TeslaSCADA2

Quickstart Tutorial

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Quickstart tutorial

Welcome, and thank you for downloading TeslaSCADA2. We would like your experience with the product to be a pleasant one, so we have created this tutorial to help new users get familiar with some of the fundamental features of the product.

This tutorial assumes that you have already successfully installed the TeslaSCADA2 IDE and TeslaSCADA2 Runtime products on your computer. You do not require any license to complete this tutorial.

Repetition is an important part of learning or memorizing. One way you can speed up your familiarization is to take a few minutes to click through all the menus in the product and (briefly) try and figure out what each item might be for, if you can't make sense of something, don't be concerned just move on to the next one anyway. You may not consciously remember everything you see, but it helps to set a framework for when you revisit these items in the tutorial and in this way you will remember them much better.

Definition of Terms

Click	= Briefly press left mouse button
Double Click	= Press left mouse button twice – quickly
Right Click	= Briefly press right mouse button
Check	= A tick or cross in an options box
Type **Text**	= Type in the word Text
Drag	= Position mouse, click and hold left mouse button, move mouse, then release mouse button.


Single Click


Right Click


Double Click

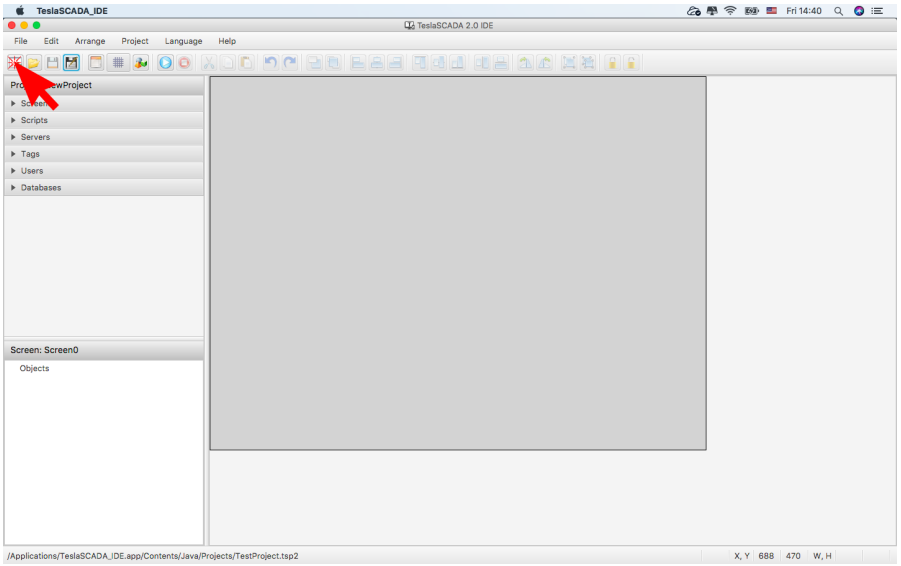

Click and drag


Type

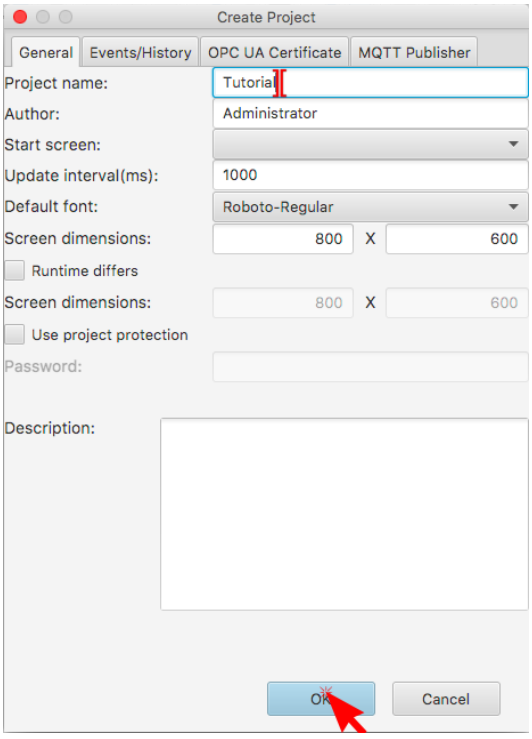
TeslaSCADA2 consists of two parts - TeslaSCADA2 IDE for creating project and TeslaSCADA2 Runtime for running your project and communicating with devices and servers.

Create a New Project

Run TeslaSCADA_IDE. On the Tool Bar, **click** on the **New Project** icon. 

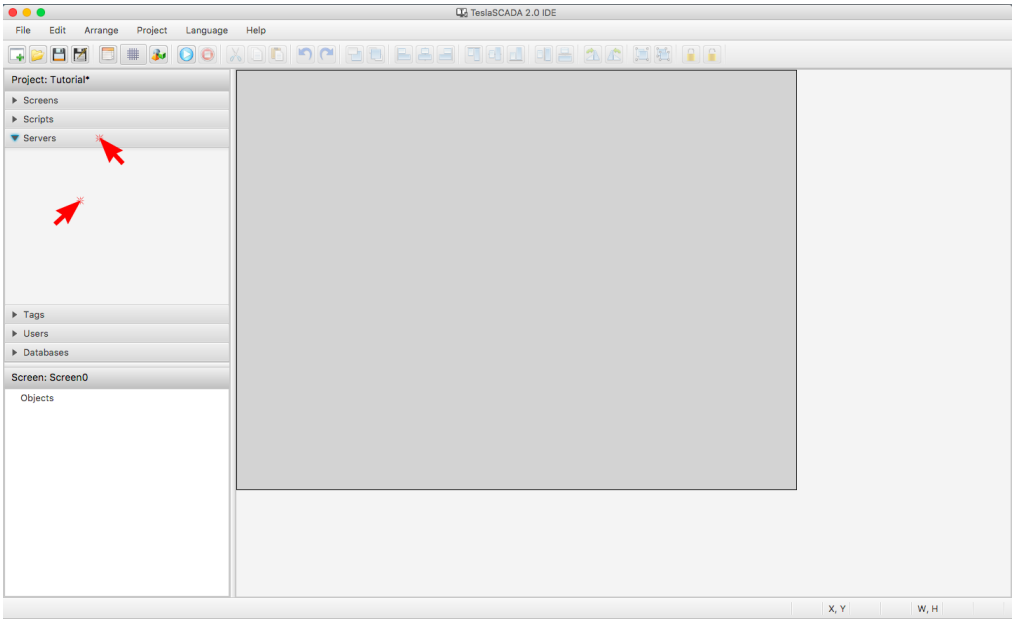


In the **Create Project Dialog Box**, type **Tutorial** in the **Name field** to give the new project a name, give it a description, then **click OK**.

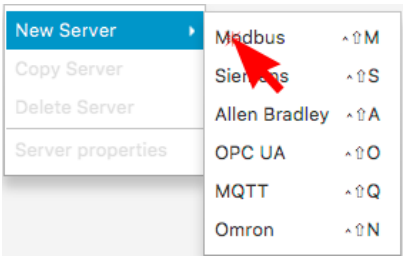


Create a New Server (I/O Device)

To create **New Server** click on the **Servers tab** and **Right click** on the server pane.

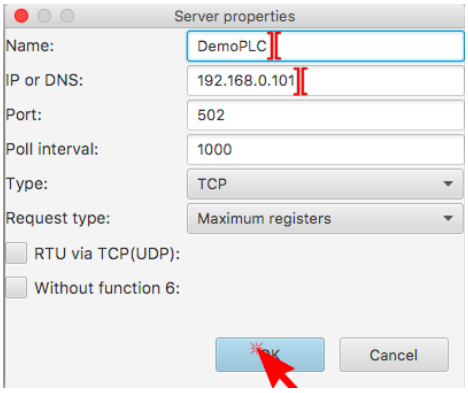


Modbus

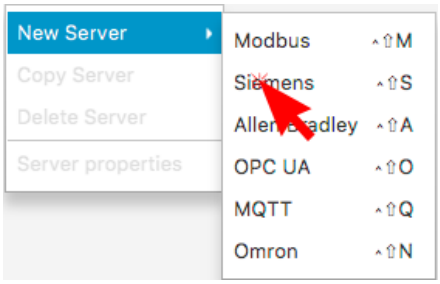


Context menu will be appear. Choose **New Server** and **click Modbus**.

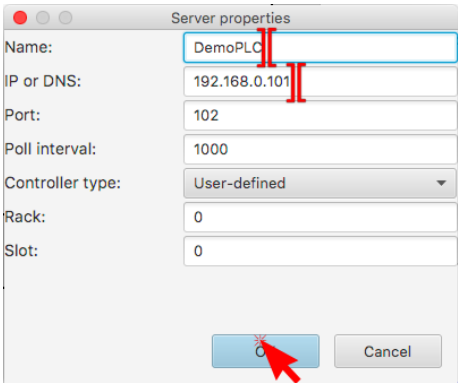
In the **Server properties Dialog Box**, type **DemoPLC** in the **Name field** to give the new server (your device) a name, in the **IP or DNS** type **IP address** of your device, then **click OK**.



Siemens

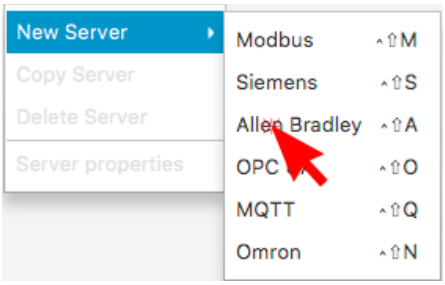


Context menu will be appear. Choose **New Server** and **click Siemens**.

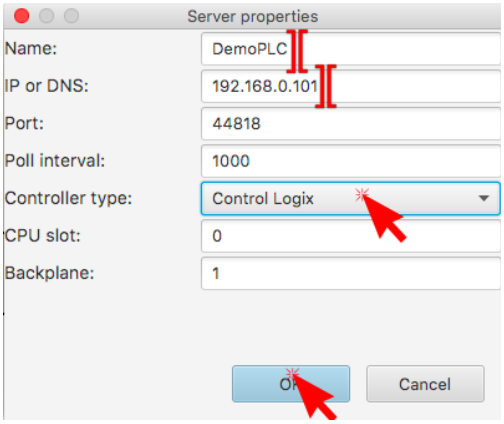


In the **Server properties Dialog Box**, type **DemoPLC** in the **Name field** to give the new server (your device) a name, in the **IP or DNS** type **IP address** of your device, then **click OK**.

Allen Bradley (Control Logix or Compact Logix)

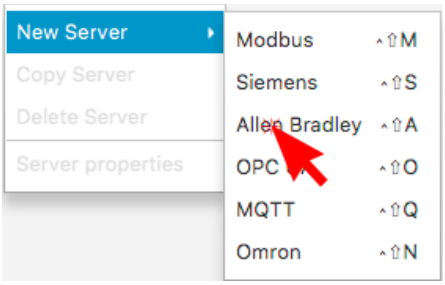


Context menu will be appear. Choose **New Server** and **click Allen Bradley**.

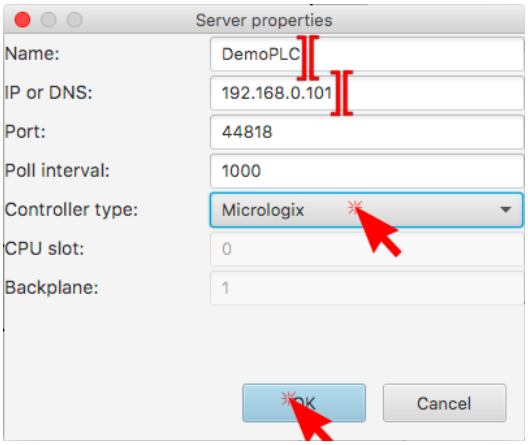


In the **Server properties Dialog Box**, type **DemoPLC** in the **Name field** to give the new server (your device) a name, in the **IP or DNS** type **IP address** of your device, choose **Control Logix** or **Compact Logix** in **Controller type** then **click OK**.

Allen Bradley (Micrologix or SLC)

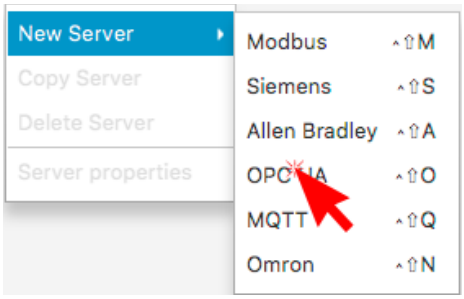


Context menu will be appear. Choose **New Server** and **click Allen Bradley**.



