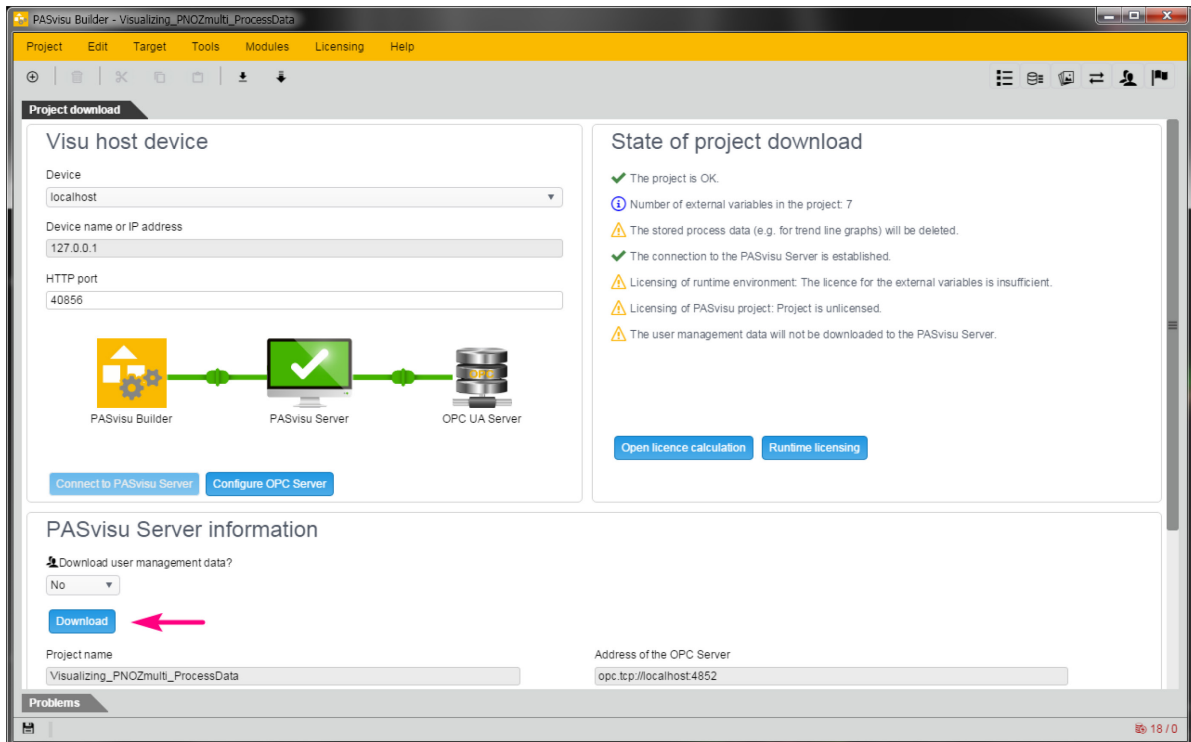


Fig. 21: PASvisu download page 1

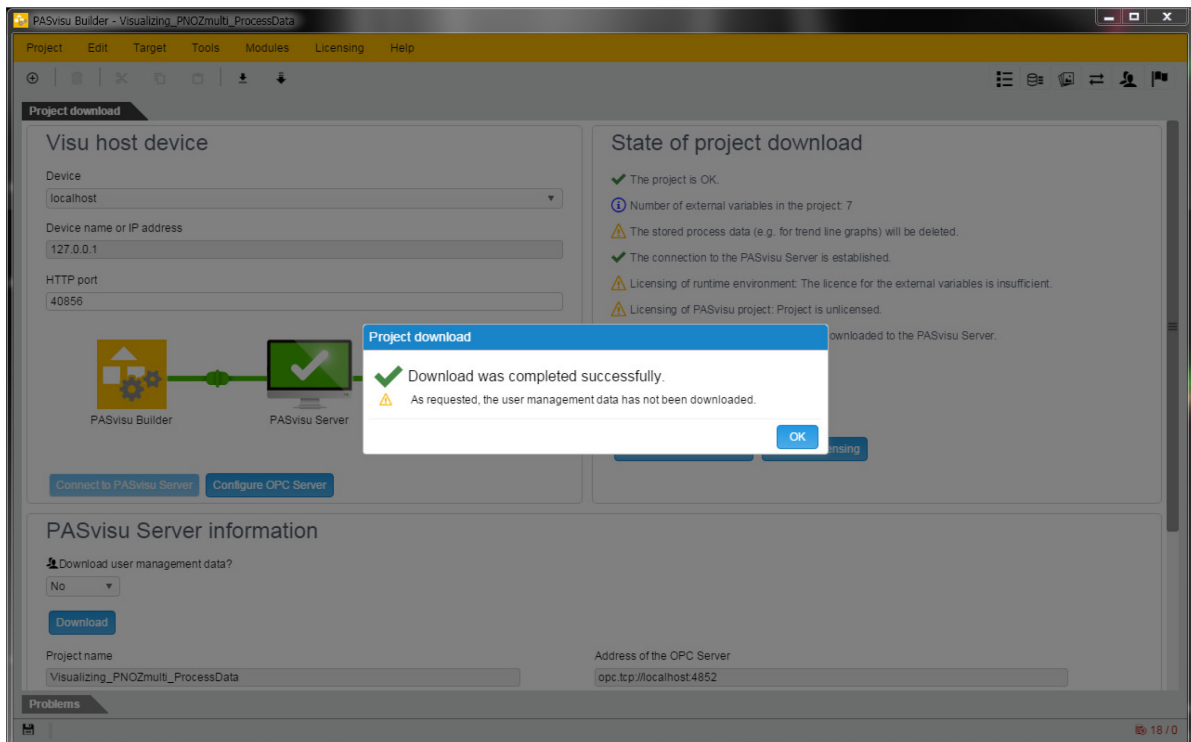


Fig. 22: PASvisu download page 2

- After downloading successfully, the PASvisu client will open and you will see the visualisation

