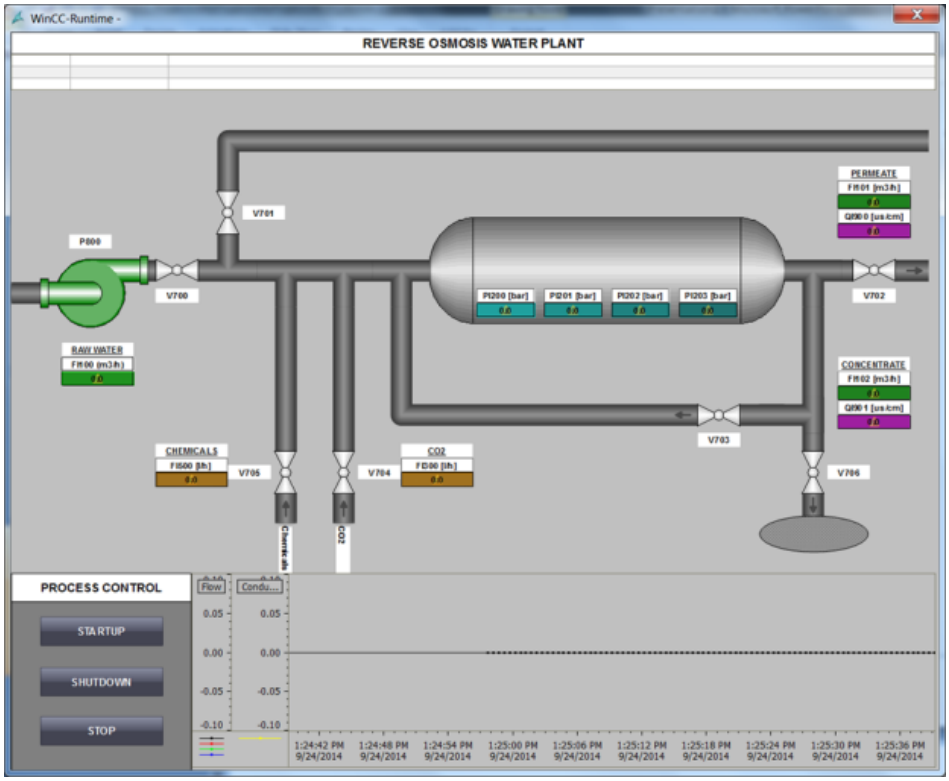
SIMATIC WinCC V7.x

Reverse Osmosis Water Plant



Revision History

Revision	Notes	Date
0	Initial Release	6-1-14
1	Updated	11-6-15
2		12-14-15
3	Minor Corrections	1-18-16
4	Updated for V7.5	9-5-19

Purpose

This SIPEC Event is intended to provide customers with an introduction to WinCC and the programming tool and steps to create a base project. It is not intended to replace any formal products training. It is set up to create a WinCC project and learn the basics of creating connections, tags, screen, alarms and trends. The average time for completion is about 4 hours. The following file contains the STEP 7 project to run in PLCSIM as well as an exported tag database and library object to be transported into WinCC.

WinCC V7.x Workshop Materials:

SIPEC Material.zip

Suggested Literature

The following literature is recommended for the WinCC V7.x An introduction to SCADA seminar.

These items can be order through Literature fulfillment:

- **General WinCC Brochure**
  Order Number: HMGF-A820P-0814
- **Demo DVD**
  Order Number: HMDV-1DN70-0516

Creating the project

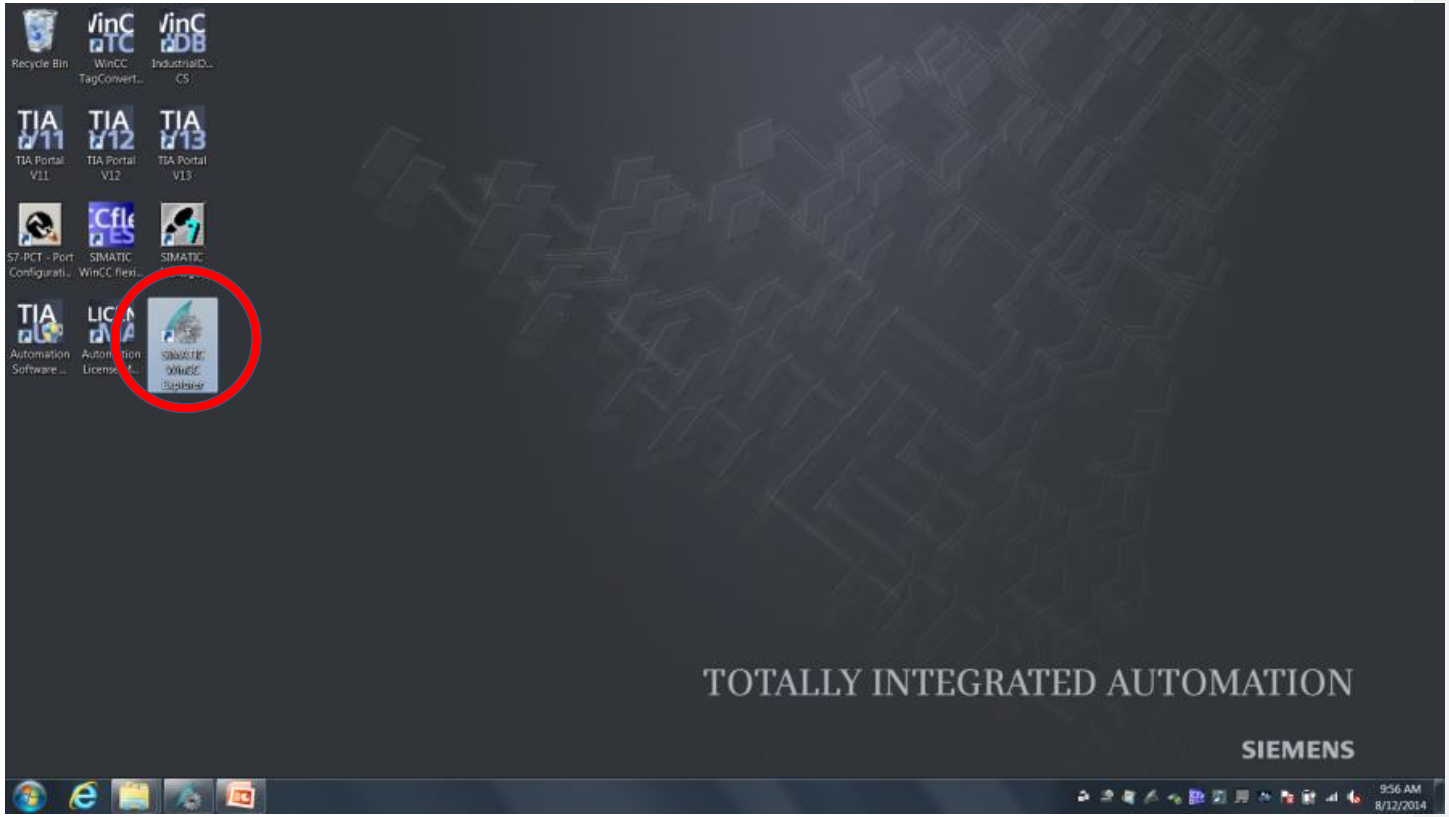
The following steps will show you how to start WinCC and create the "MyProject" project.

You will create the "MyProject" project as a "Single-user project".

A "Single-user project" only runs on one computer. Other computers cannot access this project. The project runs on a computer that serves as the server for data processing and as an operating station.

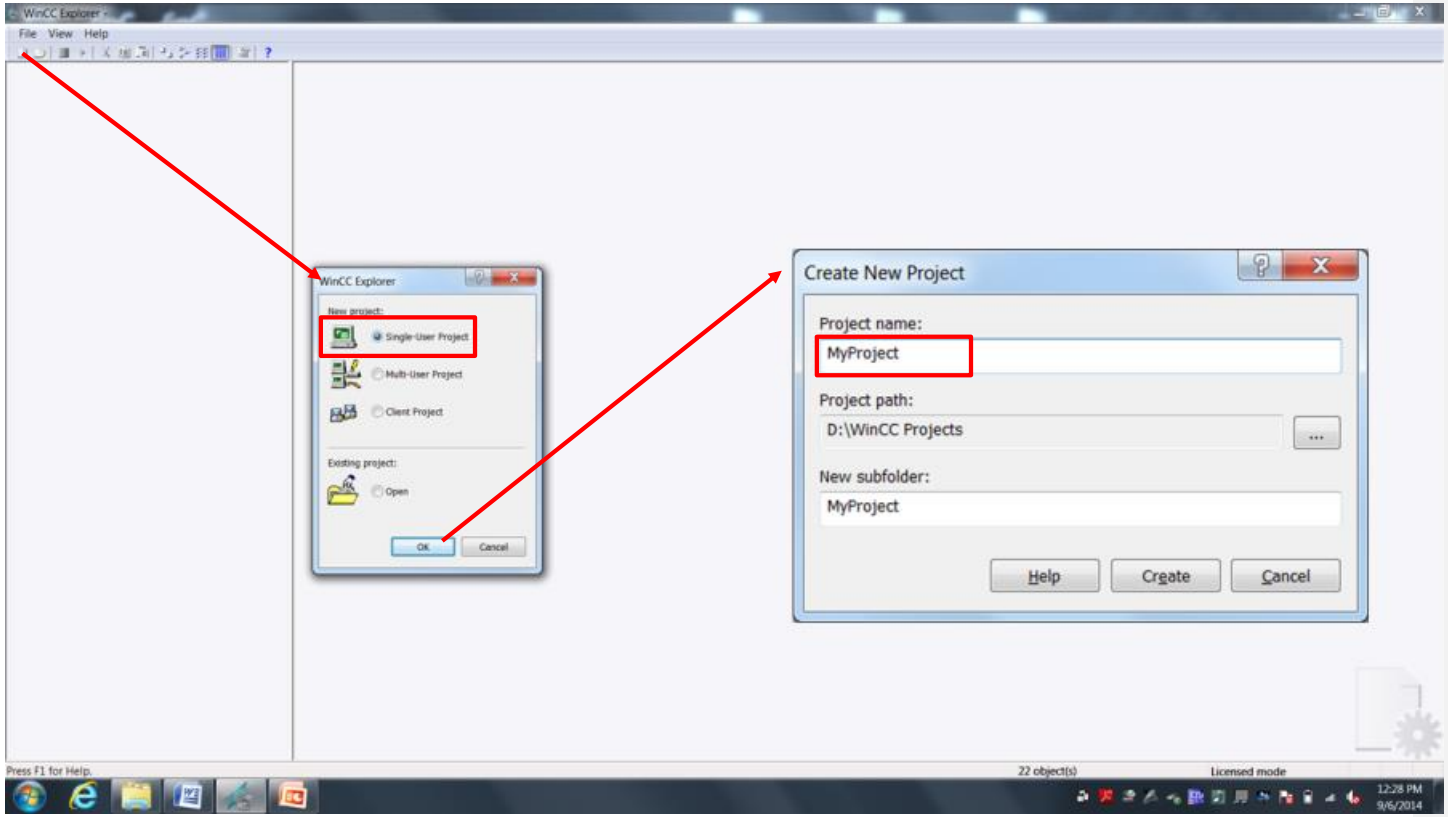
Procedure

1. Start WinCC from the desktop icon.


Recycle Bin
WinCC TagConvert...
IndustrialD... CS
TIA Portal V11
TIA Portal V12
TIA Portal V13
S7-PCT - Port Configurati...
SIMATIC WinCC flexi...
SIMATIC
Automation Software ...
TOTALLY INTEGRATED AUTOMATION
SIEMENS
9:56 AM
8/12/2014

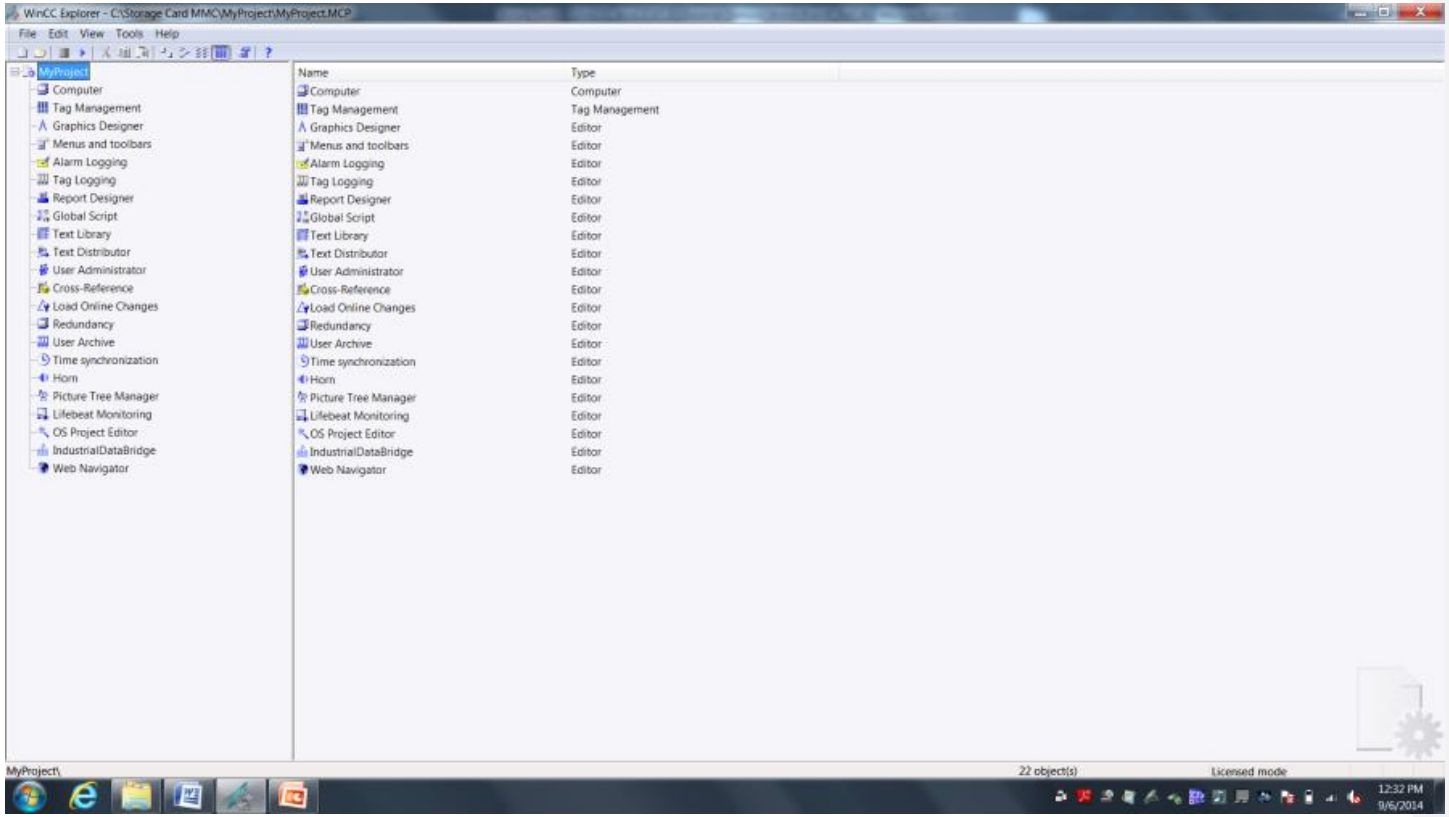
2. Select the project type "Single-user project", name your project “MyProject” and create the WinCC project.

(INSTRUCTOR NOTE: Explain the other types of projects that you can select in WinCC)


WinCC Explorer
File View Help
WinCC Explorer
New project:
Single-User Project
Multi-User Project
Client Project
Existing project:
Open
OK
Cancel
Create New Project
Project name:
MyProject
Project path:
D:\WinCC Projects
...
New subfolder:
MyProject
Help
Create
Cancel
Press F1 for Help.
22 object(s)
Licensed mode
12:28 PM
9/6/2014

Result

You have created the "MyProject" project. The project is now opened in the WinCC Explorer. The project structure with the necessary editors and directories is displayed in the left partial window of the WinCC Explorer. The right partial window shows the elements belonging to an editor or directory.


WinCC Explorer - C:\Storage Card MMC\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
Computer Computer
Tag Management Tag Management
Graphics Designer Editor
Menus and toolbars Editor
Alarm Logging Editor
Tag Logging Editor
Report Designer Editor
Global Script Editor
Text Library Editor
Text Distributor Editor
User Administrator Editor
Cross-Reference Editor
Load Online Changes Editor
Redundancy Editor
User Archive Editor
Time synchronization Editor
Horn Editor
Picture Tree Manager Editor
Lifebeat Monitoring Editor
OS Project Editor Editor
IndustrialDataBridge Editor
Web Navigator Editor
MyProject\
22 object(s)
Licensed mode
12:32 PM
9/6/2014

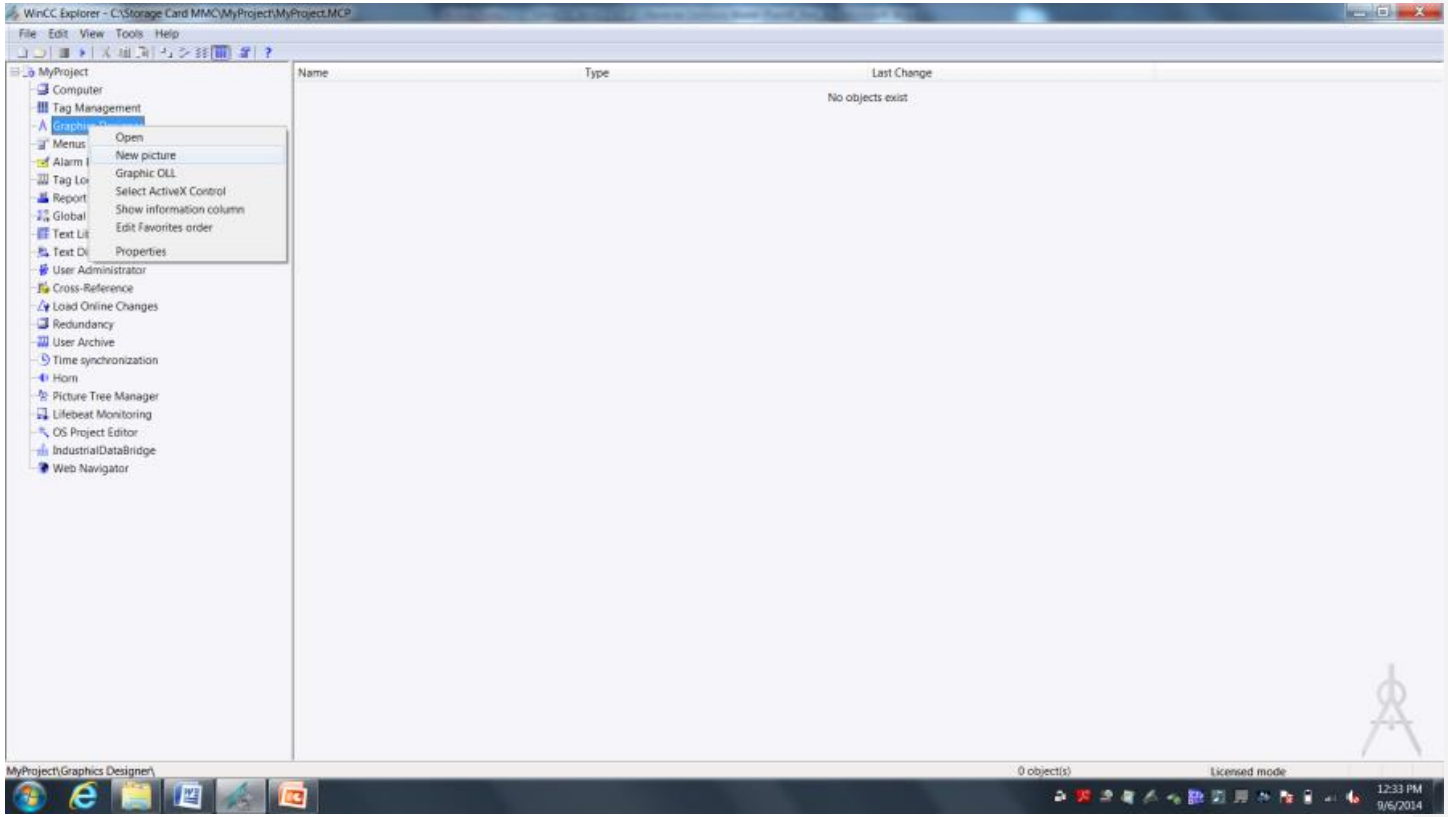
Configuring the Screen

The following steps will show you how to configure the start screen in WinCC Explorer.

The graphics screens are main elements of a project. They represent a process and allow the operation and observation of this process.

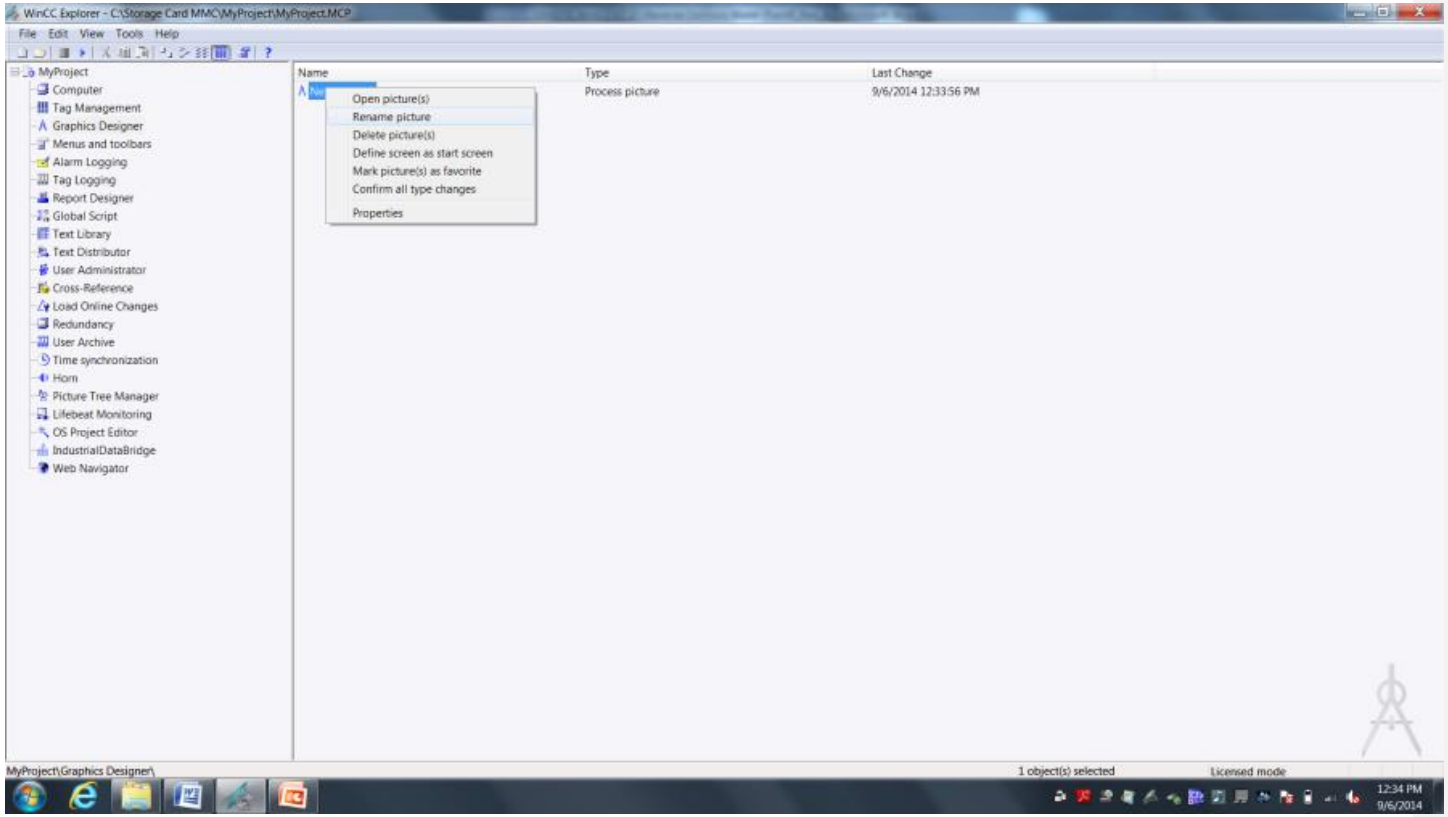
Procedure

1. Create a new graphics screen from the Graphics Design editor. Right Click to access menu.

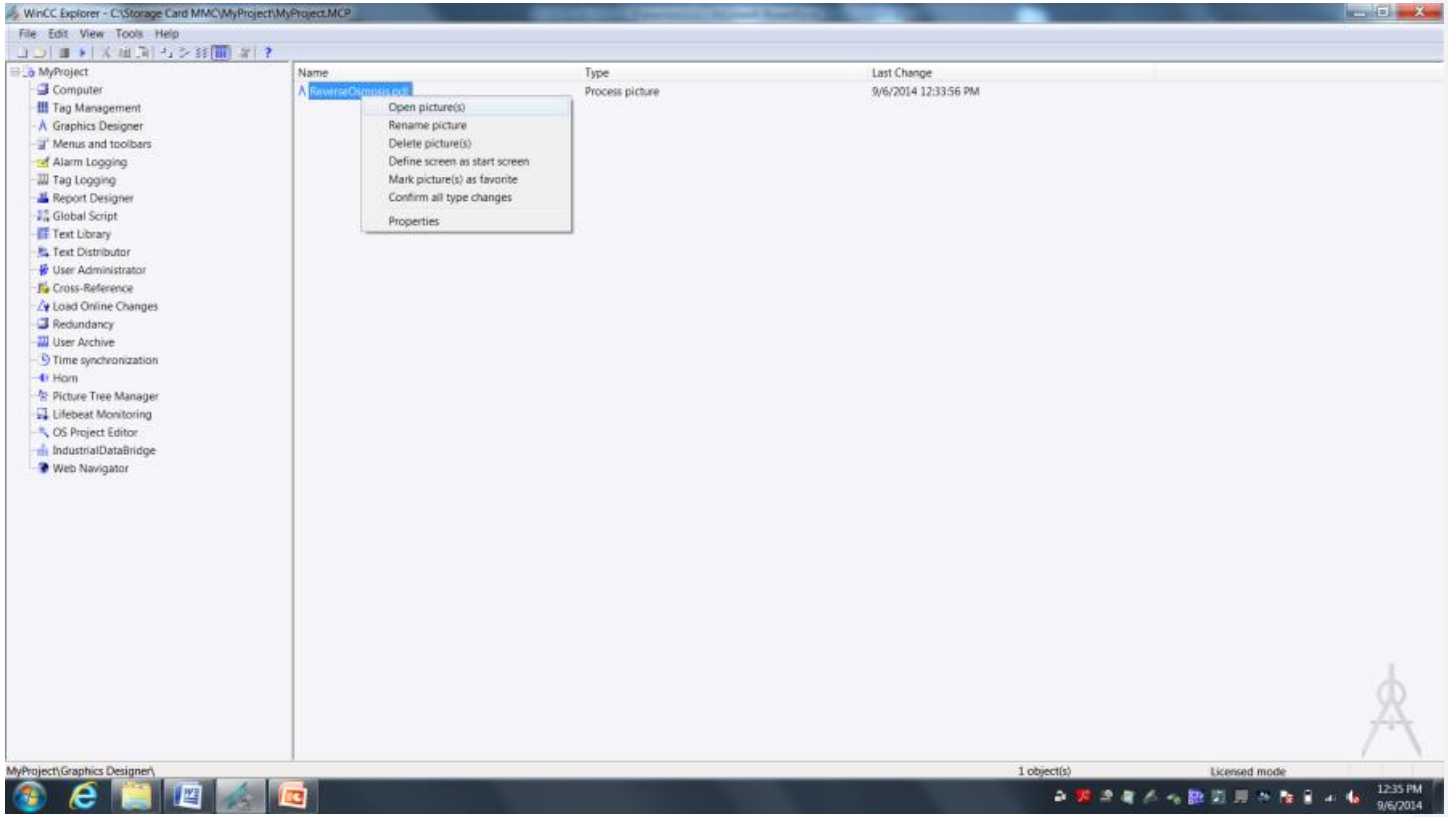

WinCC Explorer - C:\Storage Card MMC\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Menus
Alarm
Tag Lo
Report
Global
Text Li
Text D
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Open
New picture
Graphic OLL
Select ActiveX Control
Show information column
Edit Favorites order
Properties
Name
Type
Last Change
No objects exist
MyProject\Graphics Designer\
0 object(s)
Licensed mode
12:33 PM
9/6/2014