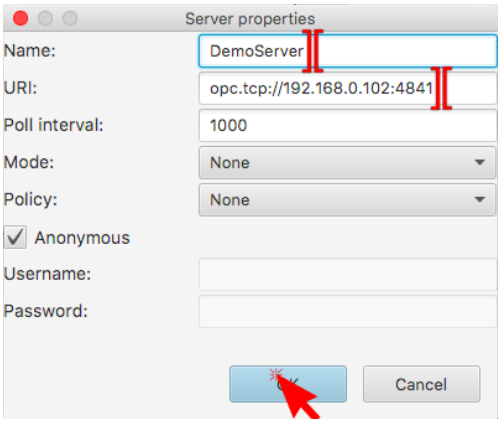
In the **Server properties Dialog Box**, type **DemoPLC** in the **Name field** to give the new server (your device) a name, in the **IP or DNS** type **IP address** of your device, choose **Micrologix** or **SLC** in **Controller type** then **click OK**.

OPC UA

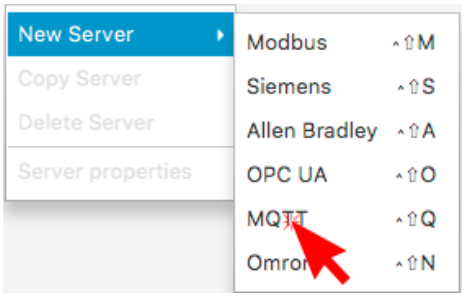


Context menu will be appear. Choose **New Server** and **click OPC UA**.

In the **Server properties Dialog Box**, type **DemoServer** in the **Name field** to give the new server (your device) a name, in the **URI** type **URI address** of your server, then **click OK**.

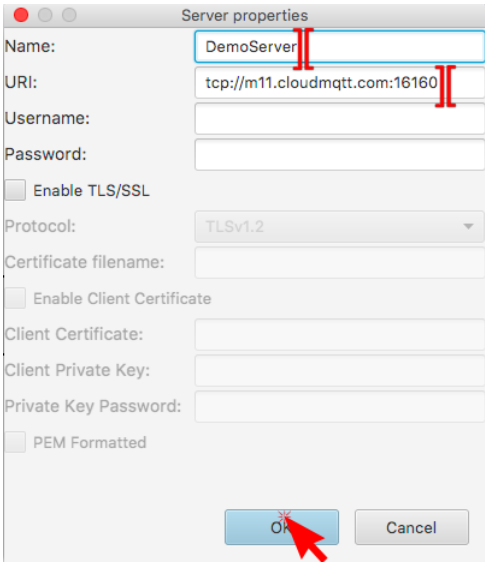


MQTT

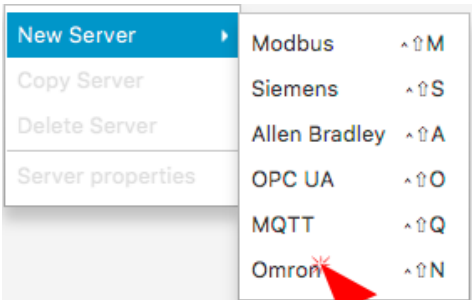


Context menu will be appear. Choose **New Server** and **click MQTT**.

In the **Server properties Dialog Box**, type **DemoServer** in the **Name field** to give the new server (your device) a name, in the **URI** type **URI address** of your server, then **click OK**.

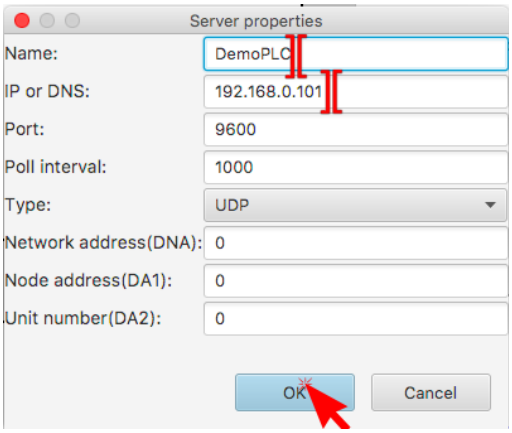


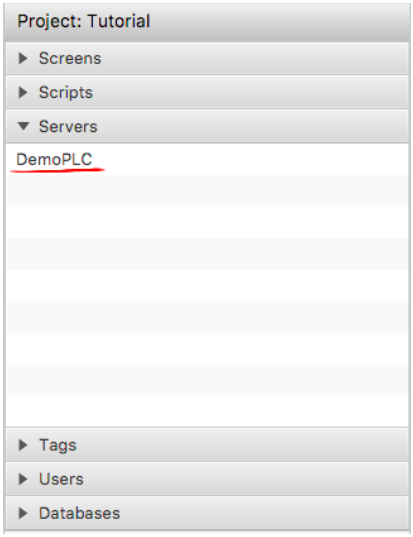
Omron



Context menu will be appear. Choose **New Server** and **click Omron**.

In the **Server properties Dialog Box**, type **DemoPLC** in the **Name field** to give the new server (your device) a name, in the **IP or DNS** type **IP address** of your device, then **click OK**.

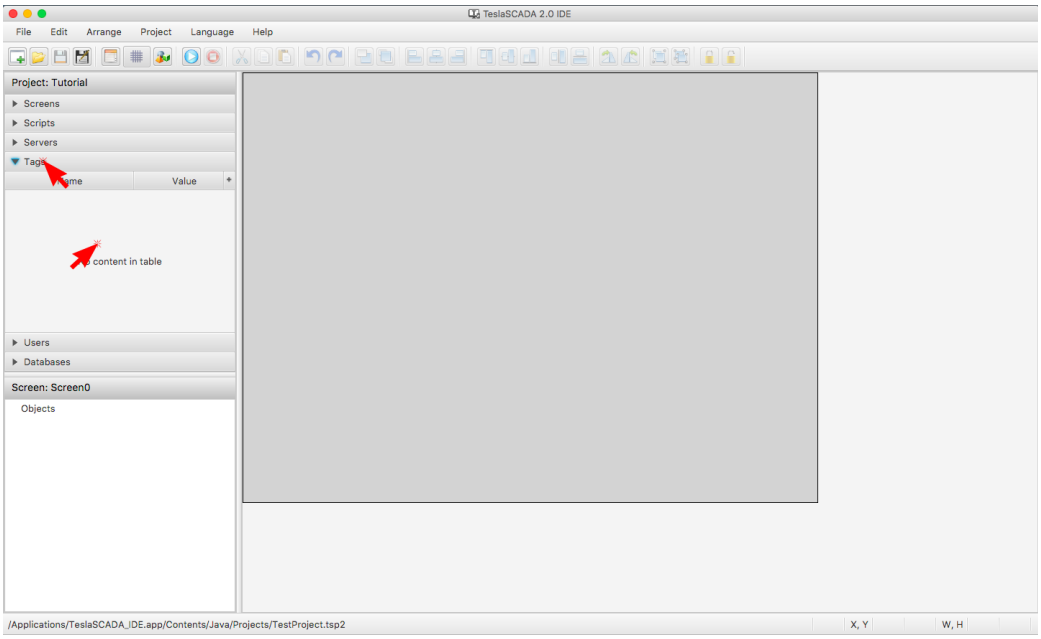


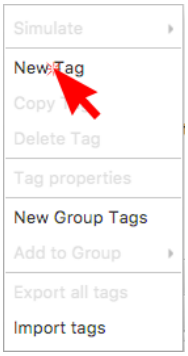


Your server will be appear on the **Servers** pane.

Create a New Tag

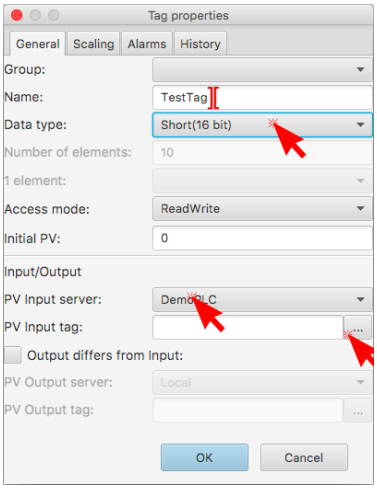
To create **New Tag** click on the **Tag tab** and **Right click** on the tag pane.



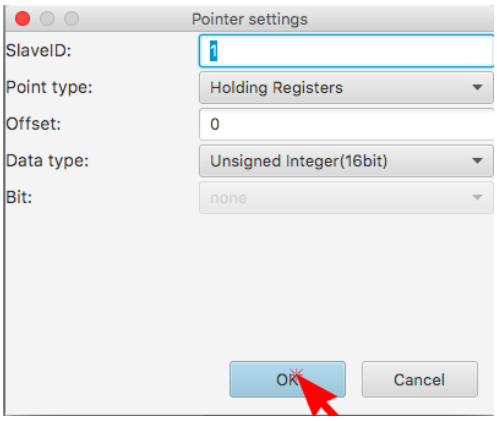


Context menu will be appear. Click **New Tag**.

In the **Tag properties Dialog Box**, type **TestTag** in the **Name field** to give the new tag a name, in the **Data type** choose **Short(16 bit)**, in the **PV input server** combobox choose **DemoPLC**. Then click **"…"** button.

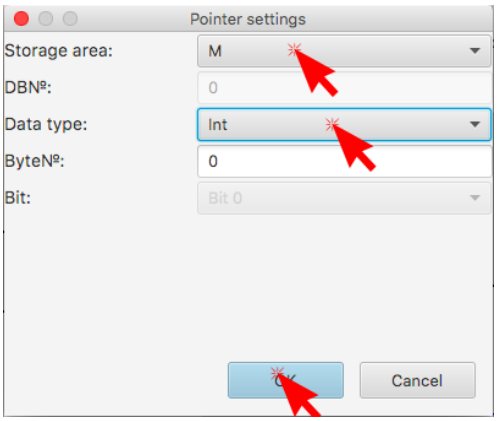


Modbus



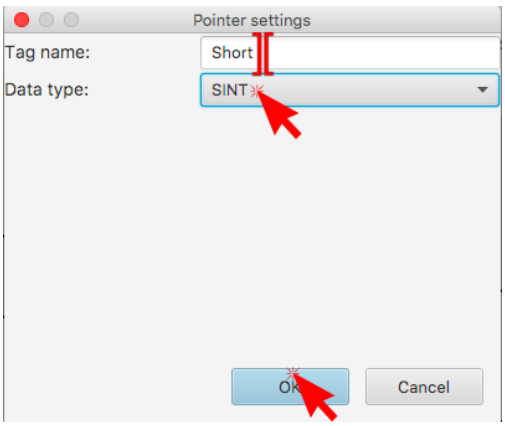
Pointer settings will be appear. Left all default parameters and then **click OK**.

Siemens



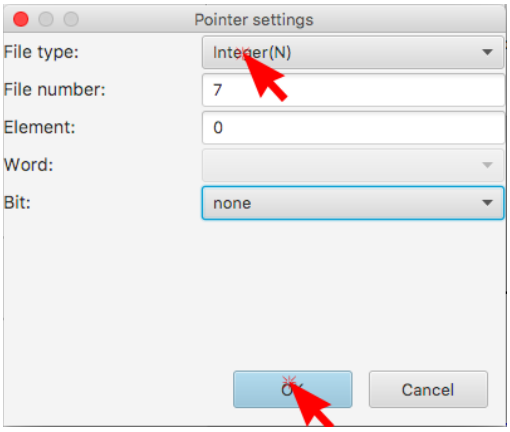
Pointer settings will be appear. Choose **M** Storage area, **Int** Data type and then **click OK**.

Allen Bradley (Control Logix or Compact Logix)



Pointer settings will be appear. Enter **Short (name of your tag)** in the **Tag name** field, choose **SINT Data type** and then **click OK**.

