TeslaSCADA IDE

User Manual

Version 2.04

Table of Content

About TeslaSCADA IDE

TeslaSCADA IDE is an integrated development environment used for configuring, developing and managing HMI/SCADA applications. In this manual you will find everything you need to create a full-featured SCADA (Supervisory Control and Data Acquisition) project visualization. With this tool you can create and manage TeslaSCADA projects, configure connections with devices, enter tags, alarms, and trends.

A simple to use interface allows for easy manipulation of the project's configuration and data processing. The project data are stored in a single file (based on xml) for easy backup and restoration.

TeslaSCADA IDE has an integrated GUI (Graphical User Interface) visualization editor for easy creation of professionally looking graphics.

Requirements

TeslaSCADA IDE requires Windows, Mac OS or Linux operating systems.

Windows

Processors: Intel Pentium 4, Intel Centrino, Intel Xeon, or Intel Core Duo (or compatible) 1.8 GHz minimum.

Operating systems: Windows 8 (Modern UI (i.e. Metro Mode) is not supported), Windows 7, Windows Vista, Windows XP (not recommended but supported).

Memory: 512MB of RAM (1 GB recommended).

Disc Space: 256MB of free disc space.

Mac OS

Processors: Dual-Core Intel, PowerPC G5

Operating systems: 10.7.3 or greater

Memory: 512MB of RAM (1 GB recommended).

Disc Space: 256MB of free disc space.

Linux

Processors: Intel Pentium 4, Intel Centrino, Intel Xeon, or Intel Core Duo (or compatible) 1.8 GHz minimum.

Operating systems: Ubuntu 10.4 + gtk2 2.18+

Memory: 512MB of RAM (1 GB recommended).

Disc Space: 256MB of free disc space.

Media: You must install the following in order to support AAC audio, MP3 audio, H.264 video, and HTTP Live Streaming:

libavcodec52 and libavformat52 on Ubuntu Linux 10.04, 10.10, 11.04 or equivalent.

libavcodec53 and libavformat53 on Ubuntu Linux 11.10, 12.04 or equivalent.

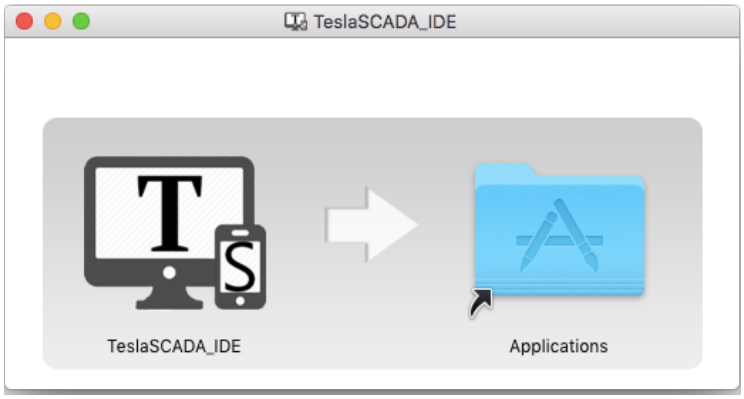
Installation

Windows

To install TeslaSCADA IDE download EXE package for your operating system. Run installation file and go through installation procedure.

Mac OS

To install TeslaSCADA IDE download DMG package for your operating system. DMG package provides a simple drag-and-drop installation experience.

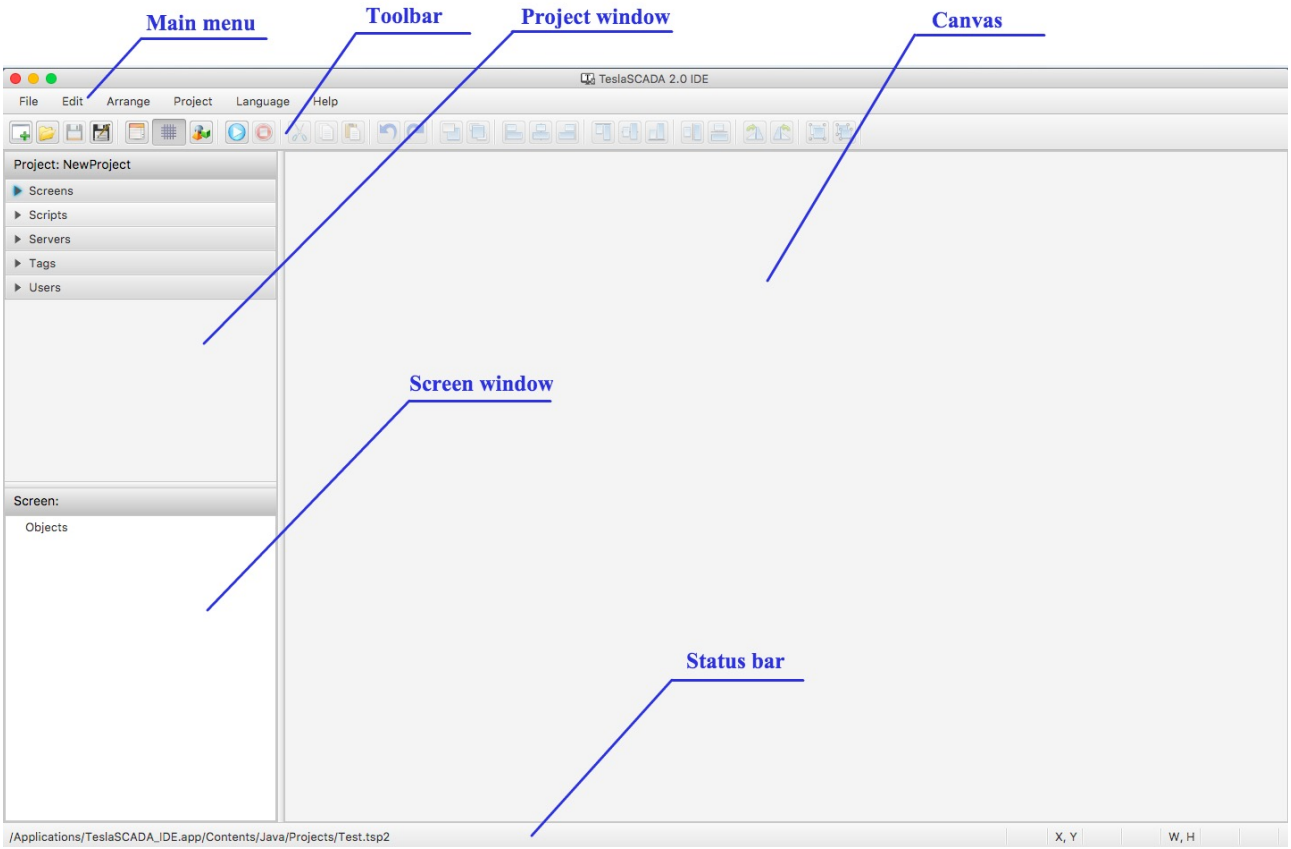


Linux

To install TeslaSCADA IDE download RPM package for your operating system. By default RPM package will install the application to /opt, add a shortcut to the application menu. RPM package does not have any UI for installation (normal behavior for Linux

Start TeslaSCADA IDE

After opening the application you will see the start screen. Look at the picture below to briefly get to know the TeslaSCADA IDE interface:



Main menu

File - manipulation with project files.

Edit - manipulation with objects (cut, copy, paste and etc.).

Arrange - arrange manipulation with objects (align, rotate and etc.).

Project - possibility to create new objects of the project, change its properties and run/stop simulation.

Language - possibility to change language of the interface.

Help - opens the help menu

Toolbar

The toolbar consists of the following functions:

 **New project –** creates a new project.

 **Open project –** opens an existing project.

 **Save –** saves your project.

 **Save as –** saves your project with a new name.

 **Properties –** properties of your project.

 **Snap to Grid –** ON/OFF snap to grid.

 **New object –** creates a new graphical object.

 **Run simulation –** start simulation of your project.

 **Stop simulation –** stop simulation of your project.

 **Cut –** cut selected object(s).

 **Copy –** copy selected object(s).

 **Paste –** paste selected object(s).

 **Undo –** undo the last operation.

 **Redo –** redo the last operation.

 **Send to Back –** send to back selected object.

 **Bring to Front –** bring to front selected object.

 **Align Left –** align to the left side the selected objects.

 **Align Center –** align the vertical center of the selected objects.

 **Align Right –** align to the right side the selected objects.

 **Align Top –** align on top of the selected objects.

 **Align Middle –** align the horizontal center of the selected objects.

 **Align Bottom –** align to the bottom of the selected objects.

 **Space Horizontal –** align the horizontal spacing between the selected objects.

 **Space Vertical –** align the vertical spacing between the selected objects.

 **Rotate Clockwise –** rotate clockwise selected object(s).

 **Rotate CounterClockwise –** rotate counterclockwise selected object(s).

 **Group Objects –** group selected objects.

 **Ungroup Objects –** ungroup selected objects.

Project window

Project window contains all the information about the project and consists:

Screens - contains all screens of the project.

Scripts - contains all scripts of the project.

Servers - contains all servers of the project.

Tags - contains all tags of the project.

Users - contains all users of the project.

Screen window

Screen window contains all objects of the current screen.

Status bar

Status bar contains information about path of the current project, information about selected object (x,y coordinates and dimension) and information about run or not simulation mode.

Canvas

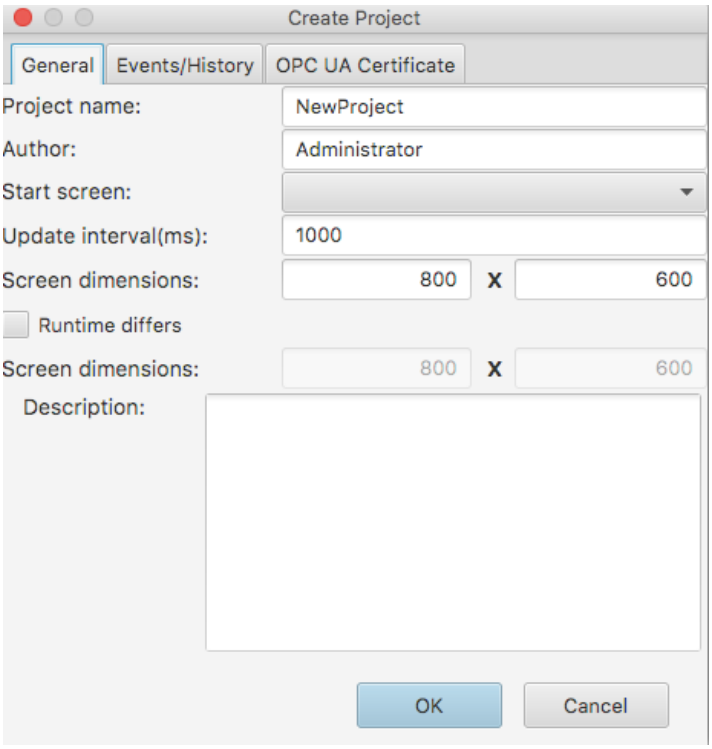
Place for the design screen or script.

Project

Create project

To create a new project TeslaSCADA IDE must be started.

1. Click on the **New** icon in the toolbar or use the command *New* from the main menu *File*. You'll see the following window:



2. On the *General* tab:

2.1. In the ***Project name*** enter the name of the project.

2.2. In the ***Author*** write the author of the project if you want.

2.3. When you create a new project the ***Start screen*** combobox is empty. You can choose the start screen after creating screens of the project.

2.4. In the ***Update interval(ms)*** enter update interval of the project. It's an interval of updating objects of the current screen.

2.5. Enter default dimensions of your design screen in the ***Screen dimensions*** fields.

2.6. If the screen dimensions of you target device differs check ***Runtime differs*** and enter its ***Screen dimensions***.

2.7. Optionally, specify a meaningful ***Description*** yet

3. On the *Events/History* tab:

3.1. Select the time period during which data will be stored in databases in the ***Storage DB period*** combobox.

3.2. Enter databases names in the ***Events DB name*** and ***History DB name.*** If you choose the simple names like *events* or *history* application will create SQLite database in the

application directory. If you choose names beginning with **jdbc:mysql:** like ***jdbc:mysql://192.168.0.104:3306/test*** the application will connect to MySQL database and create events or history table. ***Don't create big MySQL databases for connecting from Android devices (MySQL databases need a wide network bandwidth for sending and receiving data).***

3.3. Enter ***Username*** and ***Password*** if you use MySQL database.

3.4. Enter ***Notifications(Priority<).*** Events with a priority lower than this will be notified about it by using the pop-up window and sound.

4. If you use OPC UA server in your project on the *OPC UA certificate* tab enter ***Name*** of used/created certificate and ***Period(days)*** of validation if you create certificate. The certificate stored in the *{app}/private* directory.

Save project

To save project:

1. Click on the **Save** icon in the toolbar or select the menu item *File* and *Save*. The first time you save a new project, you will be asked for a location.

2. Now select the location and click the button *Save* (TeslaSCADA project extension .tsp2).

Open project

To open project:

1. Click on the **Open** icon in the toolbar or select the menu item *File* and *Open*.

2. Now select the project and click *Open* (TeslaSCADA project extension .tsp2).

Edit project properties

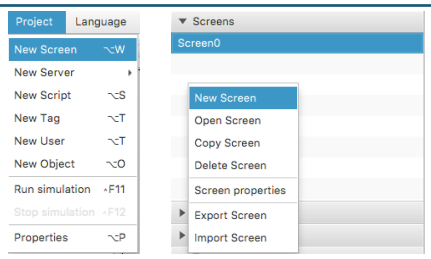
To edit project properties:

1. Click on the **Properties** icon in the toolbar or select the menu item *Project* and *Properties*.

Screens

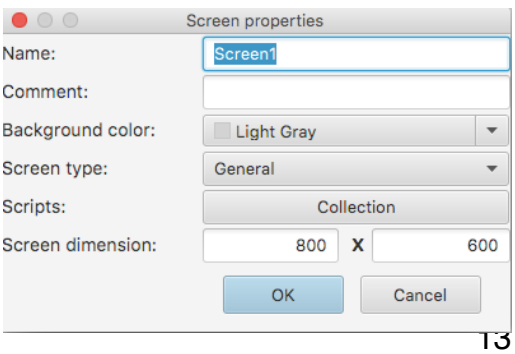
Create screen

To create a new screen select the menu item *Project* and *New Screen* or choose **Screens** on the **Project Window,** click right button on it and choose *New Screen* item.



You'll see the following window:

1. In the **Name** enter the name of the screen.
2. Optionally, specify a meaningful **Comment.**
3. Choose **Background** color.
4. Select **Screen type**: *General* or *Popup*.
5. Add **Collection** of **Scripts** for this screen if you want.
6. Enter **Screen dimension**.



Open screen

To open screen:

1. Right click on the screen you want to open and choose *Open* item.

or

2. Double click on the screen you want to open.

Copy screen

To copy screen:

1. Right click on the screen you want to copy and choose *Copy* item.

Delete screen

To delete screen:

1. Right click on the screen you want to delete and choose *Delete* item.

Edit screen properties

To edit screen properties:

1. Right click on the screen you want to edit and choose *Screen properties* item.

Export screen

To export screen:

1. Right click on the screen you want to export and choose *Export screen* item.
2. Now select the location and click the button *Save* (TeslaSCADA screen extension .tsp2screen).

Import screen

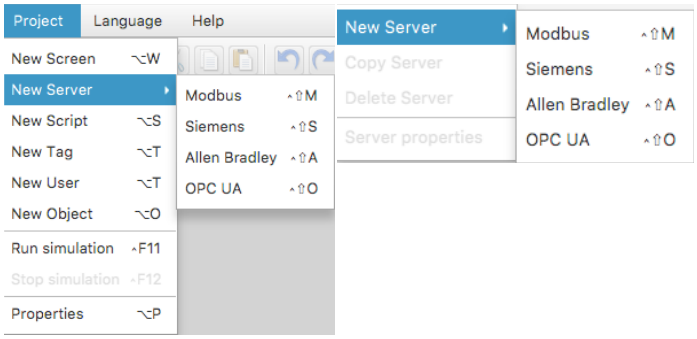
To import screen:

1. Right click on the screen window and choose *Import screen* item.
2. Now select the screen file and click *Open* (TeslaSCADA screen extension .tsp2screen).

Servers

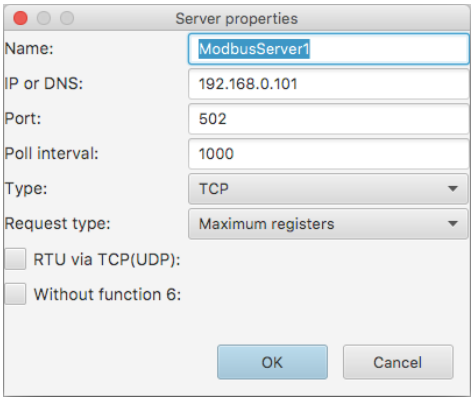
Create server

To create a new server select the menu item *Project* and *New Server* or choose **Servers** on the **Project Window,** click right button on it and choose *New Server* item. Choose server you want to add to your project.



Modbus server

To create a new Modbus server select the menu item *Modbus*. You'll see the following window:



1. In the **Name** enter the name of the Modbus server.
2. Write IP address or DNS in the **IP or DNS** field.
3. Enter Modbus server port in the **Port.**
4. Define the polling interval of the server in the **Poll interval** field.
5. Choose communication protocol in the **Type**.
6. Choose **Request type:**

- *Maximum registers* - if you choose this type the application during polling will send maximum modbus pointers in 1 polling request.