2. Rename the created picture to “Reverse Osmosis.pdl”. Right Click to access menu.

3. Create a Second Screen named “Maintenance.pdl”

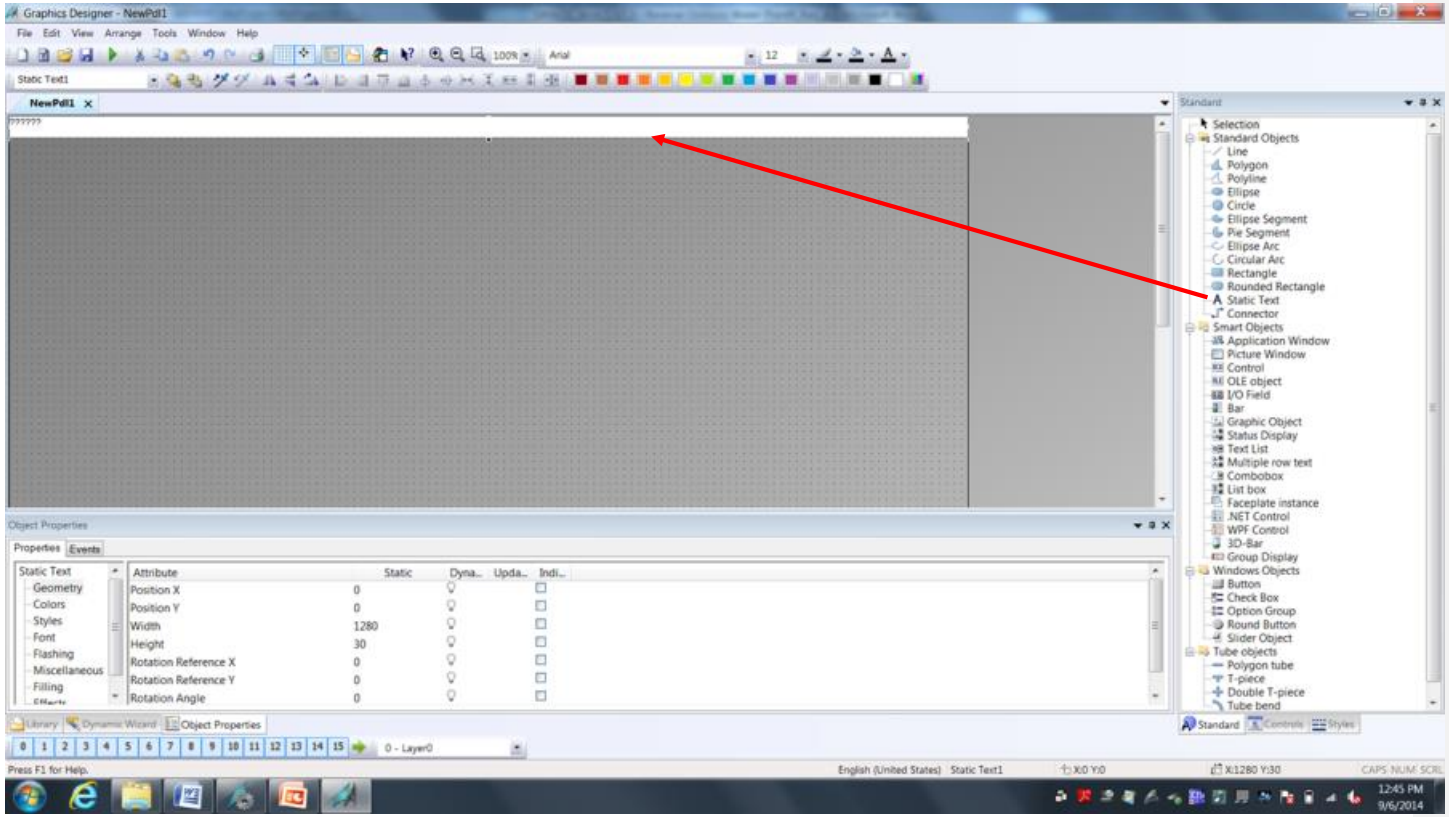

WinCC Explorer - C:\Storage Card MMC\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
Last Change
Process picture
9/6/2014 12:33:56 PM
Open picture(s)
Rename picture
Delete picture(s)
Define screen as start screen
Mark picture(s) as favorite
Confirm all type changes
Properties
MyProject\Graphics Designer\
1 object(s) selected
Licensed mode
12:34 PM
9/6/2014

4. Open the created picture “Reverse Osmosis.pdl” to start the WinCC Graphics Designer in a new window.


WinCC Explorer - C:\Storage Card MMC\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
Last Change
ReverseOsmosis.pdl
Process picture
9/6/2014 12:33:56 PM
Open picture(s)
Rename picture
Delete picture(s)
Define screen as start screen
Mark picture(s) as favorite
Confirm all type changes
Properties
MyProject\Graphics Designer\
1 object(s)
Licensed mode
12:35 PM
9/6/2014

5. Insert header into the opened picture.

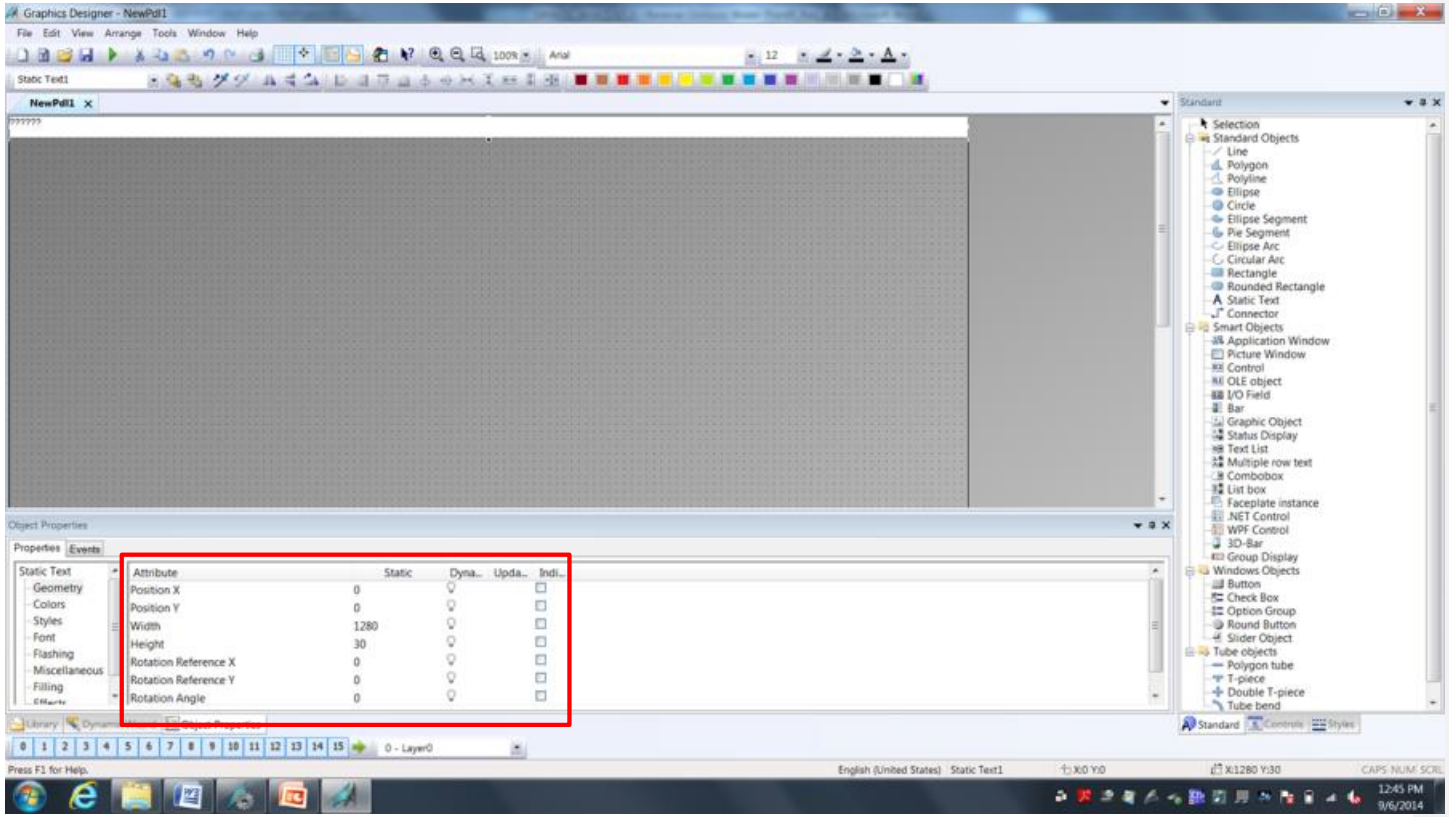
We will add a title header to the picture. To insert the header, select the “Static Text” object in the standard area of the object palette tool and place on the screen area.


Graphics Designer - NewPdl1
File Edit View Arrange Tools Window Help
NewPdl1
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Faceplate instance
.NET Control
WPF Control
3D-Bar
Group Display
Windows Objects
Button
Check Box
Option Group
Round Button
Slider Object
Tube objects
Polygon tube
T-piece
Double T-piece
Tube bend
Object Properties
Properties
Events
Static Text
Geometry
Colors
Styles
Font
Flashing
Miscellaneous
Filling
Attribute
Static
Dyna...
Upda...
Indi...
Position X
Position Y
Width
Height
Rotation Reference X
Rotation Reference Y
Rotation Angle
Object Properties
Press F1 for Help.
English (United States)
Static Text1
X:0 Y:0
X:1280 Y:30
12:45 PM
9/6/2014

6. We need to set the size and position of this header bar. We can do that by dragging and sizing on screen or by manually entering a size in the properties dialog. We will use the properties view to manualy enter the values so that we know we keep the object on the screen and fill completely from one side to the other. In the properties view of the inserted object, change size and position of the object.

   To open the properties view , select focus on the inserted control object and the properities will be in the Object Properities at the bottom of the page. Make the settings below for the Geometry settings:

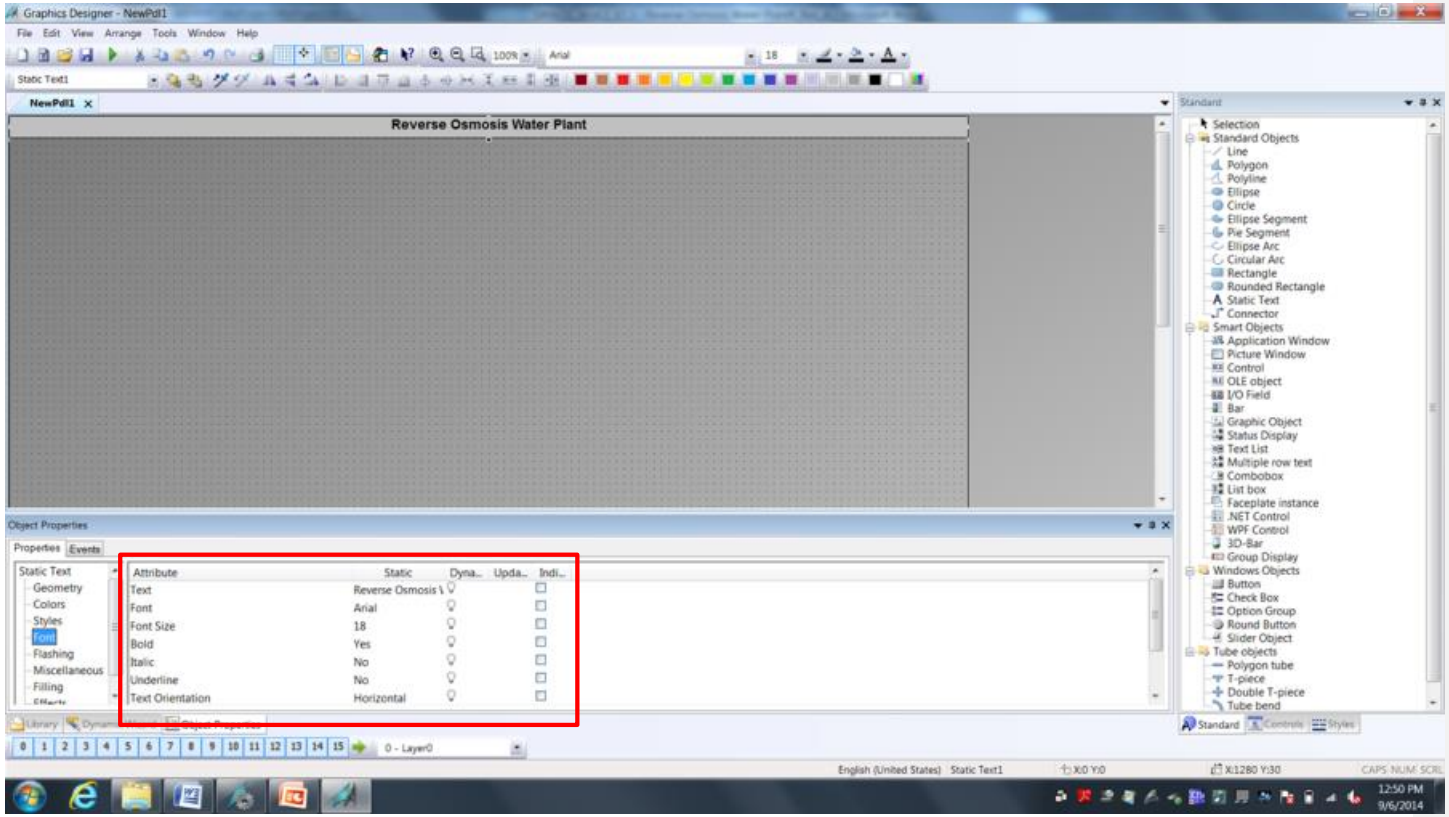
Position X:	0
Position Y:	0
Width:	1280
Height:	30


Graphics Designer - NewPdl1
File Edit View Arrange Tools Window Help
NewPdl1
Object Properties
Properties Events
Static Text
Geometry
Colors
Styles
Font
Flashing
Miscellaneous
Filling
Attribute Static Dyna... Upda... Indi...
Position X 0
Position Y 0
Width 1280
Height 30
Rotation Reference X 0
Rotation Reference Y 0
Rotation Angle 0
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Faceplate instance
.NET Control
WPF Control
3D-Bar
Group Display
Windows Objects
Button
Check Box
Option Group
Round Button
Slider Object
Tube objects
Polygon tube
T-piece
Double T-piece
Tube bend
Press F1 for Help.
English (United States) Static Text1
X:0 Y:0
X:1280 Y:30
12:45 PM
9/6/2014

7. Properties such and text, color, font, style, effect and others can also be changed in the properties view. We will change the header text and font of the object from the default values. In the properties view of the inserted object, change header text and font of the object.

   Make the settings below for the Font settings:

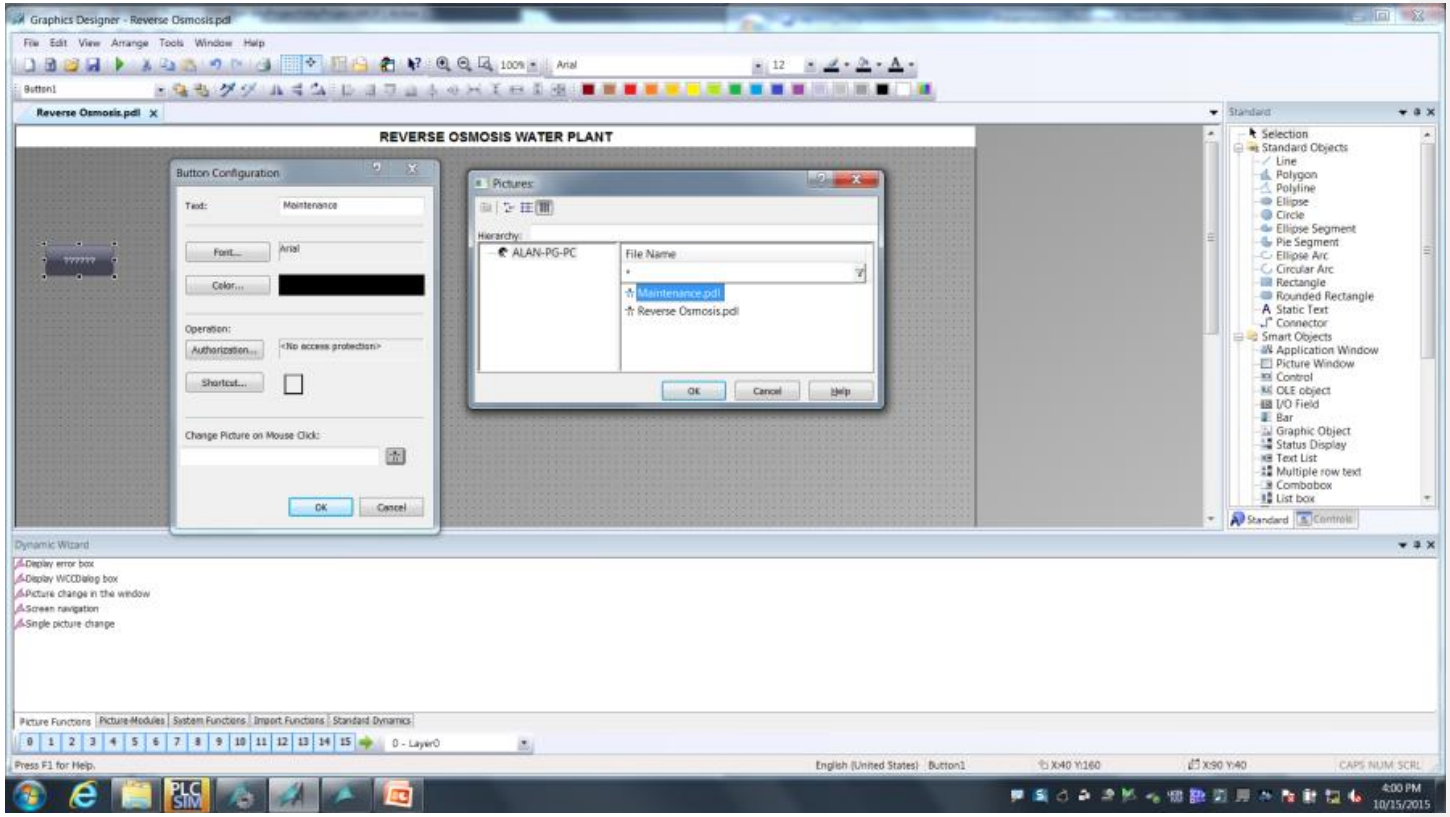
Text:	REVERSE OSMOSIS WATER PLANT
Font Size:	18
Bold:	Yes
X Alignment:	Centered
Y Alignment:	Centered


Graphics Designer - NewPdl1
File Edit View Arrange Tools Window Help
NewPdl1
Reverse Osmosis Water Plant
Object Properties
Properties Events
Static Text
Geometry
Colors
Styles
Font
Flashing
Miscellaneous
Filling
Attribute Static Dyna... Upda... Indi...
Text Reverse Osmosis
Font Arial
Font Size 18
Bold Yes
Italic No
Underline No
Text Orientation Horizontal
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Faceplate instance
.NET Control
WPF Control
3D-Bar
Group Display
Windows Objects
Button
Check Box
Option Group
Round Button
Slider Object
Tube objects
Polygon tube
T-piece
Double T-piece
Tube bend
Standard Controls Styles
English (United States) Static Text1
X:0 Y:0
X:1280 Y:30
12:50 PM
9/6/2014

8. Add button to the screen and place on the upper left part of the screen You can find the button in the Standard controls under Windows Objects

   For Text type Maintenance

   Under Change Picture on Mouse Click select the picture button and select the Maintenance Screen

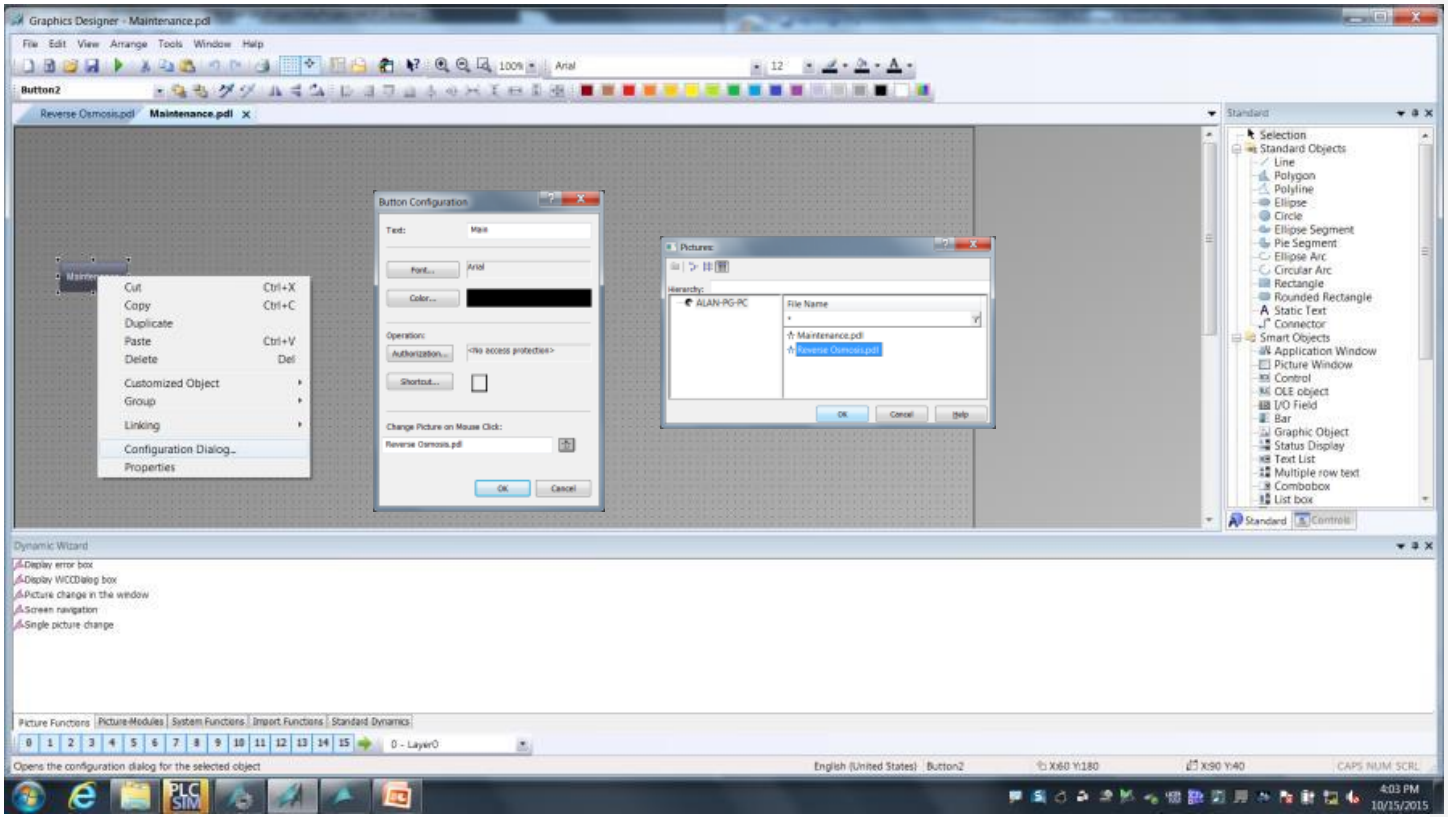

Graphics Designer - Reverse Osmosis.pdl
REVERSE OSMOSIS WATER PLANT
Button Configuration
Text:
Maintenance
Font...
Arial
Color...
Operation:
Authorization...
<No access protection>
Shortcut...
Change Picture on Mouse Click:
OK
Cancel
Pictures:
Hierarchy:
ALAN-PG-PC
File Name
Maintenance.pdl
Reverse Osmosis.pdl
OK
Cancel
Help
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Dynamic Wizard
Display error box
Display WCCDialog box
Picture change in the window
Screen navigation
Single picture change
Picture Functions
Picture Modules
System Functions
Import Functions
Standard Dynamics
Press F1 for Help.
English (United States)
Button1
X:40 Y:160
X:90 Y:40
CAPS NUM SCRL
4:00 PM
10/15/2015

9. Copy this button and paste on the Maintenance Screen.

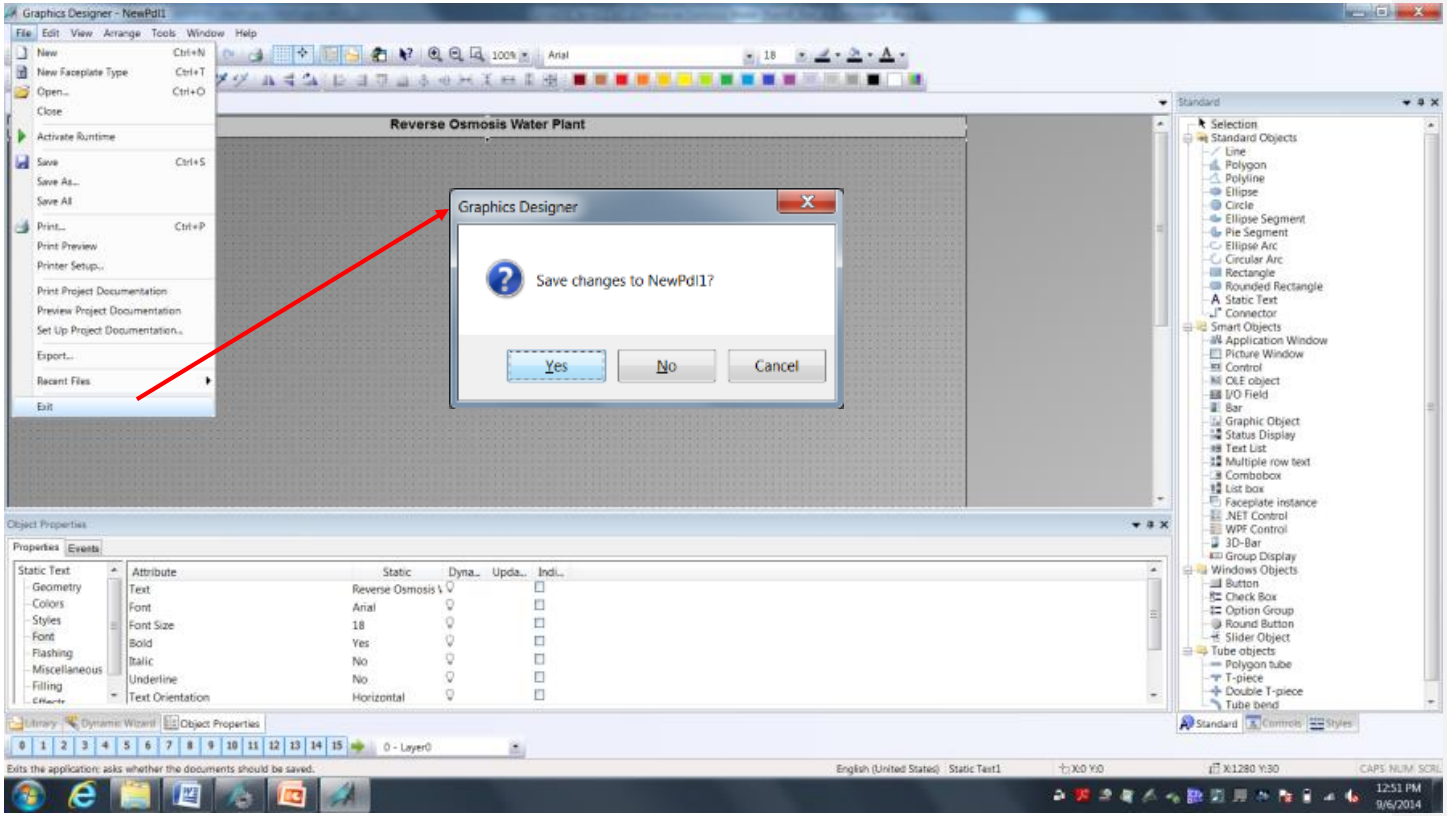
   Right Click and open the Configuration Dialog

   Rename this button to Main Screen and under Change Picture select the Reverse Osmosis picture.