Allen Bradley (Micrologix or SLC)

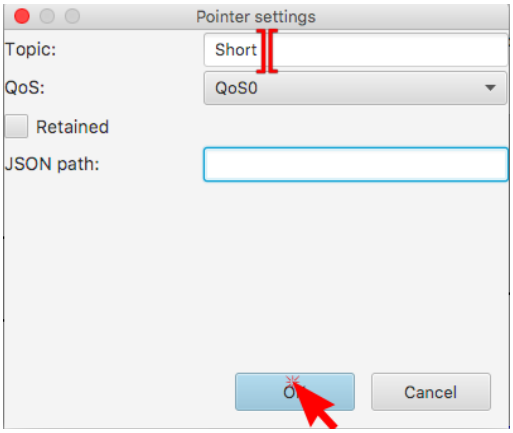


Pointer settings will be appear. Choose **Integer** in the **File type** and then **click OK**.

OPC UA

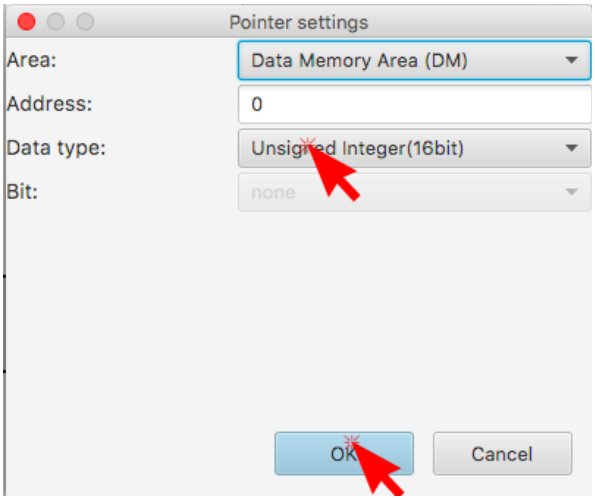
Address Space will appear. Browse address space, choose **Node** you want to bind this tag, **Right click** on in it and click **Select**.

MQTT



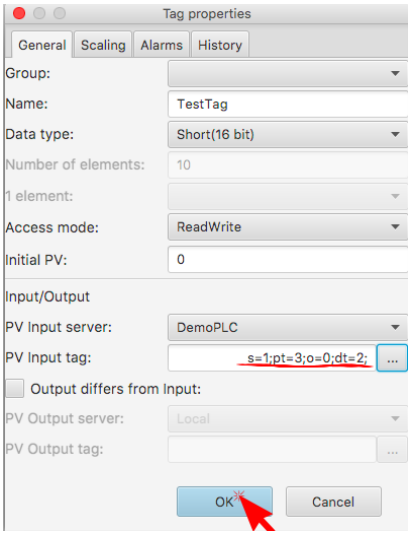
Pointer settings will be appear. Enter **Short** (name of the server's topic) in the **Topic** and then **click OK**.

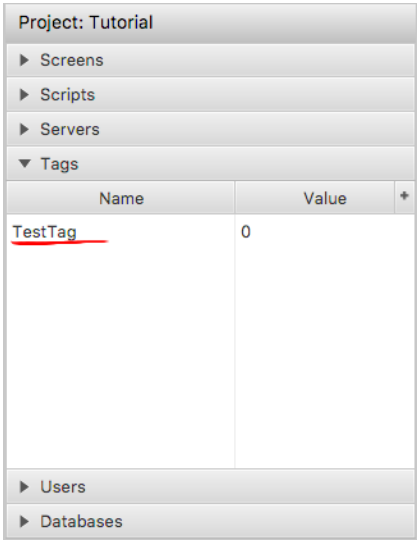
Omron



Pointer settings will be appear. Choose **Unsigned Integer (16bit)** in the **Data type** and then **click OK**.

In the **PV input tag** field of the **Tag properties** dialog symbol of the pointer will be appear. Then click **OK**.

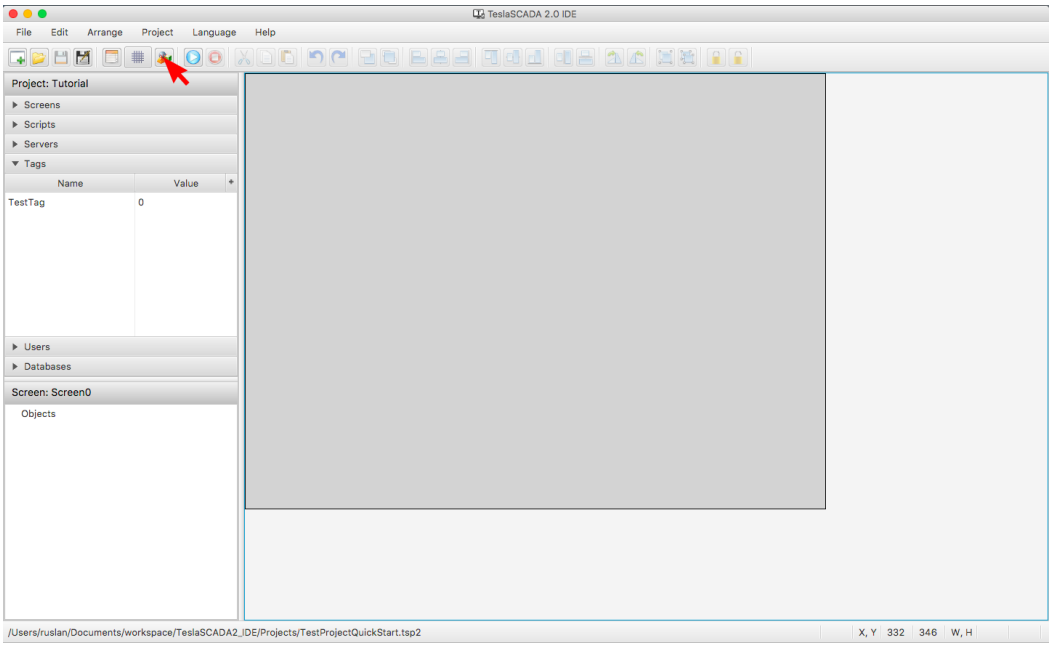




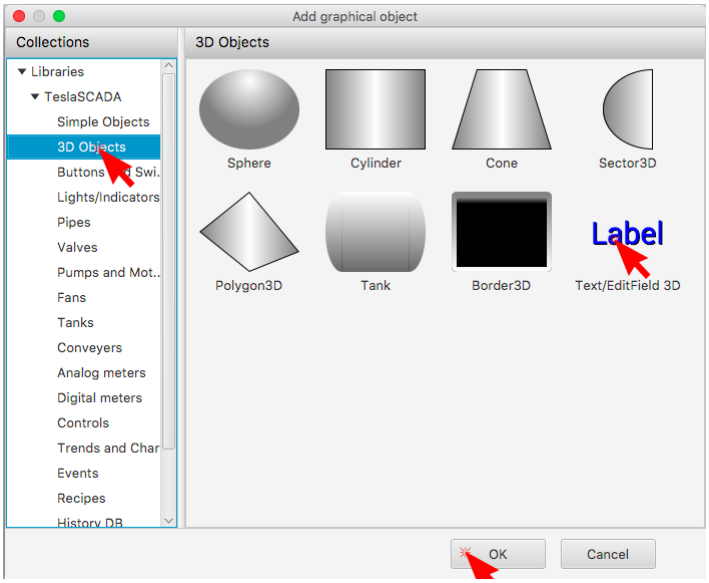
Your tag will be appear on the **Tags** pane.

Create a New Graphical Object

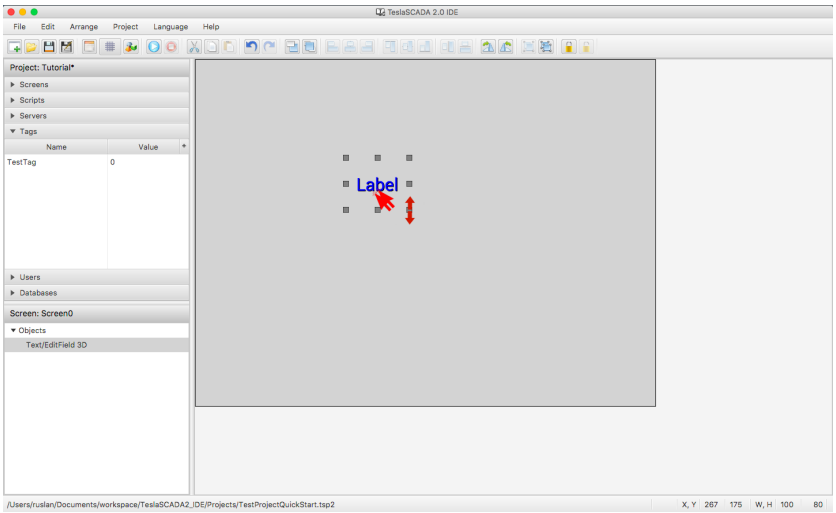
To create **New Graphical object** on the Tool Bar, **click** on the **New Object**  icon.



In the **Add graphical object** dialog box click **3D Objects** in Collections, click **Text/ EditField 3D** object and then click **OK**.



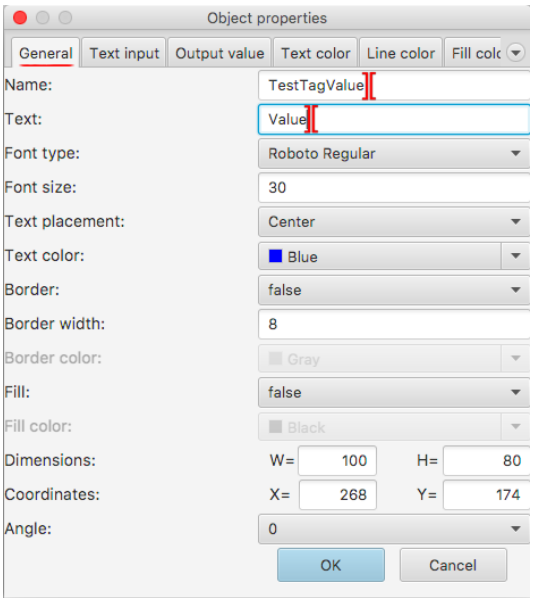
On the field for designing **Screen** (Window) you'll see a cross. Move this cross where you want and **click**. On the

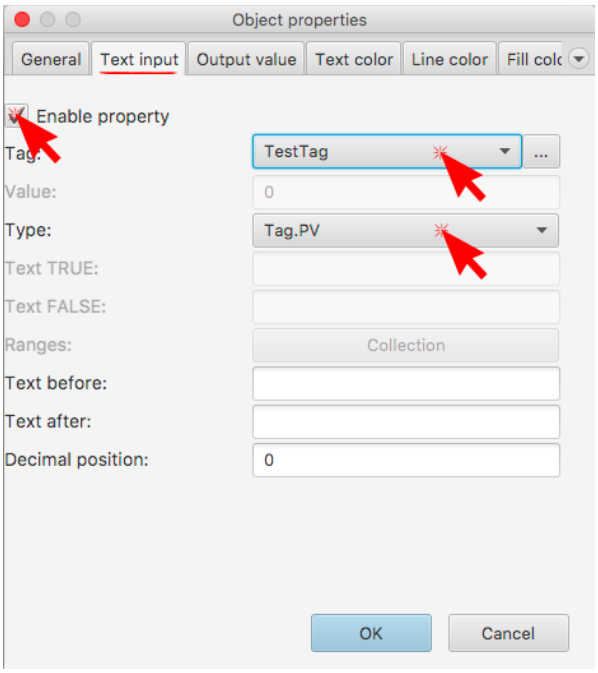


Screen you can see a graphical object **Text/EditField 3D** and squares for resizing graphical object. You can **Drag and Drop** these squares for resizing object.

Double click on the graphical object for **Edit** properties of it.

In the **Object properties** dialog box choose **General** tab and type **TestTagValue** in the **Name** field and **Value** in the **Text field**.





Then click on the **Text Input** tab.