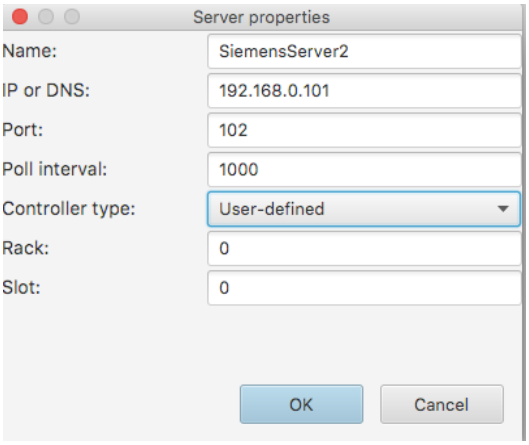
- *Consecutive registers* - if you choose this type the application during polling will send only consecutive modbus pointers in 1 polling request.

- *1 pointer registers* - if you choose this type the application during polling will send only registers used by 1 pointer in 1 polling request.

7. Check **RTU via TCP(UDP)** if you user Modbus converter from serial into TCP(UDP) protocol.
8. Check **Without function 6** if your controller doesn't support Modbus writing function 6.

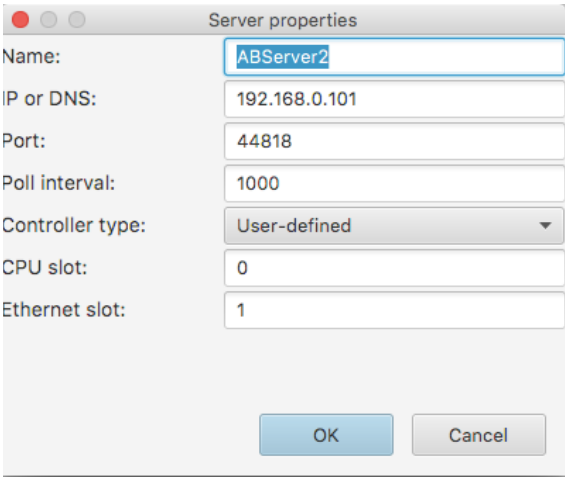
Siemens server

To create a new Siemens server select the menu item *Siemens*. You'll see the following window:



1. In the **Name** enter the name of the Siemens server.
2. Write IP address or DNS in the **IP or DNS** field.
3. Enter Siemens server port in the **Port.**
4. Define the polling interval of the server in the **Poll interval** field.
5. Choose type of the Siemens PLC in the **Controller type**.
6. Enter rack number in the **Rack** field.
7. Enter slot number in the **Slot** field.

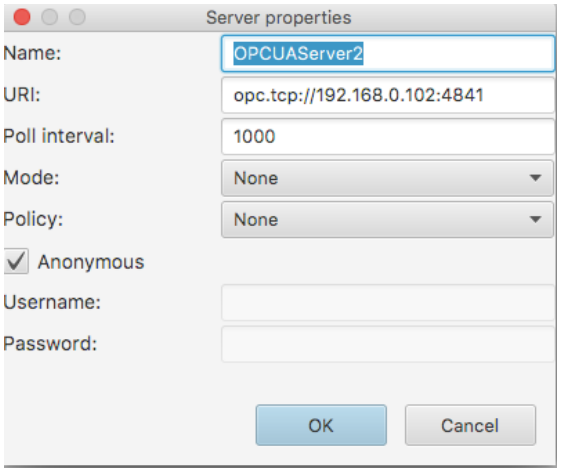
Allen Bradley server



To create a new Allen Bradley server select the menu item *Allen Bradley*. You'll see the following window:

1. In the **Name** enter the name of the Allen Bradley server.
2. Write IP address or DNS in the **IP or DNS** field.
3. Enter Allen Bradley server port in the **Port.**
4. Define the polling interval of the server in the **Poll interval** field.
5. Choose type of the Allen Bradley PLC in the **Controller type**.
6. Enter PLC's cpu slot number in the **CPU slot** field.
7. Enter PLC's ethernet slot number in the **Ethernet slot** field.

OPC UA server



To create a new OPC UA server select the menu item *OPC UA*. You'll see the following window:

1. In the **Name** enter the name of the OPC UA server.
2. Write OPC UA server address in the **URI** field.
3. Define the polling interval of the server in the **Poll interval** field.
4. Choose security mode in the **Mode**.
5. Choose security policy in the **Policy**.
6. Check **Anonymous** if you don't use User token.
7. Enter **Username** and **Password** into relevant fields if you use User token.

Open server properties

To open server properties:

1. Double click on the server properties which you want to open.

or

2. Right click on the server properties which you want to open and choose *Server properties* item.

Copy server

To copy server:

1. Right click on the server you want to copy and choose *Copy server* item.

Delete screen

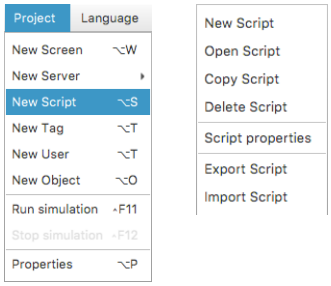
To delete server:

1. Right click on the server you want to delete and choose *Delete server* item.

Scripts

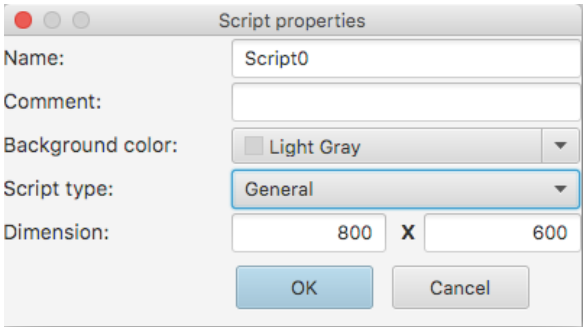
Create script

To create a new script select the menu item *Project* and *New Script* or choose **Scripts** on the **Project Window,** click right button on it and choose *New Script* item.



You'll see the following window:

1. In the **Name** enter the name of the screen.
2. Optionally, specify a meaningful **Comment.**
3. Choose **Background** color.
4. Select **Script type**: *General* or *Screen*. General script bind to the whole project. Screen script bind to the Screen.
5. Enter **Dimension** of the script's design screen.



Open script

To open script:

1. Right click on the script you want to open and choose *Open script* item.

or

2. Double click on the script you want to open.

Copy script

To copy script:

1. Right click on the script you want to copy and choose *Copy script* item.

Delete script

To delete script:

1. Right click on the script you want to delete and choose *Delete script* item.

Edit script properties

To edit script properties:

1. Right click on the script you want to edit and choose *Script properties* item.

Export script

To export script:

1. Right click on the script you want to export and choose *Export script* item.
2. Now select the location and click the button *Save* (TeslaSCADA script extension .tsp2script).

Import script

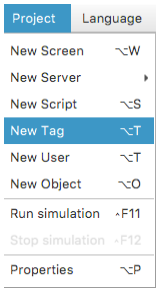
To import script:

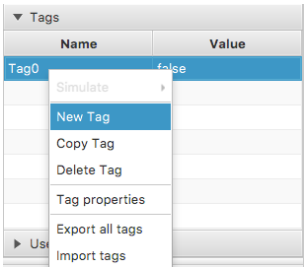
1. Right click on the script window and choose *Import script* item.
2. Now select the script file and click *Open* (TeslaSCADA screen extension .tsp2script).

Tags

Create tag

To create a new tag select the menu item *Project* and *New Tag* or choose **Tags** on the **Project Window,** click right button on it and choose *New Tag* item.

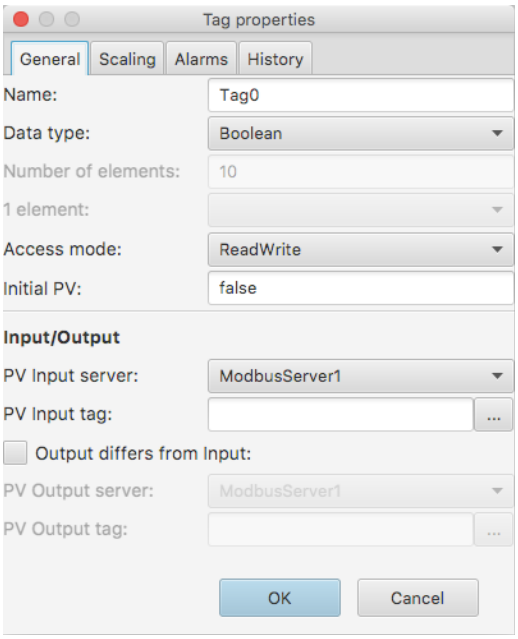




You'll see the following window:

On the *General* tab:

1. In the **Name** enter the name of the screen. The name should be unique for the project.
2. Choose **Data type.**
3. If you select *String* or *Array* data types enter **Number of elements** (letters).
4. If you select *String* or *Array* data types choose data type of **1 element** (letter).
5. Choose **Access mode** to the tag: *Read*, *Write* or *ReadWrite*.
6. Enter default tag's value into **Initial PV**.
7. In the **Input/Output** section bind tag to the server's tag. In the **PV Input server** choose server you want to bind. Then click «…» button to set up server's tag settings or enter it into the **PV Input tag**.
8. If the output server's tag differs from the input server's tag check **Output differs from input** and select **PV Output server** and enter **PV Output tag**.

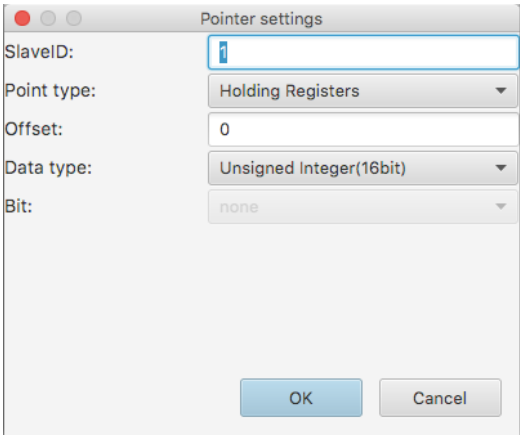


Depending on the type of **PV Input server** or **PV Output server** you'll see different server's tag (pointer) settings window:

Modbus tag settings

You'll see the following window:

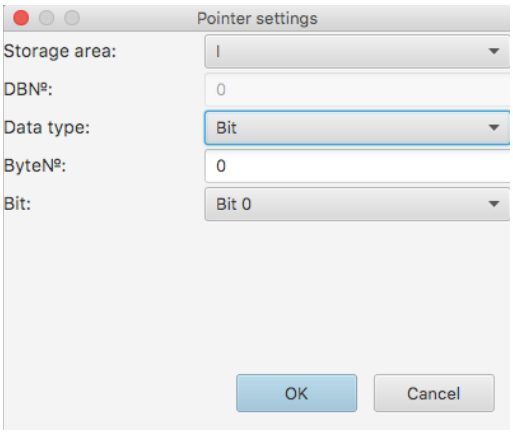
1. Enter **SlaveID** of the modbus device.
2. Choose **Point type** of the register.
3. Write offset of the register into **Offset**.
4. Choose **Data type** of the modbus tag.
5. Choose number of **Bit** if the point type is boolean.



Siemens tag settings

You'll see the following window:

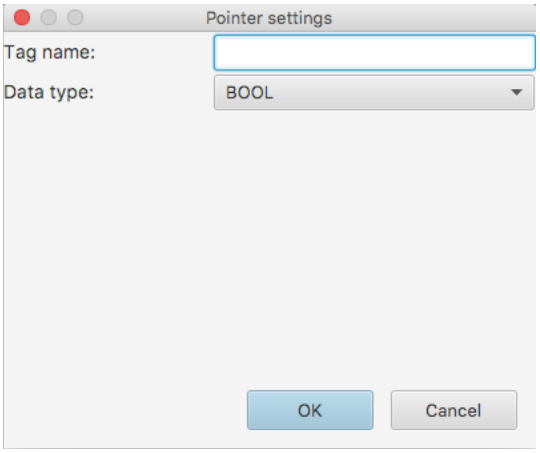
1. Choose **Storage area** of the siemens tag: *I*,*Q*,*M* or *DB*.
2. Write DB number in the **DB№** field if you choose DB storage area.
3. Choose **Data type** of the siemens tag.
4. Enter byte number of the area into **Byte№** field.
5. Choose number of **Bit** if the data type is *Bit*.



AllenBradley tag settings

You'll see the following window:

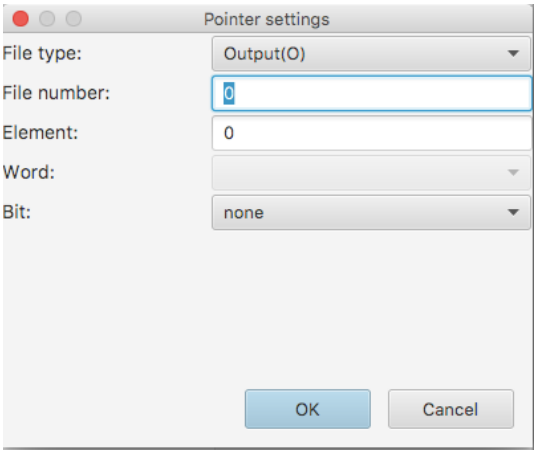
1. Enter **Tag name**.
2. Choose **Data type** of the allen bradley tag.



Micrologix tag settings

If you choose Micrologix or SLC500 controller type in the Allen Bradley server settings you'll see the following window:

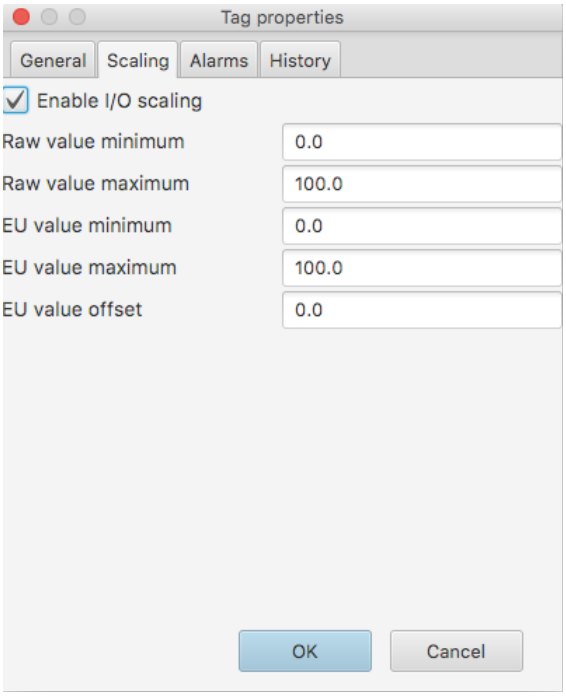
1. Choose **File type** of the server's tag.
2. Write **File number** in the field.
3. Enter **Element** of the servers tag.
4. Choose **Word** for some file types.
5. Choose number of **Bit**.



OPC UA tag settings

After clicking «…» button when you choose OPC UA server you'll get into the Address Space window. Browse through the address space by double clicking on the nodes and choose the tag(node) you need by clicking right button on it and choosing *Select* menu item on the popup window.

On the *Scaling* tab of the *Tag properties* window:

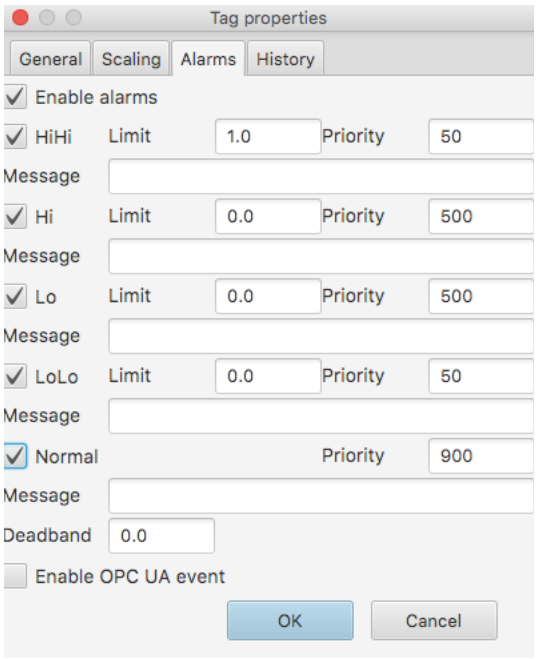


1. Check **Enable I/O scaling** if you want to scale a value get from the server.
2. Enter minimum server tag's value into **Raw value minimum** field.
3. Enter maximum server tag's value into **Raw value maximum** field.
4. Enter minimum tag's value in engineer units into **EU value minimum** field.
5. Enter maximum tag's value in engineer units into **EU value maximum** field.
6. Write tag's value offset int **EU value offset**.

When you get some value from the server application use this formula:

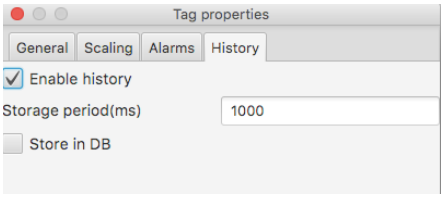
```
value = (value-rawmin)*(eumax-eumin)/
(rawmax-rawmin)+eumin + offset
```

On the *Alarms* tab of the *Tag properties* window:



1. Check **Enable alarms** if you want to use alarms for this tag.
2. Check **HiHi**, **Hi**, **Lo**, **LoLo** or **Normal** if you want to use the correspondent alarm(event).
3. Write **Limit** for the correspondent alarm(event). If the value of the tag plus **Deadband** will be more than *HiHi* or *Hi* limit the correspondent alarm will be called and be written into Event database. If the value of the tag minus **Deadband** will be less than *LoLo* or *Lo* limit the correspondent alarm will be raised and be written into Event database.
4. Enter **Priority** for the correspondent alarm(event). If the priority of the alarm(event) is less than value of ***Notifications(Priority<)*** you set in the project properties the notification dialog will be called.
5. Enter **Message** for the correspondent alarm(event).
6. Check **Enable OPC UA event** if you bind this tag to the OPC UA server tag(node) and you want to use EventNotifier of this tag(node).