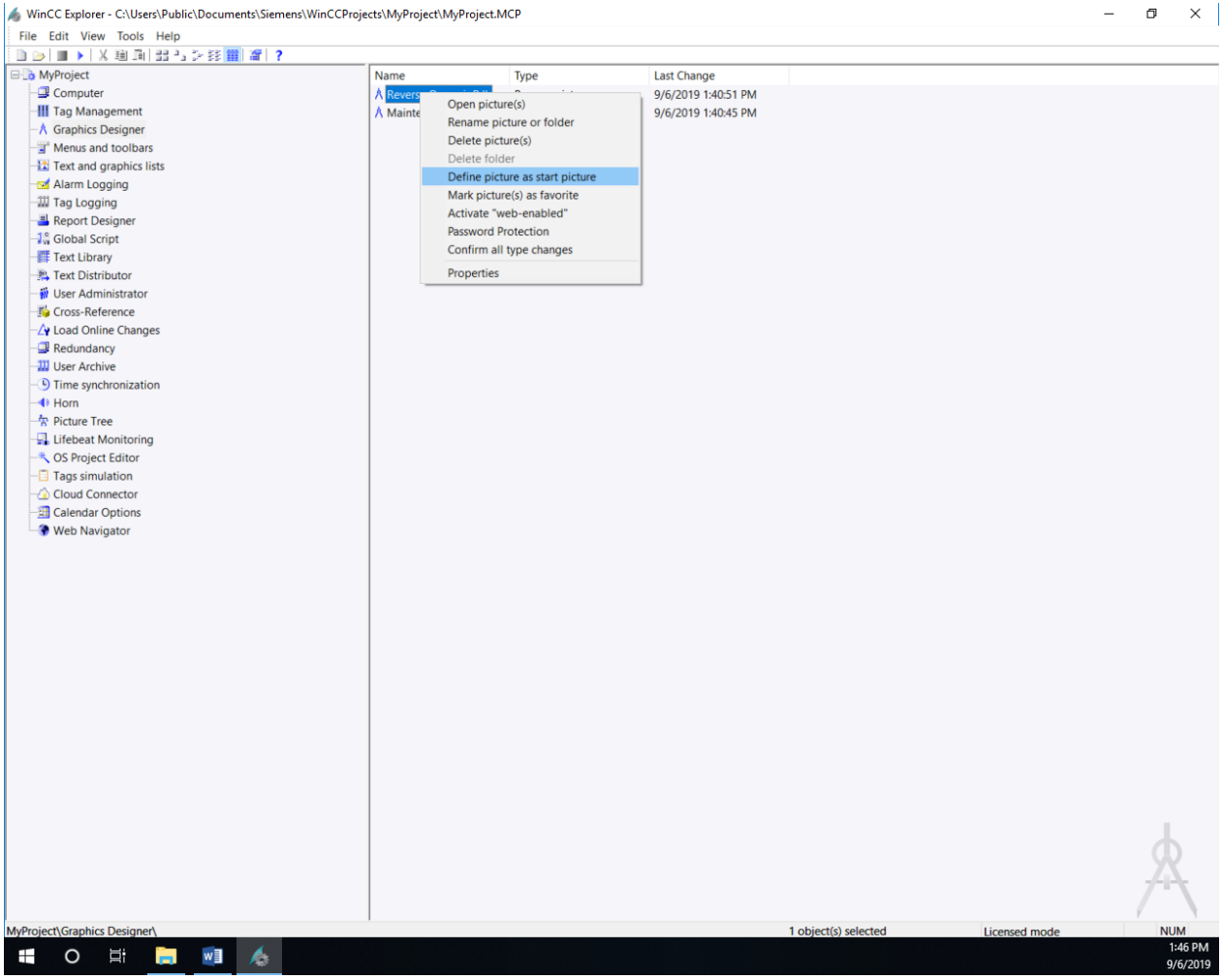
Commented [s1]: How to open maintenance screen- open file folder icon and click on maintenance.pdl


Graphics Designer - Maintenance.pdl
File Edit View Arrange Tools Window Help
Button2
Reverse Osmosis.pdl
Maintenance.pdl
Cut Ctrl+X
Copy Ctrl+C
Duplicate
Paste Ctrl+V
Delete Del
Customized Object
Group
Linking
Configuration Dialog...
Properties
Button Configuration
Text:
Main
Font...
Arial
Color...
Operation:
Authorization...
<No access protection>
Shortcut...
Change Picture on Mouse Click:
Reverse Osmosis.pdl
OK
Cancel
Pictures
Hierarchy:
ALAN-PG-PC
File Name
Maintenance.pdl
Reverse Osmosis.pdl
OK
Cancel
Help
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Standard
Controls
Dynamic Wizard
Display error box
Display WCCDialog box
Picture change in the window
Screen navigation
Single picture change
Picture Functions
Picture-Modules
System Functions
Import Functions
Standard Dynamics
0 - Layer0
Opens the configuration dialog for the selected object
English (United States)
Button2
X60 Y180
X90 Y40
CAPS NUM SCRL
4:03 PM
10/15/2015

10. Save the pictures, and exit Graphics Designer.

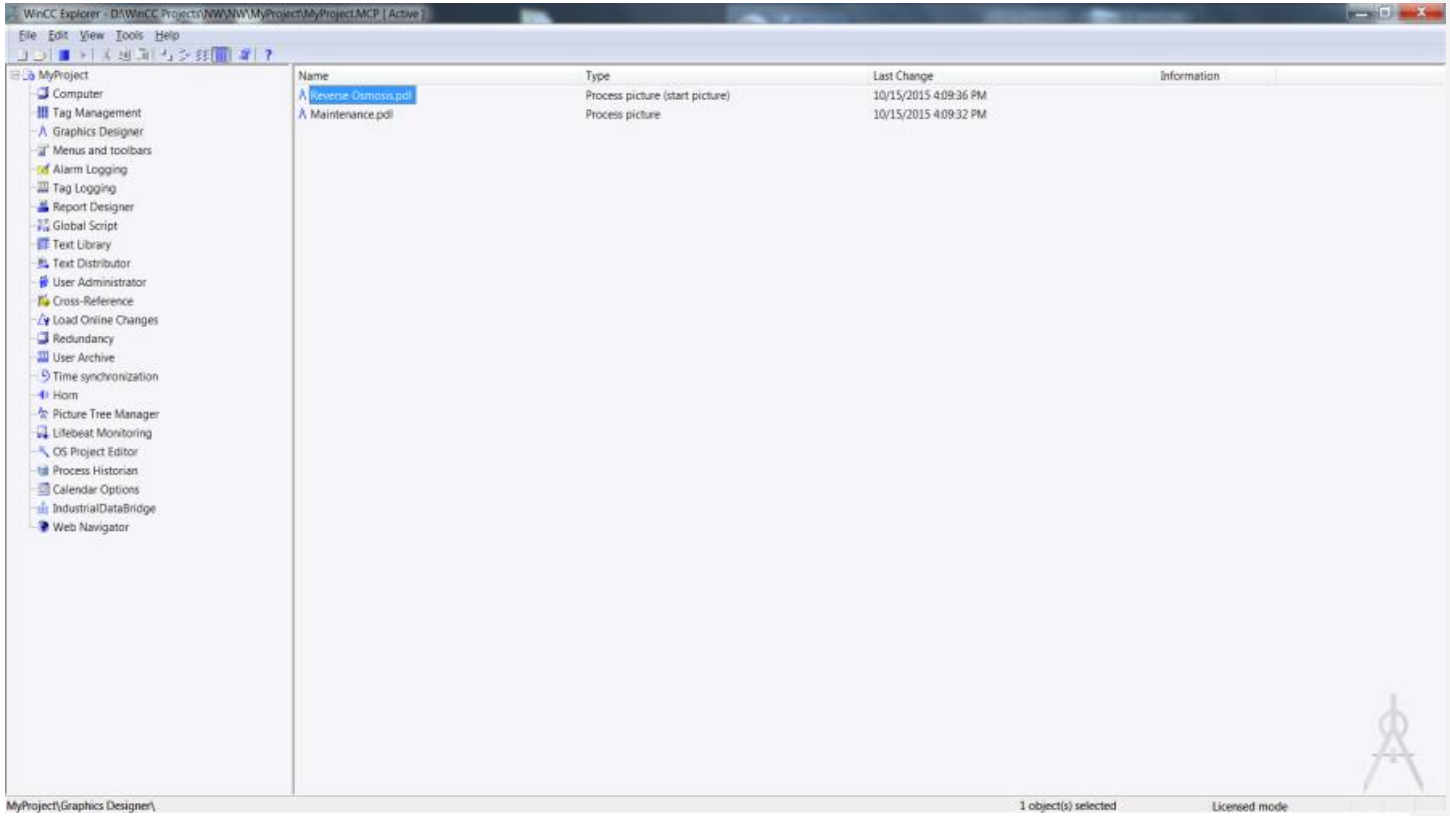

Graphics Designer - NewPdl1
Reverse Osmosis Water Plant
Graphics Designer
Save changes to NewPdl1?
Yes
No
Cancel

11. We need to tell WinCC which picture to start with when it is placed into RunTime. We can do this with either the computer editor or by right clicking on the picture name in the picture list. Set the created “Reverse Osmosis.pdl” screen as the project start picture from the Graphics Design editor in WinCC Explorer.


WinCC Explorer - C:\Users\Public\Documents\Siemens\WinCCProjects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Text and graphics lists
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree
Lifebeat Monitoring
OS Project Editor
Tags simulation
Cloud Connector
Calendar Options
Web Navigator
Name
Type
Last Change
9/6/2019 1:40:51 PM
9/6/2019 1:40:45 PM
Open picture(s)
Rename picture or folder
Delete picture(s)
Delete folder
Define picture as start picture
Mark picture(s) as favorite
Activate "web-enabled"
Password Protection
Confirm all type changes
Properties
MyProject\Graphics Designer\
1 object(s) selected
Licensed mode
NUM
1:46 PM
9/6/2019

Result

You have created the "MyProject" project and set “Reverse Osmosis.pdl” as the start screen

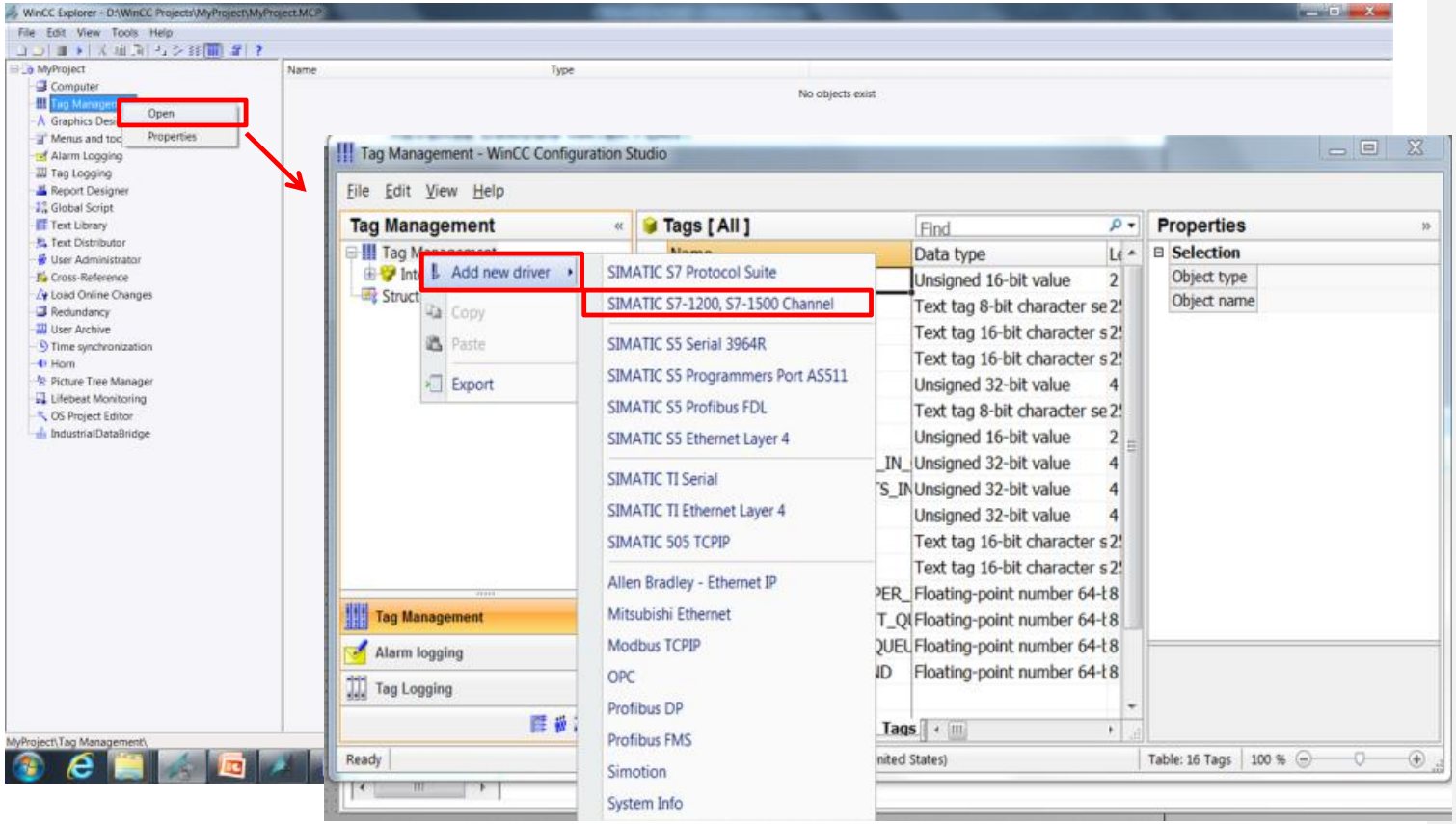

WinCC Explorer - D:\WinCC Projects\NW\NW\MyProject\MyProject.MCP [Active]
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
Process Historian
Calendar Options
IndustrialDataBridge
Web Navigator
Name
Type
Last Change
Information
Reverse Osmosis.pdl
Process picture (start picture)
10/15/2015 4:09:36 PM
Maintenance.pdl
Process picture
10/15/2015 4:09:32 PM
MyProject\Graphics Designer\
1 object(s) selected
Licensed mode

Configure Communication

For WinCC to gather data from the field you will need to define a communication channel for the devices you wish to communicate with. The following steps will show you how to configure communication between WinCC and the automation system controller. In this case we will be communicating with a S7-1500 controller.

Procedure

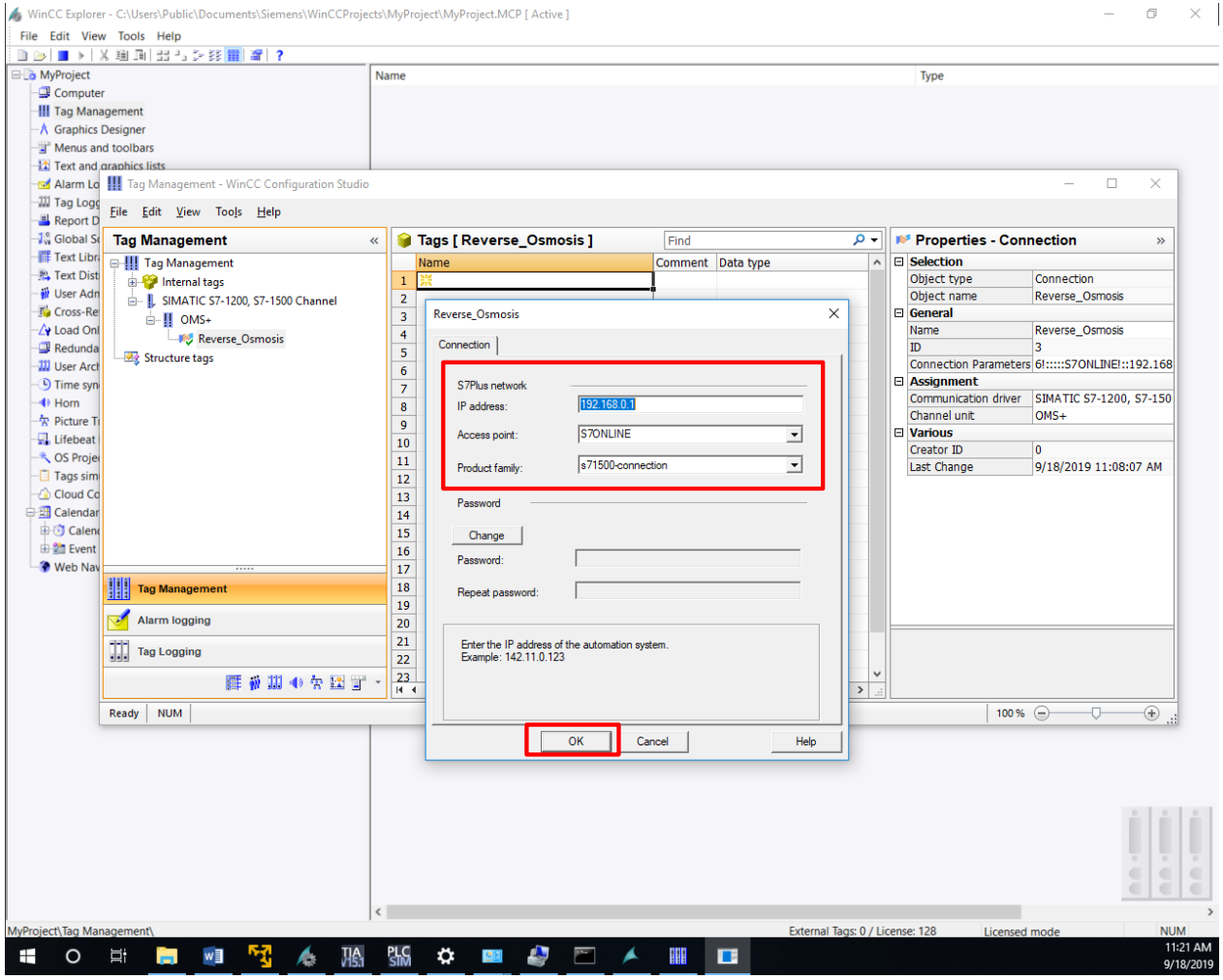
1. Right click on Tag Management Editor and open the editor.
2. Create a new communication channel from the Tag Management editor by opening the "Add new driver" dialog. Add the “S7 SIMATIC S7-1200, S7-1500 channel”.


WinCC Explorer - D:\WinCC Projects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Open
Properties
Name
Type
No objects exist
MyProject\Tag Management\
Tag Management - WinCC Configuration Studio
File Edit View Help
Tag Management
Tags [All]
Find
Properties
Selection
Object type
Object name
Add new driver
Copy
Paste
Export
SIMATIC S7 Protocol Suite
SIMATIC S7-1200, S7-1500 Channel
SIMATIC S5 Serial 3964R
SIMATIC S5 Programmers Port AS511
SIMATIC S5 Profibus FDL
SIMATIC S5 Ethernet Layer 4
SIMATIC TI Serial
SIMATIC TI Ethernet Layer 4
SIMATIC 505 TCPIP
Allen Bradley - Ethernet IP
Mitsubishi Ethernet
Modbus TCPIP
OPC
Profibus DP
Profibus FMS
Simotion
System Info
Data type
Unsigned 16-bit value
Text tag 8-bit character se
Text tag 16-bit character s
Unsigned 32-bit value
Floating-point number 64-bit
Tag Management
Alarm logging
Tag Logging
Tags
Ready
Table: 16 Tags
100 %

3. Expand, from the Tag Management editor, the “SIMATIC S7-1200, S7-1500 Channel” and right hand mouse click on “OMS+, then left click on “New Connection” to create a new connection. Rename this connection to “Reverse_Osmosis”
4. Right click on this new connection, then left click on Connection Parameters to open up the connection parameters configuration view

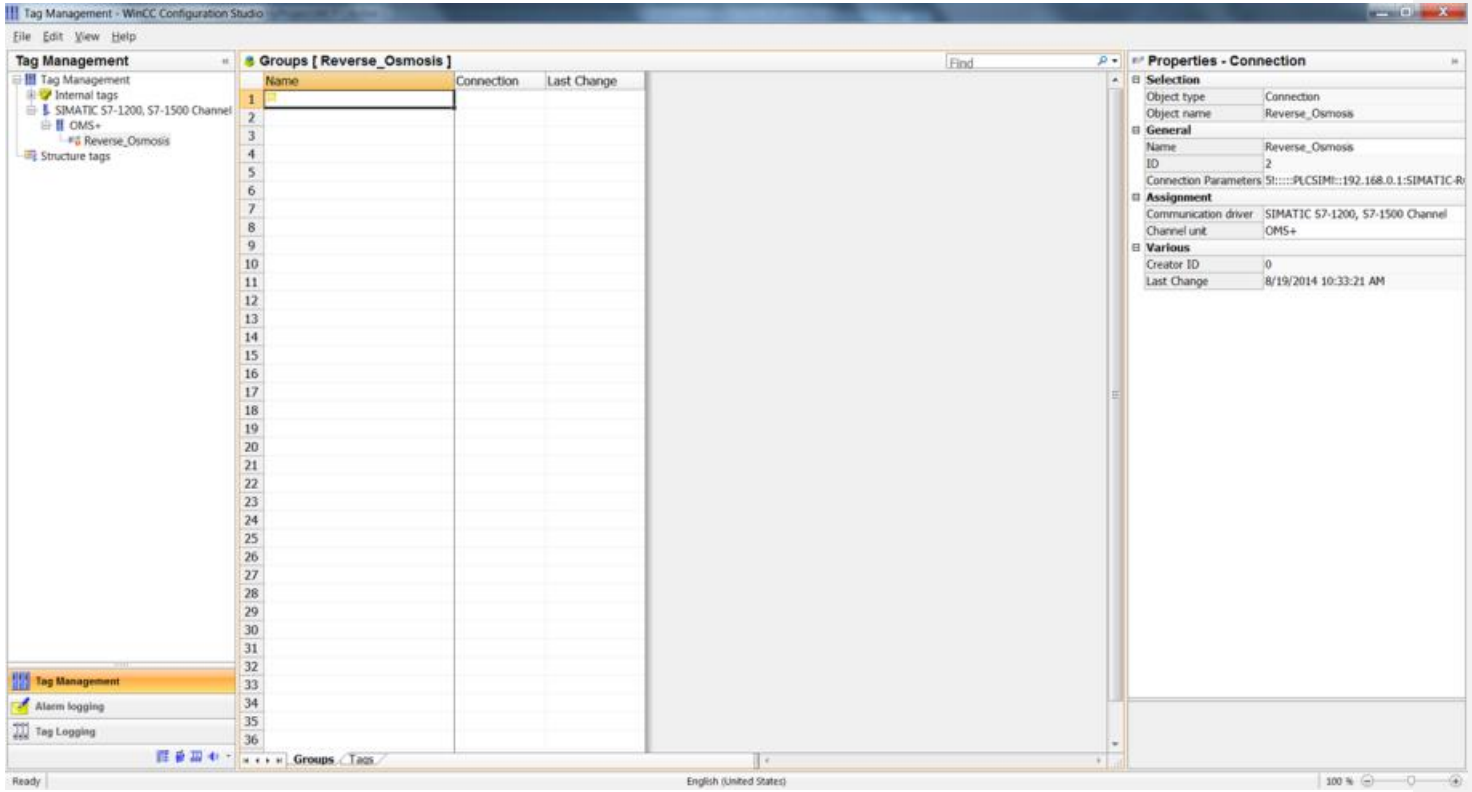
   In the System Parameter view, make the settings below for the Unit settings:

IP Address	192.168.0.1
Access Point	S7ONLINE
Product Family	s71500-connection


WinCC Explorer - C:\Users\Public\Documents\Siemens\WinCCProjects\MyProject\MyProject.MCP [Active]
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Text and graphics lists
Name
Type
Tag Management - WinCC Configuration Studio
File Edit View Tools Help
Tag Management
Tag Management
Internal tags
SIMATIC S7-1200, S7-1500 Channel
OMS+
Reverse_Osmosis
Structure tags
Tags [Reverse_Osmosis]
Find
Name
Comment
Data type
Properties - Connection
Selection
Object type
Connection
Object name
Reverse_Osmosis
General
Name
Reverse_Osmosis
ID
3
Connection Parameters
6!:::::S7ONLINE!::192.168
Assignment
Communication driver
SIMATIC S7-1200, S7-150
Channel unit
OMS+
Various
Creator ID
0
Last Change
9/18/2019 11:08:07 AM
Reverse_Osmosis
Connection
S7Plus network
IP address:
192.168.0.1
Access point:
S7ONLINE
Product family:
s71500-connection
Password
Change
Password:
Repeat password:
Enter the IP address of the automation system.
Example: 142.11.0.123
OK
Cancel
Help
Tag Management
Alarm logging
Tag Logging
Ready
NUM
100 %
MyProject\Tag Management\
External Tags: 0 / License: 128
Licensed mode
NUM
11:21 AM
9/18/2019

Result

You have created the driver communication connection to the S7 PLC, allowing for communication with the PLCSIM project located on your desktop.


Tag Management - WinCC Configuration Studio
File Edit View Help
Tag Management
Tag Management
Internal tags
SIMATIC S7-1200, S7-1500 Channel
OMS+
Reverse_Osmosis
Structure tags
Tag Management
Alarm logging
Tag Logging
Groups [Reverse_Osmosis]
Find
Name
Connection
Last Change
Groups
Tags
Properties - Connection
Selection
Object type
Connection
Object name
Reverse_Osmosis
General
Name
Reverse_Osmosis
ID
2
Connection Parameters
Assignment
Communication driver
SIMATIC S7-1200, S7-1500 Channel
Channel unit
OMS+
Various
Creator ID
0
Last Change
8/19/2014 10:33:21 AM
Ready
English (United States)
100 %

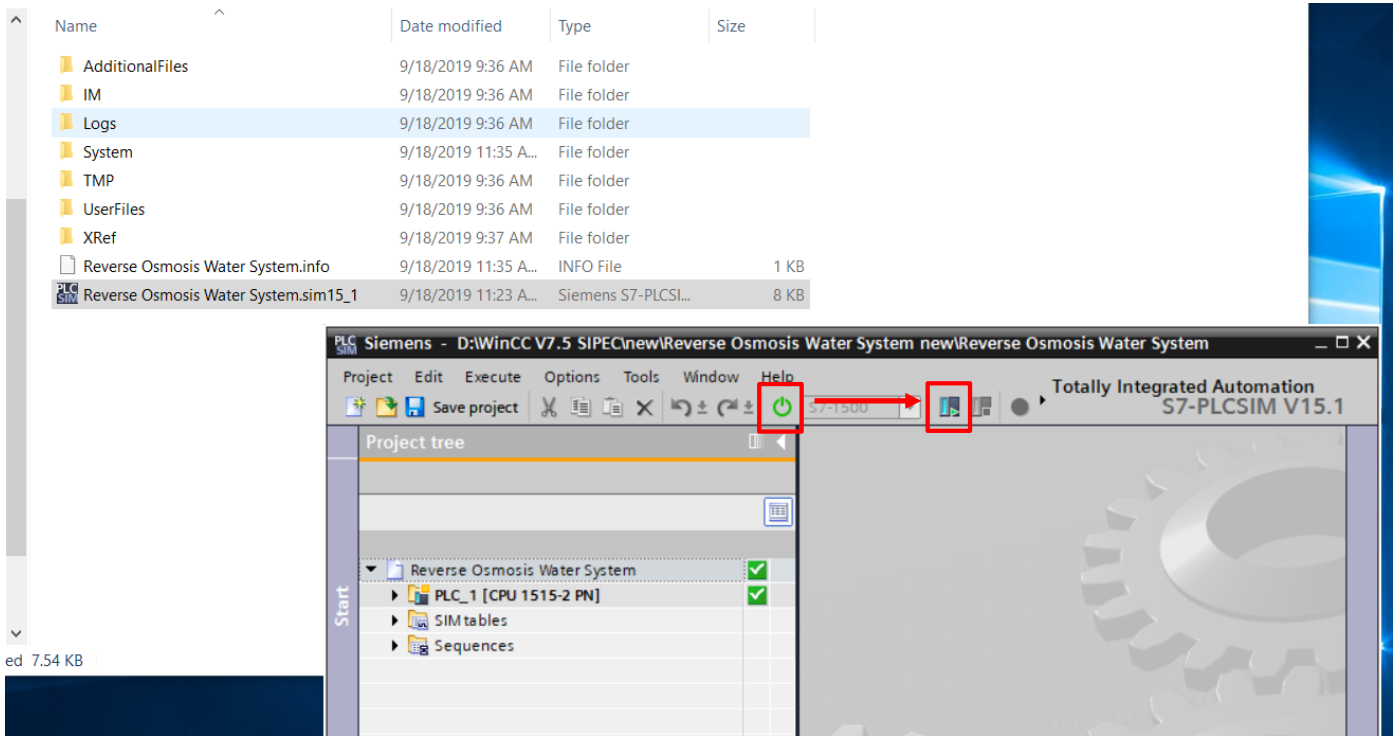
Import Tags

The following steps will show you how to import and create tags in WinCC Explorer. We will be importing tags directly from the PLC program running in the S7-1500 controller (Using the PLC Simulator, PLCSIM).

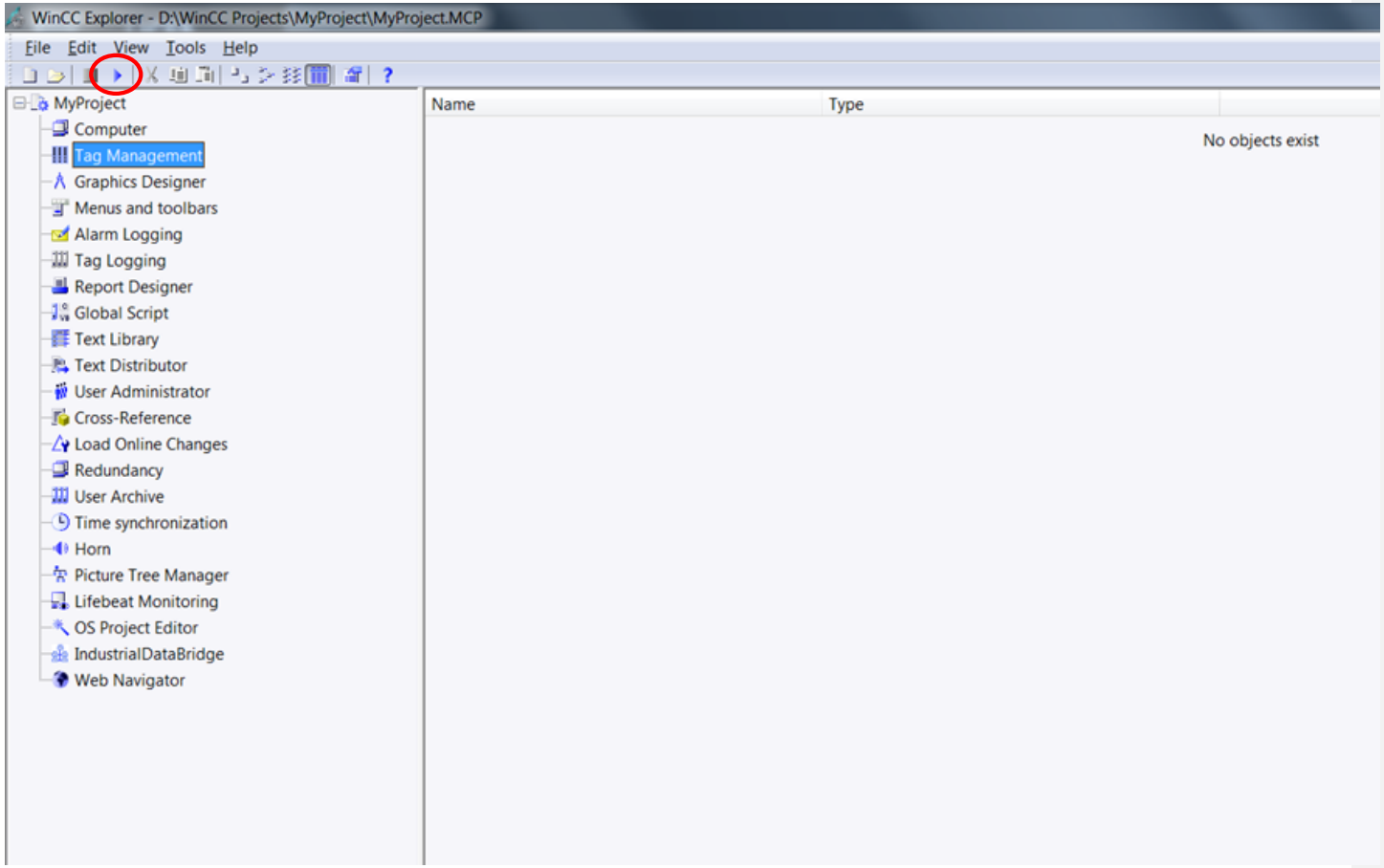
These tags will be used for monitor and control of the PLCSIM project located on your desktop.