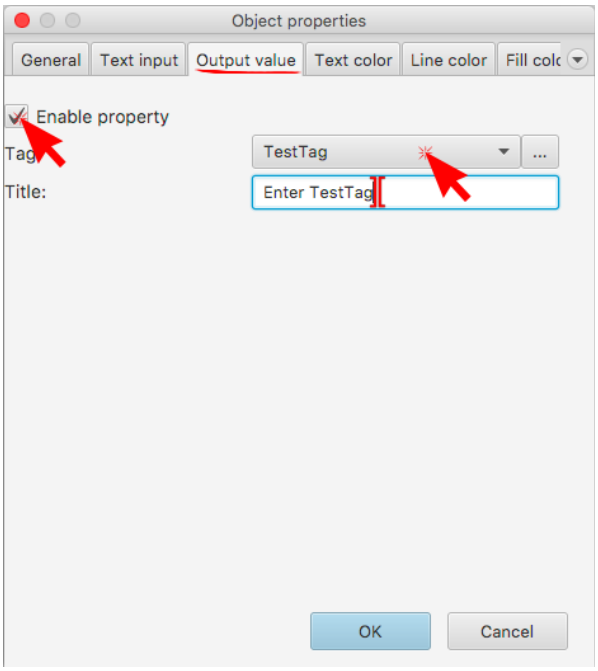
On the **Text Input** tab check **Enable property**. Choose **TestTag** in the **Tag** ComboBox. Choose **Tag.PV** in the **Type**.

Now our graphical object can display current tag's value.

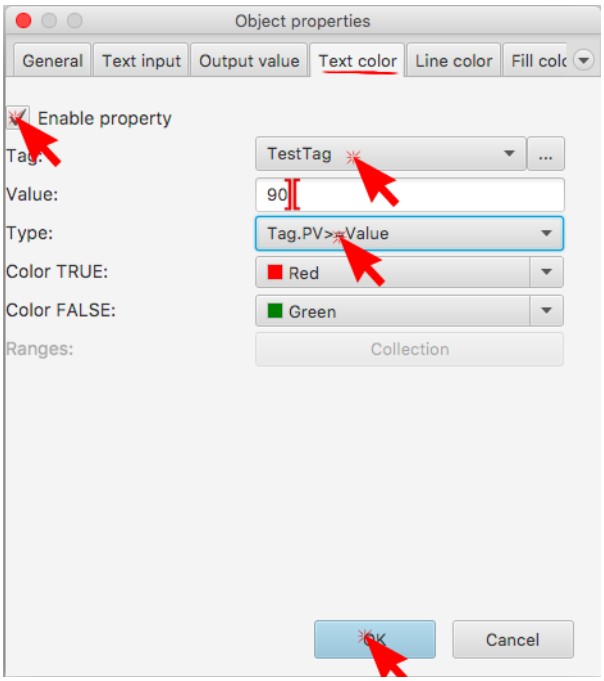
Then click **Output value** tab.

On the **Output value** tab check **Enable property**. Choose **TestTag** in the **Tag** ComboBox. **Type Enter TestTag**.

Now you can use the graphical object for entering value in the **TestTag**.



Then click **Text color** tab.

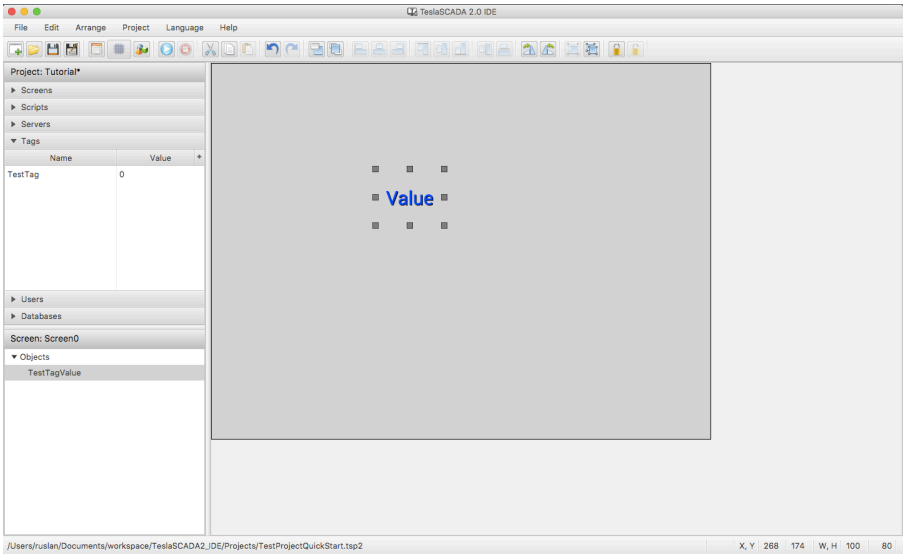


On the **Text color** tab check **Enable property**. Choose **TestTag**, **Type 90** in the **Value** field and Choose **Tag.PV>=Value** in the **Type** ComboBox.

Now if the value of **TestTag** >= 90 color of the text will be **Red.** If <90 color of the text will be **Green**.

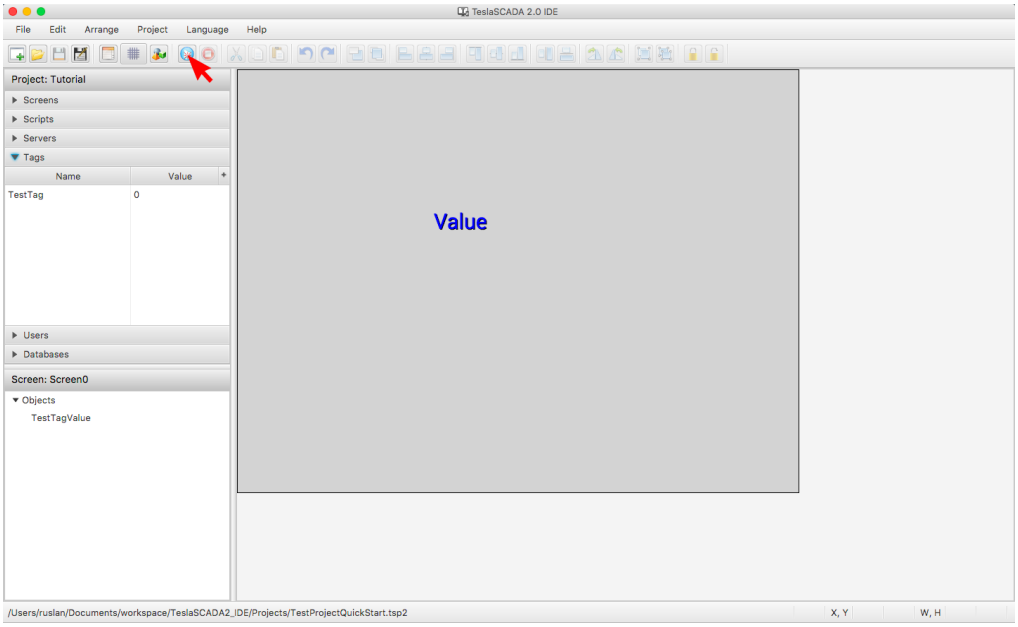
And then you can click **OK** to finish setup graphical objects properties.

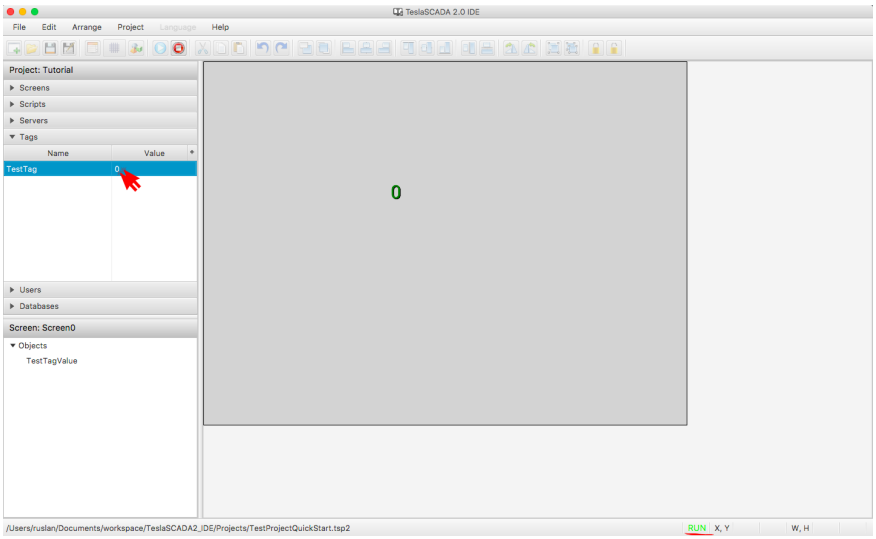
Now you can see changed graphical object on the Screen.



Run Simulation

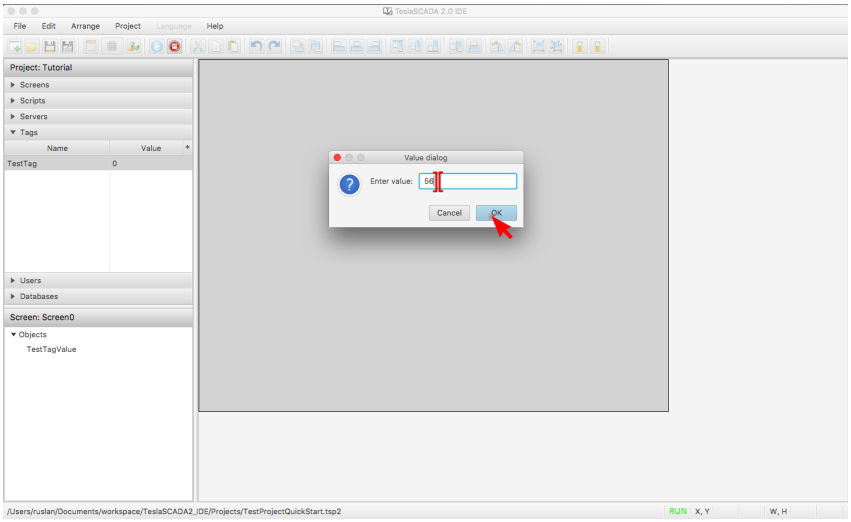
Simulation mode needs to test your project **without connection to real device**. On the Tool Bar, **click** on the **Run simulation** icon.

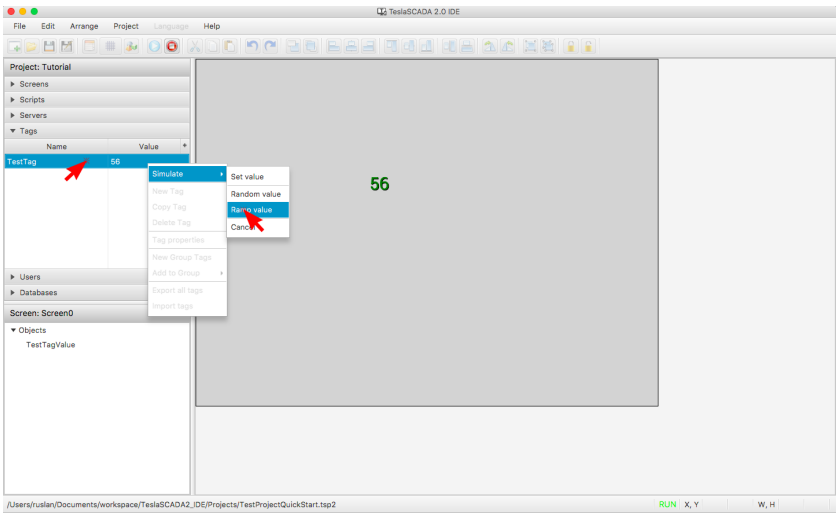




After starting simulation mode you'll see the RUN indicator in the lower right corner. Graphical object since we set up **Text Input** property displays default value **0**. To change tag's value **Double click** on the **TestTag** (we bound this tag to Text Input property) on the **Tags** pane.

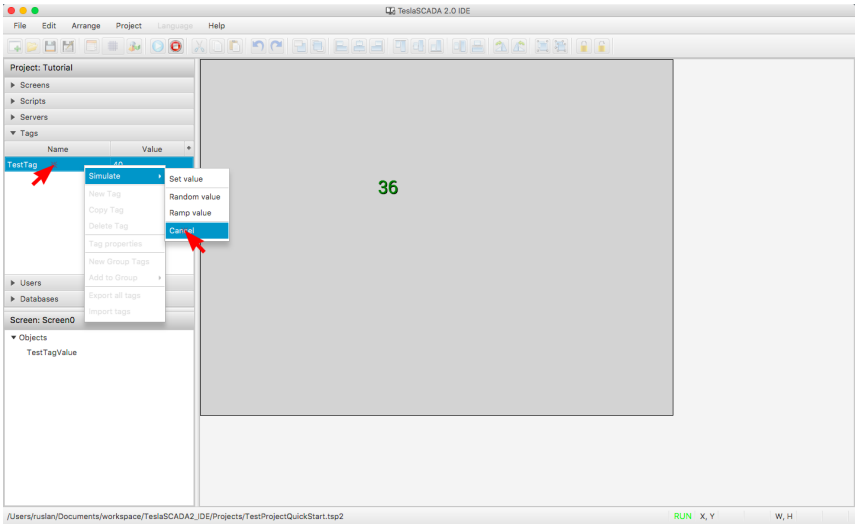
Value dialog will appear. You can change Tag's value by typing it in the EditBox and then click **OK**.