On the *History* tab of the *Tag properties* window:



1. Check **Enable history** if you want to storage values of this tag.
2. Enter **Storage period(ms).**
3. Check **Store in DB** if you want to store data in history database.

Copy tag

To copy tag:

1. Right click on the tag you want to copy and choose *Copy tag* item.

Delete tag

To delete tag:

1. Right click on the tag you want to delete and choose *Delete tag* item.

Edit tag properties

To edit tag properties:

1. Right click on the script you want to edit and choose *Tag properties* item.

or

2. Double click on the tag you want to edit.

Export all tags

To export all tags:

1. Right click on the tags window and choose *Export all tags* item.
2. Now select the location and click the button *Save* (TeslaSCADA tags extension .tsp2tags).

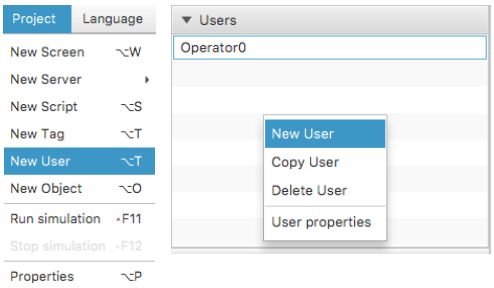
Import tags

To import tags:

1. Right click on the tags window and choose *Import tags* item.
2. Now select the tags file and click *Open* (TeslaSCADA screen extension .tsp2tags).

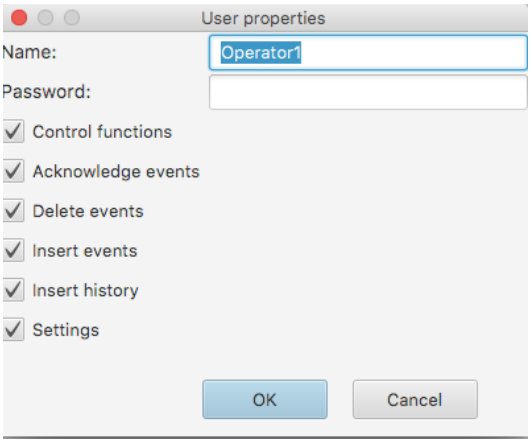
Users

Create user



User is not a mandatory element of the project. You can use or not users in it. To create a new user select the menu item *Project* and *New User* or choose **Users** on the **Project Window,** click right button on it and choose *New User* item.

You'll see the following window:



1. In the **Name** enter the name of the user.
2. Write **Password** for the current user.
3. Check **Control functions** if you want that current user can write values into the server's tags.
4. Check **Acknowledge events** if you want that current user can acknowledge events in events database.
5. Check **Delete events** if you want that current user can delete events from events database.
6. Check **Insert events** if you want that runtime application insert events into events database when current user is logged in.
7. Check **Insert history** if you want that runtime application insert history data into history database when current user is logged in.
8. Check **Settings** if you want current user can enter *Settings* menu of runtime application.

Open user properties

To open user properties:

1. Right click on the user you want to open and choose *User properties* item.

or

2. Double click on the user properties which you want to open.

Copy user

To copy user:

1. Right click on the user you want to copy and choose *Copy user* item.

Delete user

To delete user:

1. Right click on the user you want to delete and choose *Delete user* item.

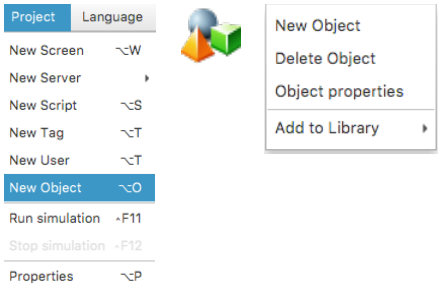
Design screen

To start designing the screen you want, you should double click on it or click right button on the **Project window->Screens** and choose *Open screen*.

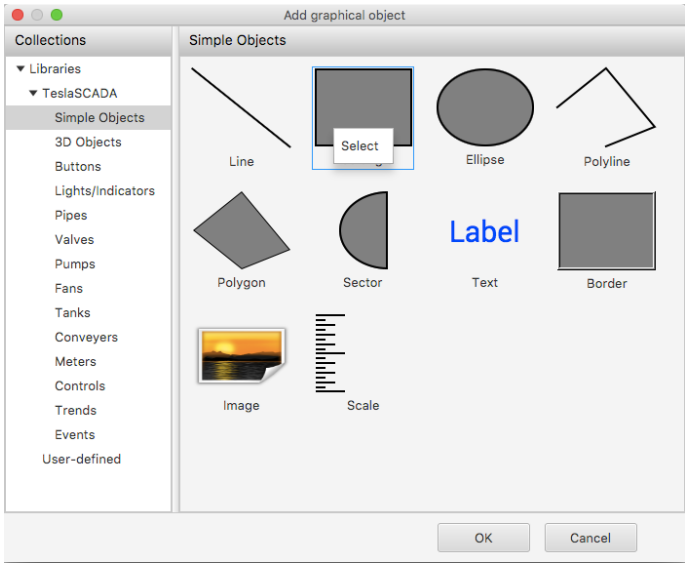
Create graphical object

Add new graphical object object on the screen you can in several ways:

1. Select the menu item *Project* and *New Object*.
2. Click **New Object** button on the Toolbar.
3. Click right button on the **Screen window** and choose *New object* item.
4. Click right button on the **Canvas** and choose *New object* item.



You'll see the **Add graphical object** window:



Select library which object you want to use in your project (all libraries and their objects described below). Select object you can in several ways:

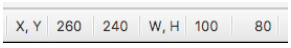
1.By double clicking on the object.

2. By clicking on the object (select rectangle will appear) and then clicking OK button.

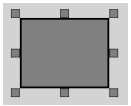
3.By clicking right button and choosing *Select* item.

Add graphical object window will disappear and you can select the location on the screen where you want to place an object.

Object information about its dimensions and coordinates you can find in the status bar on the right.



Resize graphical object

You can resize graphical object by clicking on it. Resize squares will  appear and you can change dimensions of your object as you want.

Move graphical object

You can move graphical objects by Drag and Drop technology.

Open graphical object properties

You can open graphical object properties on the **Screen Window** or on the **Canvas**.To open graphical object properties:

1. Right click on the object you want to open and choose *Object properties* item.

or

2. Double click on the object properties which you want to open.

Copy graphical object

You can copy graphical object:

1. Right click on the object you want to copy and choose *Copy* item.
2. Select the object you want to copy and choose *Edit->Copy* menu item.
3. Select the object you want to copy and click *Copy* button on the **Toolbar**.

Cut graphical object

You can cut graphical object:

1. Right click on the object you want to cut and choose *Cut* item.
2. Select the object you want to cut and choose *Edit->Cut* menu item.
3. Select the object you want to cut and click *Cut* button on the **Toolbar**.

Paste graphical object

You can paste (before cut or copied) graphical object:

1. Right click on the **Canvas** and choose *Paste* item.
2. Choose *Edit->Paste* menu item.
3. Click *Paste* button on the **Toolbar**.

Erase graphical object

You can erase graphical object:

1. Right click on the object you want to erase and choose *Erase* item.
2. Select the object you want to erase and choose *Edit->Erase* menu item.
3. Right click on the object in the **Screen Window** and choose *Delete object* item.

Duplicate graphical object

You can duplicate graphical object:

1. Right click on the object you want to duplicate and choose *Duplicate* item.
2. Select the object you want to erase and choose *Edit->Erase* menu item.

Send to back graphical object

You can send to back graphical object relative to other objects of the screen:

1. Right click on the object you want to send to back and choose *Send to Back* item.
2. Select the object you want to send to back and choose *Arrange->Send to Back* menu item.
3. Select the object you want to send to back and click *Send to Back* button on the **Toolbar**.

Bring to front graphical object

You can bring to front graphical object relative to other objects of the screen:

1. Right click on the object you want to bring to front and choose *Bring to Front* item.
2. Select the object you want to bring to front and choose *Arrange->Bring to Front* menu item.
3. Select the object you want to bring to front and click *Bring to Front* button on the **Toolbar**.

Rotate clockwise graphical object

You can rotate clockwise graphical object clockwise:

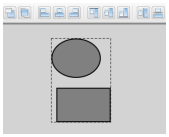
1. Select the object you want to rotate clockwise and click *Rotate Clockwise* button on the **Toolbar**.
2. Select the object you want to rotate clockwise and choose *Arrange->Rotate Clockwise* menu item.

Rotate counterclockwise graphical object

You can rotate counterclockwise graphical object clockwise:

1. Select the object you want to rotate counterclockwise and click *Rotate CounterClockwise* button on the **Toolbar**.
2. Select the object you want to rotate counterclockwise and choose *Arrange->Rotate CounterClockwise* menu item.

Align graphical objects



You can align objects relative to each other on the screen. Choose objects you want to align by selecting square. And:

1. Choose *Arrange->Align* menu items.
2. Click *Align* buttons on the **Toolbar**.
3. Right click on selecting square and choose *Align* item.

For more information about each alignment operation you can read above in section **Start TeslaSCADA IDE ->Toolbar.**

Group graphical objects

You can group objects. Choose objects you want to align by selecting square. And:

1. Select *Arrange->Group objects* menu item.
2. Click *Group objects* button on the **Toolbar**.
3. Right click on selecting square and choose *Group objects* item.

Ungroup graphical objects

You can ungroup objects. Choose group of objects you want to ungroup by clicking on it . And:

1. Select *Arrange->Ungroup objects* menu item.
2. Click Ung*roup objects* button on the **Toolbar**.
3. Right click on selecting square and choose *Ungroup objects* item.

Graphical objects

Each graphical object has several group of properties. The description of each group of properties you can find below in the chapter - **Properties**. In this chapter we describe one group for every object - **General.**

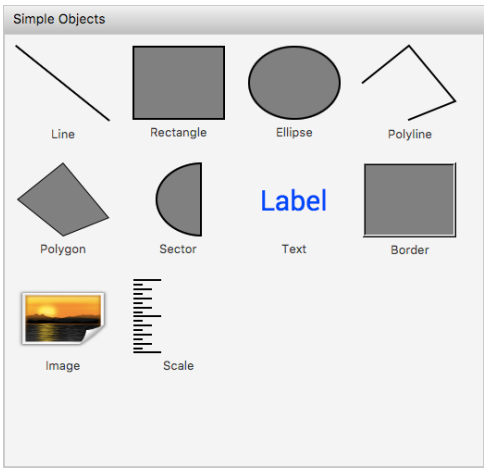
This group is responsible for the appearance of the object. Each object has the following properties:

1. **Name** - write name of the object in this field.
2. **Dimensions** - dimensions of the graphical object. Enter width of the object in the **W** field and enter height of the object in the **H** field.
3. **Coordinates** - coordinates of the graphical object. Write x coordinates of the object in the **X** field and enter y coordinates of the object in the **Y** field.
4. **Angle** - select the angle of rotation of the object.

Simple Objects library

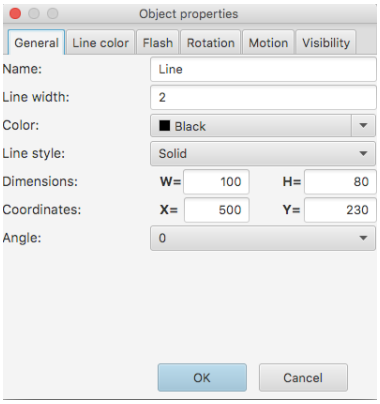
Simple objects library contains the following objects:

Line, Rectangle, Ellipse, Polyline, Polygon, Sector, Text, Border, Image and Scale.



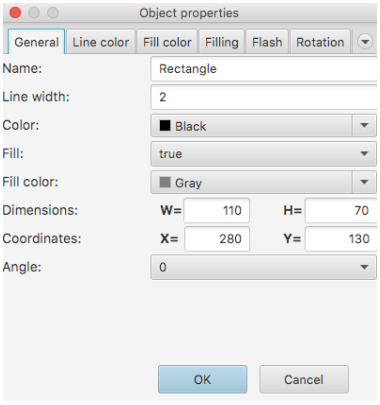
Line

1. Write width of the line in the **Line width** field.
2. Choose **Color** of the line.
3. Choose **Line style**: *Solid, Dash, Dot* or *DashDot*.



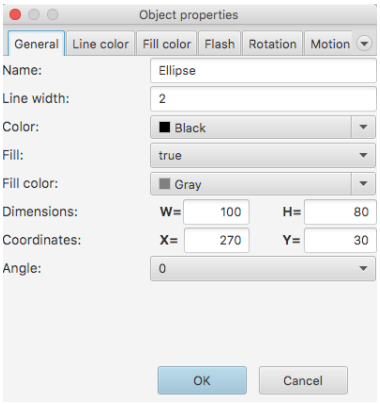
Rectangle

1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this rectangle in the **Fill** combobox.
4. Choose **Fill color** of the rectangle.



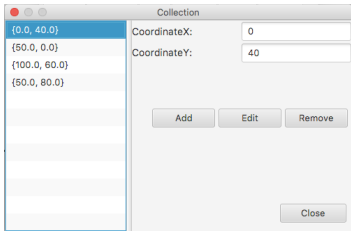
Ellipse

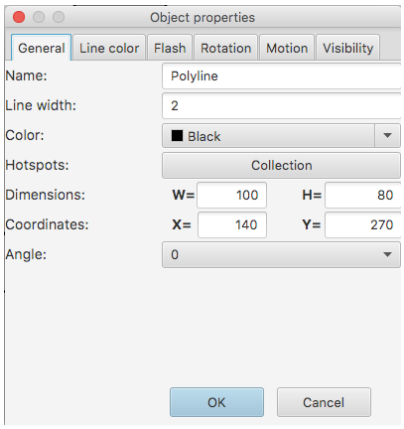
1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this ellipse in the **Fill** combobox.
4. Choose **Fill color** of the ellipse.



Polyline

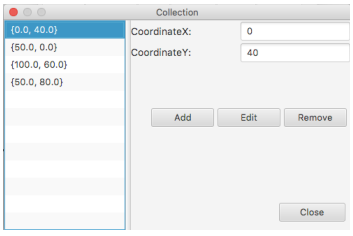
1. Write width of the line in the **Line width** field.
2. Choose **Color** of the line.
3. When you click **Collection** button the Collection window will appear. You can *Add*, *Edit* or *Remove* nodes of the polyline.

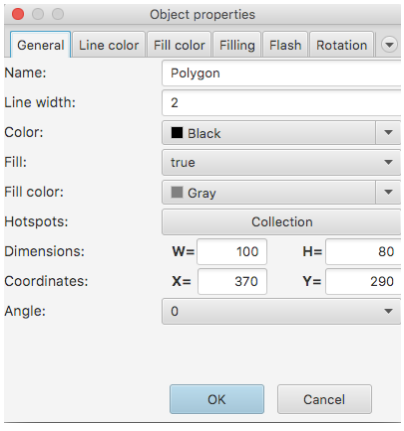




Polygon

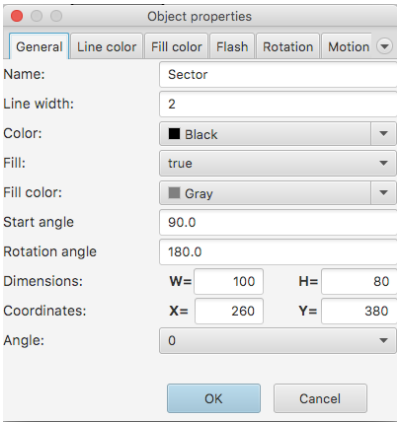
1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this polygon in the **Fill** combobox.
4. Choose **Fill color** of the polygon.
5. When you click **Collection** button the Collection window will appear. You can *Add*, *Edit* or *Remove* nodes of the polygon.



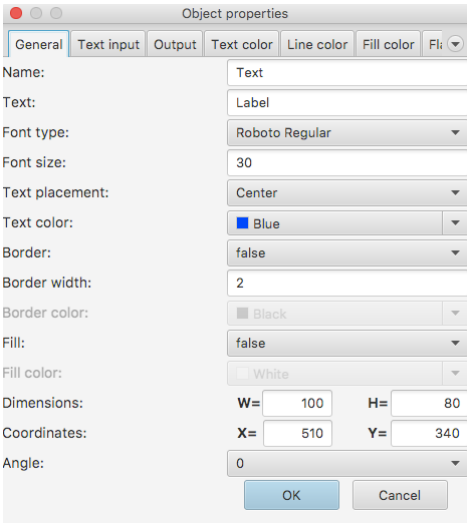


Sector

1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this sector in the **Fill** combobox.
4. Choose **Fill color** of the sector.
5. Enter **Start angle** of the sector in the field. 0 degrees is right middle point of the dimensions rectangle.
6. Write **Rotation angle** in the field. Counterclockwise rotation.