Procedure

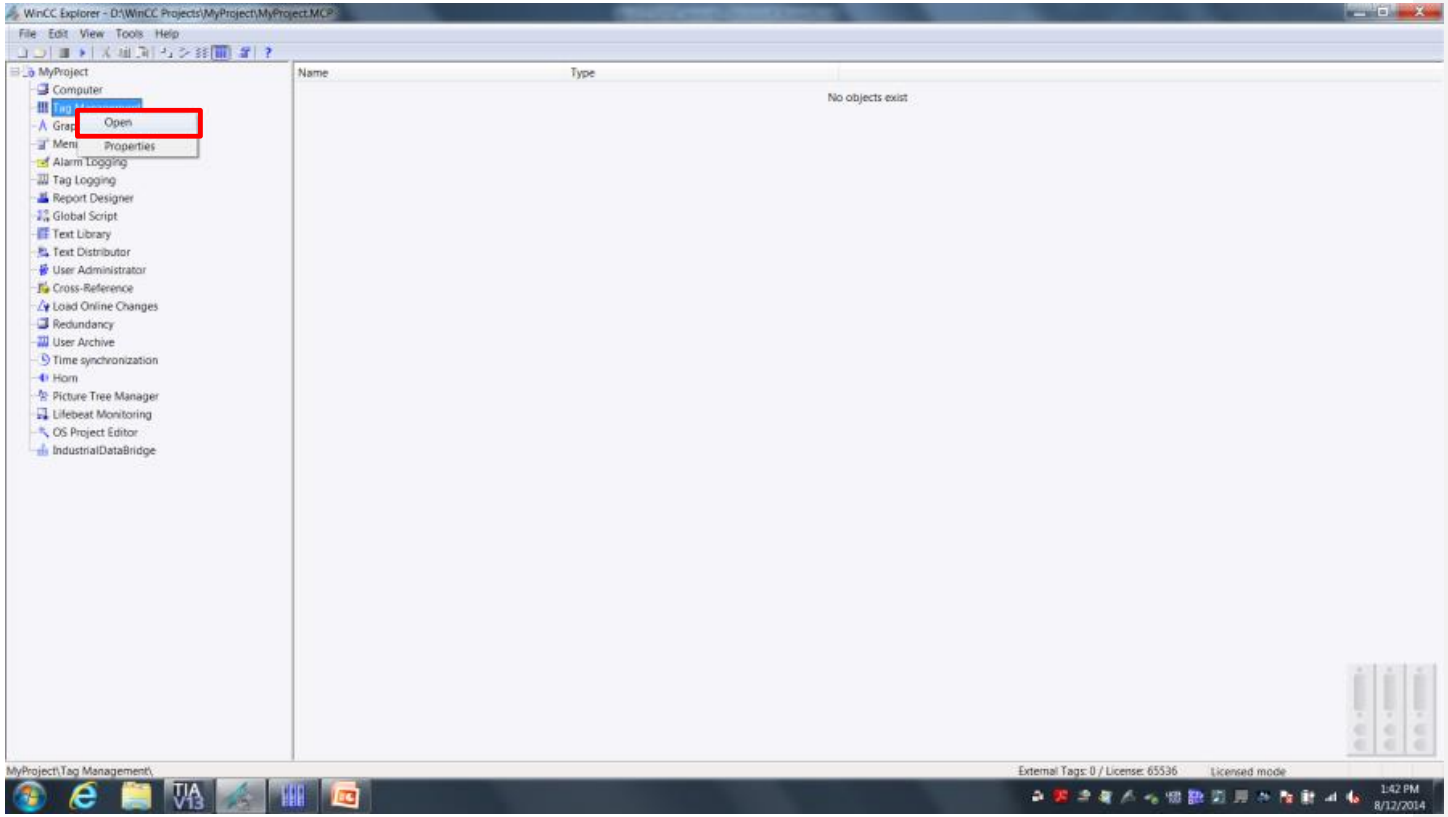
1. Open the folder on the desktop called SIPEC Material` the folder Reverse Osmosis Water System and double click on file “Reverse Osmosis Water System.sim15_1” to start PLCSIM. Once opened you will first need to turn on the CPU and then put the PLC in Run Mode.


Name
Date modified
Type
Size
AdditionalFiles
9/18/2019 9:36 AM
File folder
IM
9/18/2019 9:36 AM
File folder
Logs
9/18/2019 9:36 AM
File folder
System
9/18/2019 11:35 A...
File folder
TMP
9/18/2019 9:36 AM
File folder
UserFiles
9/18/2019 9:36 AM
File folder
XRef
9/18/2019 9:37 AM
File folder
Reverse Osmosis Water System.info
9/18/2019 11:35 A...
INFO File
1 KB
Reverse Osmosis Water System.sim15_1
9/18/2019 11:23 A...
Siemens S7-PLCSI...
8 KB
ed 7.54 KB
Siemens - D:\WinCC V7.5 SIPEC\new\Reverse Osmosis Water System new\Reverse Osmosis Water System
Project
Edit
Execute
Options
Tools
Window
Help
Save project
S7-1500
Totally Integrated Automation
S7-PLCSIM V15.1
Project tree
Start
Reverse Osmosis Water System
PLC_1 [CPU 1515-2 PN]
SIM tables
Sequences

2. To establish communications between the WinCC station and the PLC you need to put WinCC in RunTime. Click the triangle to start the WinCC RT.


WinCC Explorer - D:\WinCC Projects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
No objects exist

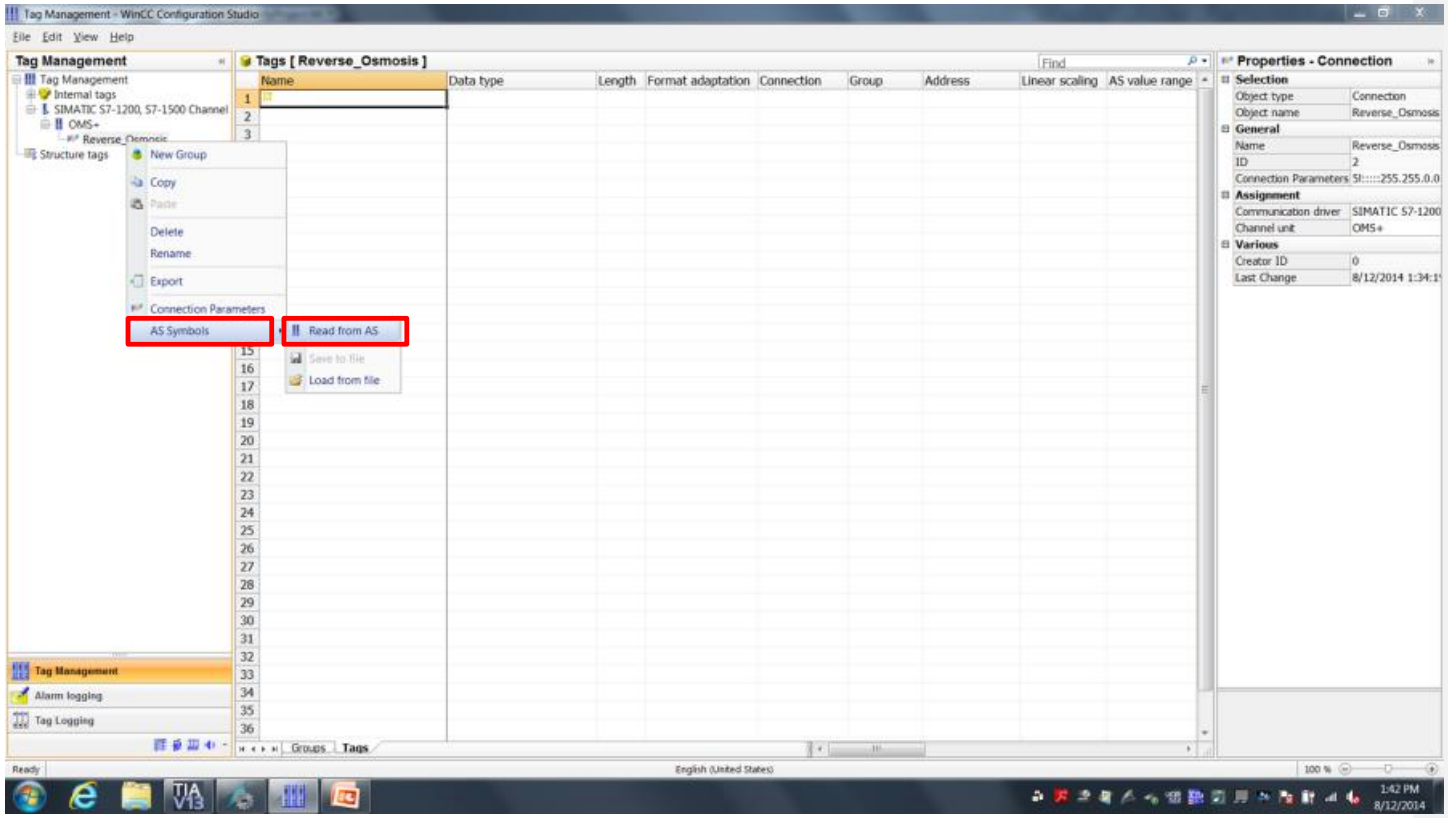
3. Open the WinCC Tag Management from the WinCC Explorer.


WinCC Explorer - D:\WinCC Projects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Open
Properties
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Name
Type
No objects exist
MyProject\Tag Management\
External Tags: 0 / License: 65536
Licensed mode
1:42 PM
8/12/2014

4. Right click on the communication channel “Reverse_Osmosis” Scroll down to “AS Symbols” then click on “Read from AS”

   Click OK

   Right click on the header field “Access” and Select All.

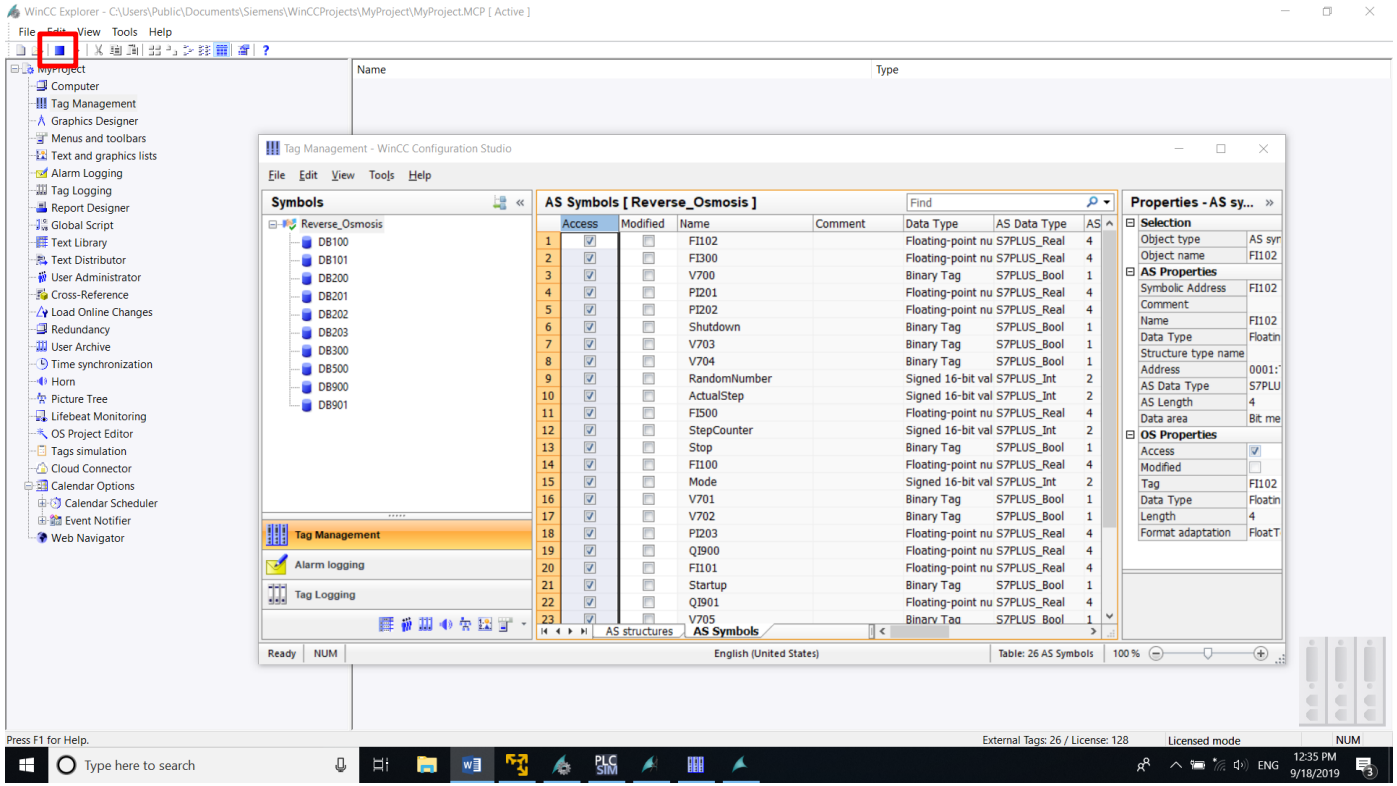

Tag Management - WinCC Configuration Studio
File Edit View Help
Tag Management
Tag Management
Internal tags
SIMATIC S7-1200, S7-1500 Channel
OMS+
Reverse_Osmosis
Structure tags
Tags [Reverse_Osmosis]
Find
Name
Data type
Length
Format adaptation
Connection
Group
Address
Linear scaling
AS value range
New Group
Copy
Paste
Delete
Rename
Export
Connection Parameters
AS Symbols
Read from AS
Save to file
Load from file
Properties - Connection
Selection
Object type
Connection
Object name
Reverse_Osmosis
General
Name
Reverse_Osmosis
ID
2
Connection Parameters
Assignment
Communication driver
SIMATIC S7-1200
Channel unit
OMS+
Various
Creator ID
0
Last Change
Tag Management
Alarm logging
Tag Logging
Groups
Tags
Ready
English (United States)
100 %
1:42 PM
8/12/2014

Result

WinCC has read the variables for the S7 PLC, allowing for monitor and control of the PLCSIM project located in the folder “WinCC V7.x Materials” on the desktop.

In WinCC Configuration Studio, select the tags tab to view the tags that were brought into WinCC.

After completion, shut down WinCC RT.

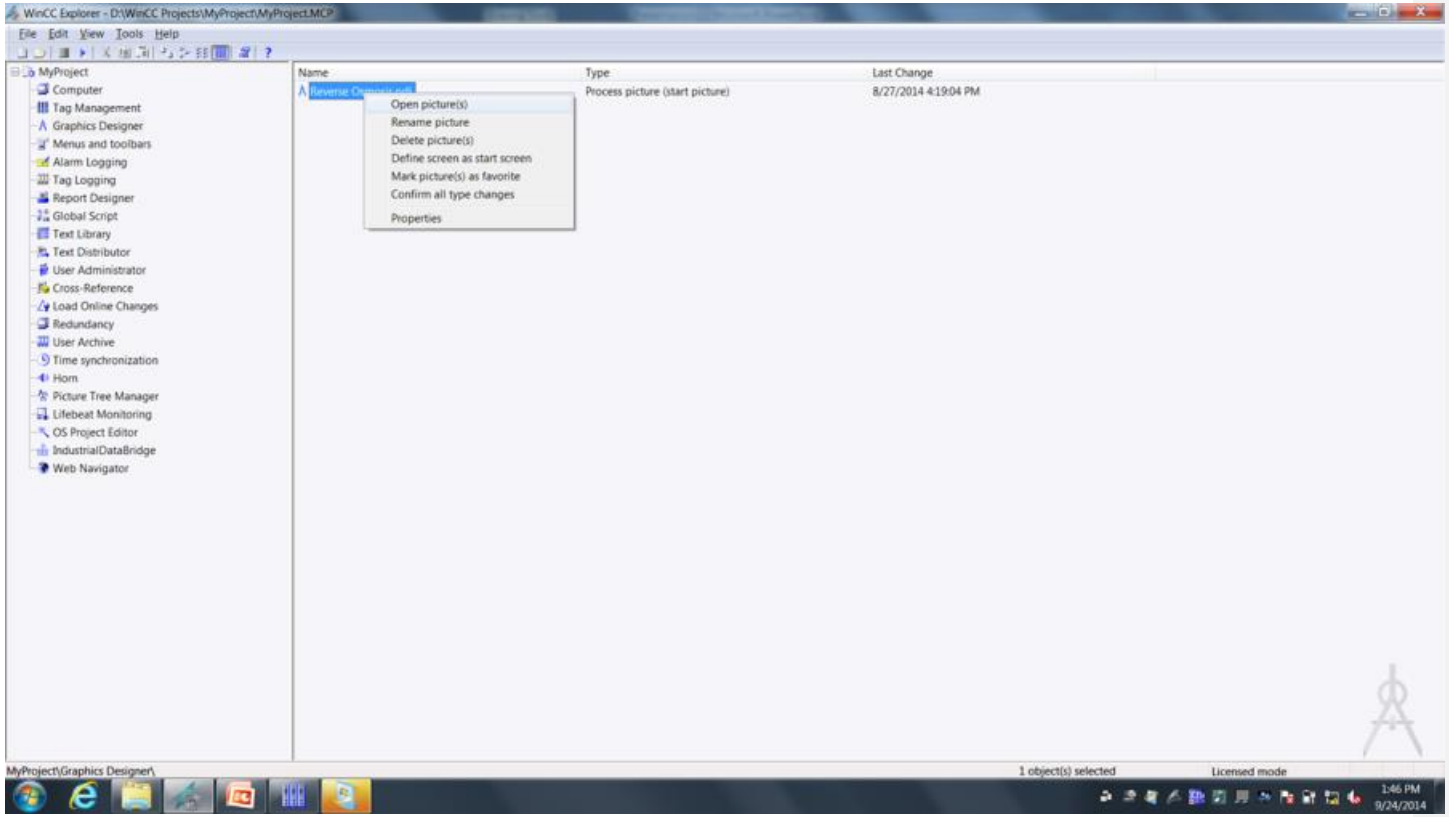

WinCC Explorer - C:\Users\Public\Documents\Siemens\WinCCProjects\MyProject\MyProject.MCP [Active]
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Text and graphics lists
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree
Lifebeat Monitoring
OS Project Editor
Tags simulation
Cloud Connector
Calendar Options
Calendar Scheduler
Event Notifier
Web Navigator
Name
Type
Tag Management - WinCC Configuration Studio
File Edit View Tools Help
Symbols
Reverse_Osmosis
DB100
DB101
DB200
DB201
DB202
DB203
DB300
DB500
DB900
DB901
AS Symbols [Reverse_Osmosis]
Find
Access Modified Name Comment Data Type AS Data Type AS
1 FI102 Floating-point nu S7PLUS_Real 4
2 FI300 Floating-point nu S7PLUS_Real 4
3 V700 Binary Tag S7PLUS_Bool 1
4 PI201 Floating-point nu S7PLUS_Real 4
5 PI202 Floating-point nu S7PLUS_Real 4
6 Shutdown Binary Tag S7PLUS_Bool 1
7 V703 Binary Tag S7PLUS_Bool 1
8 V704 Binary Tag S7PLUS_Bool 1
9 RandomNumber Signed 16-bit val S7PLUS_Int 2
10 ActualStep Signed 16-bit val S7PLUS_Int 2
11 FI500 Floating-point nu S7PLUS_Real 4
12 StepCounter Signed 16-bit val S7PLUS_Int 2
13 Stop Binary Tag S7PLUS_Bool 1
14 FI100 Floating-point nu S7PLUS_Real 4
15 Mode Signed 16-bit val S7PLUS_Int 2
16 V701 Binary Tag S7PLUS_Bool 1
17 V702 Binary Tag S7PLUS_Bool 1
18 PI203 Floating-point nu S7PLUS_Real 4
19 QI900 Floating-point nu S7PLUS_Real 4
20 FI101 Floating-point nu S7PLUS_Real 4
21 Startup Binary Tag S7PLUS_Bool 1
22 QI901 Floating-point nu S7PLUS_Real 4
23 V705 Binary Tag S7PLUS_Bool 1
AS structures
AS Symbols
Properties - AS sy...
Selection
Object type AS syr
Object name FI102
AS Properties
Symbolic Address FI102
Comment
Name FI102
Data Type Floatin
Structure type name
Address 0001:
AS Data Type S7PLU
AS Length 4
Data area Bit me
OS Properties
Access
Modified
Tag FI102
Data Type Floatin
Length 4
Format adaptation FloatT
Tag Management
Alarm logging
Tag Logging
Ready NUM
English (United States)
Table: 26 AS Symbols
100 %
Press F1 for Help.
External Tags: 26 / License: 128
Licensed mode
NUM
Type here to search
ENG
12:35 PM
9/18/2019

Configuring the Process Screen

The following steps will show you how to configure the “Reverse Osmosis” process in the Graphics Design editor.

Procedure

1. Open the graphics screen “Reverse Osmosis” from the WinCC Explorer.

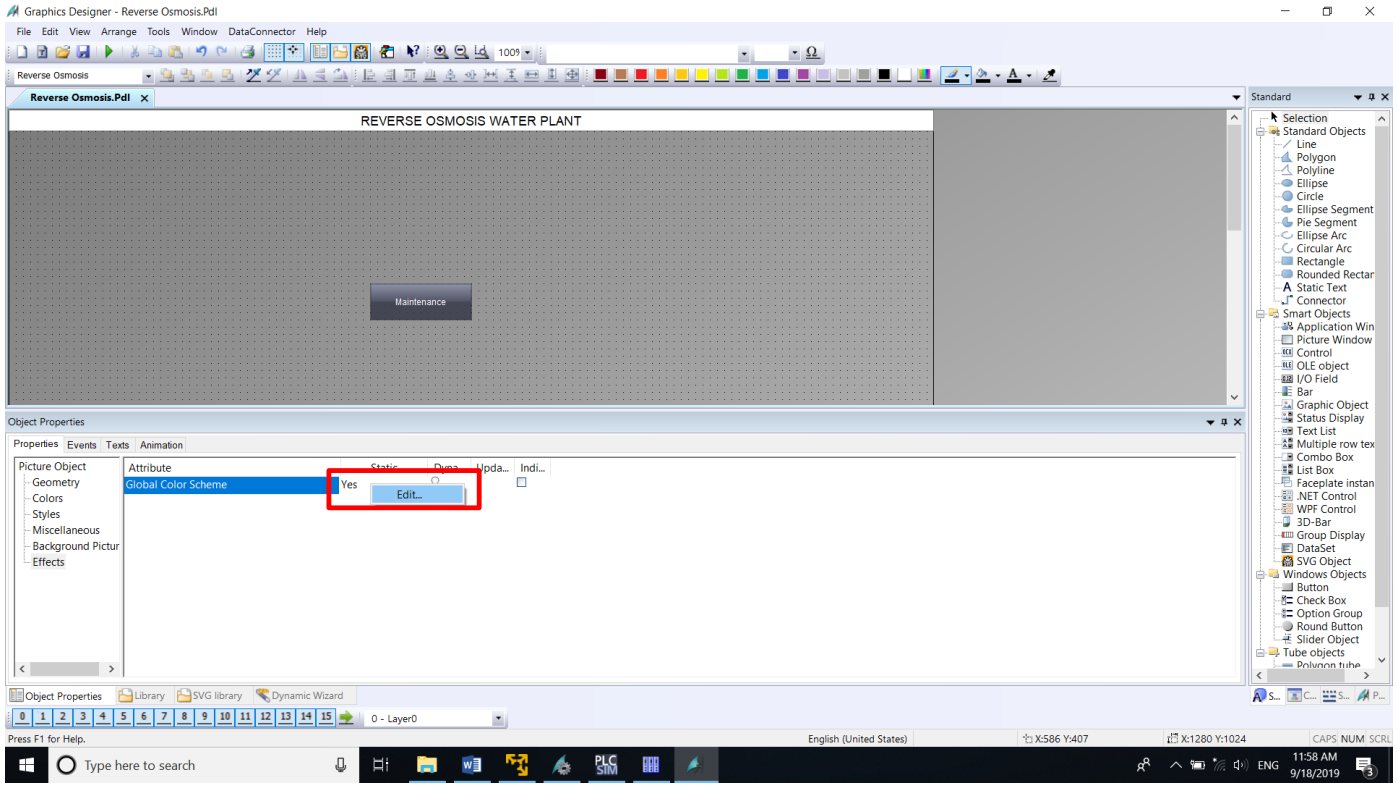

WinCC Explorer - D:\WinCC Projects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
Last Change
Process picture (start picture)
8/27/2014 4:19:04 PM
Open picture(s)
Rename picture
Delete picture(s)
Define screen as start screen
Mark picture(s) as favorite
Confirm all type changes
Properties
MyProject\Graphics Designer\
1 object(s) selected
Licensed mode
1:46 PM
9/24/2014

2. For the opened picture in the Graphics Design editor, modify background to not use global color scheme.

   The Global Color Scheme lets you define specific color screens to be used in the project. This is helpful if you are an end user and have a standard color scheme that you want OEMs and intergrators to use. You can define this color scheme and provide it to people developing WinCC applications for you and know that their project will follow your color scheme. The Global Color Scheme attribute defines whether the colors defined for the current design in the global color scheme will be used for this object.

   With the graphics picture opened, click on the View menu, then click on Toolbar, and then click on Object Properties. In the Object Properties window, click on Effects and change Global Color Scheme from Yes to No by right clicking on Yes and click Edit.

   Global Color Scheme: No


Graphics Designer - Reverse Osmosis.Pdl
File Edit View Arrange Tools Window DataConnector Help
Reverse Osmosis
Reverse Osmosis.Pdl
REVERSE OSMOSIS WATER PLANT
Maintenance
Object Properties
Properties Events Texts Animation
Picture Object
Geometry
Colors
Styles
Miscellaneous
Background Pictur
Effects
Attribute
Global Color Scheme
Yes
Edit...
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectar
Static Text
Connector
Smart Objects
Application Win
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row tex
Combo Box
List Box
Faceplate instan
.NET Control
WPF Control
3D-Bar
Group Display
DataSet
SVG Object
Windows Objects
Button
Check Box
Option Group
Round Button
Slider Object
Tube objects
Object Properties
Library
SVG library
Dynamic Wizard
0 - Layer0
Press F1 for Help.
English (United States)
X:586 Y:407
X:1280 Y:1024
Type here to search
ENG
11:58 AM
9/18/2019

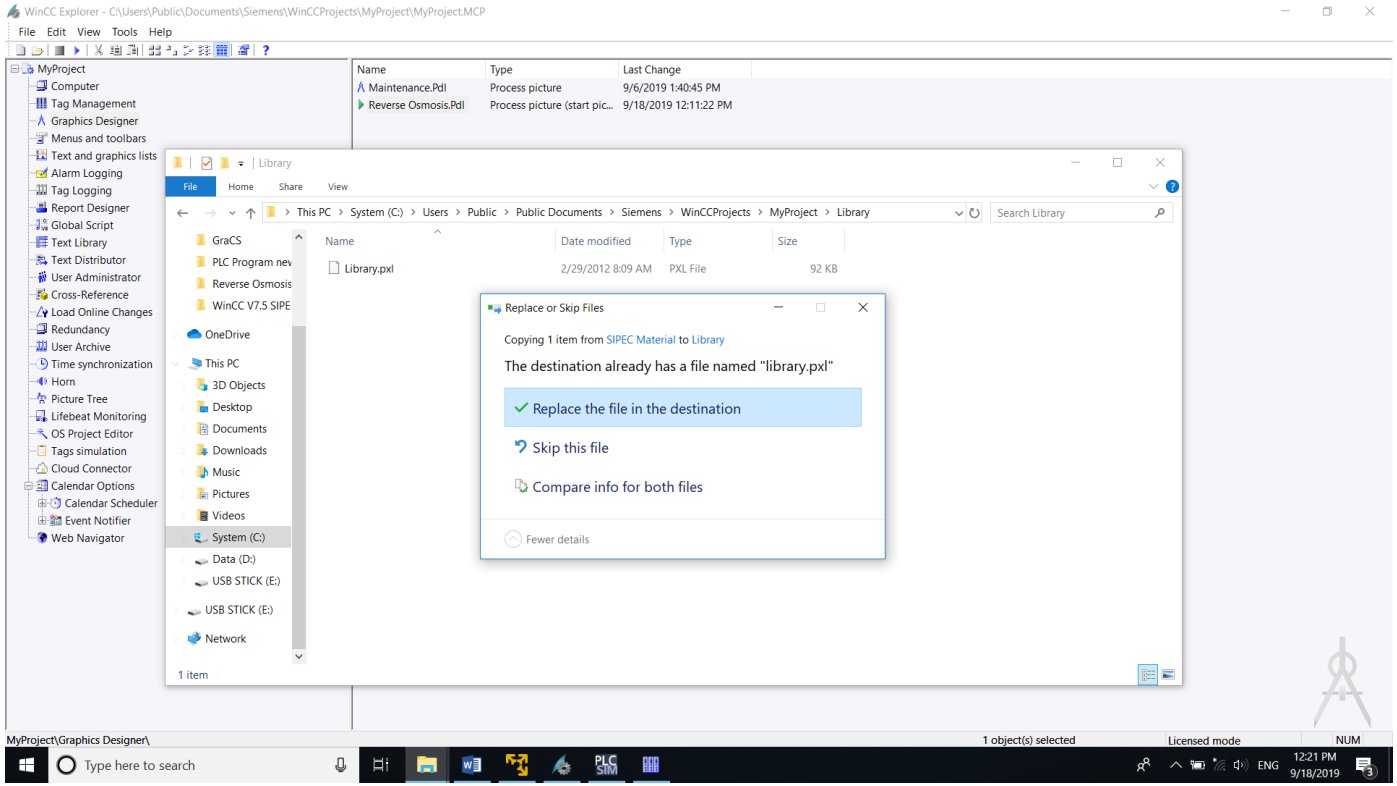
3. We will be adding a custom developed project library to the current WinCC Project. The library file “library.pxl” is located in the folder “WinCC V7.x Materials” on the desktop.