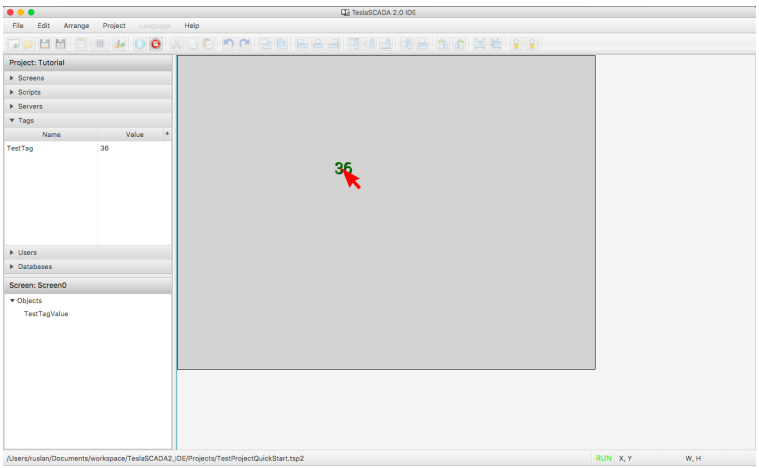




It is also possible to simulate a sequential change in the tag's value from 0 to 100. To do this you should **Right Click** on the **TestTag** and choose **Simulate->Ramp** menu item.

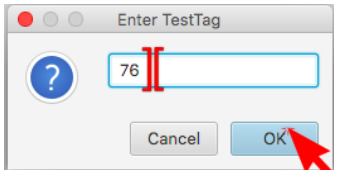
To stop the automatic change of the value of the tag you should **Right Click** on the **TestTag** and choose **Simulate->Cancel** menu item.

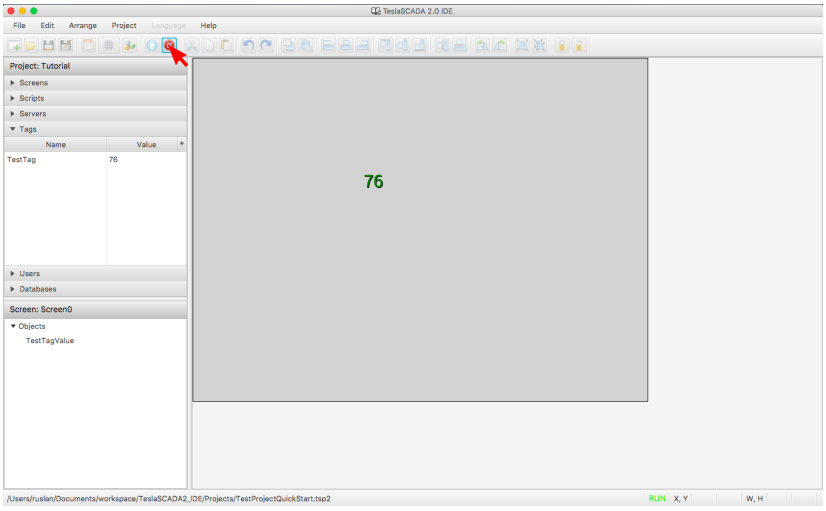




To test **Output Value** property of the object click on it. **Enter TestTag** dialog box will appear.

In the **Enter TestTag** dialog box type value (in our example 76) and then click **OK**.

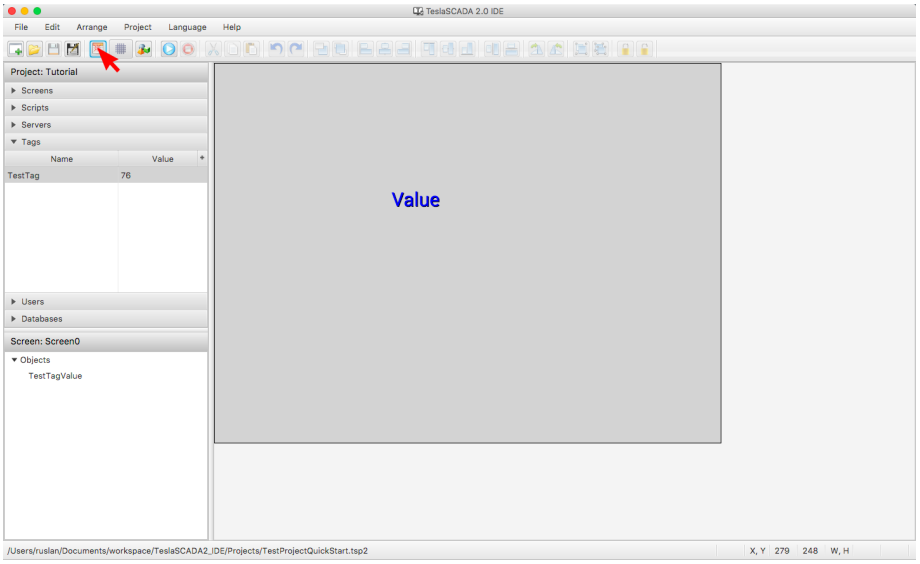




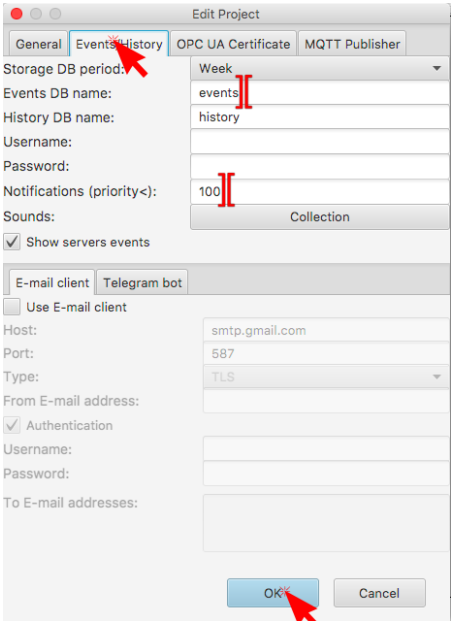
To stop **Simulation mode** on the Tool Bar, click on the **Stop simulation** icon.

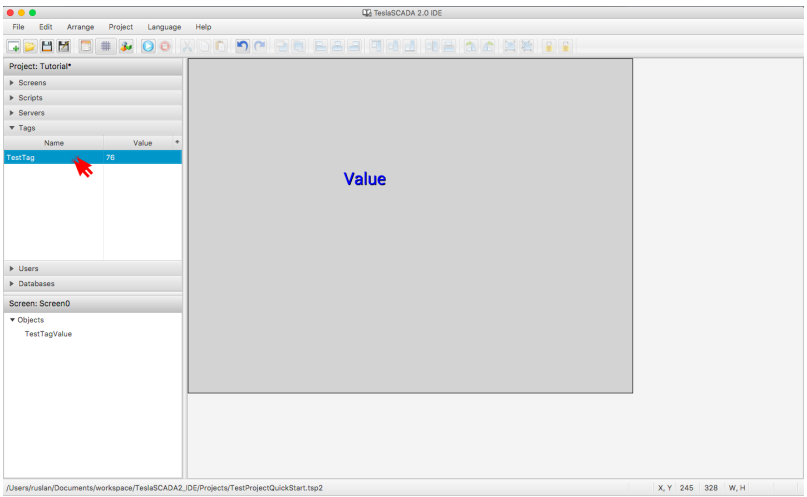
Setup Events

To understand how to work with **Events** in TeslaSCADA2 first of all lets open project **Properties**. To do this on the Tool Bar, click on the **Properties** icon.

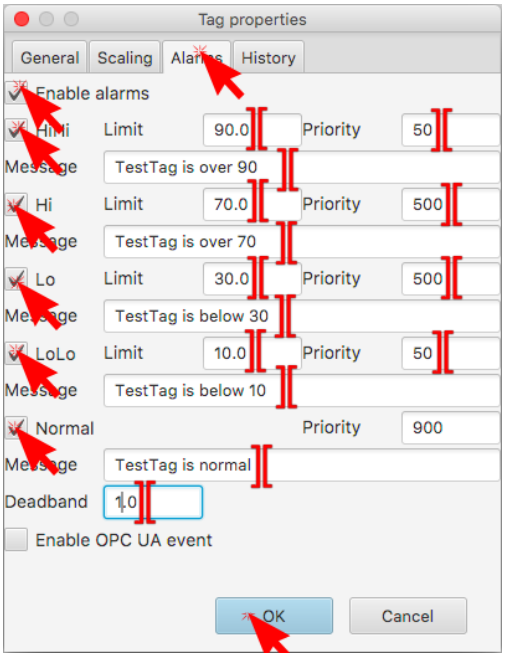


In the **Edit Project Dialog Box**, open **Events/History** tab by clicking on it, type **events** in the **Events DB name field.** This is the name of the SQL Lite database (it's stored in the folder where installed TeslaSCADA packet or if this is not possible in the folder where your project saved). Type 100 in the **Notifications (priority<) field** (if priority of the event you setup below this value the notification dialog box appear), then **click OK**.



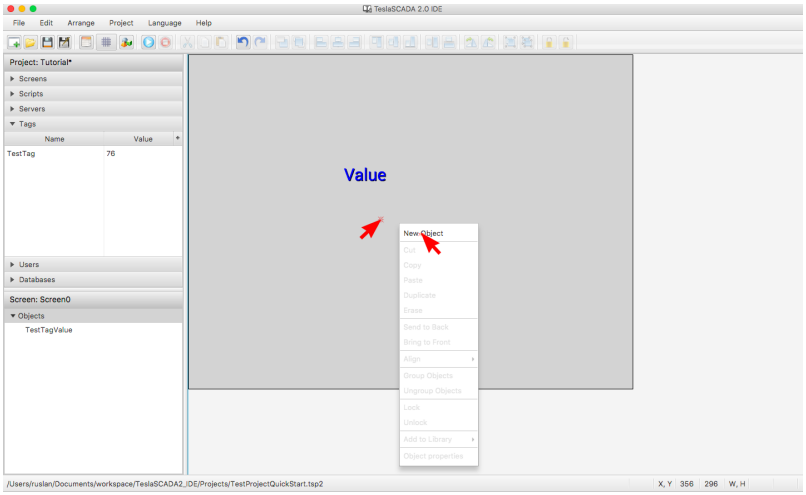


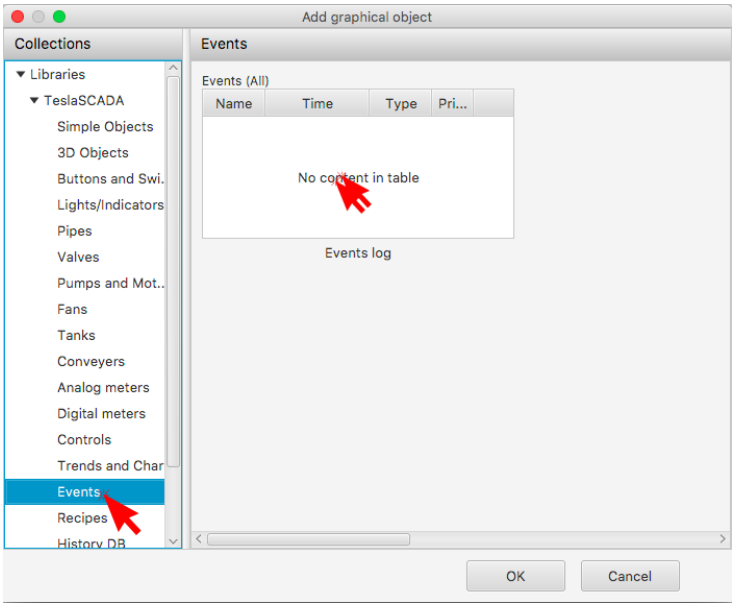
Now let's open **TestTag** properties by **Double clicking** on it.