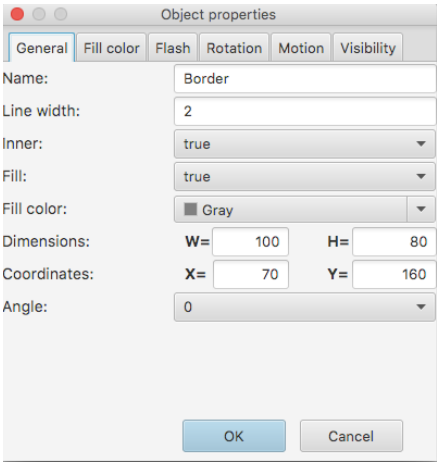


Text



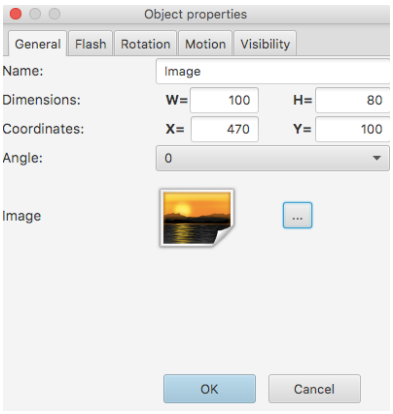
1. Write text in the **Text** field.
2. Choose **Font type** of the text.
3. Enter **Font size** in the field.
4. Select **Text placement:** *Left*, *Center* or *Right*.
5. Choose **Text color**.
6. Select use or not **Border** around text.
7. Write width of the border in the **Border width** field.
8. Choose **Border color**.
9. Select fill or not text background in the **Fill** combobox.
10. Choose **Fill color** of the text background.

Border



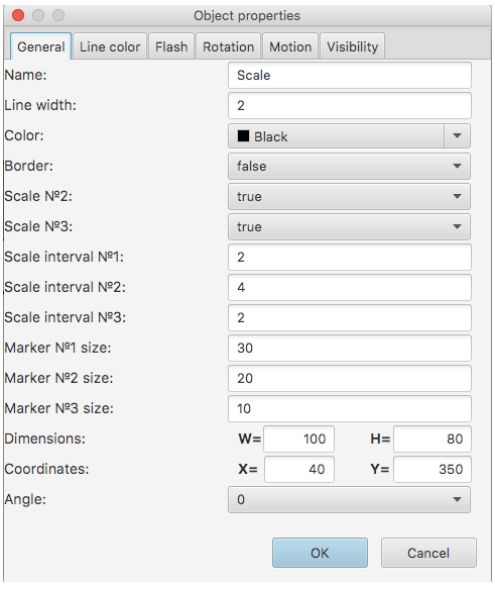
1. Write width of the border in the **Line width** field.
2. Select **Inner** or not border style.
3. Select fill or not this border in the **Fill** combobox.
4. Choose **Fill color** of the border.

Image



1. Select **Image** you want to add to the project by clicking **«...»** button. Open file dialog will appear. Choose file with image you want to add to the project and click Open button.

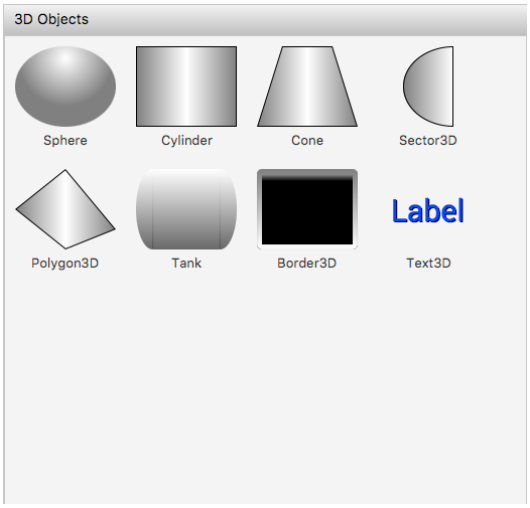
Scale



1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border and scale lines.
3. Select use or not **Border** for this scale.
4. Select use or not **Scale №2** for this scale.
5. Select use or not **Scale №3** for this scale.
6. Enter **Scale interval №1** in the field.
7. Enter **Scale interval №2** in the field.
8. Enter **Scale interval №3** in the field.
9. Write width of the scale №1 in the **Marker №1 size** field.
10. Write width of the scale №2 in the **Marker №2 size** field.
11. Write width of the scale №3 in the **Marker №3 size** field.

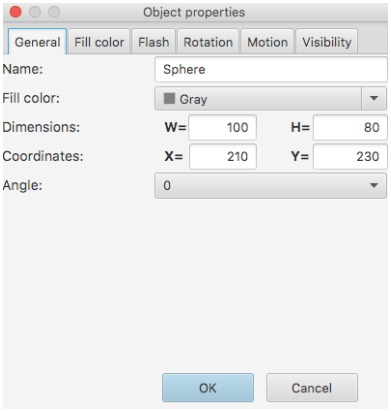
3D Objects library

3D objects library contains the following objects: Sphere, Cylinder, Cone, Sector 3D, Polygon 3D, Tank, Border 3D, Text 3D.



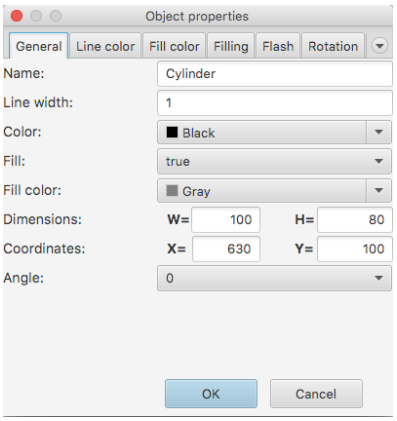
Sphere

1. Choose **Fill color** of the border.



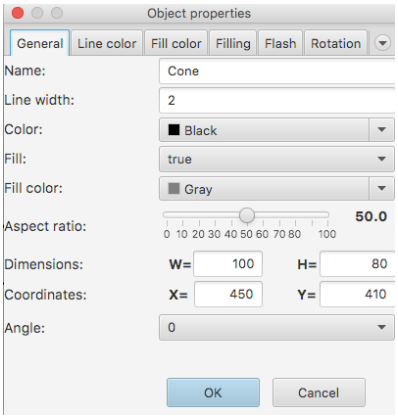
Cylinder

1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this cylinder in the **Fill** combobox.
4. Choose **Fill color** of the cylinder.

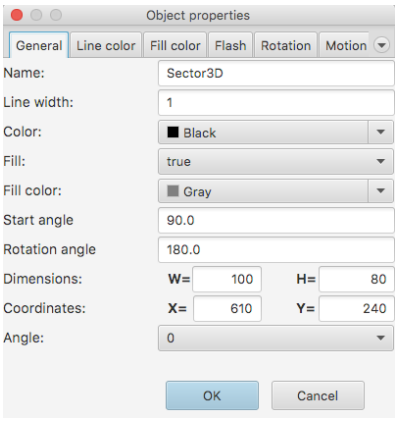


Cone

1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this cone in the **Fill** combobox.
4. Choose **Fill color** of the cone.
5. Select **Aspect ratio** of the cone.

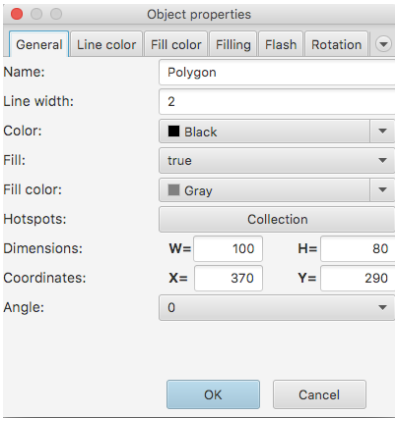


Sector 3D

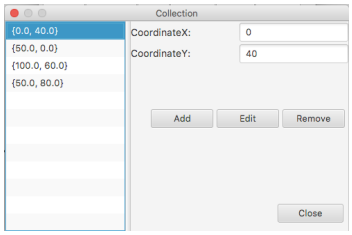


1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this sector in the **Fill** combobox.
4. Choose **Fill color** of the sector.
5. Enter **Start angle** of the sector in the field. 0 degrees is right middle point of the dimensions rectangle.
6. Write **Rotation angle** in the field. Counterclockwise rotation.

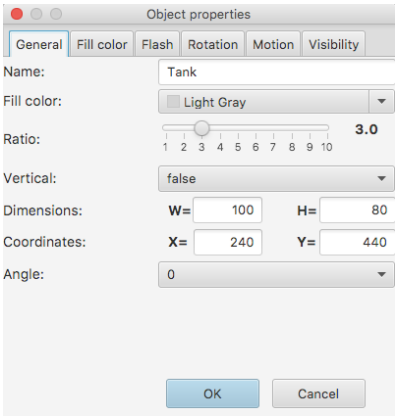
Polygon 3D



1. Write width of the line in the **Line width** field.
2. Choose **Color** of the border line.
3. Select fill or not this polygon in the **Fill** combobox.
4. Choose **Fill color** of the polygon.
5. When you click **Collection** button the Collection window will appear. You can *Add*, *Edit* or *Remove* nodes of the polygon.

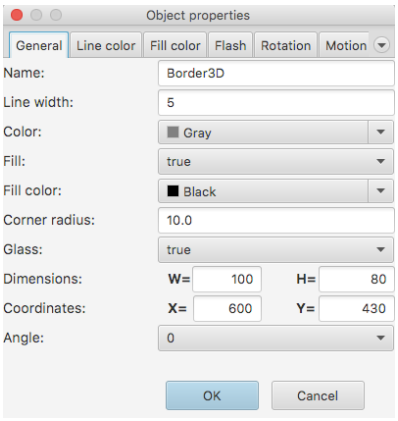


Tank



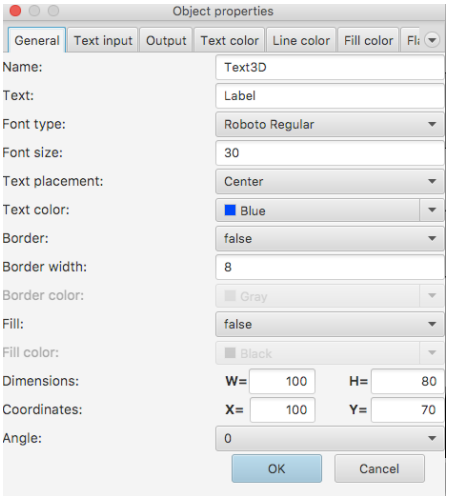
1. Choose **Fill color** of the tank.
2. Select **Ratio** of the tank.
3. Select vertical or horizontal will be tank in **Vertical** combobox.

Border 3D



1. Write width of the border in the **Line width** field.
2. Choose **Color** of the border.
3. Select fill or not this border in the **Fill** combobox.
4. Choose **Fill color** of the border.
5. Enter radius of the border's corner in the **Corner radius** field.
6. Select use or not **Glass** effect.

Text 3D



1. Write text in the **Text** field.
2. Choose **Font type** of the text.
3. Enter **Font size** in the field.
4. Select **Text placement:** *Left*, *Center* or *Right*.
5. Choose **Text color**.
6. Select use or not **Border** around text.
7. Write width of the border in the **Border width** field.
8. Choose **Border color**.
9. Select fill or not text background in the **Fill** combobox.
10. Choose **Fill color** of the text background.

Buttons library

Buttons library contains the following objects: Button, Press button, Toggle button, Light button, Oval light button, Image button, Oval jump and Rectangle jump. All buttons except Image button have the same General group properties. Below we describe it only for two graphical objects - **Button** and **Image button**.

Button

1. Write text of the button in the **Text** field.
2. Choose **Text color**.
3. Choose **Fill color** of the button.

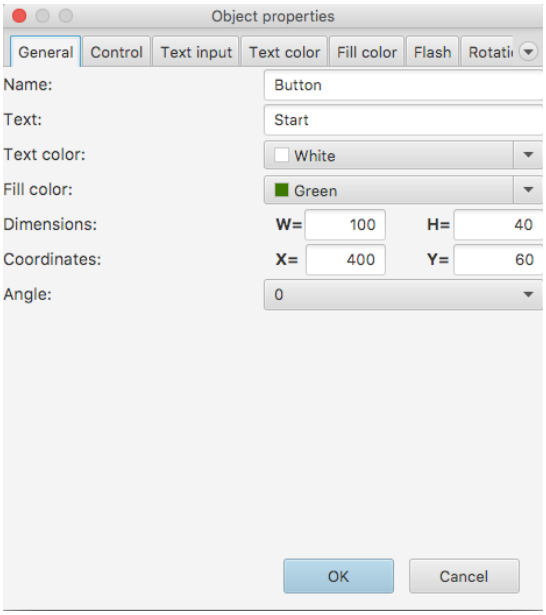
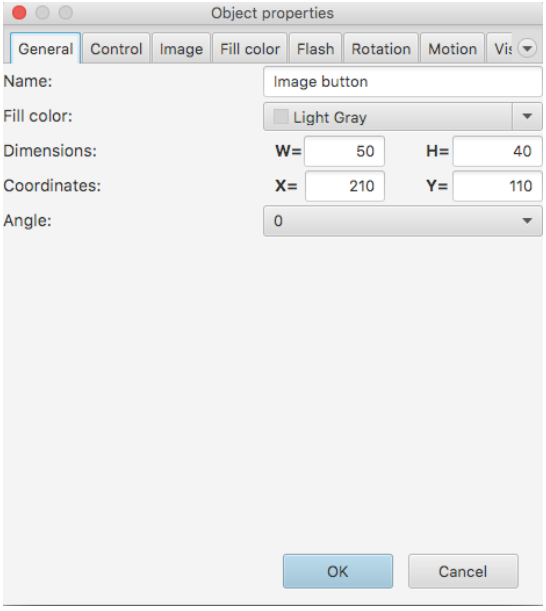


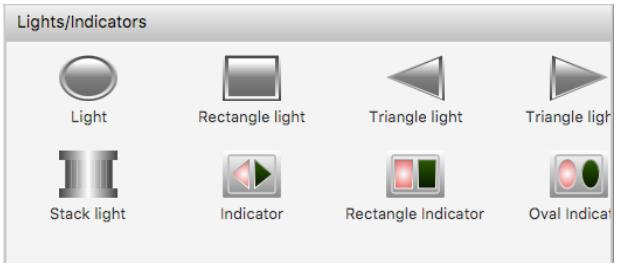
Image Button

1. Choose **Fill color** of the button's background.



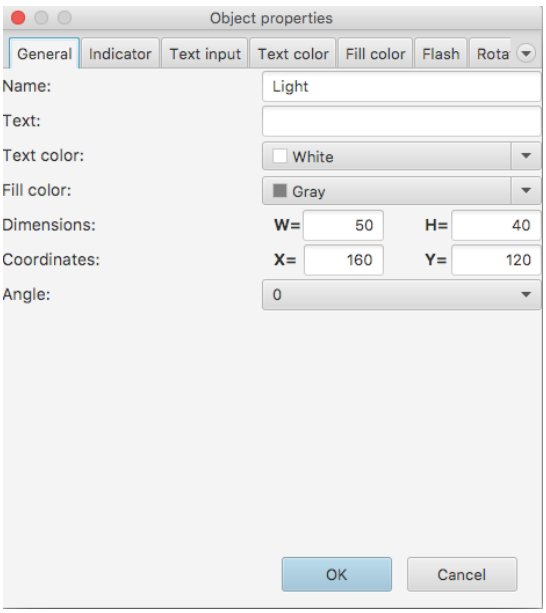
Lights/Indicators library

Lights/Indicators library contains the following objects: Light, Rectangle light, Triangle light, Triangle light 2, Stack light, Indicator, Rectangle Indicator and Oval Indicator. All lights have the same General group properties and all indicators have the same General group properties. Below we describe it only for two graphical objects - **Light** and **Indicator**.



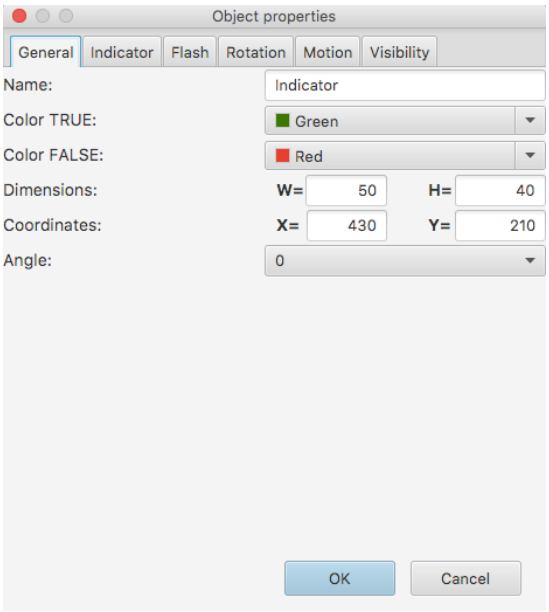
Light

1. Write text of the light in the **Text** field.
2. Choose **Text color**.
3. Choose **Fill color** of the light.



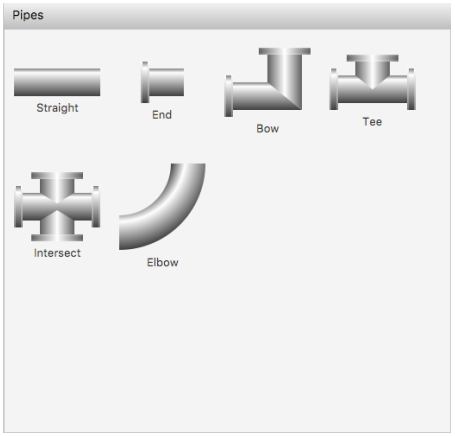
Indicator

1. Choose **Color TRUE** of the indicator.
2. Choose **Color FALSE** of the indicator.



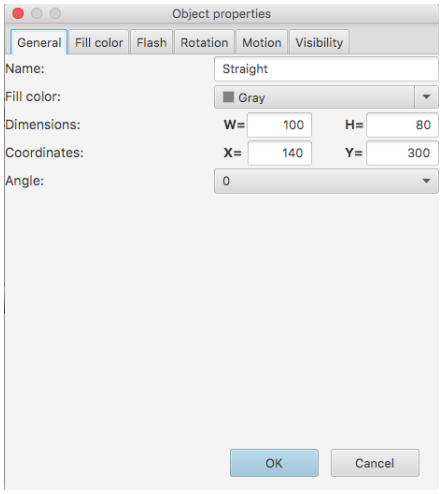
Pipes library

Pipes library contains the following pipes objects: Straight, End, Bow, Tee, Intersect and Elbow. All pipes have the same General group properties. Below we describe it only for one graphical object - **Straight** .