   You can create your own library objects and provide these to other users so that they can use your custom objects. In this proejct we are doing this to help speed up screen design.

   To add the custom developed project library to the current WinCC project, copy the “library.pxl’ file from the folder “WinCC V7.x Materials” on the desktop to the Library folder directory of the current WinCC project. If there is already a “Library.pxl”, you will need to close the Graphics Designer, paste “library.pxl” into the current WinCC project, and click on “Replace the file in the destination”

   (INSTRUCTOR NOTE: List out this folder path to make sure everyone can find it.)

   Drive: C:¥Users¥Public¥Documents¥Siemens¥WinCCProjects¥MyProject¥Library


WinCC Explorer - C:\Users\Public\Documents\Siemens\WinCCProjects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Text and graphics lists
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree
Lifebeat Monitoring
OS Project Editor
Tags simulation
Cloud Connector
Calendar Options
Calendar Scheduler
Event Notifier
Web Navigator
Name Type Last Change
Maintenance.Pdl Process picture 9/6/2019 1:40:45 PM
Reverse Osmosis.Pdl Process picture (start pic... 9/18/2019 12:11:22 PM
Library
File Home Share View
This PC > System (C:) > Users > Public > Public Documents > Siemens > WinCCProjects > MyProject > Library
Search Library
GraCS
PLC Program nev
Reverse Osmosis
WinCC V7.5 SIPE
OneDrive
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
System (C:)
Data (D:)
USB STICK (E:)
USB STICK (E:)
Network
Name Date modified Type Size
Library.pxl 2/29/2012 8:09 AM PXL File 92 KB
1 item
Replace or Skip Files
Copying 1 item from SIPEC Material to Library
The destination already has a file named "library.pxl"
Replace the file in the destination
Skip this file
Compare info for both files
Fewer details
MyProject\Graphics Designer\
1 object(s) selected
Licensed mode
NUM
Type here to search
ENG
12:21 PM
9/18/2019

4. If you had to close the Graphics Designer, go back to WinCC Explorer and click on Grapghics Designer. Right click on “Reverse Osmosis.Pdl” and click on “Open Picture(s)”

   To speed up project development we will bring in most of the graphics for our project as a custom library object.

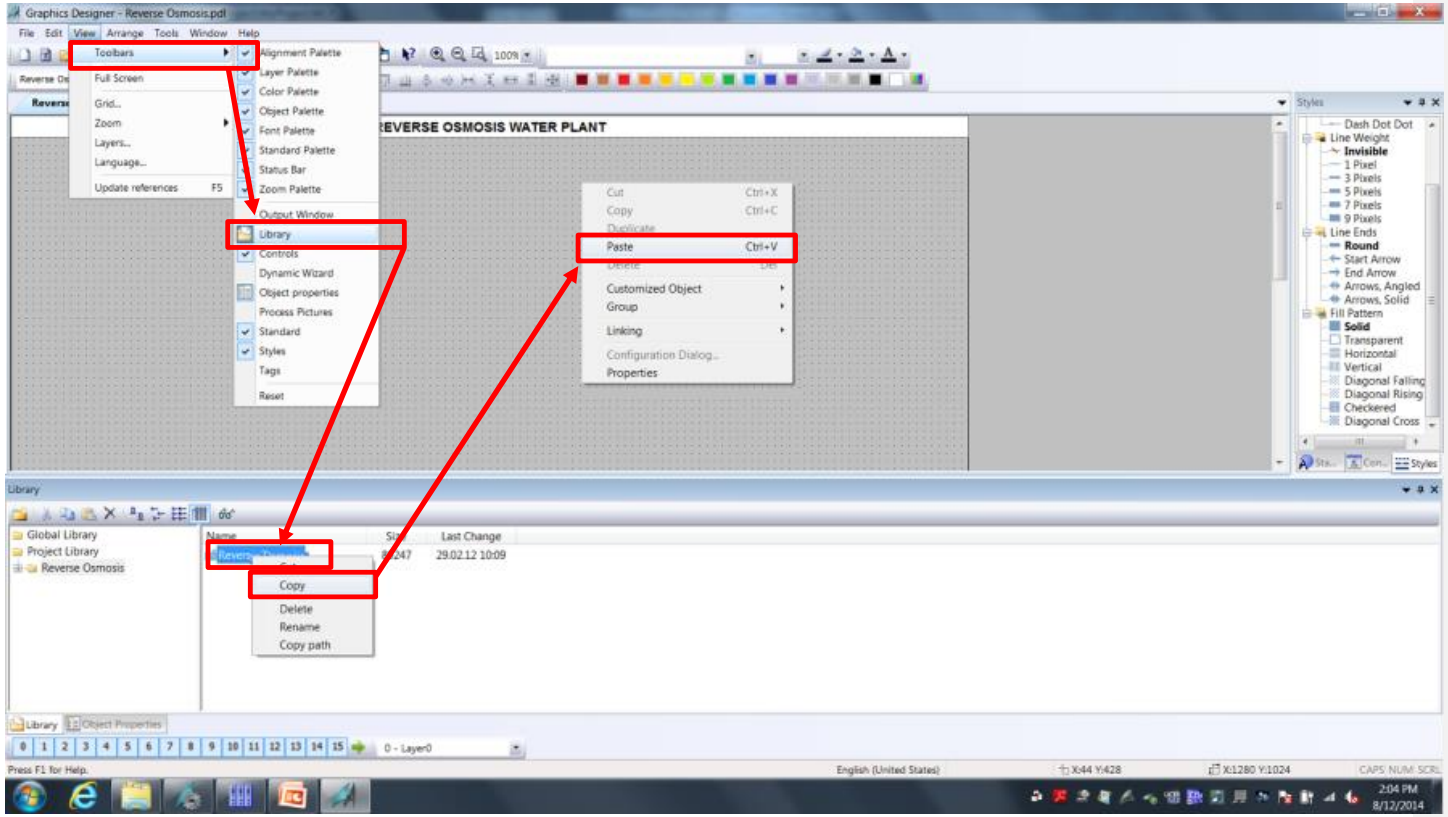
   To add objects to the screen from the project library, open the project library and copy the library objects to be added to the screen. To open the project library, click View, Toolbars, Library.

   Under Project Library choose “Reverse Osmosis” and place on the screen.

   After insertion of new objects from library, place objects on screen with the geometry settings for X and Y position:

   Position X: 180
   Position Y: 140

   Use keyboard keys for up/down/left/right to place objects in above location.


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Toolbars
Full Screen
Grid...
Zoom
Layers...
Language...
Update references F5
Alignment Palette
Layer Palette
Color Palette
Object Palette
Font Palette
Standard Palette
Status Bar
Zoom Palette
Output Window
Library
Controls
Dynamic Wizard
Object properties
Process Pictures
Standard
Styles
Tags
Reset
EVERSE OSMOSIS WATER PLANT
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Customized Object
Group
Linking
Configuration Dialog...
Properties
Styles
Dash Dot Dot
Line Weight
Invisible
1 Pixel
3 Pixels
5 Pixels
7 Pixels
9 Pixels
Line Ends
Round
Start Arrow
End Arrow
Arrows, Angled
Arrows, Solid
Fill Pattern
Solid
Transparent
Horizontal
Vertical
Diagonal Falling
Diagonal Rising
Checkered
Diagonal Cross
Library
Global Library
Project Library
Reverse Osmosis
Name
Last Change
29.02.12 10:09
Copy
Delete
Rename
Copy path
Library
Object Properties
0 - Layer0
Press F1 for Help.
English (United States)
X:44 Y:428
X:1280 Y:1024
CAPS NUM SCRL
2:04 PM
8/12/2014

5. To finish our picture we will need to add a pump, piping and I/O fields to the picture. Let's start with adding a pump.

With the imported objects from the custom library already in place, we willl now add the raw water feed objects for this process.

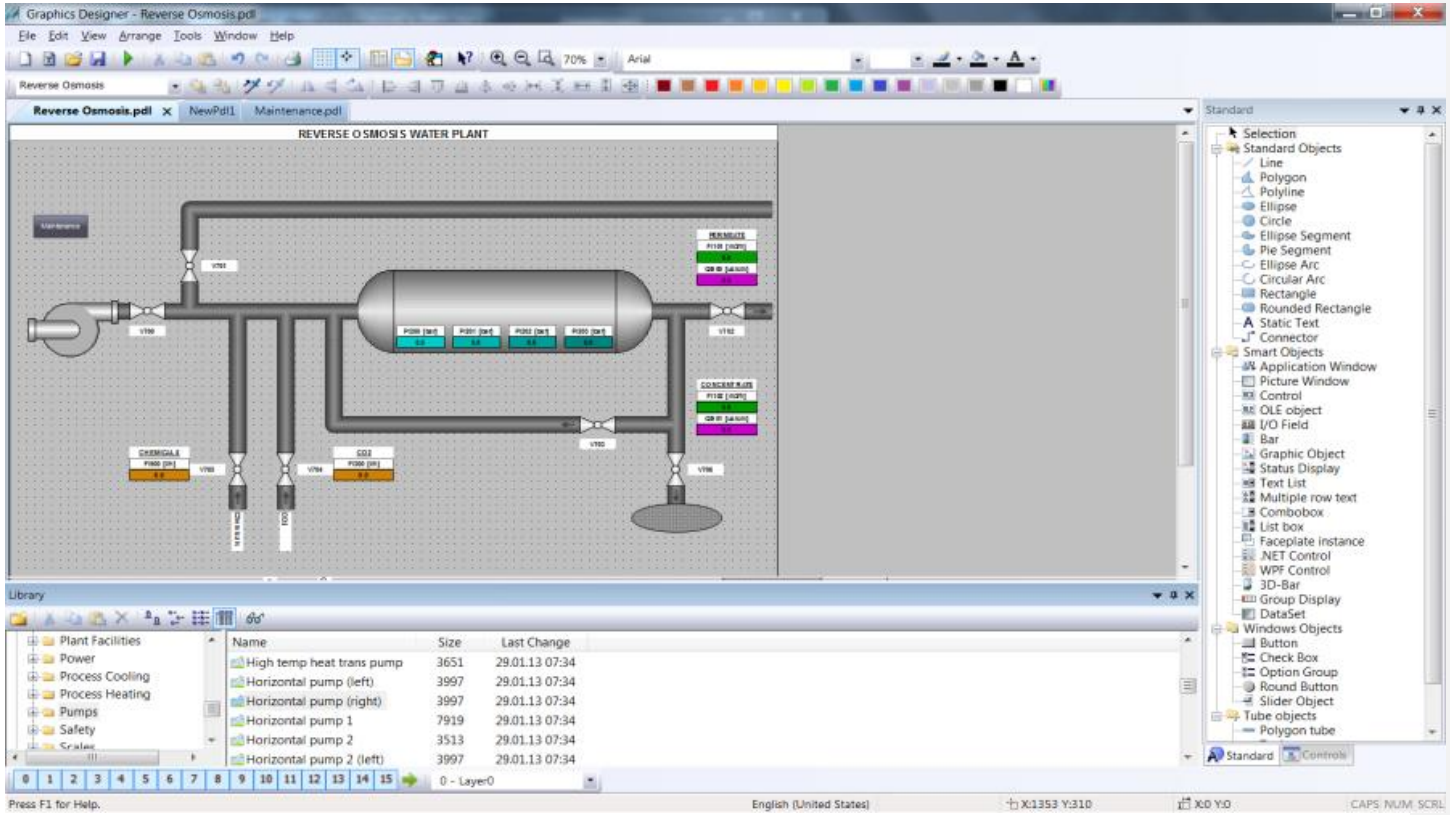
For the raw water feed we will add to the screen:

- A horizontal pump object from the WinCC library
- Horizontal pump designation P800
- Incoming pipe to the pump using the WinCC tube objects
- Monitoring of the raw water flow meter

First we will add the pump object to the process, and here we will use the horizontal pump object from the WinCC library.

1. Open the WinCC library
2. Find the "Horizontal Pump (right)" object from "Global Library → Siemens HMI Symbol Library → Pumps", and add to screen by drag-and-drop.
3. Place the pump at the left end of the pipe exiting the V700 valve.

The WinCC Object Library contains thousands of objects that you can use to create your screens and is included with the base WinCC package


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
NewPdl1
Maintenance.pdl
REVERSE OSMOSIS WATER PLANT
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Faceplate instance
.NET Control
WPF Control
3D-Bar
Group Display
DataSet
Windows Objects
Button
Check Box
Option Group
Round Button
Slider Object
Tube objects
Polygon tube
Library
Plant Facilities
Power
Process Cooling
Process Heating
Pumps
Safety
Name
Size
Last Change
High temp heat trans pump 3651 29.01.13 07:34
Horizontal pump (left) 3997 29.01.13 07:34
Horizontal pump (right) 3997 29.01.13 07:34
Horizontal pump 1 7919 29.01.13 07:34
Horizontal pump 2 3513 29.01.13 07:34
Horizontal pump 2 (left) 3997 29.01.13 07:34
0 - Layer0
Press F1 for Help.
English (United States)
X:1353 Y:310
X:0 Y:0
CAPS NUM SCRL

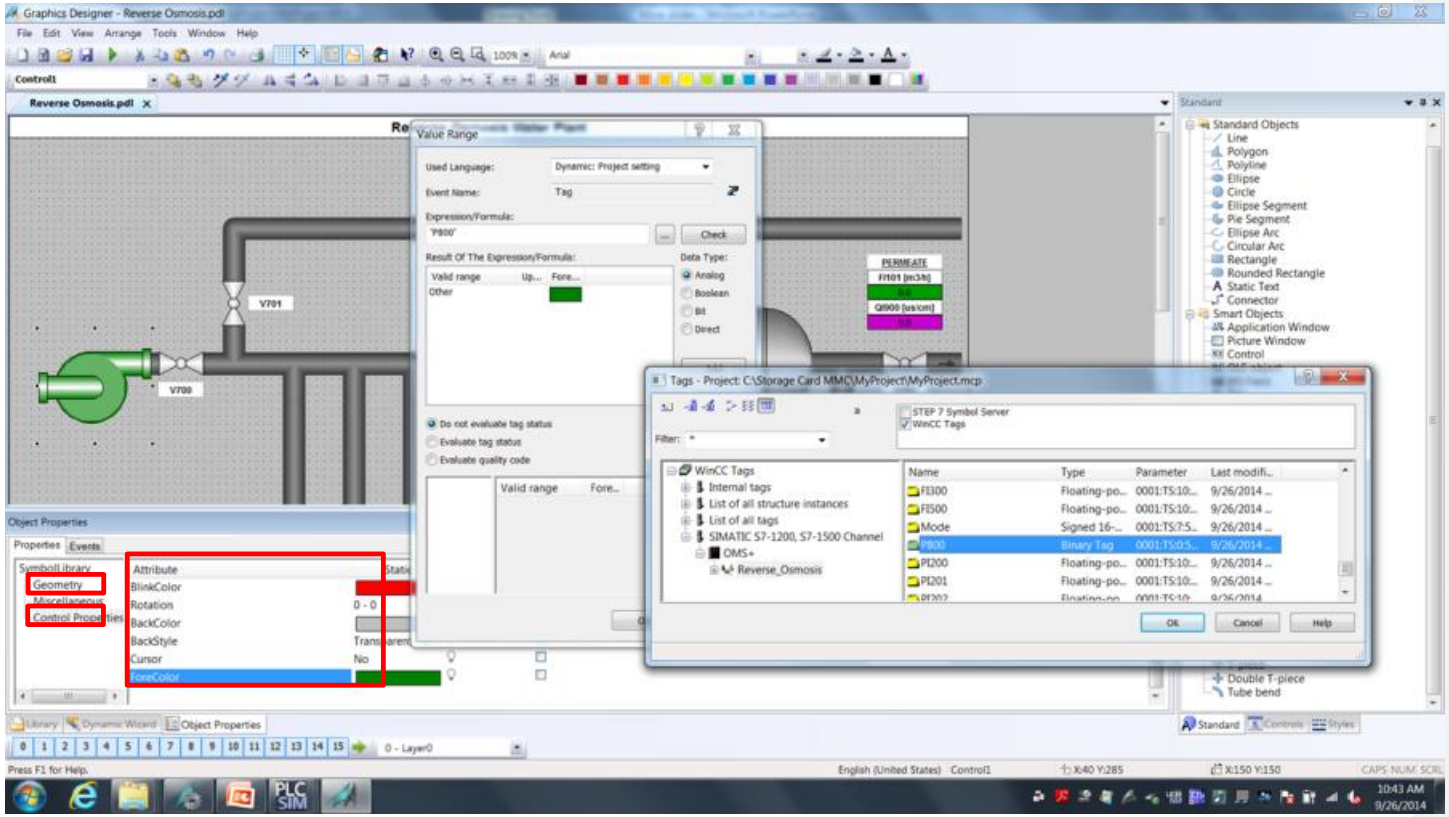
6. With the pump added to the screen, we will now add dynamic to the pump object to indicate when the pump is running. We will do this by changing the pump color based upon a tag from the PLC.

   In the object properties window for the inserted pump, make the settings for the control properties as:

SymbolApperance:	Shaded – 1
ForeColor	Dynamic Dialog (right-hand mouse click on light bulb to open dialog)

   In the window “Value Range”.

   1. Browse for tag P800 in the controller, and add to the Expression/Formula
   2. Select Data Type to Boolean
   3. For Yes/TRUE leave default color
   4. For No/FALSE select light grey
   5. Click Ok and then close “Value Range” window and object properties window.


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
Value Range
Tags - Project: C:\Storage Card MMC\MyProject\MyProject.mcp
Object Properties
Standard Objects
Smart Objects
V701
V700
PERMEATE

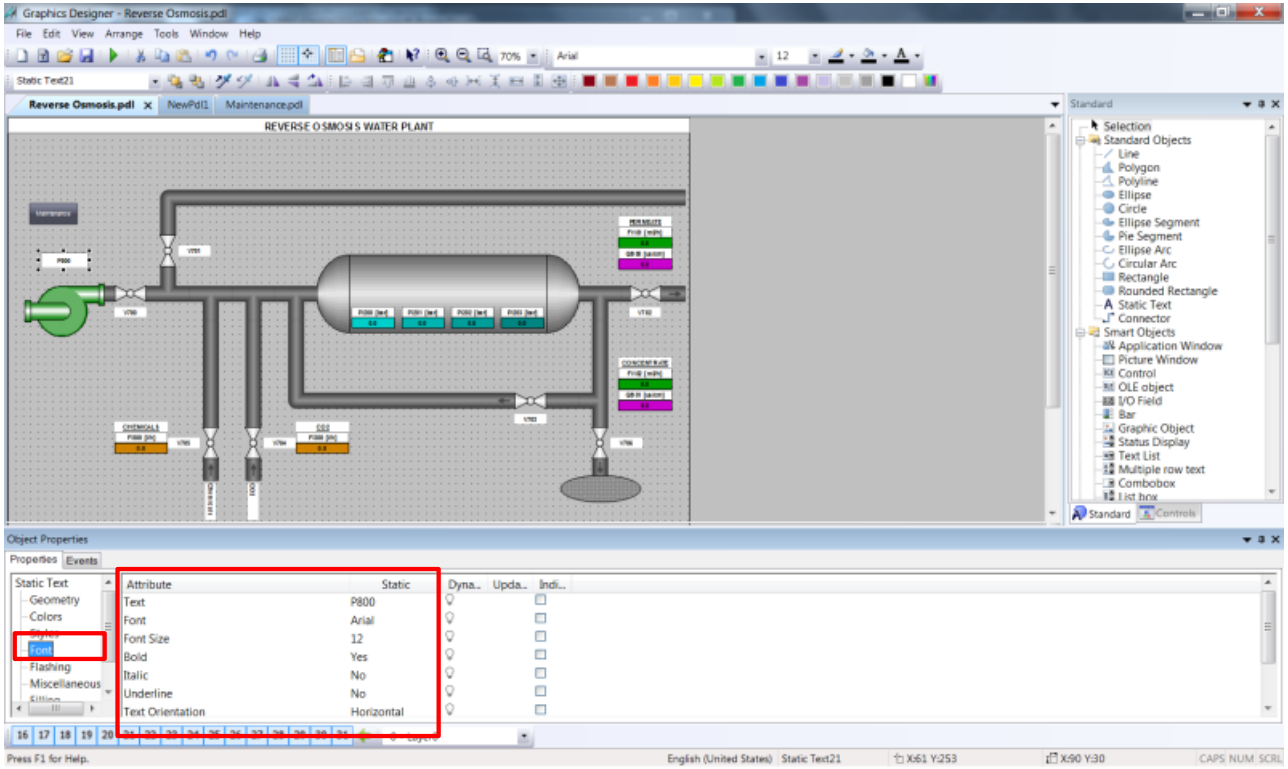
7. Add the pump designation “P800” for the inserted pump object.

To insert the pump designation, select the “Static Text” object in the standard area of the object palette tool and place on the screen area above the pump.

In the properties view of the inserted object change styles and font of the object. To open the properties view , select focus on the inserted control object and right-hand mouse click to open the properties window.

Make the settings below for the Font settings:

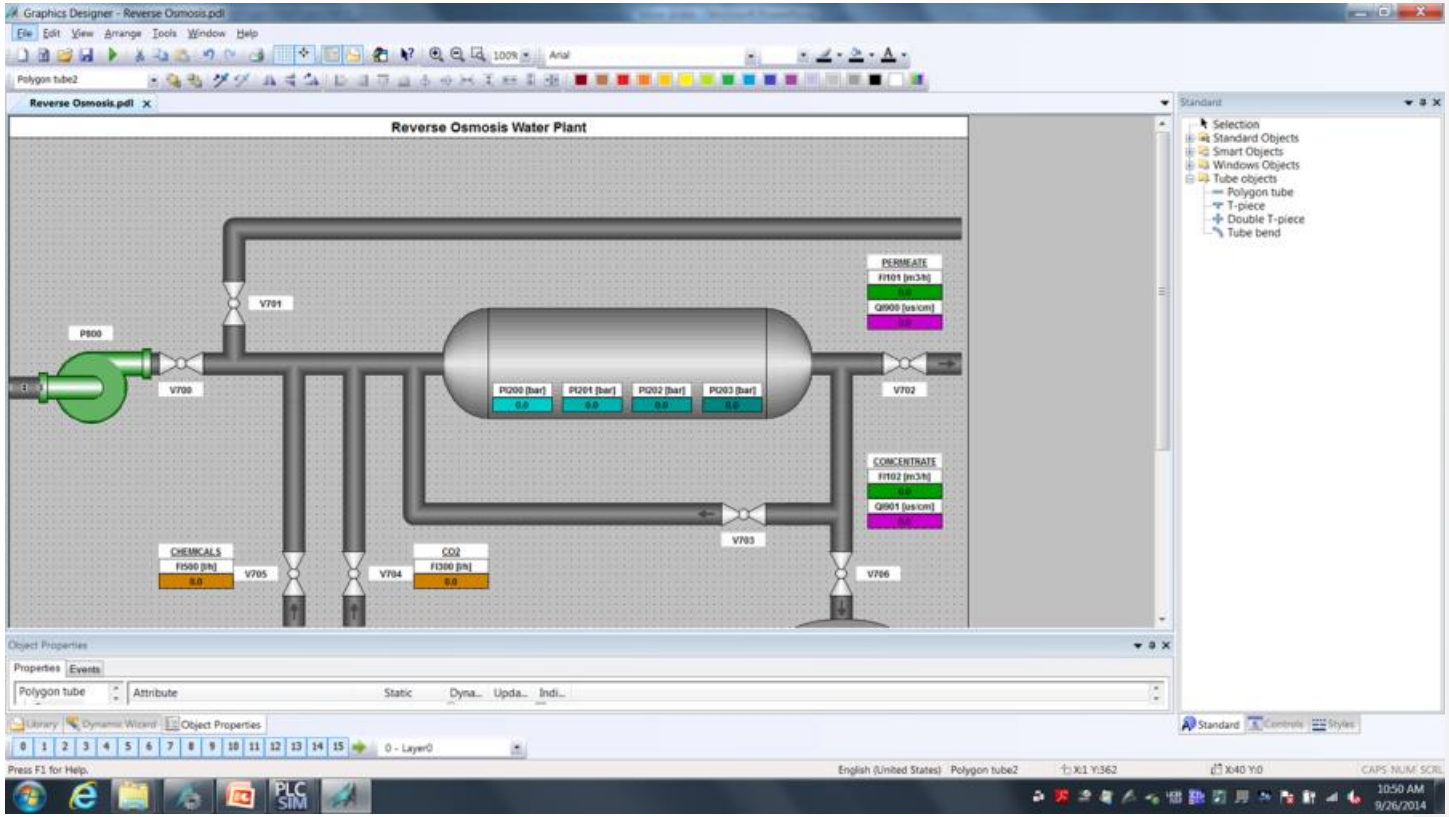
Text:	P800
Bold:	Yes
X Alignment:	Centered
Y Alignment:	Centered


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
NewPdl1
Maintenance.pdl
REVERSE OSMOSIS WATER PLANT
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Object Properties
Properties
Events
Static Text
Geometry
Colors
Font
Flashing
Miscellaneous
Attribute
Static
Dyna...
Upda...
Indi...
Text
P800
Font
Arial
Font Size
12
Bold
Yes
Italic
No
Underline
No
Text Orientation
Horizontal
Press F1 for Help.
English (United States)
Static Text21
X:61 Y:253
X:90 Y:30
CAPS NUM SCRL

8. Draw an incoming pipe object to pump P800.

To insert the pipe object, select the “Polygon Tube” object in the standard “Tube Objects” area of the object palette tool and draw pipe on the screen area before the pump P800.

After inserting the pipe object onto screen area, draw a polygon tube. When done with your pipe object, end pipe object with double-click at end point.


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
Reverse Osmosis Water Plant
PERMEATE
V701
P800
V700
V702
CONCENTRATE
V703
CHEMICALS
V705
CO2
V704
V706
Standard
Selection
Standard Objects
Smart Objects
Windows Objects
Tube objects
Polygon tube
T-piece
Double T-piece
Tube bend
Object Properties
Properties
Events
Polygon tube
Attribute
Static
Dyna...
Upda...
Indi...
Press F1 for Help.
English (United States) Polygon tube2
10:50 AM
9/26/2014

9. Add monitoring of the raw water flow meterFI100 to the process screen. First we will add the I/O Field used to monitor the process value.To insert the I/O Field object, select the “I/O Field” object in the standard area of the object palette tool and place on the screen area below the pump P800.

In the pop-up view of the inserted object, browse and select tag FI100 from the controller. Then close the I/O Field Configuration dialog.

In the properties view of the inserted object change colors, font, Output/Input and effects of the object. To open the properties view , select focus on the inserted control object and right-hand mouse click to open the properties window. Place the IO field beneath the Pump.