In the **Tag properties Dialog Box**, open **Alarms** tab by clicking on it. Check on **Enable Alarms**, **HiHi**, **Hi**, **Lo**, **LoLo** and **Normal** checkboxes. Fill up all **Edit boxes** like it's shown in the Picture. Then click **OK**.

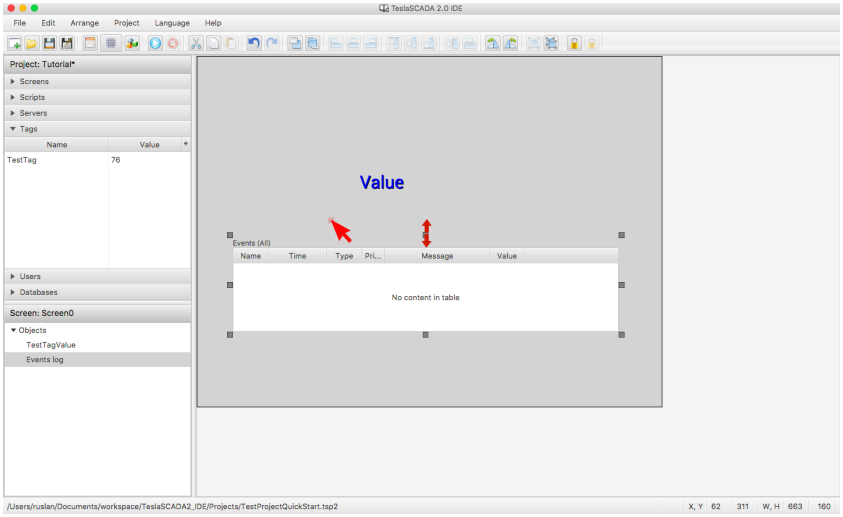
Now we have to setup graphical object for display **Events/Alarms** in our project. To do this Right click on the **Screen** and choose **New Object** menu item.

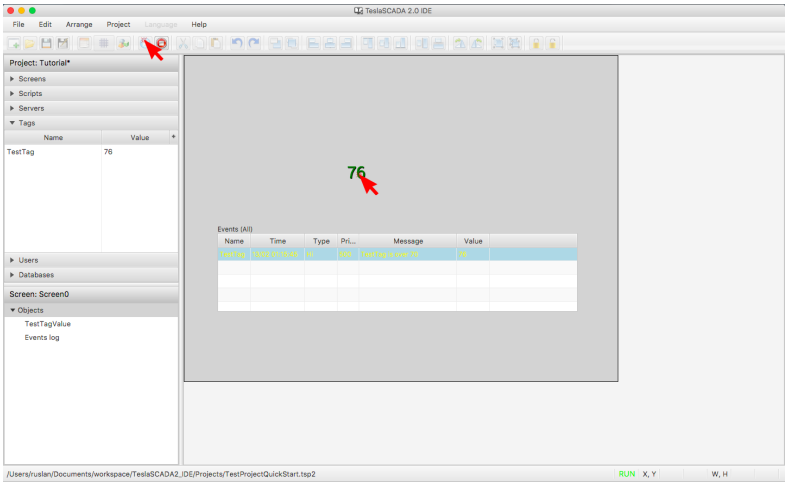




In the **Add graphical object dialog box** select **Events** library by **clicking** and select **Events log** by **double clicking**.

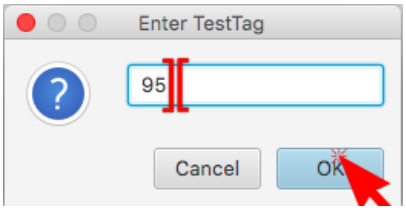
Choose place where you want to place **Events log** by clicking and table will appear on the **Screen**. You can resize it if you want.



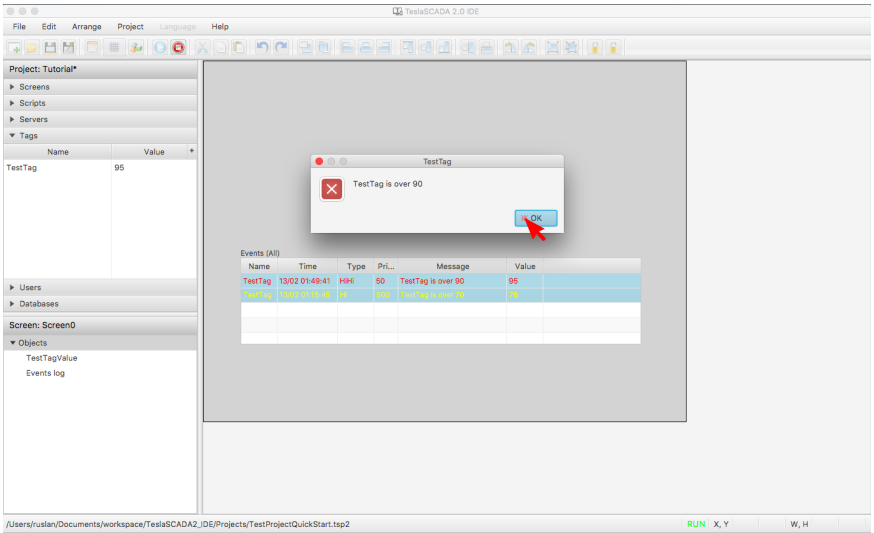


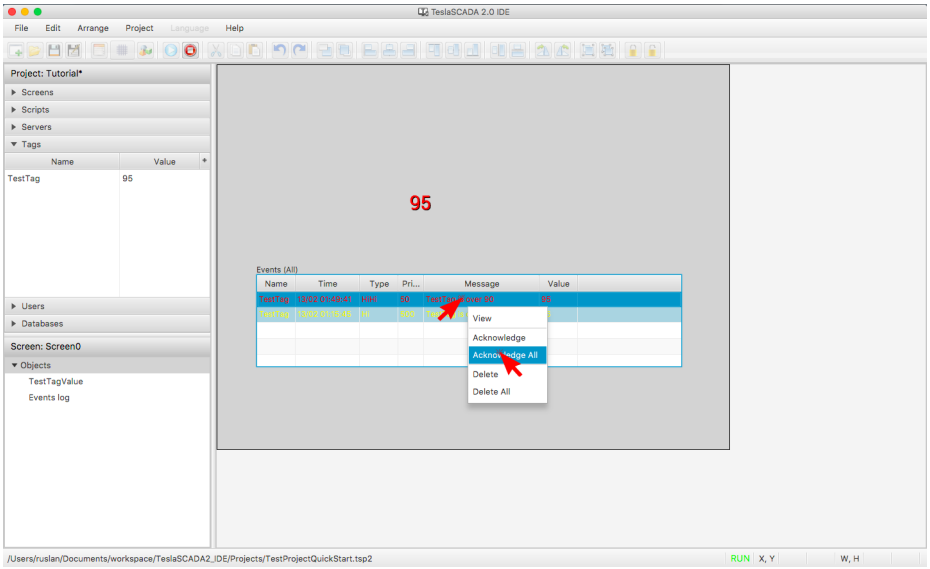
Now let's **Run simulation** as we did in previous chapter. Since the tag's value is greater than 70, the first event appears in the table (you can change color in the **Event Log** settings). To change tag's value click on Text graphical object.

In the **Enter TestTag** dialog box **Type** 95 and then click **OK**.



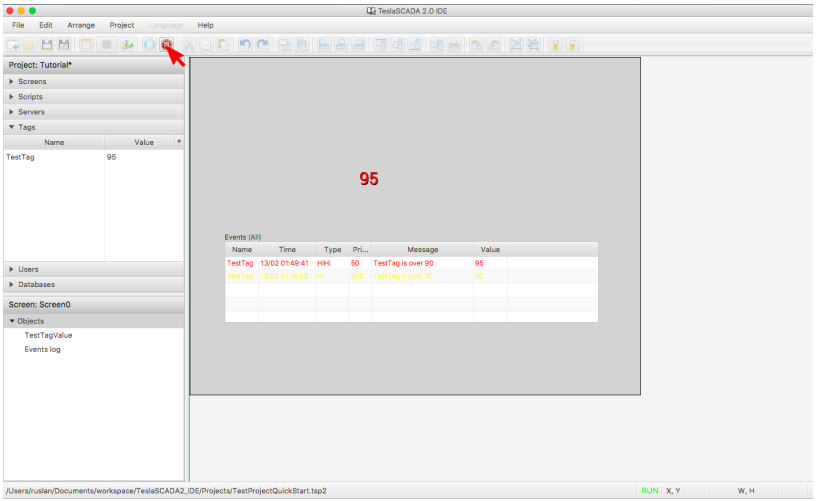
Alert message **TestTag is over 90** will appear and new row will be added in the **Events log**. Click OK on the Alert message dialog box.





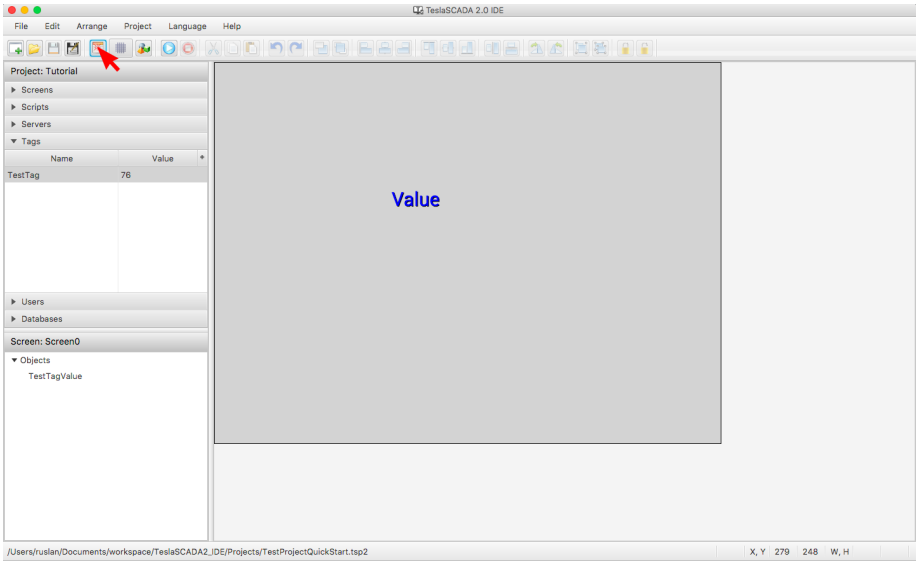
To acknowledge all **Events** in the table **Right click** on it and choose **Acknowledge All** menu item.

Color of the background of all rows will be changed. And then **Stop simulation**, by clicking  icon on the Tool Bar.

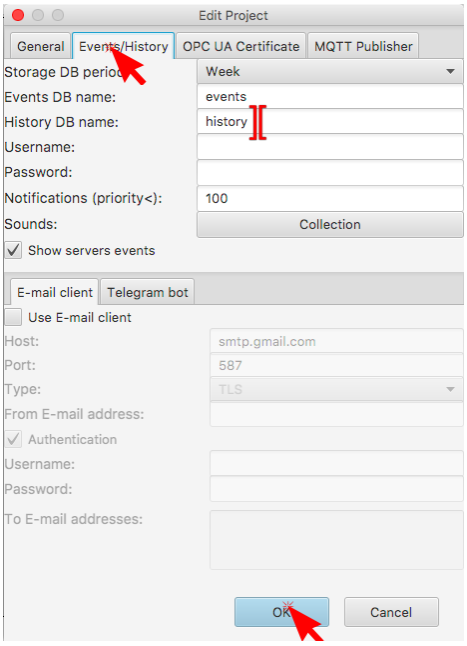


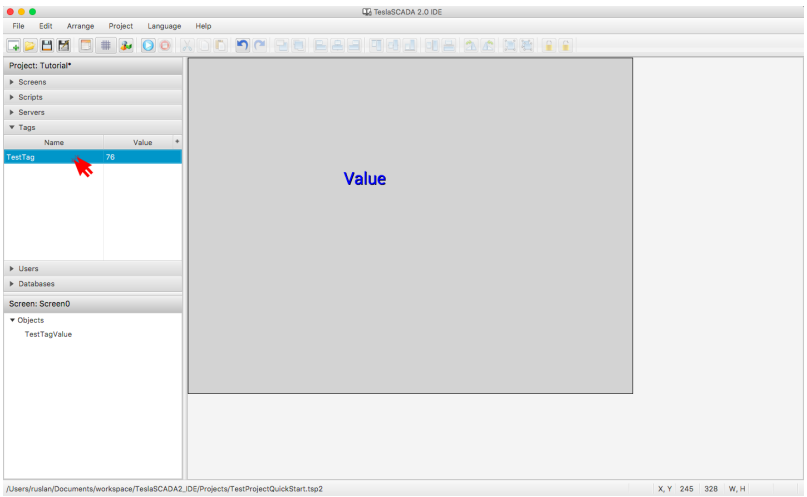
Setup History

To understand how to work with **History** in TeslaSCADA2 first of all lets open project **Properties**. To do this on the Tool Bar, click on the **Properties** icon. 