Pipe

1. Choose **Fill color** of the pipe.

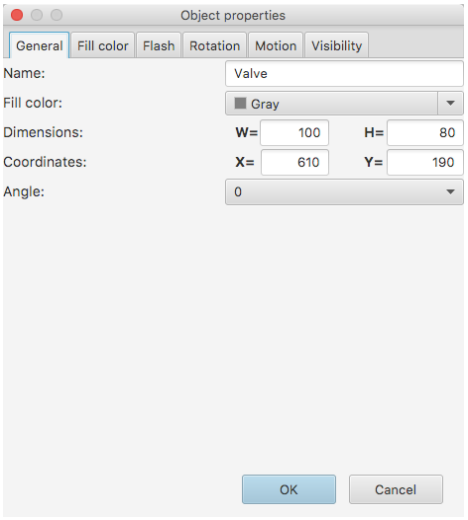


Valves library

Valves library contains the following object: Valve.

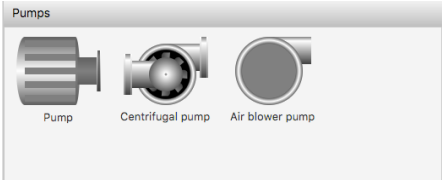
Valve

1. Choose **Fill color** of the valve.



Pumps library

Pumps library contains the following objects: Pump, Centrifugal pump and Air blower pump. All pumps have the same General group properties. Below we describe it only for one graphical object - **Pump**.



Pump

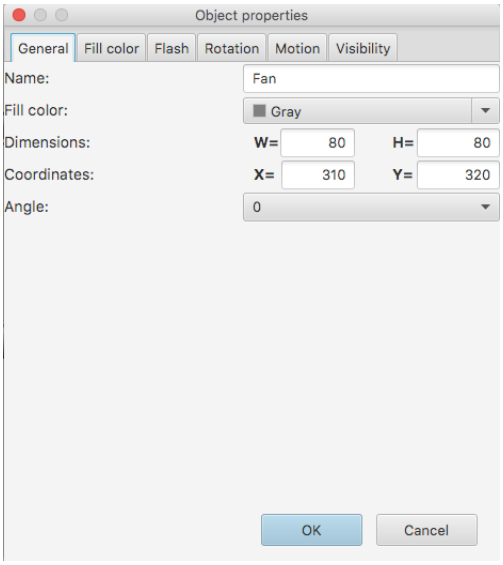
1. Choose **Fill color** of the pump.

Fans library

Fans library contains the following object: Fan.

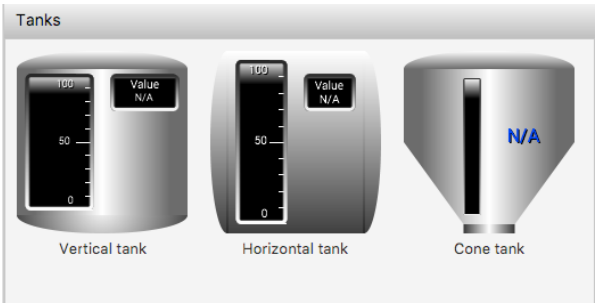
Fan

1. Choose **Fill color** of the fan.



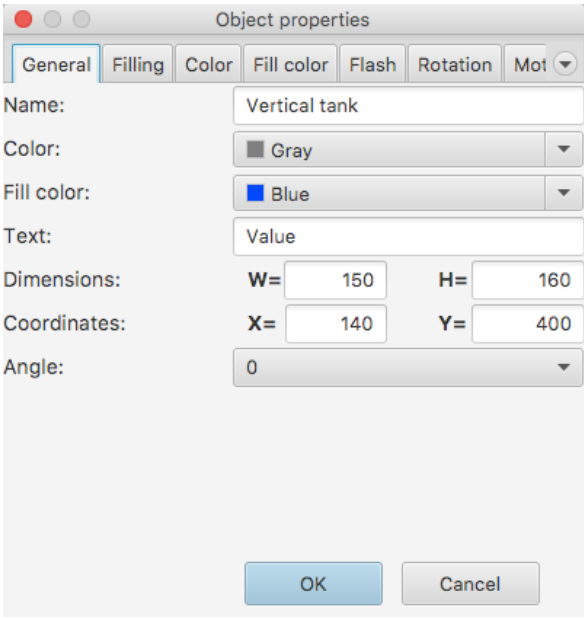
Tanks library

Tanks library contains the following objects: Vertical tank, Horizontal tank and Cone tank. All tanks have the same General group properties. Below we describe it only for one graphical object - **Vertical tank**.



Vertical tank

1. Choose background color of the tank in **Color**.
2. Choose filling color of the tank in **Fill color**.
3. Enter text in the **Text** field.

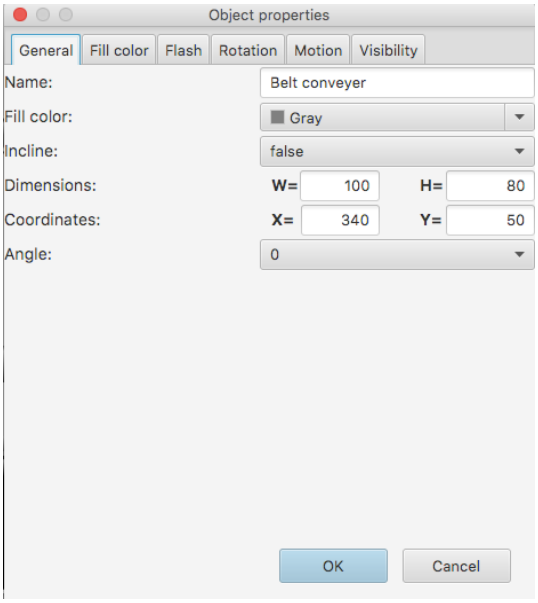


Conveyers library

Conveyers library contains the following objects: Screw conveyer and Belt conveyer. All conveyers have the same General group properties. Below we describe it only for one graphical object - **Belt conveyer**.

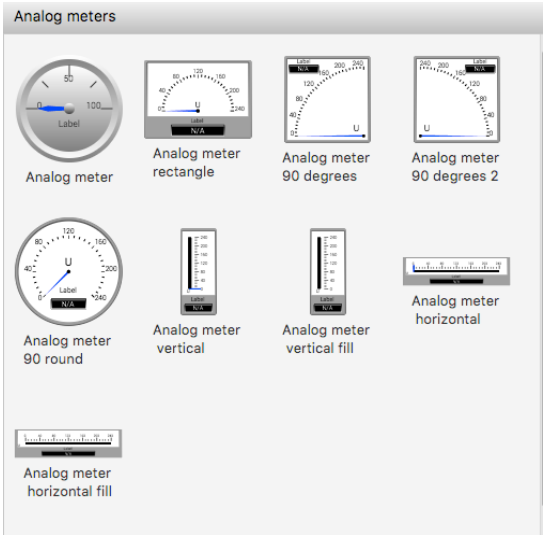
Belt conveyer

1. Choose **Fill color** of the conveyer.
2. Select incline or not in **Incline** combobox.



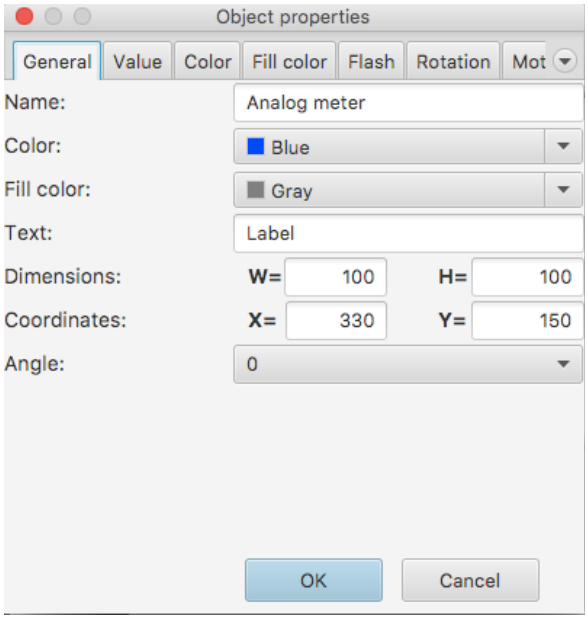
Analog meters library

Analog meters library contains the following objects: Analog meter, Analog meter rectangle, Analog meter 90 degrees, Analog meter 90 degrees 2, Analog meter 90 round, Analog meter vertical, Analog meter vertical fill, Analog meter horizontal and Analog meter horizontal fill.



Analog meter

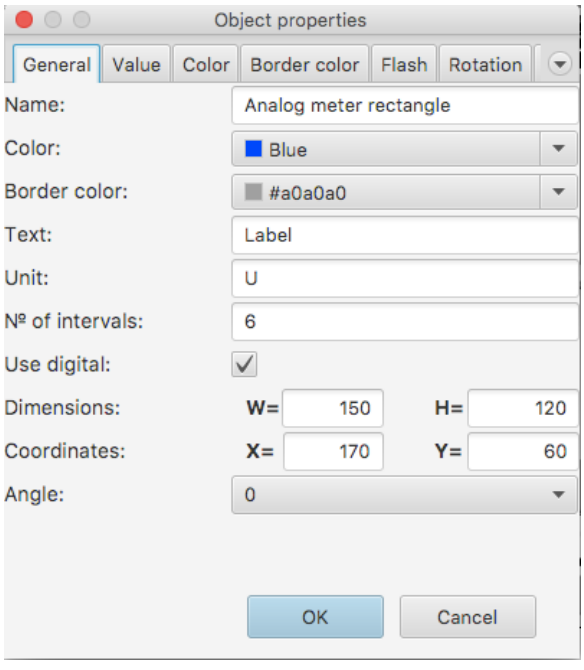
1. Write text of the label in the **Text** field.
2. Choose color of the arrow in the **Color**.
3. Choose filling color of the meter in **Fill color**.



Other analog meters

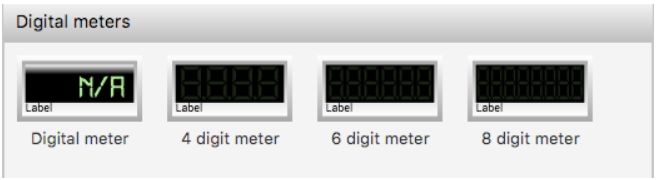
Analog meter rectangle, Analog meter 90 degrees, Analog meter 90 degrees 2, Analog meter 90 round, Analog meter vertical, Analog meter vertical fill, Analog meter horizontal and Analog meter horizontal fill have the same General properties:

1. Write text of the label in the **Text** field.
2. Choose color of the arrow in the **Color**.
3. Choose border color of the meter in **Border color**.
4. Write unit text in the **Unit** field.
5. Enter the number of intervals of the meter in the **№ of intervals** field.
6. Check **Use digital** if you want to use digital meter.



Digital meters library

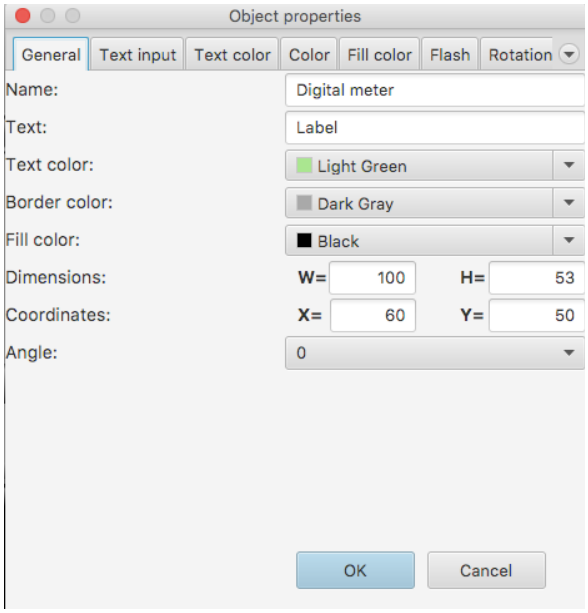
Digital meters library contains the following objects: Digital meter, 4 digit meter, 6 digit meter and 8 digit meter.



Digital meters

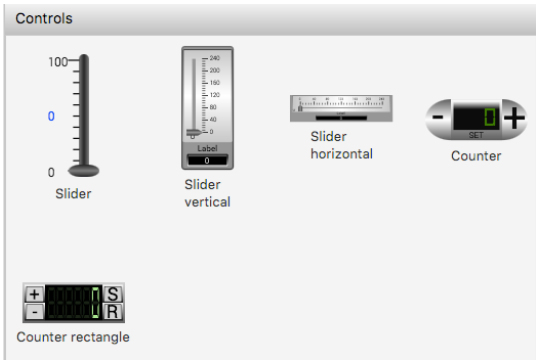
All digital meters have the same general properties:

1. Write text of the label in the **Text** field.
2. Choose **Text color**.
3. Choose color of the border in the **Border color**.
4. Choose filling color of the meter in **Fill color**.



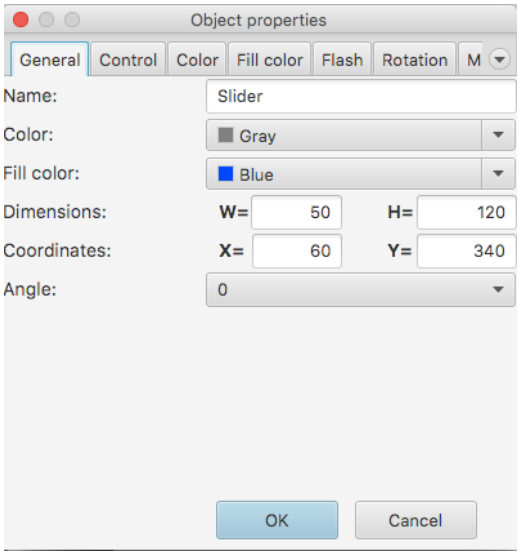
Controls library

Controls library contains the following objects: Slider, Slider vertical, Slider horizontal, Counter and Counter rectangle.



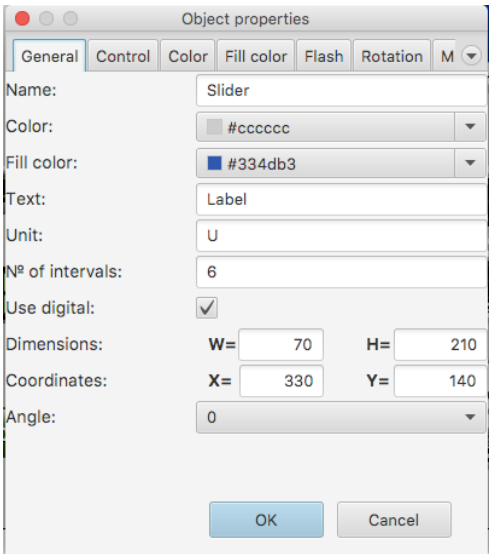
Slider

1. Choose color of the background in the **Color**.
2. Choose filling color of the slider in **Fill color**.



Slider vertical and horizontal

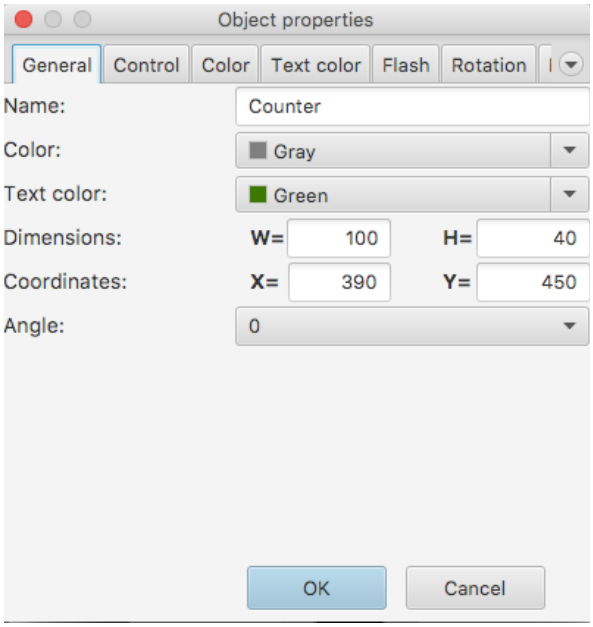
1. Choose color of the background in the **Color**.
2. Choose filling color of the slider in **Fill color**.
3. Enter label text in the **Text** field.
4. Write unit text in the **Unit** field.
5. Enter the number of intervals of the slider in the **№ of intervals** field.
6. Check **Use digital** if you want to use digital meter.