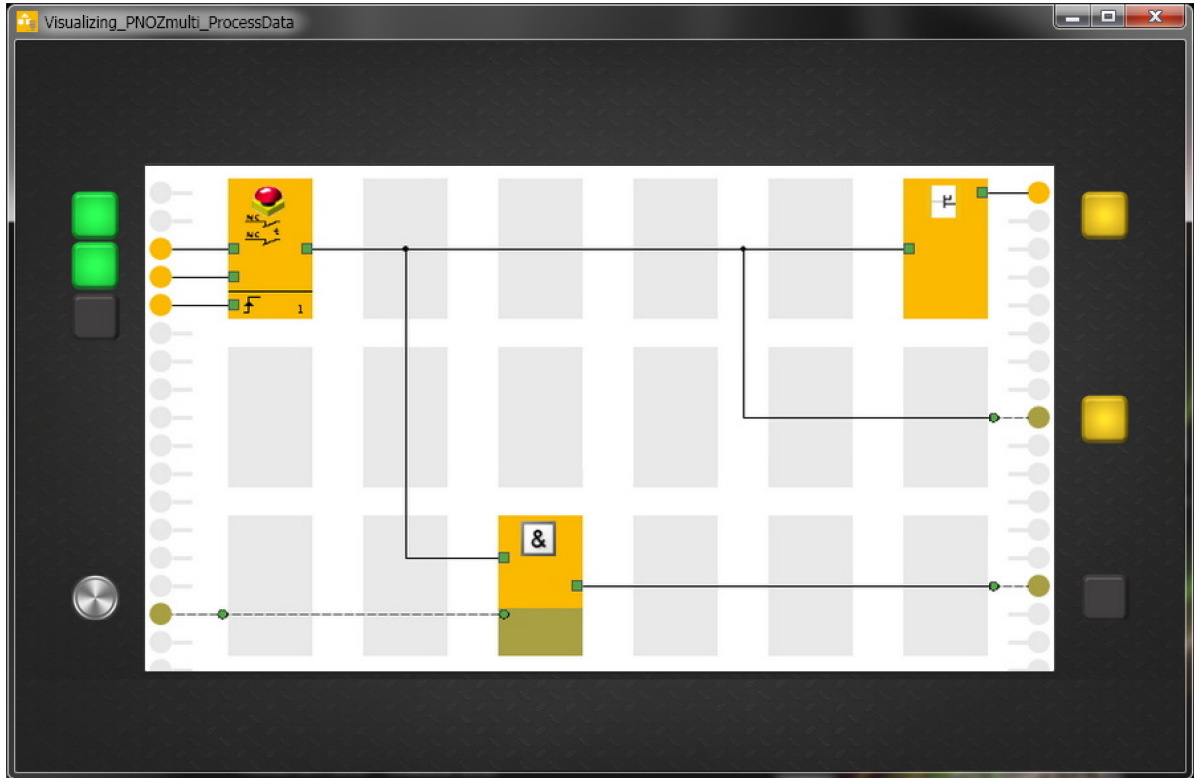


Fig. 23: PASvisu client live view



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# ► Support

Technical support is available from Pilz round the clock.

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