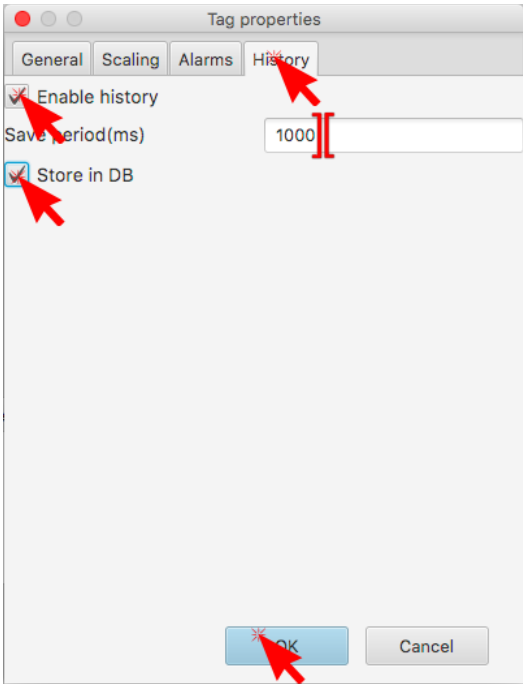


In the **Edit Project Dialog Box**, open **Events/History** tab by clicking on it, type **history** in the **History DB name field.** This is the name of the SQL Lite database (it's stored in the folder where installed TeslaSCADA packet or if this is not possible in the folder where your project saved). Then **click OK**.



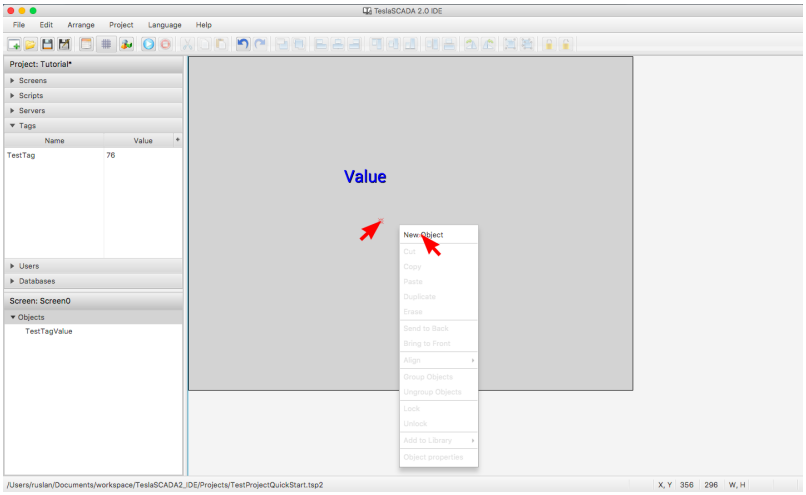


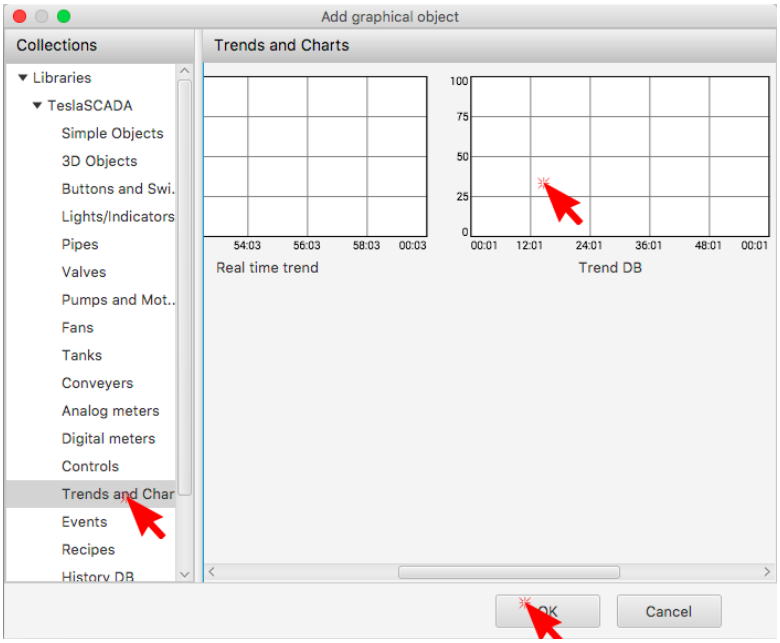
Now let's open **TestTag** properties by **Double clicking** on it.



In the **Tag properties Dialog Box**, open **History** tab by clicking on it. Check on **Enable History**, Type 1000 in the **Save period(ms)** field, check on **Store in DB** like it's shown in the Picture. Then click **OK**.

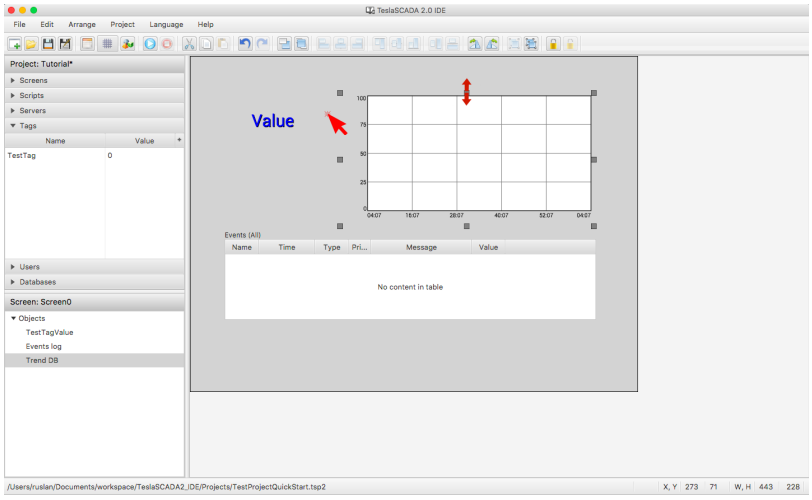
Now we have to setup graphical object for display **History** in our project. To do this **Right click** on the **Screen** and choose **New Object** menu item.

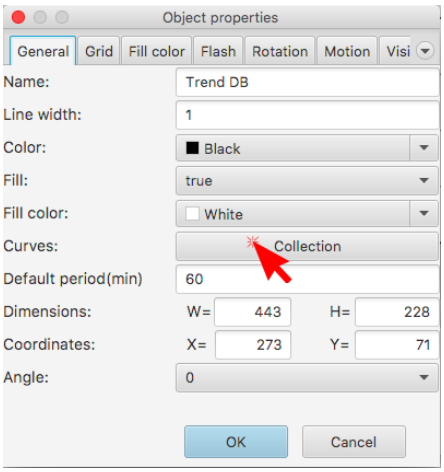




In the **Add graphical object dialog box** select **Trend and charts** library by **clicking** and select **Trend DB** by **clicking** on it. Then click **OK**.

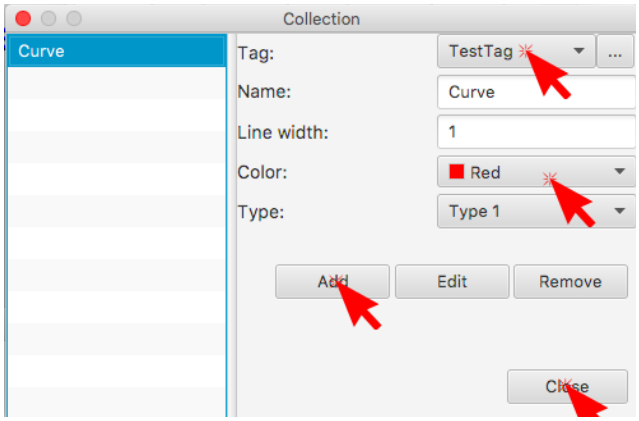
Choose place where you want to place **Trend DB** by clicking and chart will appear on the **Screen**. You can move and resize it if you want.

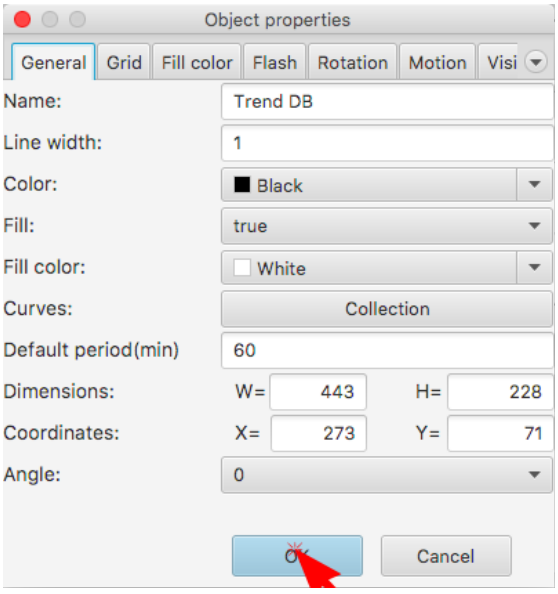




To edit Trend properties **Double click** on the object. In the **Object properties** dialog box click **Collection**.

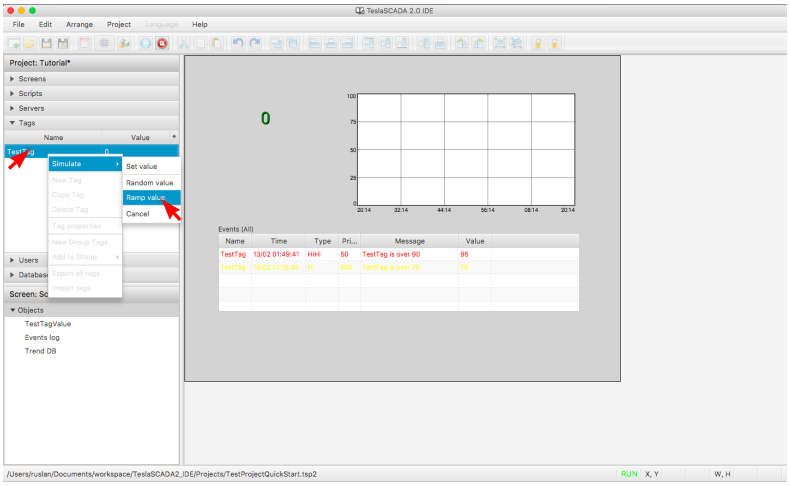
In the **Collection** dialog box Choose **TestTag** in Tag field, Choose **Red** color in the **Color** field, click **Add** and then click **Close**.

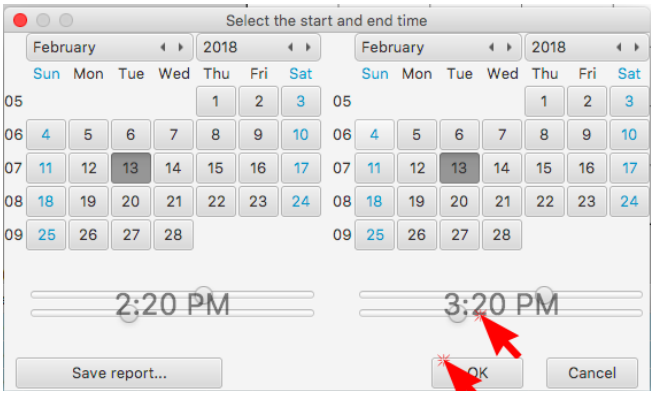




Click **OK** in the **Object properties** dialog.