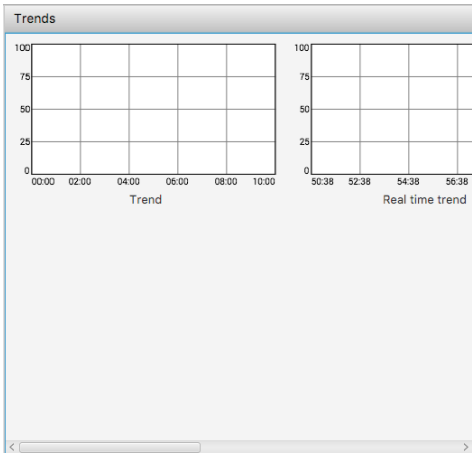
Counter and counter rectangle

General properties for counter and counter rectangle are the same:

1. Choose color of the background in the **Color**.
2. Choose **Text color**.

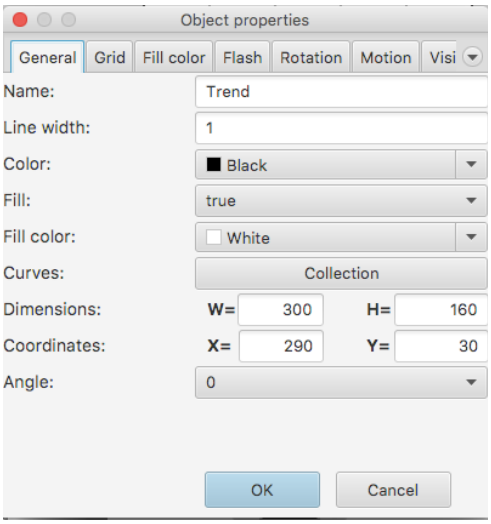


Trends library

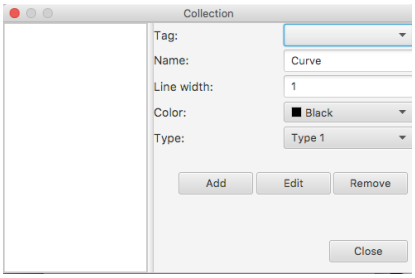


Trends library contains the following objects: Trend, Real time trend, Trend DB and Trend OPC UA History. *Trend* and *Real time trend* draw curves based on tags that used history data collection (check **Enable history** in Tags properties). *Trend DB* draw curves based on tags that used data stored in database (check **Store in DB** in Tags properties). *Trend OPC UA History* draw curves based on tags that bind to OPC UA nodes supported Historyzing property. All trends have the same General and Grid group properties. Below we describe their only for one graphical object - **Trend**.

Trend



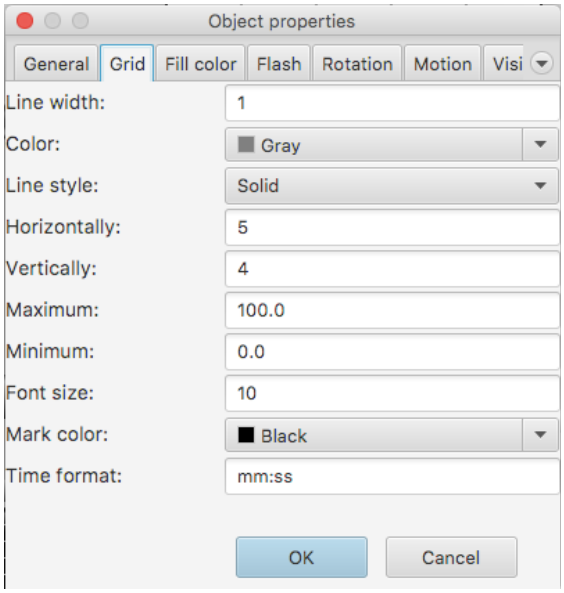
1. Enter width of line in the **Line width**.
2. Choose background color of the trend in **Color**.
3. Select fill or not in the **Fill** combobox.
4. Choose filling color of the tank in **Fill color**.
5. To add curve click **Collection** button.



Collection window will appear:

1. Select tag that you want to bind to this curve in the **Tag**.
2. Enter curve's name in the **Name** field.
3. Write width of curve's line in **Line width** field.
4. Choose **Color** of the curve.
5. Select **Type** of the curve. *Type 1* just draw the line. *Type 2* draw line with filling till axis X.

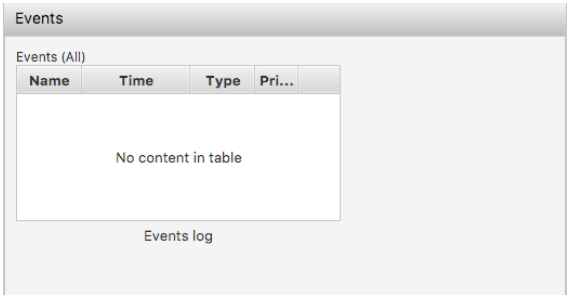
On the *Grid* tab:



1. Enter width of grid's lines in the **Line width** field.
2. Choose **Color** of grid's lines.
3. Select **Line style**: *Solid*, *Dash*, *Dot* or *DashDot*.
4. Write number of horizontal grid's lines in **Horizontally** field.
5. Write number of vertical grid's lines in **Vertically** field.
6. Enter **Maximum** value of the trend.
7. Enter **Minimum** value of the trend.
8. Write **Font size** of the marks.
9. Choose **Mark color**.
10. Enter **Time format** of trend's time axis.

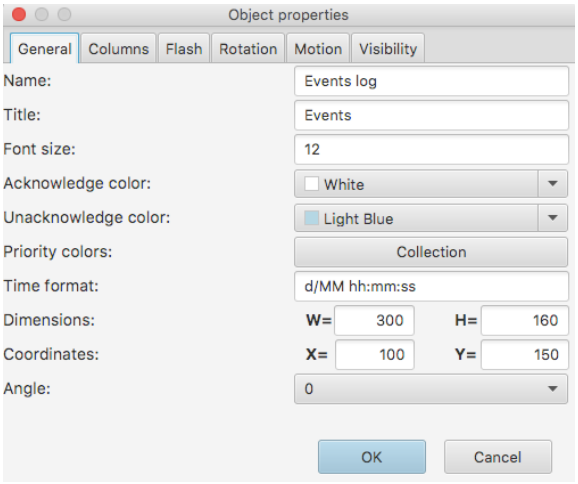
Events library

Events library contains the following object: Events log. *Events log* collects tag's events (check **Enable alarms** and check events you want to collect in Tags properties).



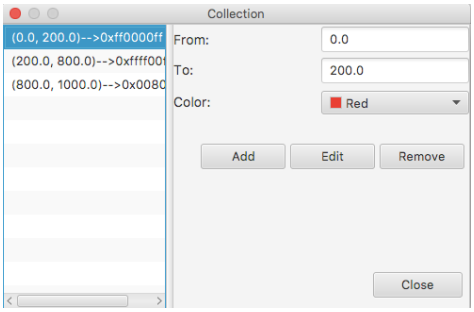
Events log

1. Enter title of the table in the **Title** field.
2. Write size of text in the **Font size**.
3. Choose row's background color of acknowledged events in the **Acknowledge color**.
4. Choose row's background color of not acknowledged events in the **Unacknowledge color**.
5. Choose color of the event's text by clicking **Collection** button.
6. Enter **Time format** of the time's text.



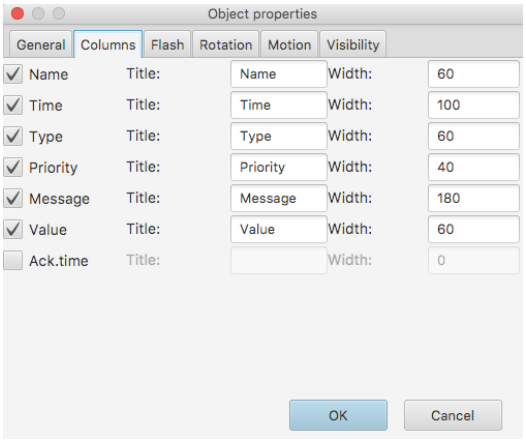
After clicking **Collection** button you'll see the window:

1. Enter the priority of the event from which be used this color in the **From** field.
2. Enter the priority of the event to which be used this color in the **To** field.
3. Choose **Color** of the event's text.



On the *Columns* tab:

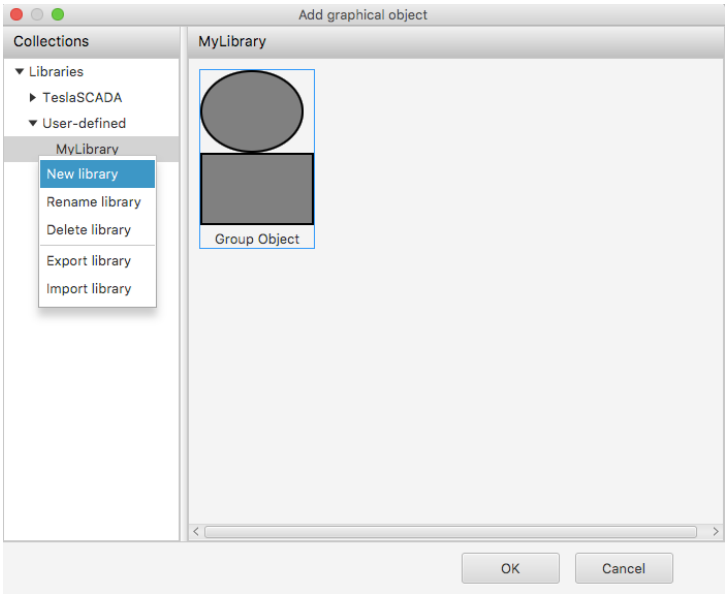
1. Select columns that you want to use in the table.
2. Write titles of the columns in correspondent **Title** field.
3. Enter **Width** of the correspondent column.



User-defined library

Create user-defined library

You can create your own library by clicking right button on *Collections* section of the **Add graphical object** window and choosing *New library* menu item. You can add graphical object in your library by clicking right button on the object on **Canvas** or **Screen window** and choosing *Add to Library->You library* menu item. You can *Select, Rename* or *Delete* created object in your library by clicking right button on it and selecting correspondent menu item.



Rename user-defined library

To rename library:

1. Right click on the library you want to rename and choose *Rename library* item.

Delete user-defined library

To delete library:

1. Right click on the library you want to delete and choose *Delete library* item.

Export user-defined library

To export library:

1. Right click on the library you want to export and choose *Export library* item.
2. Now select the location and click the button *Save* (TeslaSCADA library extension .tsp2lib).

Import user-defined library

To import library:

1. Right click on the Collections window and choose *Import library* item.
2. Now select the library file and click *Open* (TeslaSCADA library extension .tsp2lib).

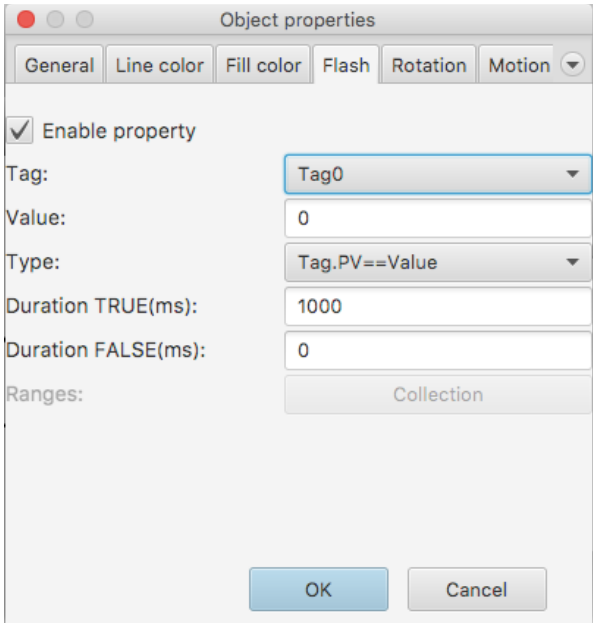
Properties

Each graphical object has several group of properties. To use property of the graphical object check **Enable Property**. Each object has *Flash*, *Rotation*, *Motion* and *Visibility* properties. Other properties depend on the object.

Flash

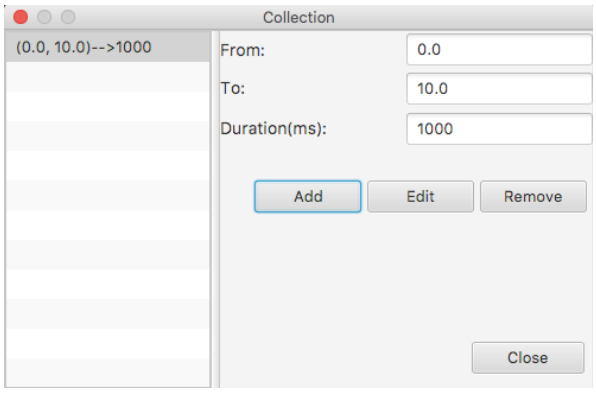
Flash property lets object to flash when conditions is TRUE or FALSE. To edit flash property click **Flash** tab on the object property window.

1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.
4. Write period's time in milliseconds of objects flashing if the comparison is true in the **Duration TRUE(ms)** field. If you enter 0 the object will not flashing.
5. Write period's time in milliseconds of objects flashing if the comparison is false in the **Duration FALSE(ms)** field. If you enter 0 the object will not flashing.
6. If you select *Tag.PV in the range* in the **Type** combobox and click **Collection** button. You'll see the window:



1. Enter the value from which the object will flash with this periodicity in the **From** field.
2. Enter the value to which the object will flash with this periodicity in the **To** field.
3. Enter period of flashing in the **Duration(ms)** field.

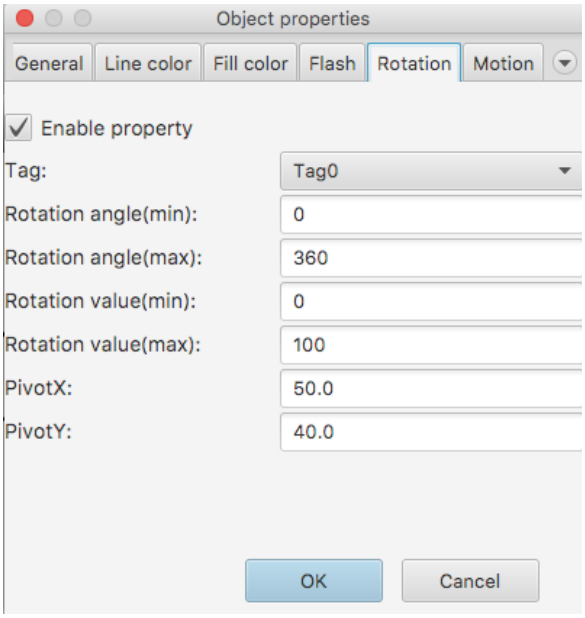
You can *Add*, *Edit* or *Remove* collection element of flashing conditions.



Rotation

Rotation property lets to rotate the object proportional to the value of the tag. To edit rotation property click **Rotation** tab on the object property window.

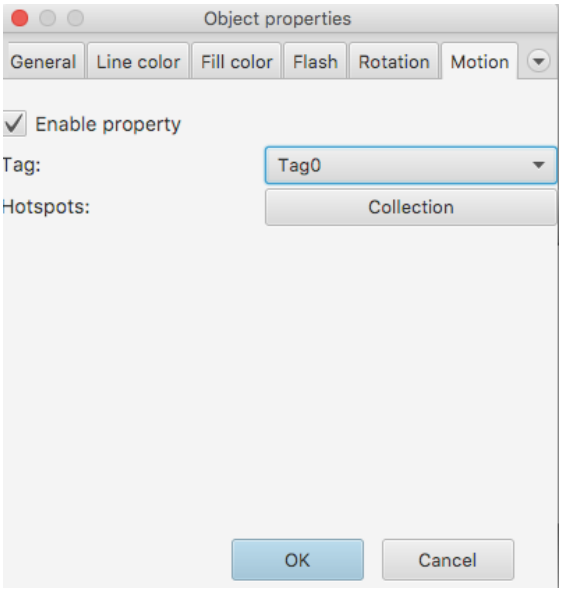
1. Select the **Tag** value of which will be compared.
2. Enter the minimum of rotation angle in the **Rotation angle(min)** field**.**
3. Enter the maximum of rotation angle in the **Rotation angle(max)** field.
4. Write the minimum of the tag's value in the **Rotation value(min)**.
5. Write the maximum of the tag's value in the **Rotation value(max)**.
6. Enter X coordinate of the pivot in **PivotX** field.
7. Enter Y coordinate of the pivot in **PivotY** field.



Motion

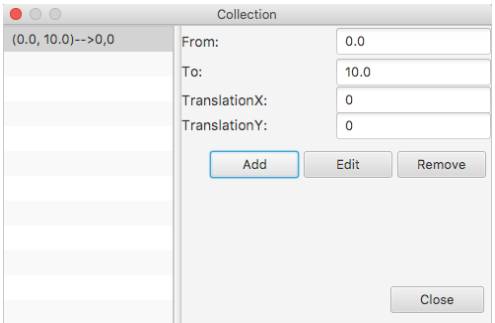
Motion property lets to move the object depending on value of the tag. To edit motion property click **Motion** tab on the object property window.

1. Select the **Tag** depending on value of which the object will change location coordinates.
2. Click Collection button to edit move conditions coordinates.



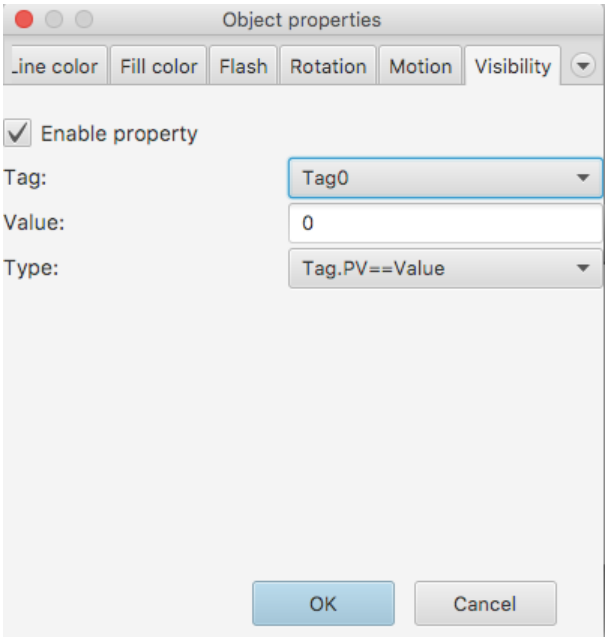
After clicking you'll see window:

1. Enter the value from which the object will change coordinates in the **From** field.
2. Enter the value to which the object will change coordinates in the **To** field.
3. Write **TranslationX** coordinates.
4. Write **TranslationY** coordinates.