Make the settings below for the **Colors** settings

Background Color: Green HTML Code 00B500
(fifth color selection from the left in fourth row)

Make the settings below for the **Font** settings:

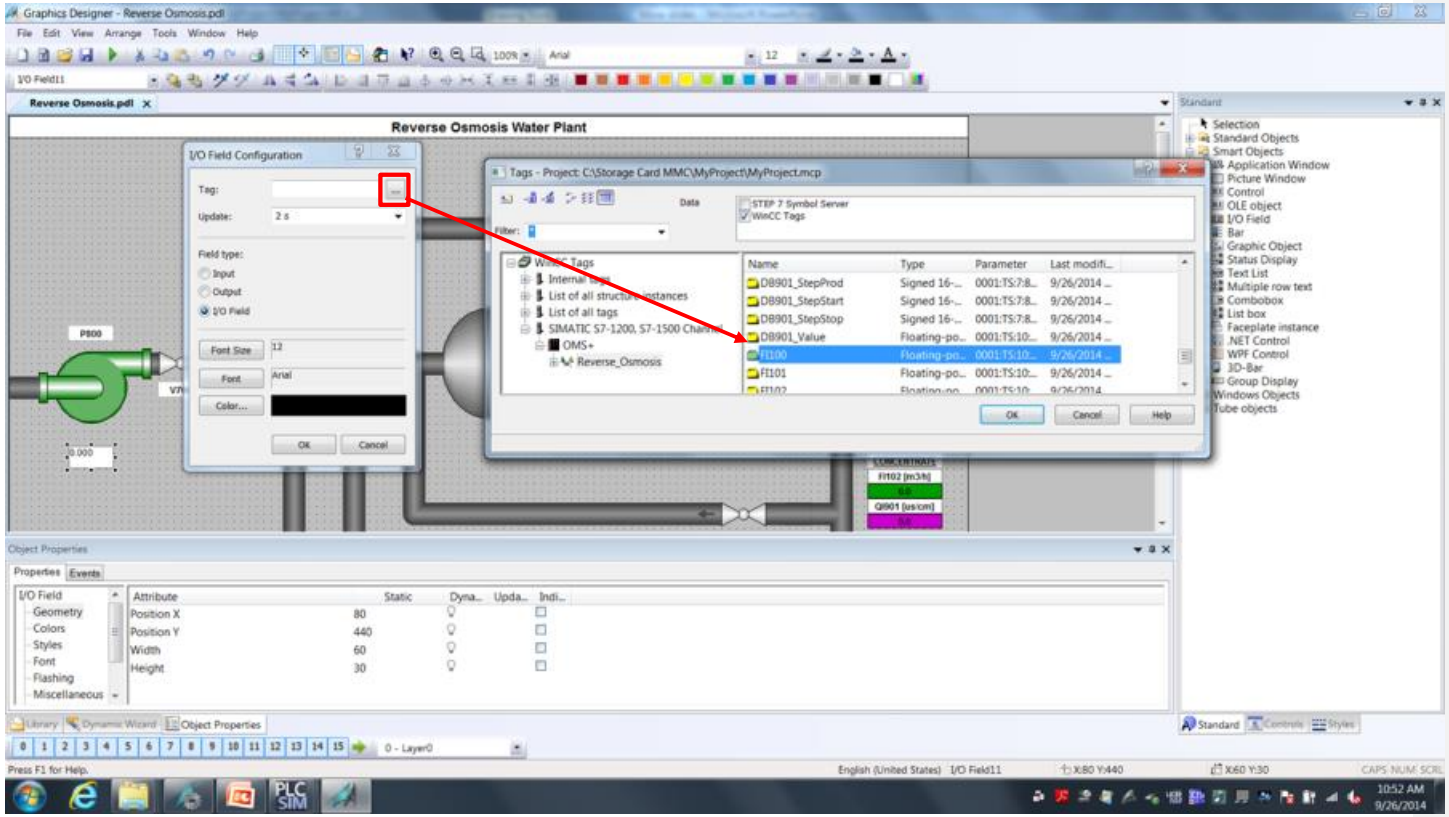
Bold:	Yes
X Alignment:	Centered
Y Alignment:	Centered

Make the settings below for the **Output/Input** settings:

Output Format	999.9

Make the settings below for the **Effects** settings:

Global Shadow	No


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
Reverse Osmosis Water Plant
I/O Field Configuration
Tag:
Update:
Field type:
Input
Output
I/O Field
Font Size
Font
Color...
OK
Cancel
Tags - Project: C:\Storage Card MMC\MyProject\MyProject.mcp
Data
STEP 7 Symbol Server
WinCC Tags
Filter:
Name
Type
Parameter
Last modifi...
DB901_StepProd
DB901_StepStart
DB901_StepStop
DB901_Value
FI100
FI101
OMS+
Reverse_Osmosis
OK
Cancel
Help
Object Properties
Properties
Events
I/O Field
Geometry
Colors
Styles
Font
Flashing
Miscellaneous
Attribute
Static
Position X
Position Y
Width
Height
Standard
Selection
Standard Objects
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Faceplate instance
.NET Control
WPF Control
3D-Bar
Group Display
Windows Objects
Tube objects
Press F1 for Help.
English (United States)
I/O Field11
10:52 AM
9/26/2014

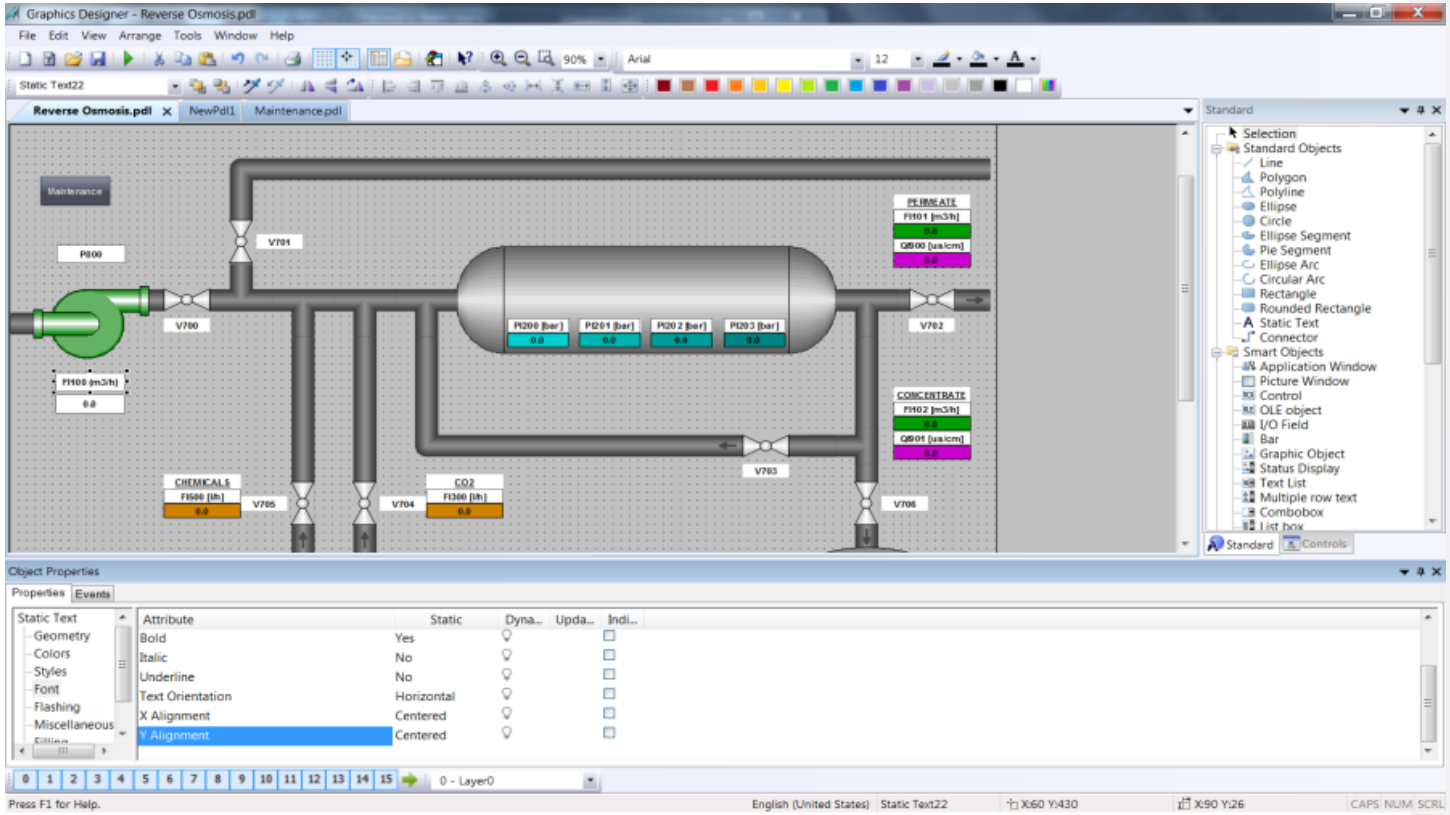
10. Next we will add the flow meter designation.

To insert the flow meter designation, select the “Static Text” object in the standard area of the object palette tool and place on the screen area just above the inserted I/O Field for flow meter FI100.

In the properties view of the inserted object change the font of the object.

Make the settings below for the Font settings:

Text:	FI100 (m3/h)
Bold:	Yes
X Alignment:	Centered
Y Alignment:	Centered


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
NewPdl1
Maintenance.pdl
Maintenance
P800
V701
V700
FI100 [m3/h]
PERMEATE
FI101 [m3/h]
QI800 [us/cm]
PI200 [bar]
PI201 [bar]
PI202 [bar]
PI203 [bar]
V702
CONCENTRATE
FI102 [m3/h]
QI801 [us/cm]
V703
CHEMICALS
FI500 [l/h]
V705
V704
CO2
FI300 [l/h]
V706
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Standard
Controls
Object Properties
Properties
Events
Static Text
Geometry
Colors
Styles
Font
Flashing
Miscellaneous
Attribute
Static
Dyna...
Upda...
Indi...
Bold
Yes
Italic
No
Underline
No
Text Orientation
Horizontal
X Alignment
Centered
Y Alignment
Centered
0 - Layer0
Press F1 for Help.
English (United States)
Static Text22
X:60 Y:430
X:90 Y:26
CAPS NUM SCRL

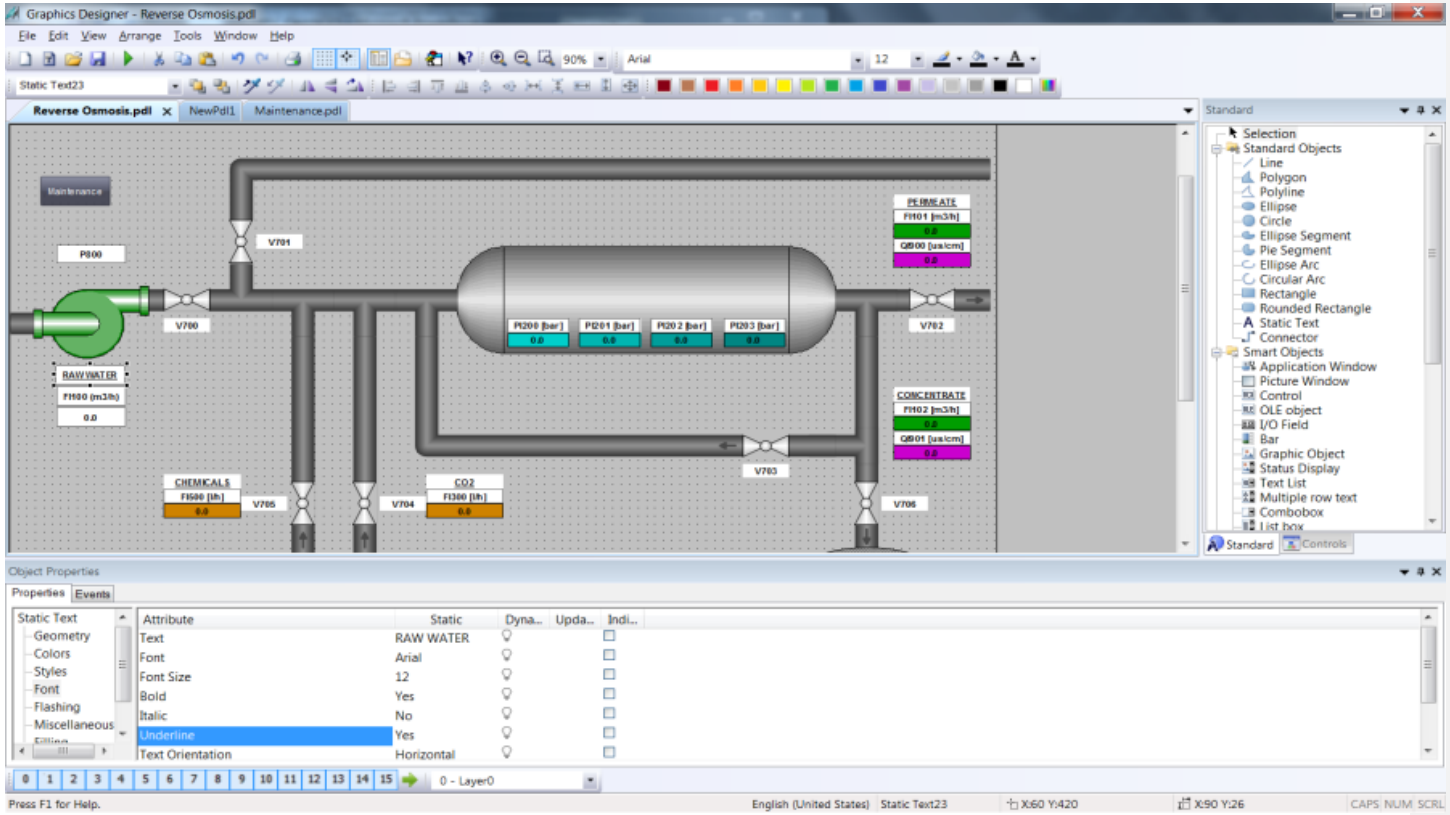
11. Now we will add the flow meter description.

To insert the flow meter description, select the “Static Text” object in the standard area of the object palette tool and place on the screen area just above the inserted designated text for flow meter FI100. You can also copy and paste the static text field you enter previously to save time

In the properties view of the inserted object change font of the object. To open the properties view , select focus on the inserted control object and right-hand mouse click to open the properties window.

Make the settings below for the **Font** settings:

Text:	RAW WATER
Bold:	Yes
Underline:	Yes
X Alignment:	Centered
Y Alignment:	Centered


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
NewPdl1
Maintenance.pdl
Maintenance
P800
V701
V700
RAWWATER
FI100 (m3/h)
PERMEATE
FI101 [m3/h]
QI800 [us/cm]
PI200 [bar]
PI201 [bar]
PI202 [bar]
PI203 [bar]
V702
CONCENTRATE
FI102 [m3/h]
QI801 [us/cm]
V703
CHEMICALS
FI500 [l/h]
V705
V704
CO2
FI300 [l/h]
V706
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Standard
Controls
Object Properties
Properties
Events
Static Text
Geometry
Colors
Styles
Font
Flashing
Miscellaneous
Attribute
Static
Dyna...
Upda...
Indi...
Text
RAW WATER
Font
Arial
Font Size
12
Bold
Yes
Italic
No
Underline
Yes
Text Orientation
Horizontal
0 - Layer0
Press F1 for Help.
English (United States)
Static Text23
X:60 Y:420
X:90 Y:26
CAPS NUM SCRL

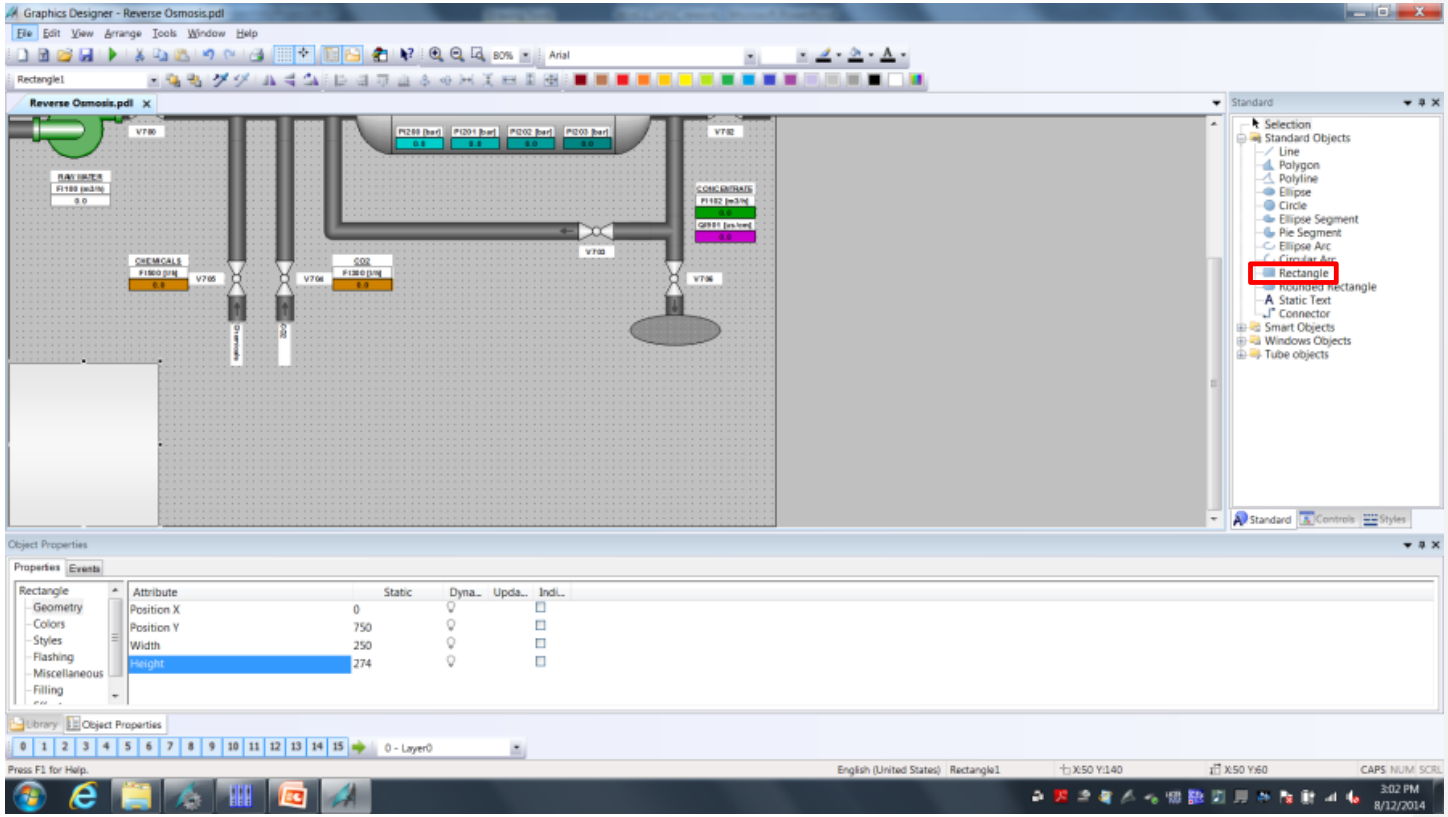
12. As we have added objects to the process screen to monitor the process, we will now add objects to control the Reverse Osmosis Water Plant.

    We will add three new control buttons to operate the plant:

    1. Startup of process
    2. Shutdown of process
    3. Stop of process

    First we will add a new area for our process control on the screen. This area will consist of a text field and a background (rectangle).

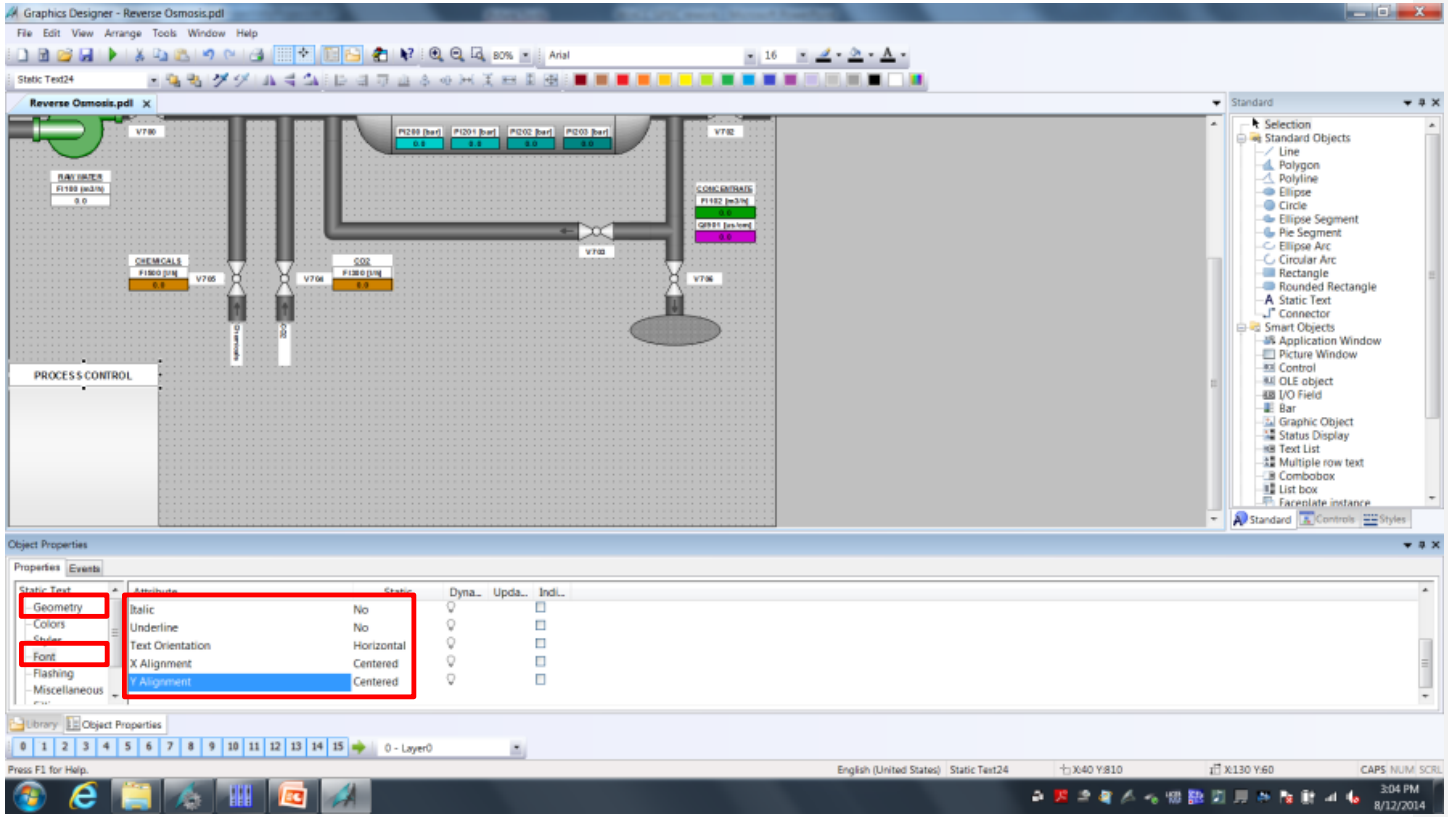
    To insert the background, select the “Rectangle” object in the standard area of the object palette tool and place on the screen area in the lower left corner.


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Windows Objects
Tube objects
Object Properties
Properties
Events
Rectangle
Geometry
Colors
Styles
Flashing
Miscellaneous
Filling
Attribute
Static
Position X 0
Position Y 750
Width 250
Height 274
Press F1 for Help.
English (United States)
Rectangle1
X:50 Y:140
X:50 Y:60
3:02 PM
8/12/2014

13. To insert the static text, select the “Static Text” object in the standard area of the object palette tool and place on the screen area.

    Make the settings below for the **Font** settings:

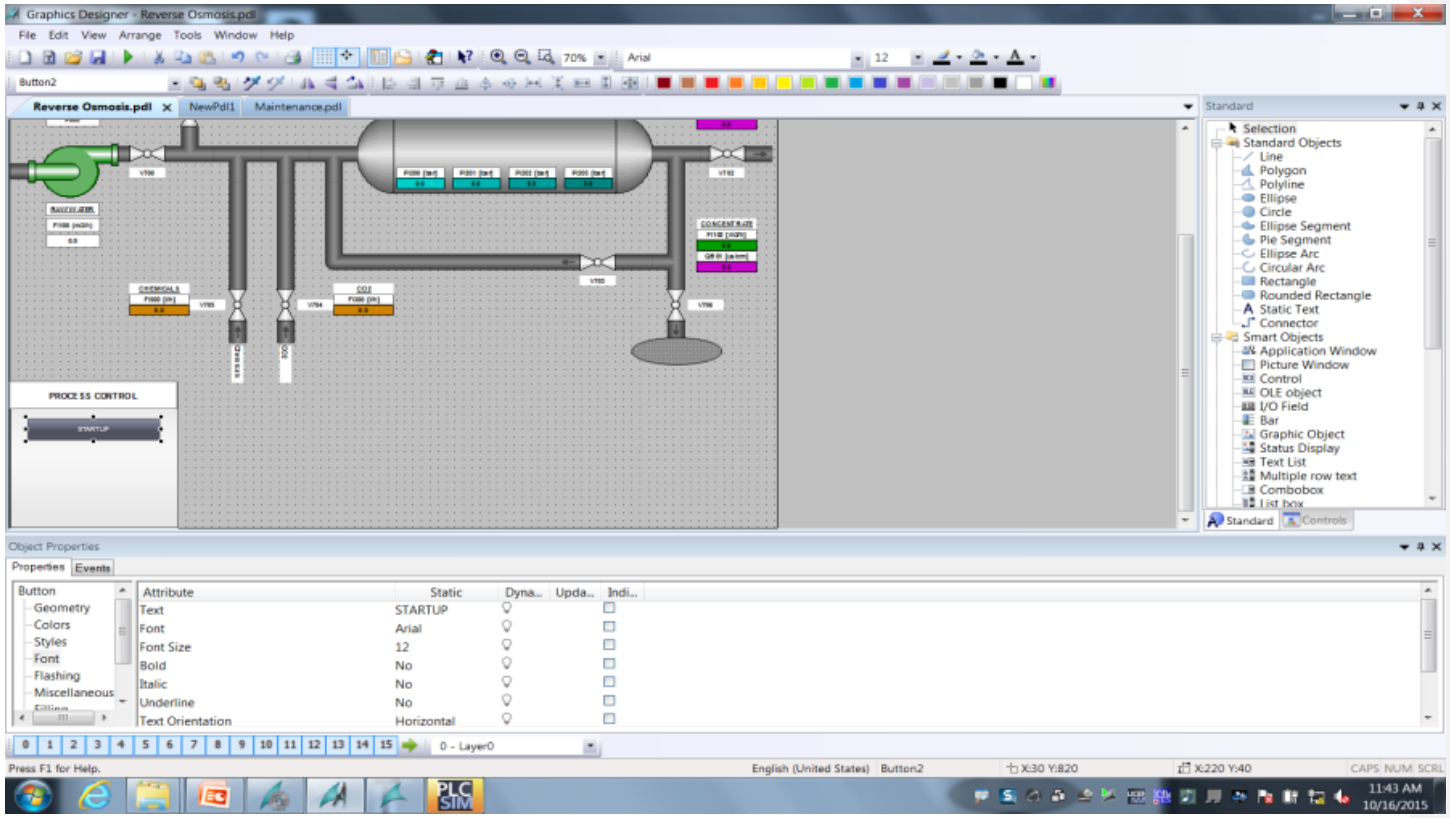
Text:	PROCESS CONTROL
Font Size:	16
Bold:	Yes
X Alignment:	Centered
Y Alignment:	Centered


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
PROCESS CONTROL
Object Properties
Properties Events
Geometry
Colors
Font
Flashing
Miscellaneous
Italic No
Underline No
Text Orientation Horizontal
X Alignment Centered
Y Alignment Centered
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Faceplate instance

14. In the control area we will add our three control buttons.

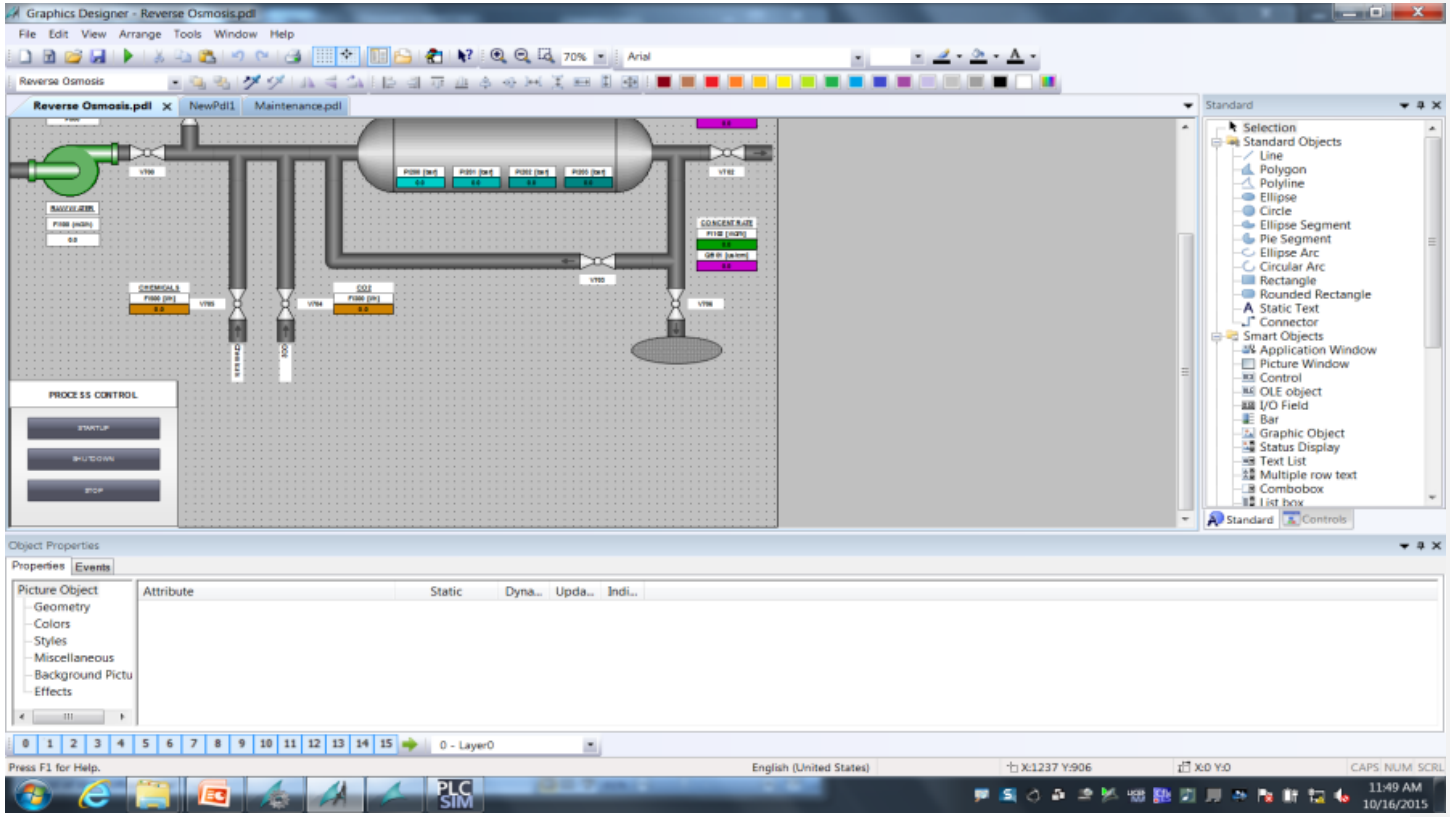
    To insert the first control button, select the “Button” object in the windows object of the object palette tool and place on the screen area.