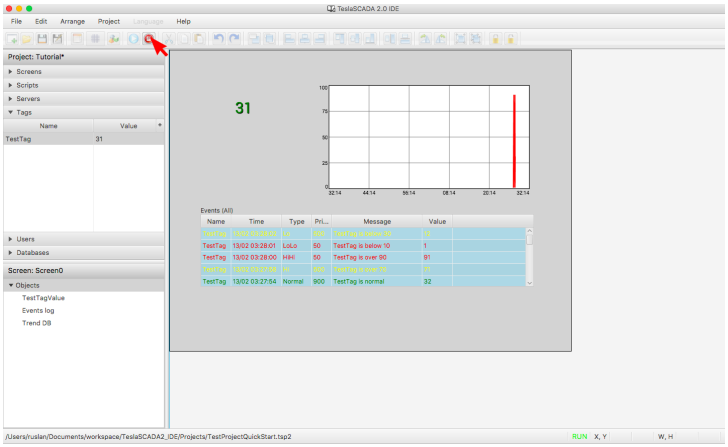
Run simulation mode like we did in one of previous chapter. And **Right Click** on **TestTag** and choose **Simulate->Ramp** menu item. Wait some time. You'll see new events will appear in the Events table. Then again **Right Click** on **TestTag** and choose **Simulate->Cancel**. Then **click** on the **Trend DB** object.





In the **Select the start and end time dialog box** choose period you need to watch. Then click **OK**.

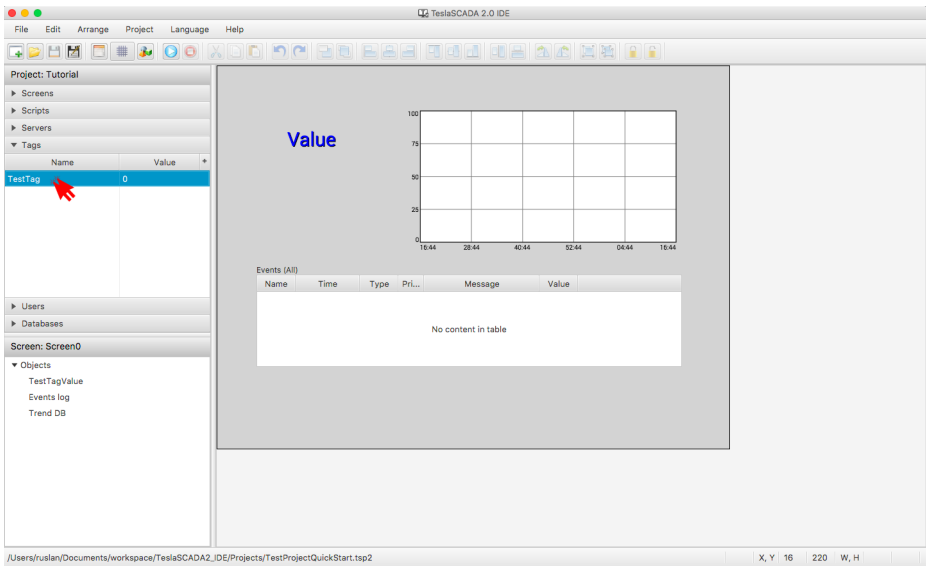
You'll see some history information on the **Trend**. You can make some manual simulation of **TestTag** by changing value of it and refresh **Trend's** information by changing time period. Then you click **Stop simulate** to end your history testing.

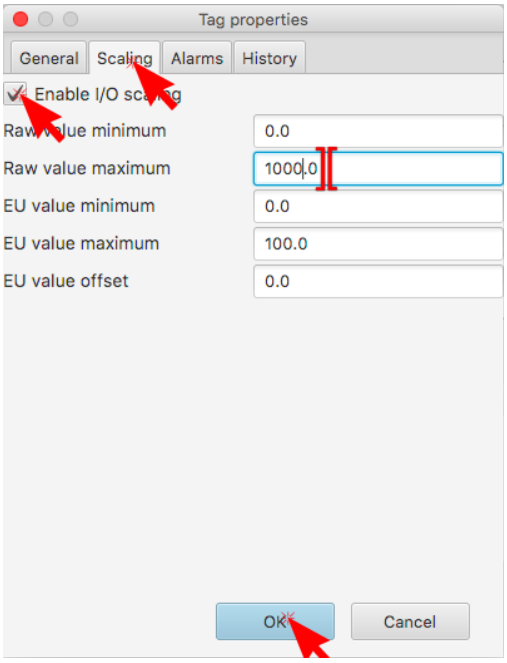


Setup Scaling

To understand how to setup scaling let's suppose that our **TestTag** bind to the for example **Holding Register** of our Modbus PLC and 1000 raw value of the register is equal to 100 engineer units value. Now let's setup this possibility in TeslaSCADA IDE.

To do this open **TestTag** by double clicking on it.





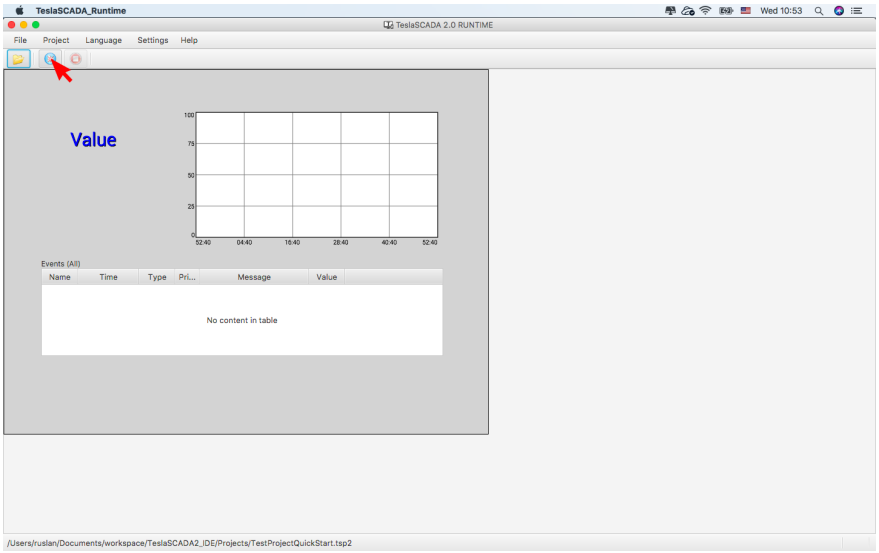
In the **Tag properties dialog box** open **Scaling** tab by clicking on it. Type 1000 in the **Raw value maximum** text field. Other text fields left unchangeable. Then click **OK.**

Now we are ready to interact with the real device. To do this we should run TeslaSCADA2 Runtime.

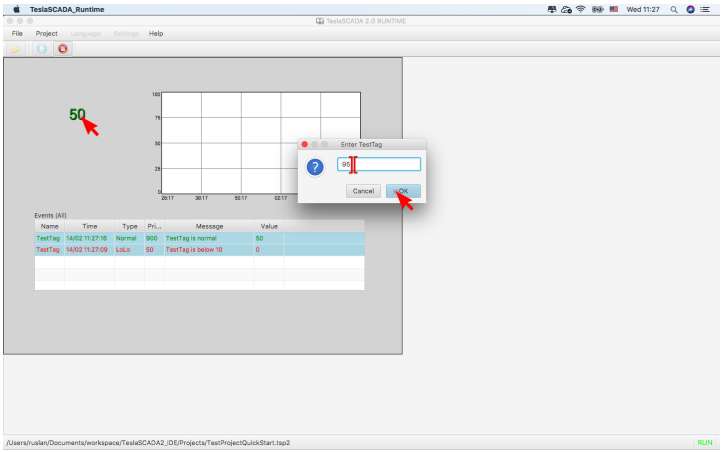
Run Project in TeslaSCADA2 Runtime

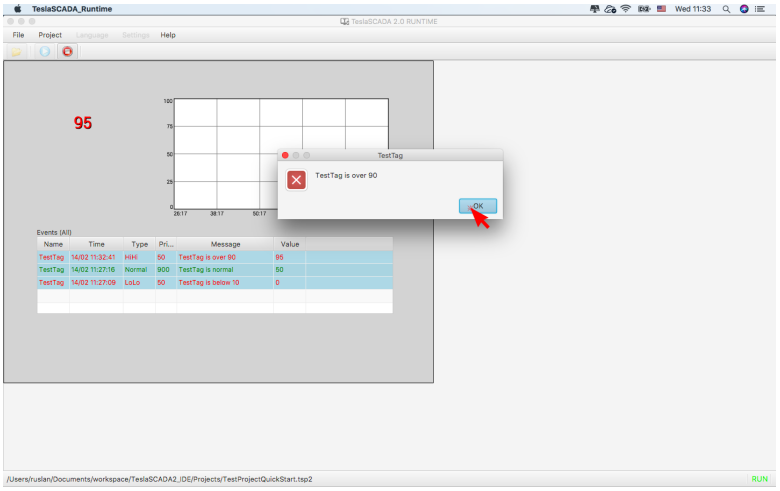
Run TeslaSCADA_Runtime. You'll see your project automatically loaded in TeslaSCADA2 Runtime. If not On the Tool Bar, **click** on the  **Open…** icon.

Then you can Run your project by clicking on the **Run**  icon.



You can see values from your **Modbus PLC**. To change value of the tag click on it. In the **Enter TestTag dialog box** type value 95. Then click **OK**.

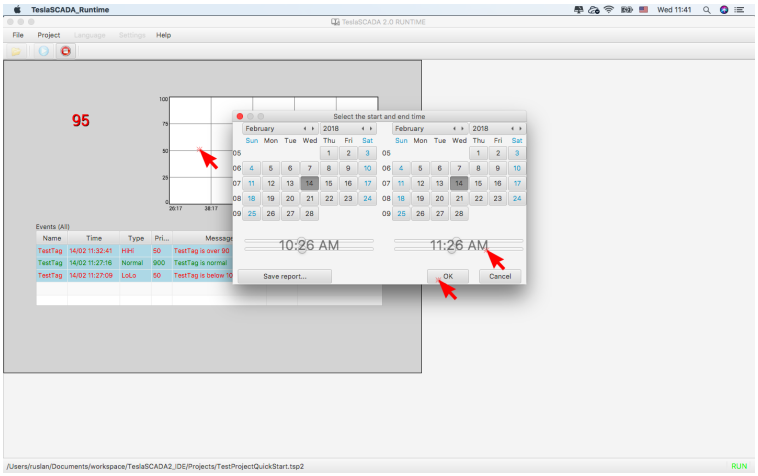


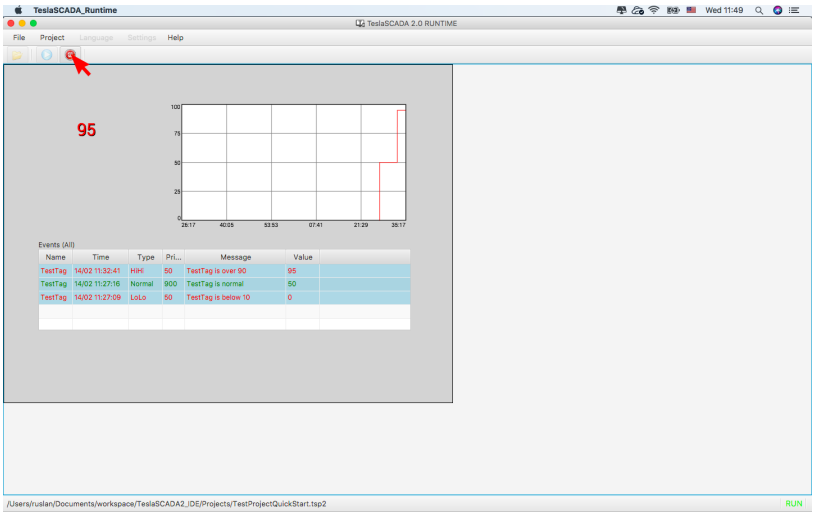


Because we set up **Alarms** in our **TestTag** we see Alarm message and in the **Event Log** new row is added.

Because we set up **Scaling** in our project raw value in **PLC register** is other then we entered. In our case entered value **95** is saved in Holding Register of Modbus PLC as **950**.

To check **History** settings of the **TestTag** click on the **Trend DB** and choose time period, then click **OK**.





You'll see results of your settings on the **Trend DB**. Click **Stop** icon on the **Tool Bar** to stop running of your project.

Congratulations! By now you should have a basic working knowledge of TeslaSCADA software.