Visibility

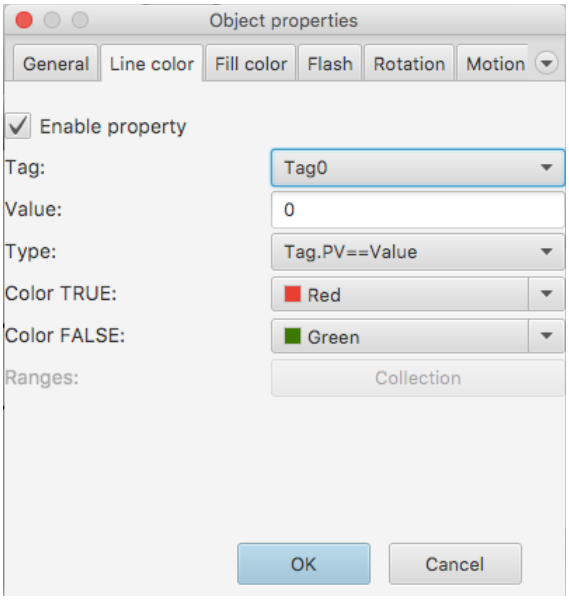
Visibility property lets to make the object visible or not depending on the tag's value. To edit visibility property click **Visibility** tab on the object property window.



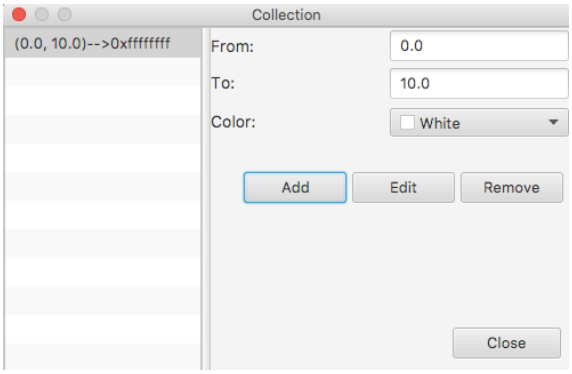
1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.

Line color

Line color property lets object to change color of its line when conditions is TRUE or FALSE. To edit line color property click **Line color** tab on the object property window.



1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.
4. Choose a color that will result if the comparison is true in **Color TRUE**.
5. Choose a color that will result if the comparison is false in **Color FALSE**.
6. If you select *Tag.PV in the range* in the **Type** combobox and click **Collection** button. You'll see the window:

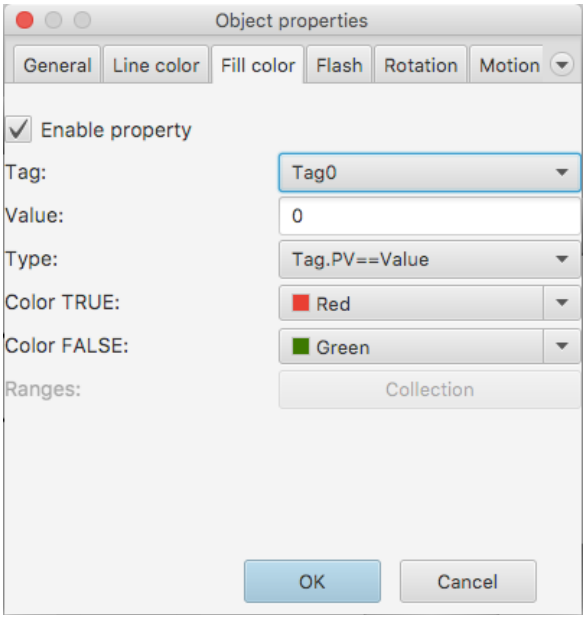


1. Enter the value from which the object will change color in the **From** field.
2. Enter the value to which the object will change color in the **To** field.
3. Choose **Color**.

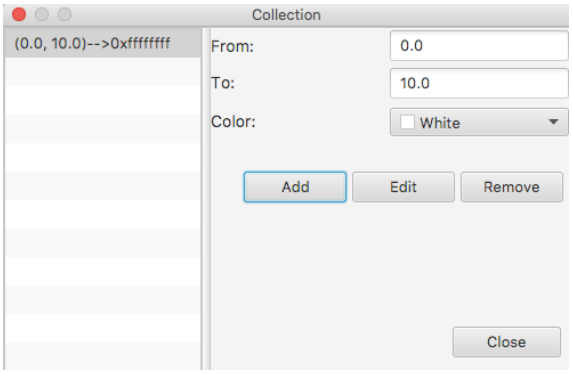
You can *Add*, *Edit* or *Remove* collection element of line color conditions.

Fill color

Fill color property lets object to change color of its filling when conditions is TRUE or FALSE. To edit fill color property click **Fill color** tab on the object property window.



1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.
4. Choose a color that will result if the comparison is true in **Color TRUE**.
5. Choose a color that will result if the comparison is false in **Color FALSE**.
6. If you select *Tag.PV in the range* in the **Type** combobox and click **Collection** button. You'll see the window:

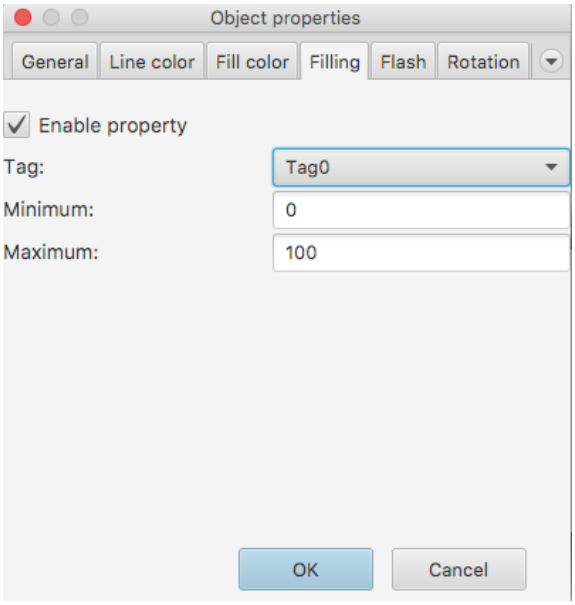


1. Enter the value from which the object will change color in the **From** field.
2. Enter the value to which the object will change color in the **To** field.
3. Choose **Color**.

You can *Add*, *Edit* or *Remove* collection element of fill color conditions.

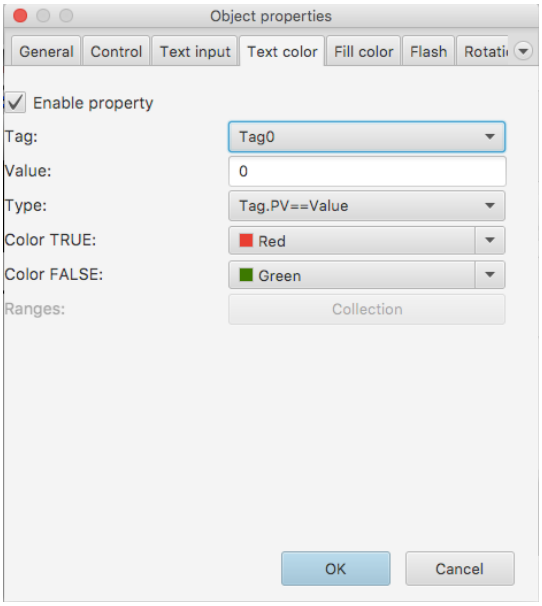
Filling

Filling property lets to control filling of the object depending on value of the tag. To edit filling property click **Filling** tab on the object property window.



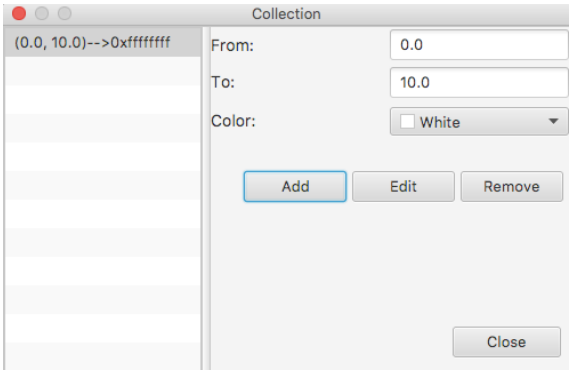
1. Select the **Tag** value of which will be used to control filling.
2. Enter minimum value of the object's filling in the **Minimum** field**.**
3. Enter maximum value of the object's filling in the **Maximum** field.

Text color



Text color property lets object to change color of text when conditions is TRUE or FALSE. To edit text color property click **Text color** tab on the object property window.

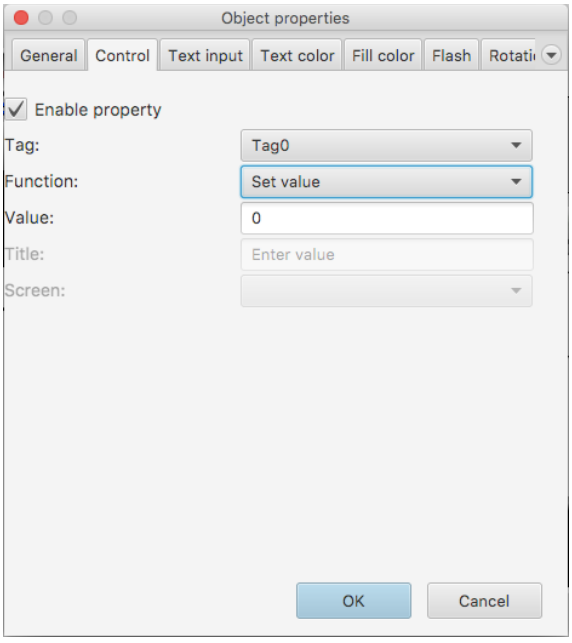
1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.
4. Choose a color that will result if the comparison is true in **Color TRUE**.
5. Choose a color that will result if the comparison is false in **Color FALSE**.
6. If you select *Tag.PV in the range* in the **Type** combobox and click **Collection** button. You'll see the window:



1. Enter the value from which the object will change color in the **From** field.
2. Enter the value to which the object will change color in the **To** field.
3. Choose **Color**.

You can *Add*, *Edit* or *Remove* collection element of text color conditions.

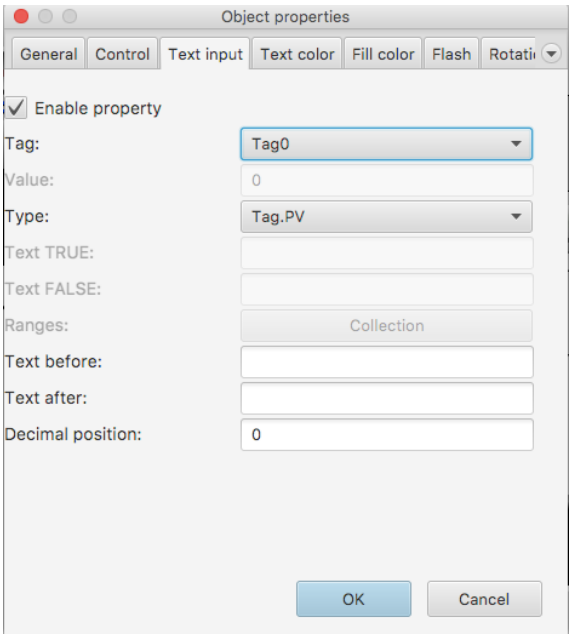
Control (for buttons)



Control property lets to write value to the tag. To edit control property click **Control** tab on the object property window.

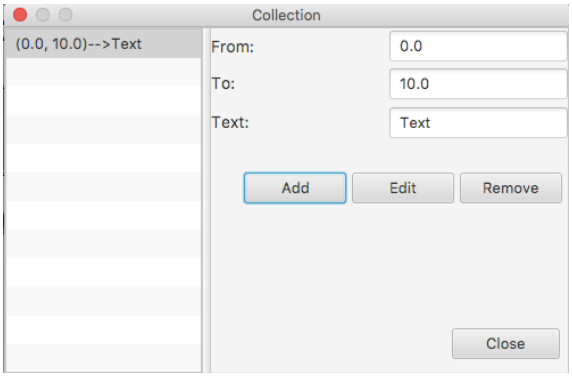
1. Select **Tag** which will be recorded value.
2. Select **Function** of writing value: *Set* - will write true to the tag; *Reset* - will write false to the tag; *Toggle* - if current tag's value true will write false, if currents tag's value false will write true; *Push* - during pressing button will write true; *Set value* - will write Value to the tag; *Enter value* - will call dialog that lets you enter value; *Call screen* - will call selected screen; *Call popup* - will call selected popup screen.
3. When you select *Set value* **Function** write **Value** that will be written to the tag.
4. When you select *Enter value* **Function** write **Title** of the called dialog that lets you enter value.
5. When you select *Call screen* or *Call popup* **Function** choose **Screen** that will be called after clicking button.

Text input



Text input property lets object to control display text when conditions is TRUE or FALSE. To edit text input property click **Text input** tab on the object property window.

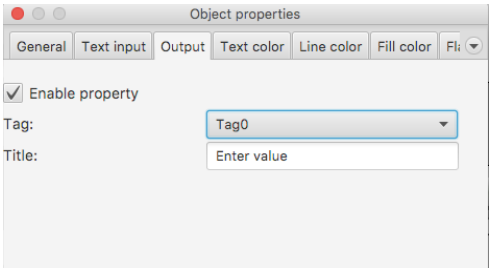
1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.
4. Enter text that will result if the comparison is true in **Text TRUE**.
5. Enter text that will result if the comparison is false in **Text FALSE**.
6. Write the text will be shown before displayed text in the **Text before**.
7. Write the text will be shown after displayed text in the **Text after**.
8. Enter **Decimal position** of displayed text in the field.
9. If you select *Tag.PV in the range* in the **Type** combobox and click **Collection** button. You'll see the window:



1. Enter the value from which the object will change text in the **From** field.
2. Enter the value to which the object will change text in the **To** field.
3. Write displayed **Text**.

You can *Add*, *Edit* or *Remove* collection element of displayed text conditions.

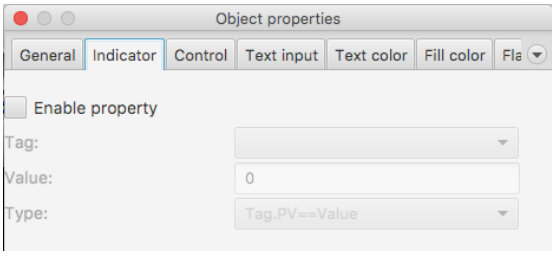
Output



Output property lets to write value to the tag. To edit output property click **Output** tab on the object property window.

1. Select the **Tag** where value will be written.
2. Enter **Title** of the dialog that will be used to write value to the tag.

Indicator

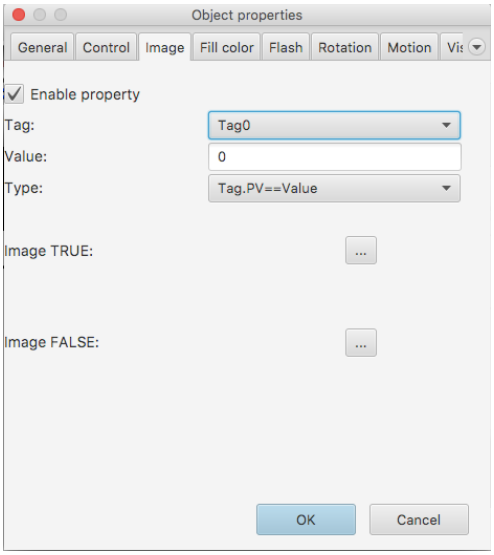


Indicator property lets to indicate object depending on value of the tag. To edit indicator property click **Indicator** tab on the object property window.

1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.

Image

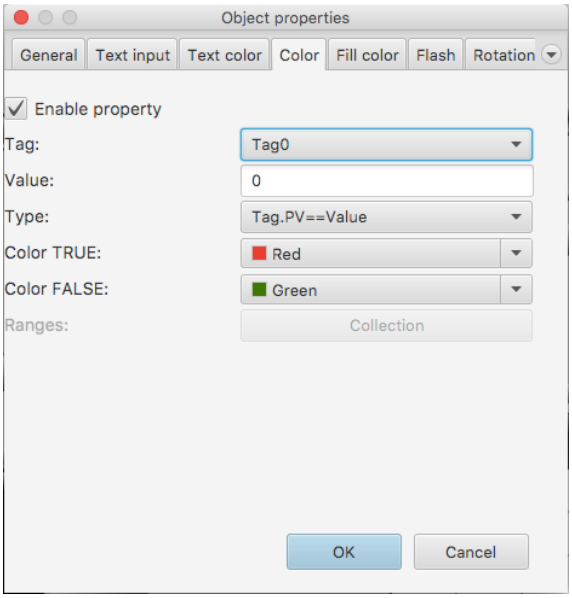
Image property lets object to change image when conditions is TRUE or FALSE. To edit image property click **Image** tab on the object property window.



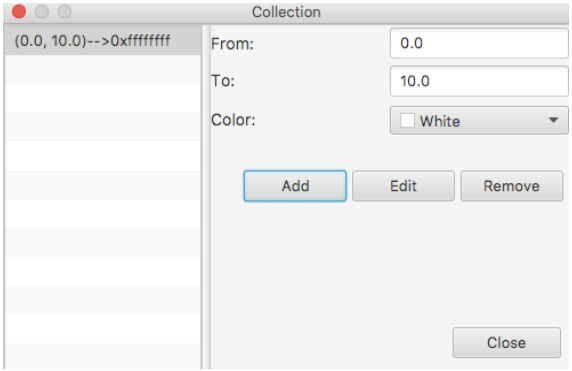
1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.
4. Choose image that will result if the comparison is true by clicking **Image TRUE** button.
5. Choose image that will result if the comparison is false by clicking **Image FALSE** button.