    In the pop-up view of the inserted object, type STARTUP in the text field. Then close the Button Configuration dialog.


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
NewPdl1
Maintenance.pdl
PROCESS CONTROL
STARTUP
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Object Properties
Properties
Events
Button
Geometry
Colors
Styles
Font
Flashing
Miscellaneous
Attribute
Static
Text
STARTUP
Font
Arial
Font Size
12
Bold
No
Italic
No
Underline
No
Text Orientation
Horizontal
0 - Layer0
Press F1 for Help.
English (United States)
Button2
X:30 Y:820
X:220 Y:40
11:43 AM
10/16/2015

15. We need to insert a second and third button. To do this just copy and past the Startup button twice and adjust on the screen. Rename the button as follow.

Center Button	SHUTDOWN
Bottom Button	STOP


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
NewPdl1
Maintenance.pdl
PROCESS CONTROL
START-UP
SHUTDOWN
STOP
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Object Properties
Properties
Events
Picture Object
Geometry
Colors
Styles
Miscellaneous
Background Pictu
Effects
Attribute
Static
Dyna...
Upda...
Indi...
0 - Layer0
Press F1 for Help.
English (United States)
X:1237 Y:906
X:0 Y:0
CAPS NUM SCRL
11:49 AM
10/16/2015

16. To add events when buttons are being pressed, insert an action. To do this for the first button, add the action in the properties view, events tab of the object.

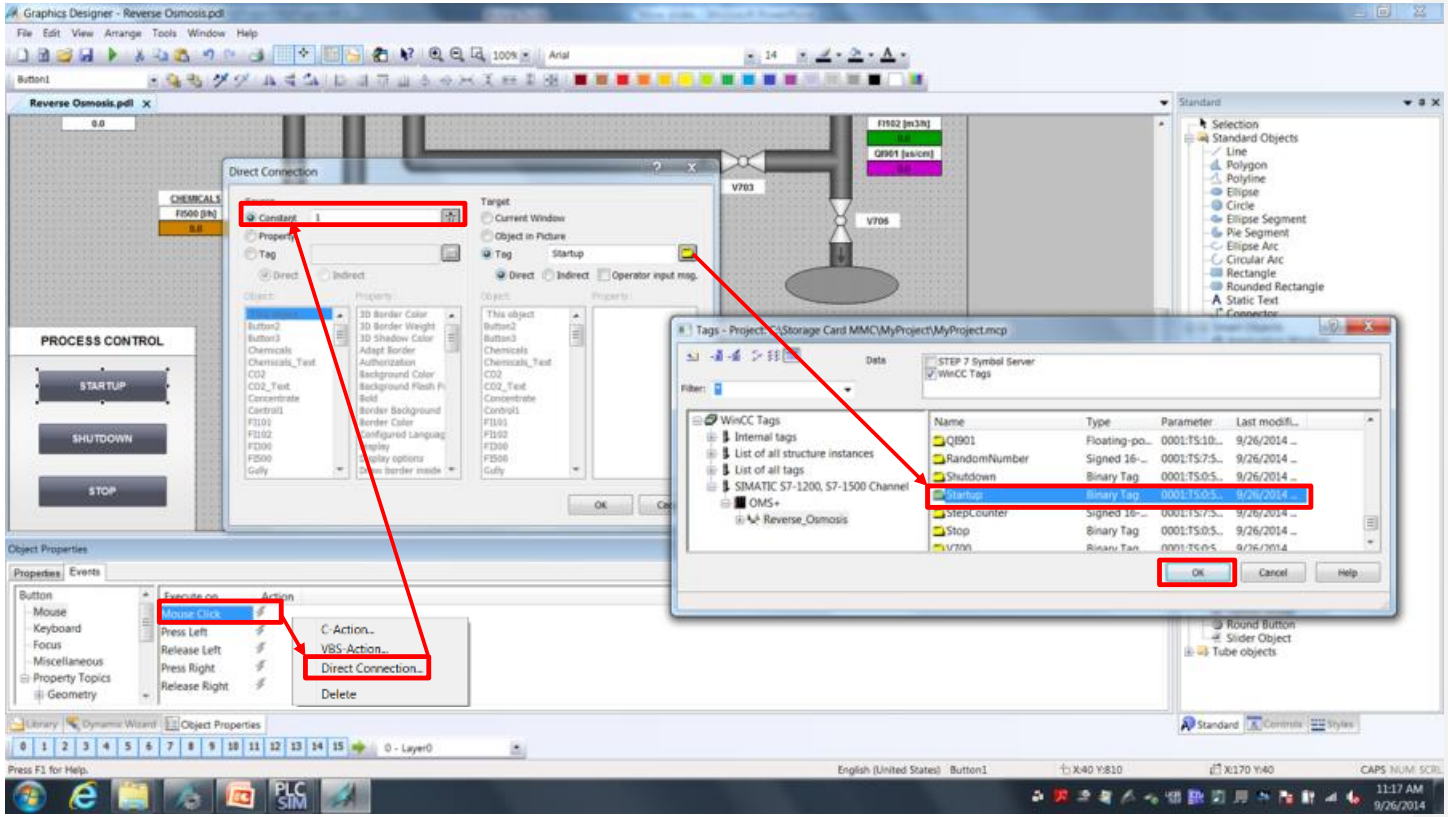
    In the Direct Connection dialog, select a Constant as the source with numeric value of “1”, and a Tag as the target.

    Open the tag browser, and select to add a new tag by first navigating in the tree structure to WinCC Tags → SIMATIC S7-1200, S7-1500 Channel→OMS+ and highlight the connection labeled Reverse_Osmosis. Now select the tag for STARTUP of process.

    Select the tag “Startup” in the Tags dialog, and close all open dialog and properties windows.

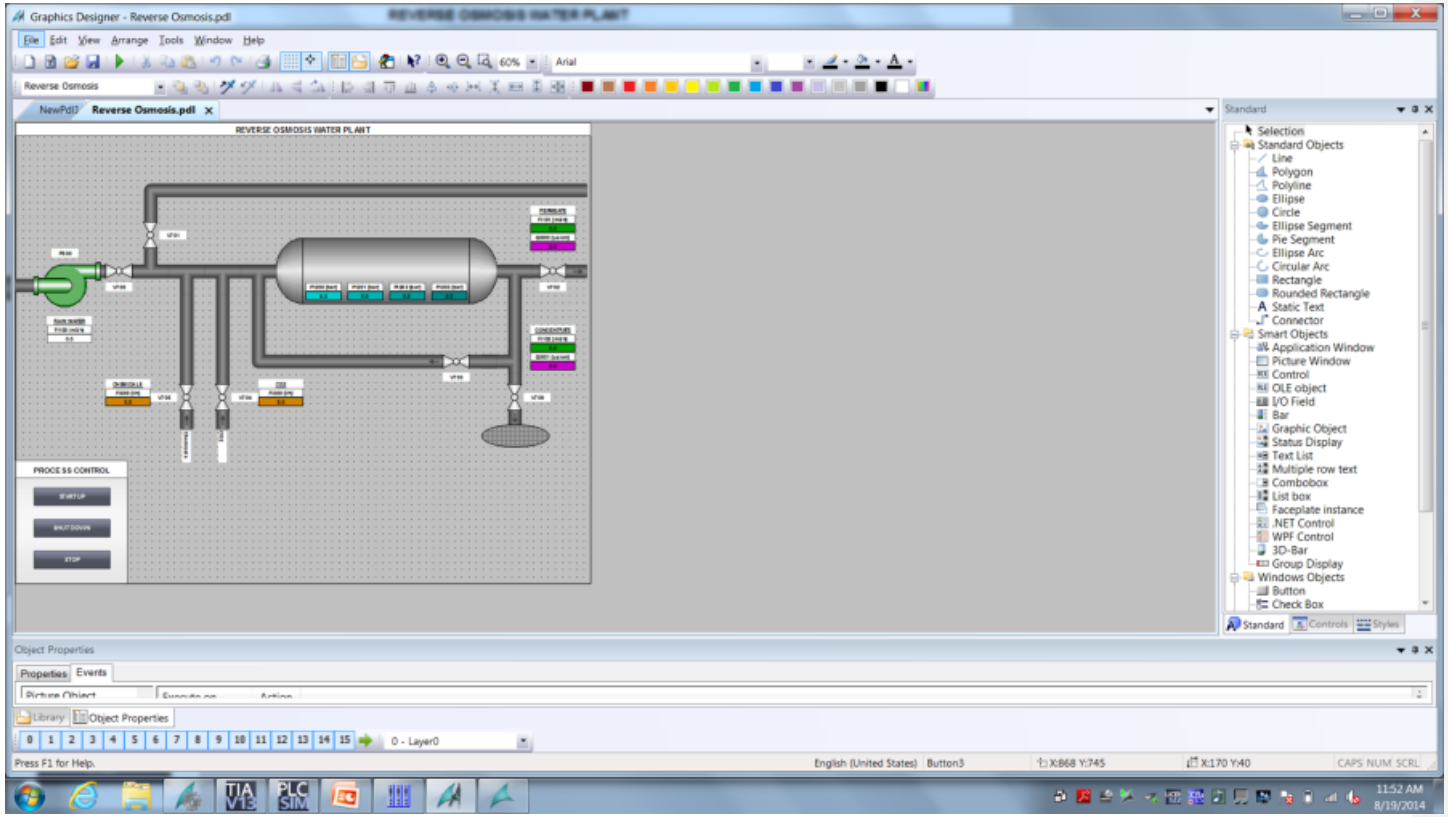
    Repeat for the second and third button selecting the SHUTDOWN and STOP tags for the buttons.

    Save the changes


Graphics Designer - Reverse Osmosis.pdl
Direct Connection
PROCESS CONTROL
STARTUP
SHUTDOWN
STOP
Tags - Project: C:\Storage Card MMC\MyProject\MyProject.mcp
WinCC Tags
Internal tags
List of all structure instances
List of all tags
SIMATIC S7-1200, S7-1500 Channel
OMS+
Reverse_Osmosis
Name
Type
Parameter
Last modifi...
Qf901
RandomNumber
Shutdown
Startup
Stop
OK
Cancel
Help
Object Properties
Events
Mouse Click
Press Left
Release Left
Press Right
Release Right
C-Action...
VBS-Action...
Direct Connection...
Delete
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Round Button
Slider Object
Tube objects

Result

You have created the process screen to be used to control and monitor the process of the Reverse Osmosis Water Plant.

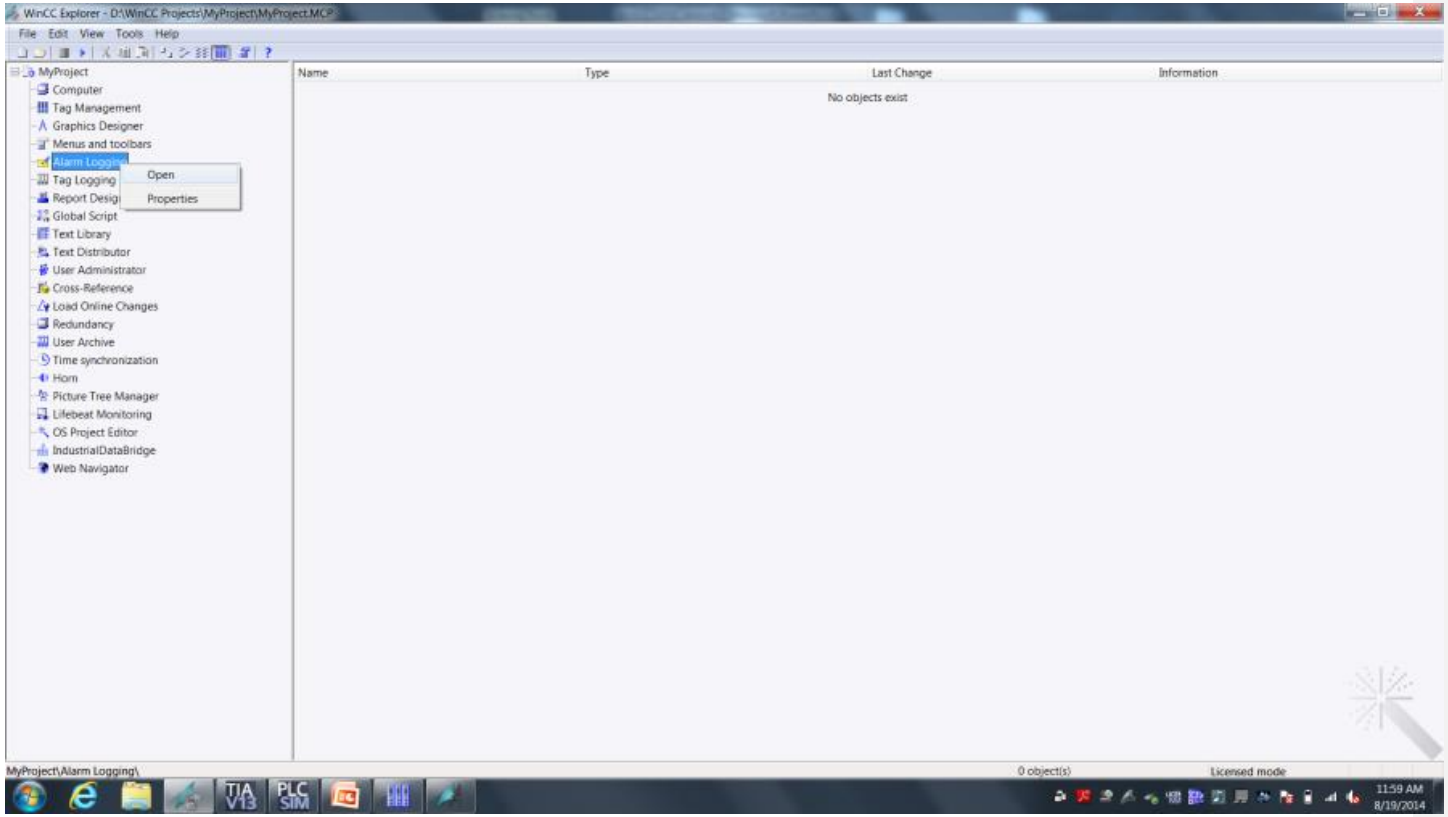

Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis
NewPdl0
Reverse Osmosis.pdl
REVERSE OSMOSIS WATER PLANT
PROCESS CONTROL
START UP
SHUT DOWN
STOP
Standard
Selection
Standard Objects
Line
Polygon
Polyline
Ellipse
Circle
Ellipse Segment
Pie Segment
Ellipse Arc
Circular Arc
Rectangle
Rounded Rectangle
Static Text
Connector
Smart Objects
Application Window
Picture Window
Control
OLE object
I/O Field
Bar
Graphic Object
Status Display
Text List
Multiple row text
Combobox
List box
Faceplate instance
.NET Control
WPF Control
3D-Bar
Group Display
Windows Objects
Button
Check Box
Object Properties
Properties
Events
Library
Object Properties
0 - Layer0
Press F1 for Help.
English (United States)
Button3
X:868 Y:745
X:170 Y:40
CAPS NUM SCRL
11:52 AM
8/19/2014

Configure Alarms

We will add alarm messages to the project to provide the operator with a message on state change of the process. The following steps will show you how to configure the operation messages.

Procedure

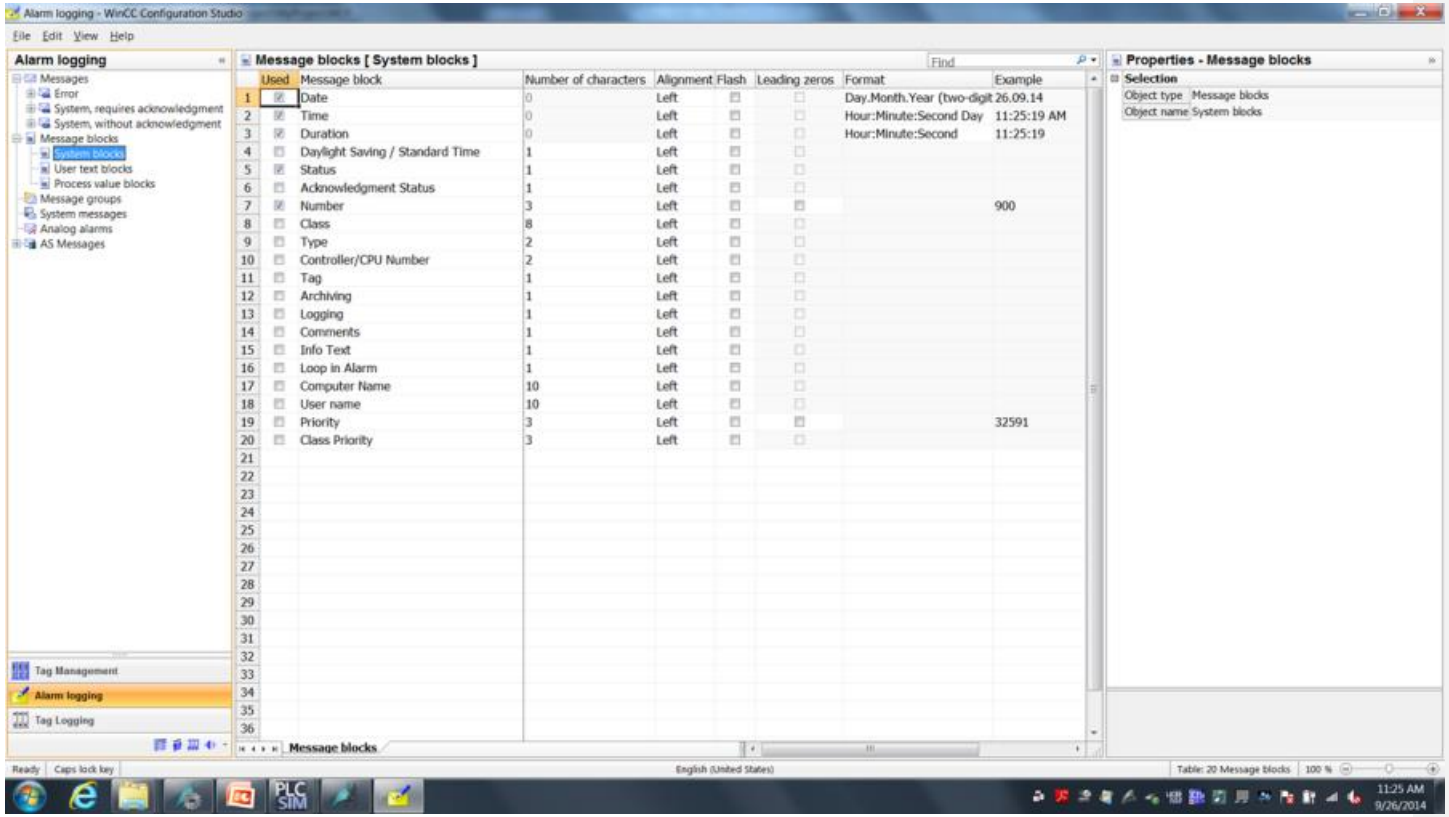
1. In WinCC Explorer, open the alarm logging configuration dialog.


WinCC Explorer - D:\WinCC Projects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Design
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Open
Properties
Name
Type
Last Change
Information
No objects exist
MyProject\Alarm Logging\
0 object(s)
Licensed mode
11:59 AM
8/19/2014

2. In the WinCC Configuration Studio, Message Blocks, use the settings below for this configuration. Select the following message blocks

Message Blocks:

System Blocks	Date, Time, Duration, Status, Number
User Text Blocks	Msg Txt, Point of Error
Process Value Blocks	None

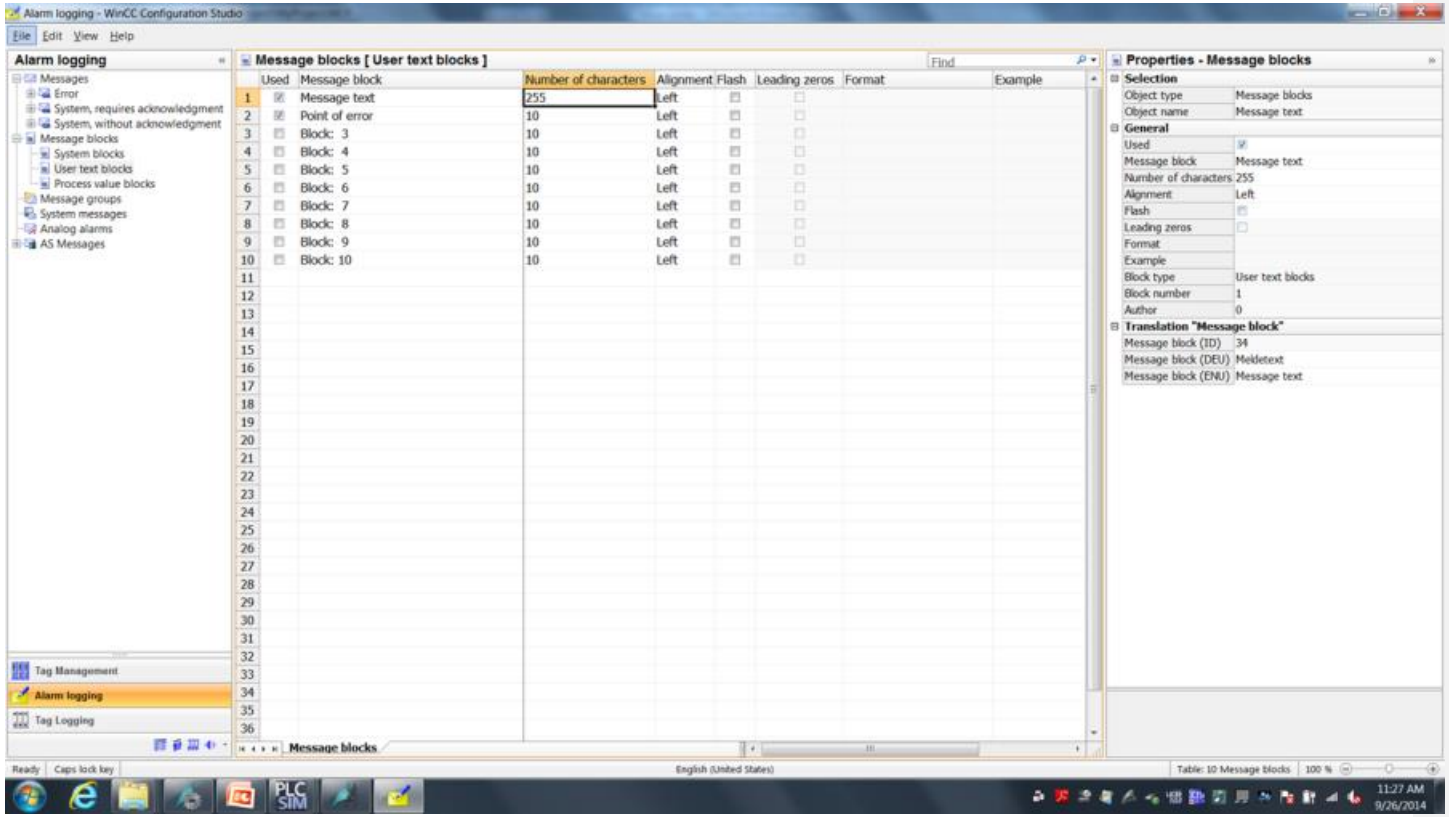

Alarm logging - WinCC Configuration Studio
File Edit View Help
Alarm logging
Messages
Error
System, requires acknowledgment
System, without acknowledgment
Message blocks
System blocks
User text blocks
Process value blocks
Message groups
System messages
Analog alarms
AS Messages
Tag Management
Alarm logging
Tag Logging
Message blocks [System blocks]
Find
Used | Message block | Number of characters | Alignment | Flash | Leading zeros | Format | Example
1 | Date | 0 | Left | | | Day.Month.Year (two-digit | 26.09.14
2 | Time | 0 | Left | | | Hour:Minute:Second Day | 11:25:19 AM
3 | Duration | 0 | Left | | | Hour:Minute:Second | 11:25:19
4 | Daylight Saving / Standard Time | 1 | Left
5 | Status | 1 | Left
6 | Acknowledgment Status | 1 | Left
7 | Number | 3 | Left | | | | 900
8 | Class | 8 | Left
9 | Type | 2 | Left
10 | Controller/CPU Number | 2 | Left
11 | Tag | 1 | Left
12 | Archiving | 1 | Left
13 | Logging | 1 | Left
14 | Comments | 1 | Left
15 | Info Text | 1 | Left
16 | Loop in Alarm | 1 | Left
17 | Computer Name | 10 | Left
18 | User name | 10 | Left
19 | Priority | 3 | Left | | | | 32591
20 | Class Priority | 3 | Left
Message blocks
Properties - Message blocks
Selection
Object type Message blocks
Object name System blocks
Ready
Caps lock key
English (United States)
Table: 20 Message blocks
100 %
PLC SIM
11:25 AM
9/26/2014

3. Modify the default message configuration to allow for additional characters in the “Message Text” block.

   Select the **Message Blocks** selection and select “**User Text Block**”.

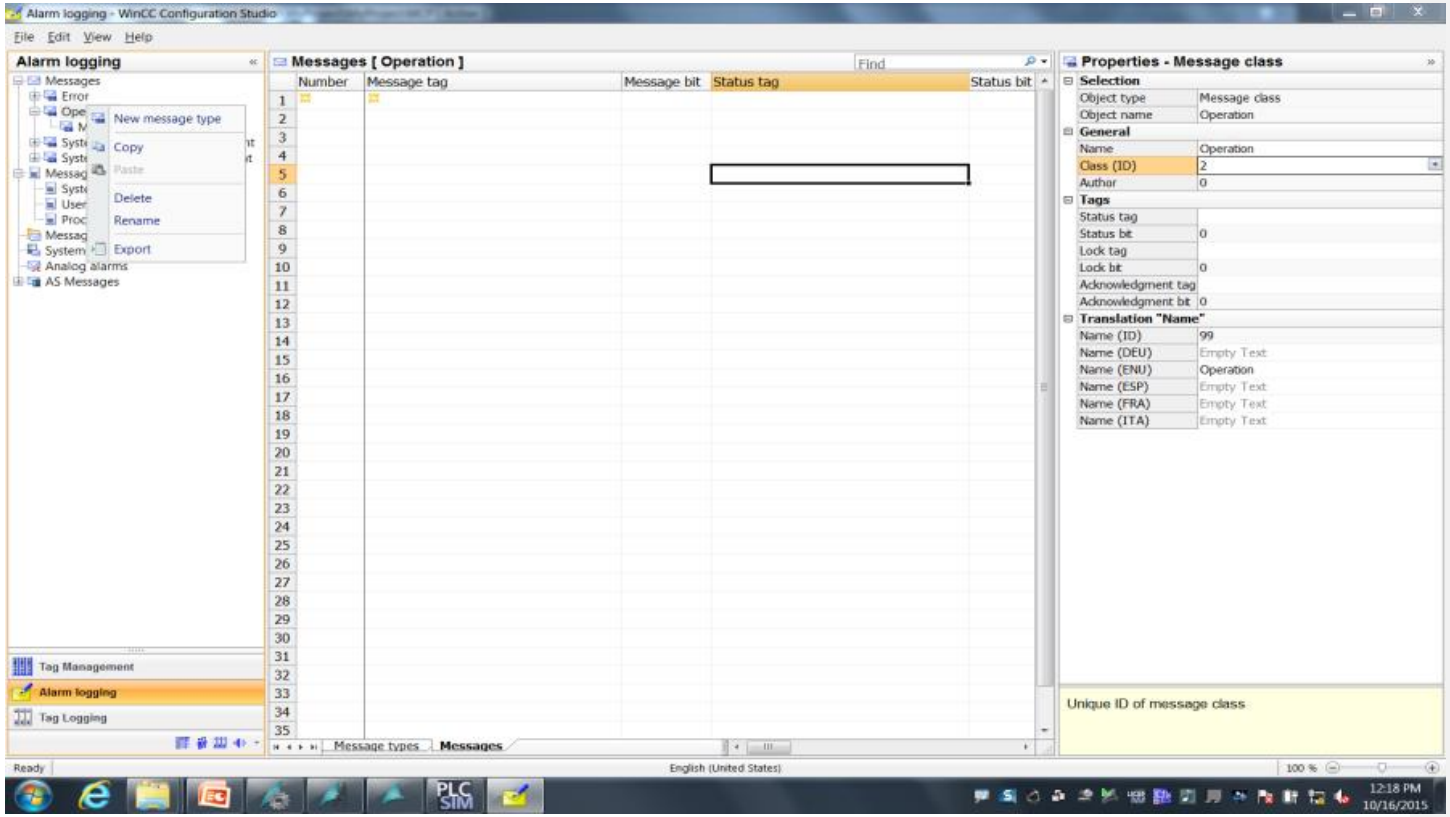
   In the number of characters field for message text, change the length to 255 characters. Drag and drop to make them all 255 characters.