Color

Color property lets object to change color of its when conditions is TRUE or FALSE. To edit color property click **Color** tab on the object property window.



1. Select the **Tag** value of which will be compared.
2. Enter the comparison **Value.**
3. Select **Type** of comparison.
4. Choose a color that will result if the comparison is true in **Color TRUE**.
5. Choose a color that will result if the comparison is false in **Color FALSE**.
6. If you select *Tag.PV in the range* in the **Type** combobox and click **Collection** button. You'll see the window:



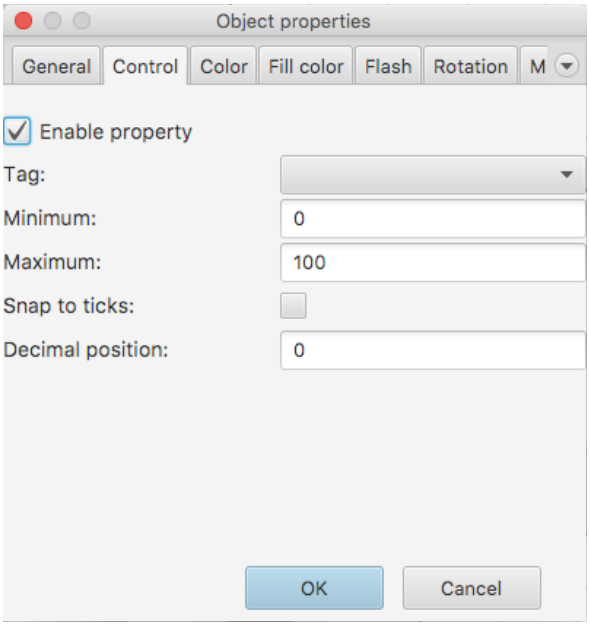
1. Enter the value from which the object will change color in the **From** field.
2. Enter the value to which the object will change color in the **To** field.
3. Choose **Color**.

You can *Add*, *Edit* or *Remove* collection element of color conditions.

Control (slider)

Control property lets object to write value to the tag. To edit control property click **Control** tab on the object property window.

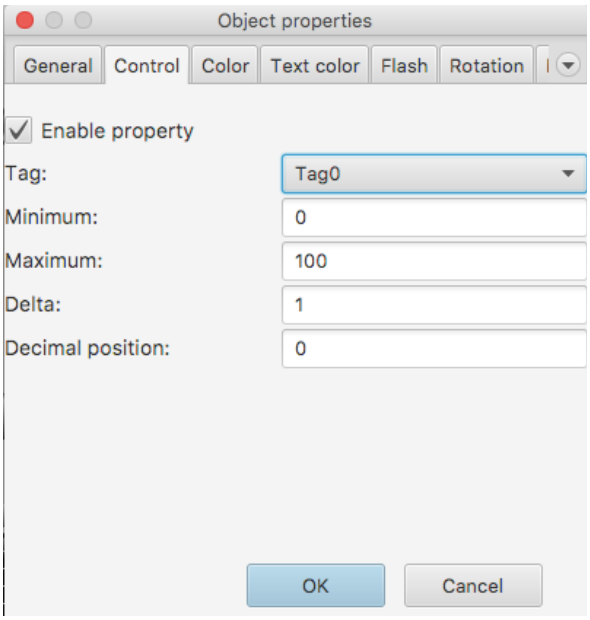
1. Select the **Tag** value of which will be changed.
2. Enter **Minimum** value of the control.
3. Enter **Maximum** value of the control.
4. Check **Snap to ticks** if you want to bind control's value.
5. Enter **Decimal position** of displayed text in the field.



Control (counter)

Control property lets object to write value to the tag. To edit control property click **Control** tab on the object property window.

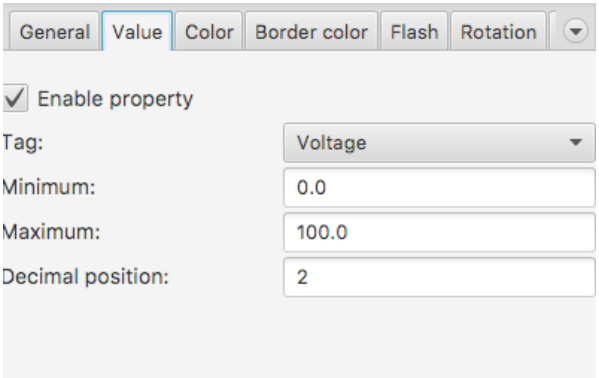
1. Select the **Tag** value of which will be changed.
2. Enter **Minimum** value of the control.
3. Enter **Maximum** value of the control.
4. Write **Delta** in the field.
5. Enter **Decimal position** of displayed text in the field.



Value (for meters)

Value property lets to control values of analog and digital meters depending on value of the tag. To edit value property click **Value** tab on the object property window.

1. Select the **Tag** value of which will be used to control value of meter.
2. Enter minimum value of the meter in the **Minimum** field**.**
3. Enter maximum value of the meter in the **Maximum** field.
4. Enter **Decimal position** of displayed text in the field.

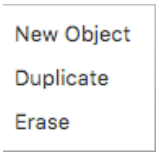


Design script

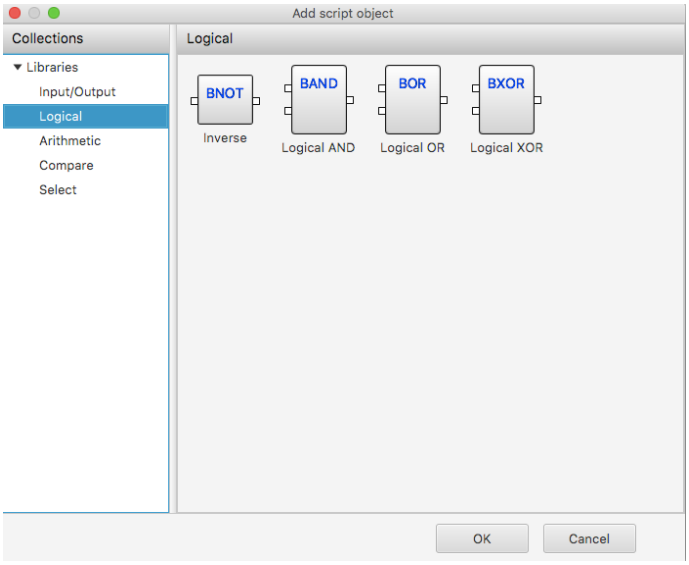
To start designing the script you want, you should double click on it or click right button on the **Project window->Scripts** and choose *Open script*. For creating scripts you should use FBD objects.

Create script object

Add new graphical object object on the screen you can in this way: click right button on the **Canvas** and choose *New object* item



You'll see the **Add script object** window:



Select library which object you want to use in your project (all libraries and their objects described below). Select object you can in several ways:

1.By double clicking on the object.

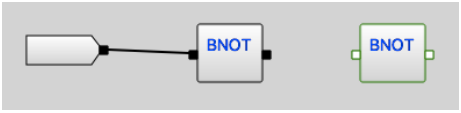
2. By clicking on the object (select rectangle will appear) and then clicking OK button.

3.By clicking right button and choosing *Select* item.

Add script object window will disappear and you can select the location on the screen where you want to place an object.

Connect script objects

To connect two objects, click the end of the first (the end to paint over) and click start the second. This will bring up a line connection.

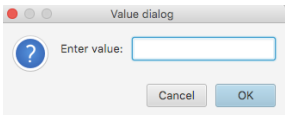


Bind script object to the tag

You can bind Input/Output script objects to the tag. To do this click on Input/ Output script object, dialog will appear. Select tag you want to bind.

Enter value to the value script object

You can enter value to value script objects to the tag. To do this click on value script object, dialog will appear. Enter value you want to use with this object.



Duplicate script object

You can duplicate script object. Right click on the object you want to duplicate and select *Duplicate* menu item.

Erase script object

You can erase script object. Right click on the object you want to erase and select *Erase* menu item.

Erase connection line

You can erase connection line. Right click on the line you want to erase and select *Erase* menu item.

Script objects

Below description of script libraries and object.

Input/Output library

Input tag - this script object used to bind input tag to the script.

Output tag - this script object used to bind output tag to the script.

Value - this script object used to bind input constant value to the script.

Logical library

Inverse - this script object used to inverse input boolean value (Output = ! Input).

Logical AND - this script object used to logical operation AND for input boolean values (Output = Input & Input2).

Logical OR - this script object used to logical operation OR for input boolean values (Output = Input || Input2).

Logical XOR - this script object used to logical operation XOR for input boolean values (Output = Input XOR Input2).

Arithmetic library

Addition - this script object used to arithmetic operation addition for input values (Output = Input + Input2).

Subtraction - this script object used to arithmetic operation subtraction for input values (Output = Input - Input2).

Multiplication - this script object used to arithmetic operation multiplication for input values (Output = Input * Input2).

Division- this script object used to arithmetic operation division for input values (Output = Input / Input2).

Modulo - this script object used to arithmetic operation modulo for input values (Output = Input % Input2).

Compare library

Equal - this script object used to comparison operation equal for input values (Output = Input == Input2).

Not Equal - this script object used to comparison operation not equal for input values (Output = Input != Input2).

Greater - this script object used to compare operation greater for input values (Output = Input > Input2).

Less - this script object used to compare operation less for input values (Output = Input < Input2).

Equal or Greater - this script object used to compare operation equal or greater for input values (Output = Input >= Input2).

Equal or Less - this script object used to compare operation equal or less for input values (Output = Input <= Input2).

Select library

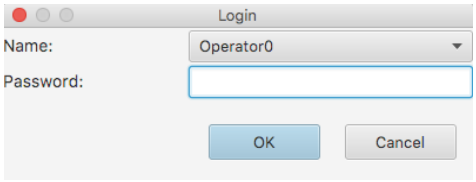
Selectable enable - this script object used to select value form Input2 if Input1 is true (IF Input==true THEN Output=Input2).

Selectable negate - this script object used to select value form Input2 if Input1 is false (IF Input==false THEN Output=Input2)

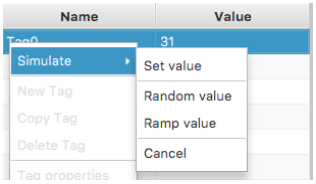
Simulation

You can simulate behavior of you project. To start simulation select the menu item *Project* and *Run simulation* or click button on the **Toolbar**.

If you use users in your project Login dialog will appear. Select user and enter password in the field. Now you can simulate your project.



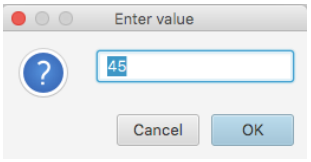
You can change value of the tag by double clicking on it in the **Project window ->Tags.** Or you can click by right button on the tag and select *Simulate* and *Set value* menu item. Also you can simulate behavior of the tag:



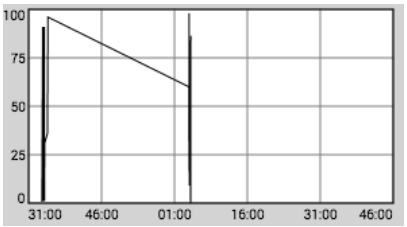
1. *Random value* - periodically change the value of the tag randomly.
2. *Ramp value* - periodically change the tag value from 1 to 100 by adding 1.

By selecting *Simulate* and *Cancel* you annul the task.

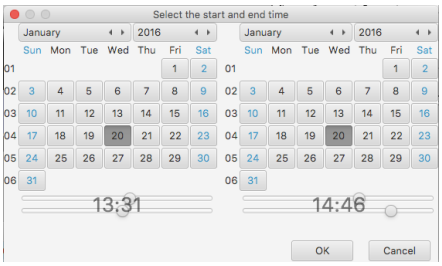
Also it's possible to change value of the tag using control graphical objects of your project like text, buttons, slider, counter and etc. For example if you use Text object enable output property and bind to the tag you want to use. During simulation click on it and enter value you want.



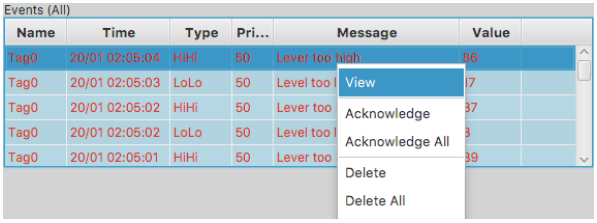
Also you can simulate behavior of **Trend** and **Events log** objects. Place these objects on the **Canvas.** Set properties of the object as describe in previous chapters.
During simulation trend will be look like this:



To select start and end time click on it. You'll see the following dialog. Select times and click OK.

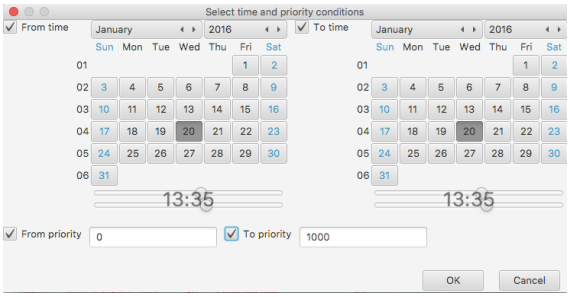


During simulation Events log will be look like this:



1. To **View** message in the separate dialog double click on it or click right button on it and select *View* menu item.
2. To acknowledge record click by right button on it and select **Acknowledge** menu item.
3. To acknowledge all records on the table click by right button on the table and select **Acknowledge All** menu item.
4. To delete record click by right button on it and select **Delete** menu item.
5. To delete all records on the table click by right button on the table and select **Delete All** menu item.

You can select records that you want to see in the table. Click on the table't title. You'll see **Select time and priority conditions** dialog. Select start and end times of records displayed in the table. You can also set records with what priorities will be displayed.



Load on device

When a project is created (screens, servers, tags, scripts and users), the project can be loaded on the mobile device or other PC. For this purpose, first the corresponding TeslaSCADA Runtime mobile app on the Android device or PC apps on the Windows, Linux or MAC OS must be installed and started.

If the app has now been installed on the mobile device or PC, there are 2 ways to load the project to the device.

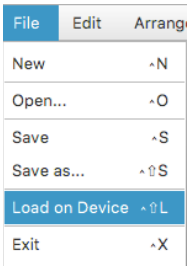
1. Network method.
2. Manual method.

Network method

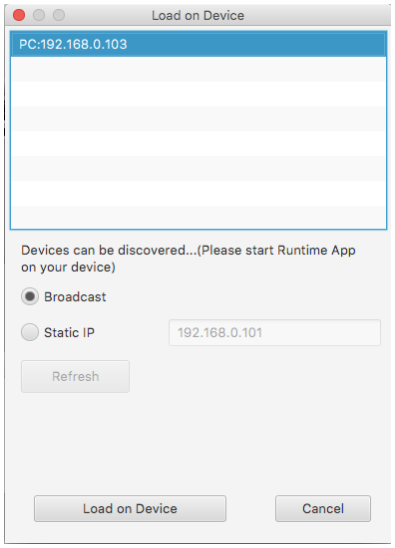
This method must, the PC on which the TeslaSCADA IDE is started, and the mobile device or PC on which TeslaSCADA Runtime started and the project will be stored in a Wi - Fi network (note IP addresses) are.

Procedure:

1. Enable WiFi on your mobile device or PC where installed TeslaSCADA Runtime.
2. Start the TeslaSCADA Runtime app.
3. Open it in the editor TeslaSCADA IDE the desired project to be transferred.
4. Select the menu item *File* and *Load on Device*.



5. It now opens the dialog **Load on Device** and it will now search for mobile devices with the active TeslaSCADA Runtime. You can start a broadcast search and browse the entire network. However, since some routers do not forward broadcasts, there is also the possibility of a specific device search on the IP address.

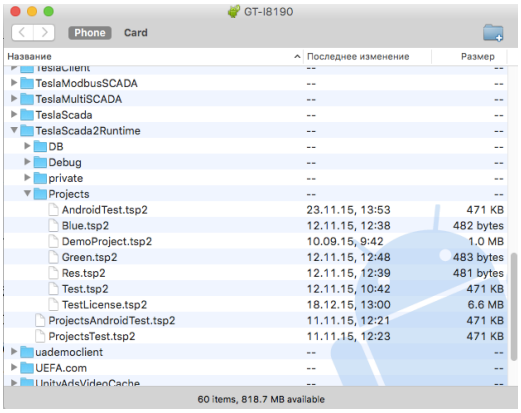


This search takes a normally 5-10s. In individual cases it may happen that this search can take up to 3 minutes.

If you can't find a device you can try to restart **Load on Device** dialog and TeslaSCADA Runtime application.

6. After a successful search in this dialog box all found mobile devices with active TeslaSCADA Runtime app will be shown.
7. Now select the desired target device and press the **Load on Device** button.
8. After a successful transfer, the target device with TeslaSCADA Runtime load new project.

Manual method



Another way to load a project on the mobile device is a file explorer such as: the **Android File Transfer** for Mac OS. Once the TeslaSCADA Runtime installed mobile app and once started on the sd card, a folder called **TeslaSCADA2Runtime->Projects** is created.
Now, if the project which has been stored as .tsp2 file from the Windows, Linux or MacOS system TeslaSCADA IDE(The path was chosen when you first save of the project) will be manually copied to the folder of the sd card of the TeslaSCADA Runtime mobile device, the app can be started normally. Now loads the app, the file from this folder by clicking *Load* on the main menu of TeslaSCADA Runtime.
There is no problem to manually copy to the PC where TeslaSCADA Runtime is installed. You can use local network, flash driver or use any other storage device.