   Configuration Studio allows you to do mass data configuration and editing by drag and drop creation and replacement of values.


Alarm logging - WinCC Configuration Studio
File Edit View Help
Alarm logging
Messages
Error
System, requires acknowledgment
System, without acknowledgment
Message blocks
System blocks
User text blocks
Process value blocks
Message groups
System messages
Analog alarms
AS Messages
Tag Management
Alarm logging
Tag Logging
Message blocks [User text blocks]
Find
Used
Message block
Number of characters
Alignment
Flash
Leading zeros
Format
Example
1 Message text 255 Left
2 Point of error 10 Left
3 Block: 3 10 Left
4 Block: 4 10 Left
5 Block: 5 10 Left
6 Block: 6 10 Left
7 Block: 7 10 Left
8 Block: 8 10 Left
9 Block: 9 10 Left
10 Block: 10 10 Left
Message blocks
Properties - Message blocks
Selection
Object type Message blocks
Object name Message text
General
Used
Message block Message text
Number of characters 255
Alignment Left
Flash
Leading zeros
Format
Example
Block type User text blocks
Block number 1
Author 0
Translation "Message block"
Message block (ID) 34
Message block (DEU) Meldetext
Message block (ENU) Message text
Ready
Caps lock key
English (United States)
Table: 10 Message blocks
100 %
PLC SIM
11:27 AM
9/26/2014

4. Create a new message class called “operation”, to do this select “Messages” on the left side. Right Mouse Click and select “New Message Class” and enter “Operation” for the text. Next select “Operation” and select the “Message Types” Tab at the bottom of the screen. Enter “Operation Mode Message” on the name column.

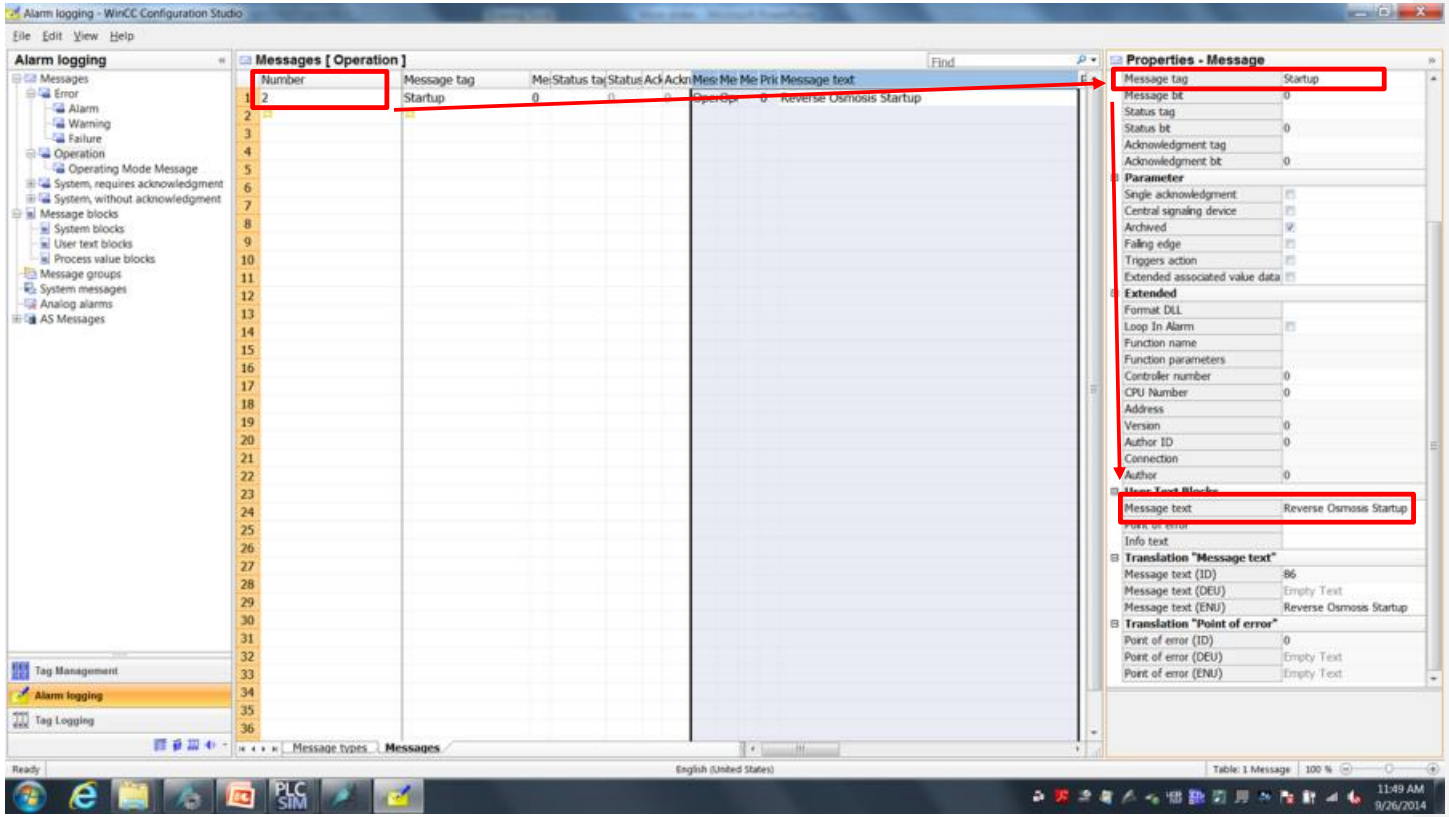
   Scroll across the line to find the column **Without status “went out”** and check the box


Alarm logging - WinCC Configuration Studio
File Edit View Help
Alarm logging
Messages
Error
New message type
Copy
Paste
Delete
Rename
Export
Analog alarms
AS Messages
Tag Management
Alarm logging
Tag Logging
Messages [Operation]
Find
Number
Message tag
Message bit
Status tag
Status bit
Message types
Messages
Properties - Message class
Selection
Object type
Message class
Object name
Operation
General
Name
Operation
Class (ID)
2
Author
0
Tags
Status tag
Status bit
0
Lock tag
Lock bit
0
Acknowledgment tag
Acknowledgment bit
0
Translation "Name"
Name (ID)
99
Name (DEU)
Empty Text
Name (ENU)
Operation
Name (ESP)
Empty Text
Name (FRA)
Empty Text
Name (ITA)
Empty Text
Unique ID of message class
Ready
English (United States)
100 %
12:18 PM
10/16/2015

5. Go to the Message tab of Operations and create a new message. Create an entry by entering 2 under the Number column. On the right hand properties scroll down to make the following changes:

   Reverse Osmosis Startup message (1st message):

Message Tag	Browse for tag selection, and select the tag labeled "Startup"
Message Text (under User Text Blocks)	Reverse Osmosis Startup


Alarm logging - WinCC Configuration Studio
File Edit View Help
Alarm logging
Messages
Error
Alarm
Warning
Failure
Operation
Operating Mode Message
System, requires acknowledgment
System, without acknowledgment
Message blocks
System blocks
User text blocks
Process value blocks
Message groups
System messages
Analog alarms
AS Messages
Tag Management
Alarm logging
Tag Logging
Messages [Operation]
Find
Number
Message tag
Message text
2
Startup
Reverse Osmosis Startup
Message types
Messages
Properties - Message
Message tag
Startup
Message bit
Status tag
Status bit
Acknowledgment tag
Acknowledgment bit
Parameter
Single acknowledgment
Central signaling device
Archived
Failing edge
Triggers action
Extended associated value data
Extended
Format DLL
Loop In Alarm
Function name
Function parameters
Controller number
CPU Number
Address
Version
Author ID
Connection
Author
Message text
Reverse Osmosis Startup
Info text
Translation "Message text"
Message text (ID)
86
Message text (DEU)
Empty Text
Message text (ENU)
Reverse Osmosis Startup
Translation "Point of error"
Point of error (ID)
Point of error (DEU)
Empty Text
Point of error (ENU)
Empty Text
Ready
English (United States)
Table: 1 Message
100 %
11:49 AM
9/26/2014

6. Configure the second and third operation message in the same fashion. Or Drag and Drop to copy, then edit

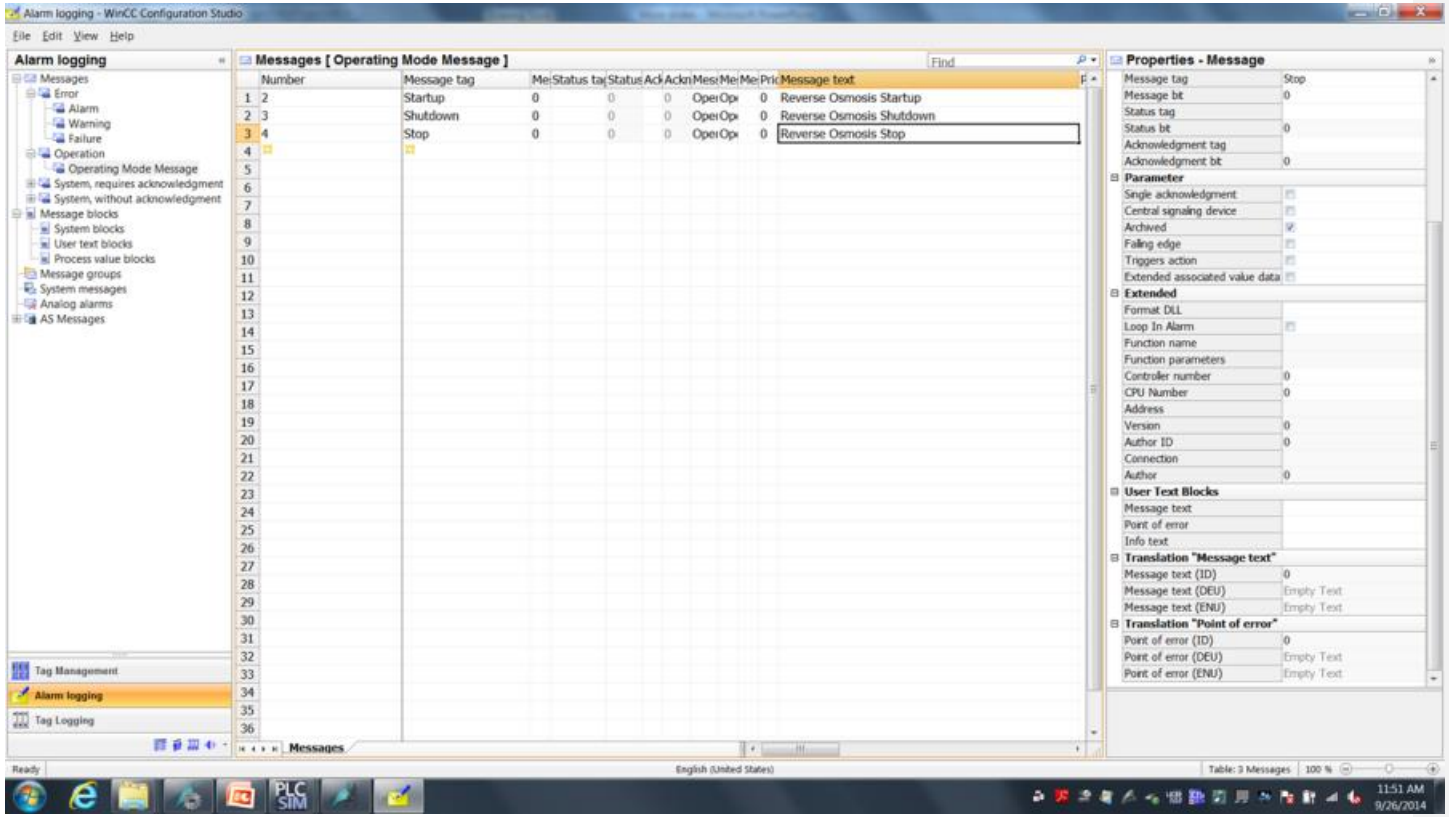
To add a new message in the alarm message view, append a new message line to the table.

Reverse Osmosis Shutdown message (2nd message):

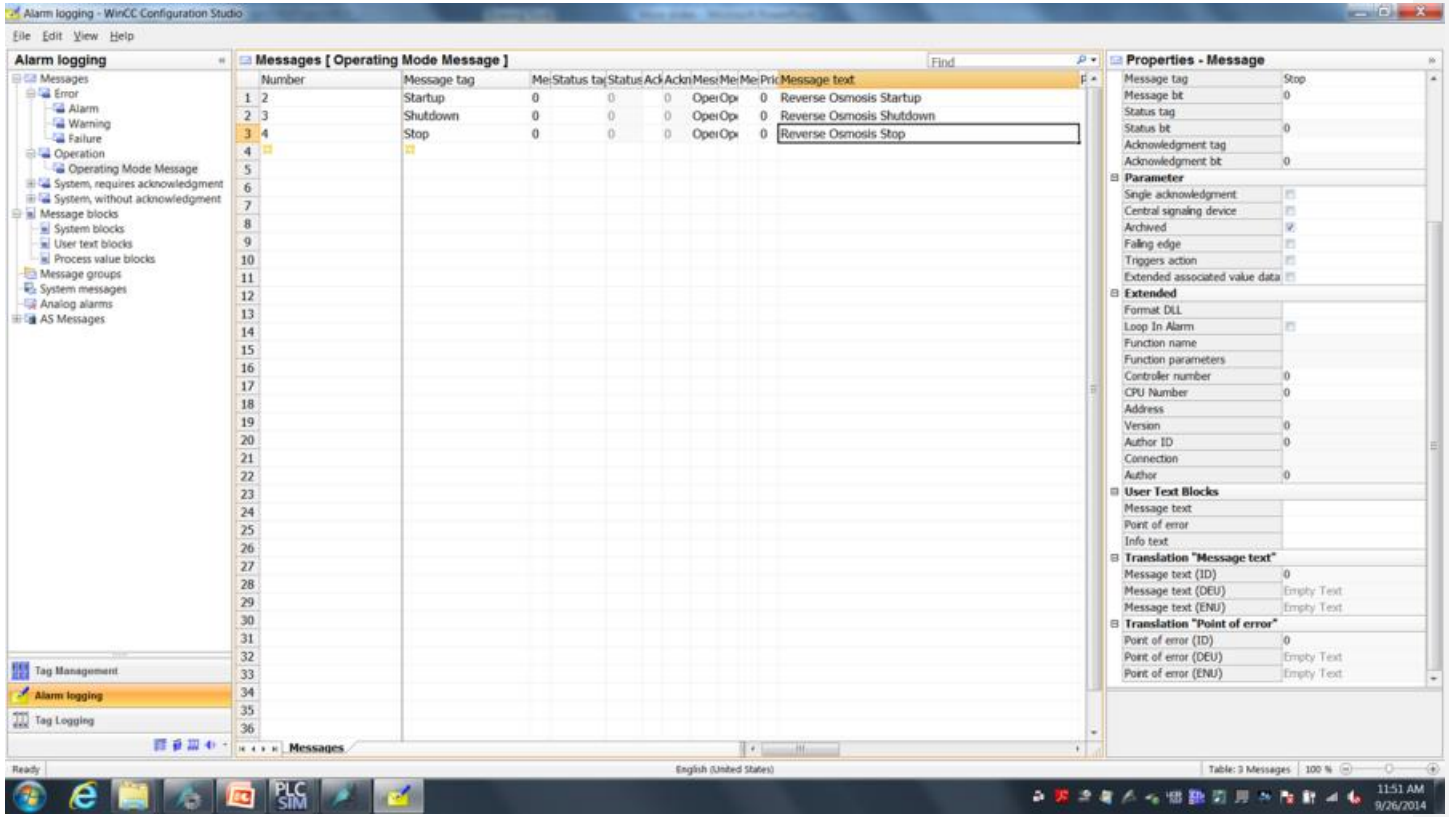
Message Tag		Browse for tag selection, and select the tag labeled "Shutdown"
Message Text	(under User Text Blocks)	Reverse Osmosis Shutdown

Reverse Osmosis Stop message (3rd message):

Message Tag		Browse for tag selection, and select the tag labeled "Stop"
Message Text	(under User Text Blocks)	Reverse Osmosis Stop

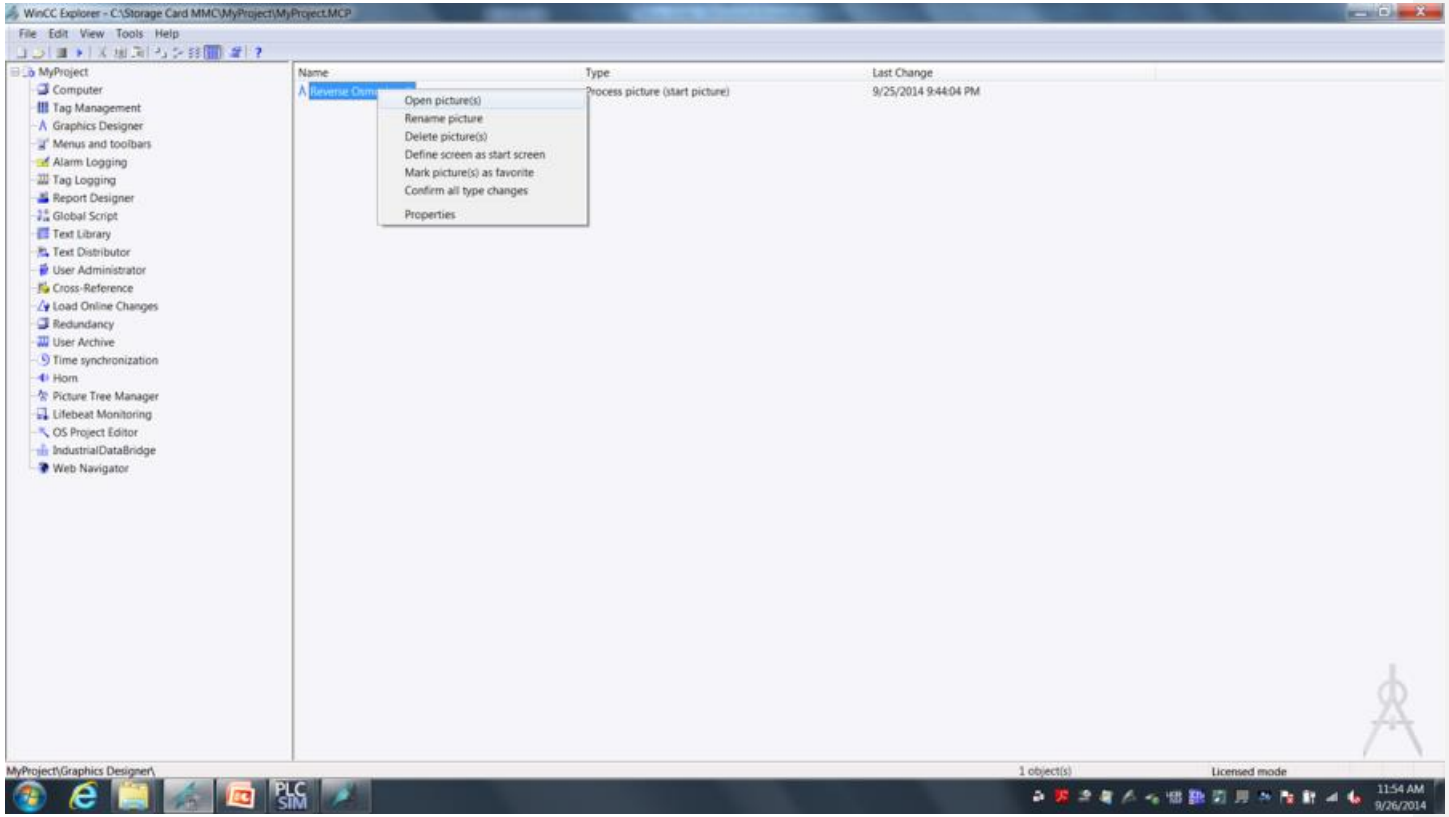

Alarm logging - WinCC Configuration Studio
File Edit View Help
Alarm logging
Messages
Error
Alarm
Warning
Failure
Operation
Operating Mode Message
System, requires acknowledgment
System, without acknowledgment
Message blocks
System blocks
User text blocks
Process value blocks
Message groups
System messages
Analog alarms
AS Messages
Tag Management
Alarm logging
Tag Logging
Messages [Operating Mode Message]
Find
Number
Message tag
Message text
1 2 Startup 0 0 0 0 0 Reverse Osmosis Startup
2 3 Shutdown 0 0 0 0 0 Reverse Osmosis Shutdown
3 4 Stop 0 0 0 0 0 Reverse Osmosis Stop
Messages
Properties - Message
Message tag Stop
Message bit 0
Status tag
Status bit 0
Acknowledgment tag
Acknowledgment bit 0
Parameter
Single acknowledgment
Central signaling device
Archived
Failing edge
Triggers action
Extended associated value data
Extended
Format DLL
Loop In Alarm
Function name
Function parameters
Controller number 0
CPU Number 0
Address
Version 0
Author ID 0
Connection
Author 0
User Text Blocks
Message text
Point of error
Info text
Translation "Message text"
Message text (ID) 0
Message text (DEU) Empty Text
Message text (ENU) Empty Text
Translation "Point of error"
Point of error (ID) 0
Point of error (DEU) Empty Text
Point of error (ENU) Empty Text
Ready
English (United States)
Table: 3 Messages
100 %
11:51 AM
9/26/2014

7. Exit alarm logging configuration studio. Note the configuration will be automatically saved.


Alarm logging - WinCC Configuration Studio
File Edit View Help
Alarm logging
Messages
Error
Alarm
Warning
Failure
Operation
Operating Mode Message
System, requires acknowledgment
System, without acknowledgment
Message blocks
System blocks
User text blocks
Process value blocks
Message groups
System messages
Analog alarms
AS Messages
Tag Management
Alarm logging
Tag Logging
Messages [Operating Mode Message]
Find
Number
Message tag
Message text
1 2 Startup 0 0 0 0 Reverse Osmosis Startup
2 3 Shutdown 0 0 0 0 Reverse Osmosis Shutdown
3 4 Stop 0 0 0 0 Reverse Osmosis Stop
Messages
Properties - Message
Message tag Stop
Message bit 0
Status tag
Status bit 0
Acknowledgment tag
Acknowledgment bit 0
Parameter
Single acknowledgment
Central signaling device
Archived
Failing edge
Triggers action
Extended associated value data
Extended
Format DLL
Loop In Alarm
Function name
Function parameters
Controller number 0
CPU Number 0
Address
Version 0
Author ID 0
Connection
Author 0
User Text Blocks
Message text
Point of error
Info text
Translation "Message text"
Message text (ID) 0
Message text (DEU) Empty Text
Message text (ENU) Empty Text
Translation "Point of error"
Point of error (ID) 0
Point of error (DEU) Empty Text
Point of error (ENU) Empty Text
Ready
English (United States)
Table: 3 Messages
100 %
11:51 AM
9/26/2014

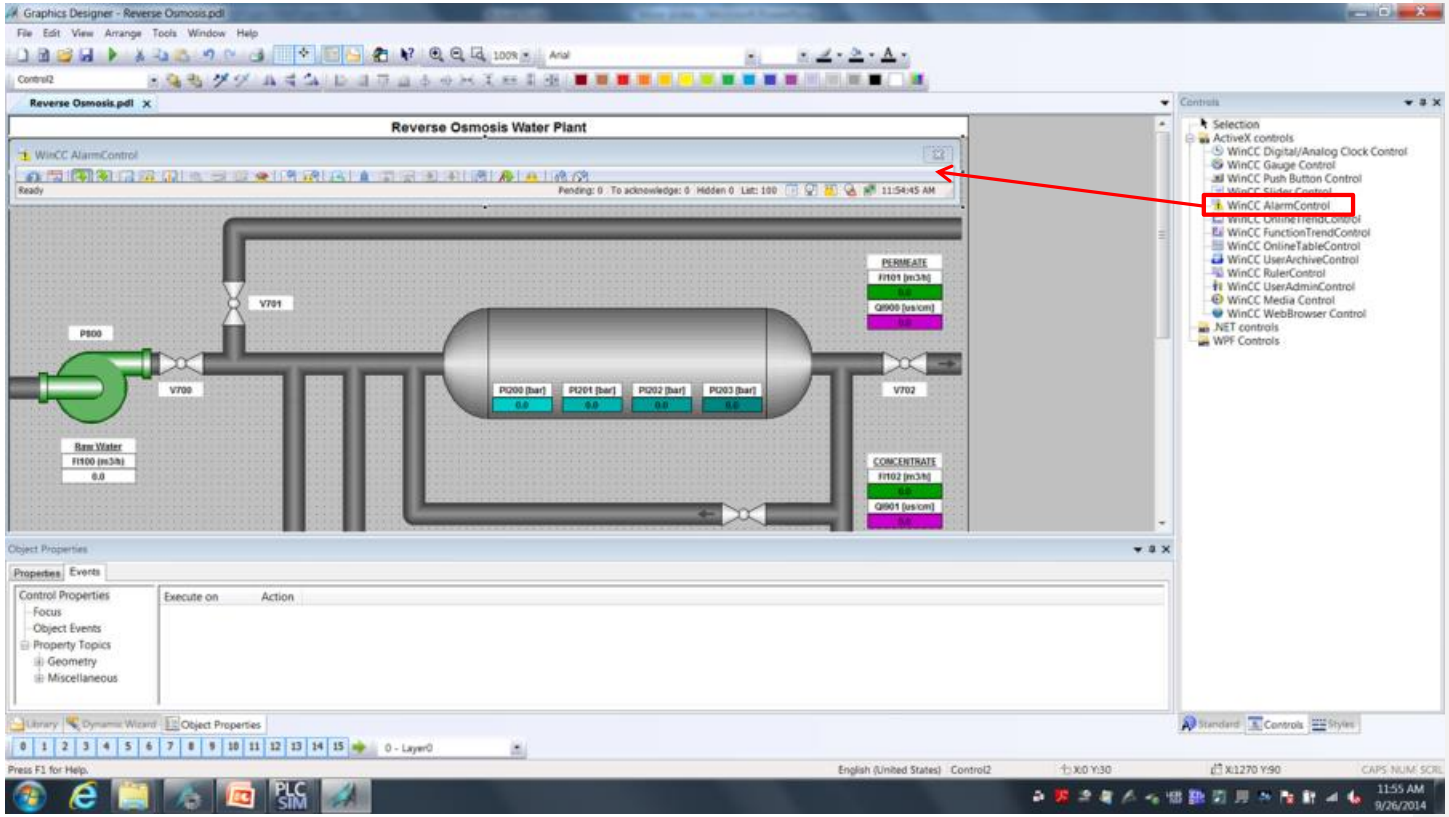
8. Now let's add a message window to our picture.

   Open the screen "Reverse Osmosis.pdl" from WinCC Explorer to configure the alarm ActiveX control in WinCC Runtime.


WinCC Explorer - C:\Storage Card MMC\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
Last Change
Process picture (start picture)
9/25/2014 9:44:04 PM
Open picture(s)
Rename picture
Delete picture(s)
Define screen as start screen
Mark picture(s) as favorite
Confirm all type changes
Properties
MyProject\Graphics Designer\
1 object(s)
Licensed mode
11:54 AM
9/26/2014

9. The alarm window is an ActiveX control called “WinCC AlarmControl”.

   To insert the “WinCC AlarmControl” object, select the ActiveX control in the controls area of the object palette tool and place on the screen area.


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
Reverse Osmosis Water Plant
WinCC AlarmControl
PERMEATE
V701
P800
V700
V702
Raw Water
CONCENTRATE
Controls
WinCC AlarmControl
Object Properties
Properties
Events
Control Properties
Execute on
Action

10. We're going to clean up our Alarm Control a little. In the "WinCC AlarmControl" view of the object configuration dialog window, make the settings below:

General Tab:

Window Title		0 - No
Sizable		Check
Row Scroll Bar		0 - No(note other settings)
Column Scroll Bar		0 - No
Active list upon open picture		1 – Short-term archive list

Parameter Tab:

Column Header –	Show	Uncheck
Row label -	Show	Uncheck

Toolbar Tab:

Toolbar –	Show toolbar	Uncheck

Status Bar Tab:

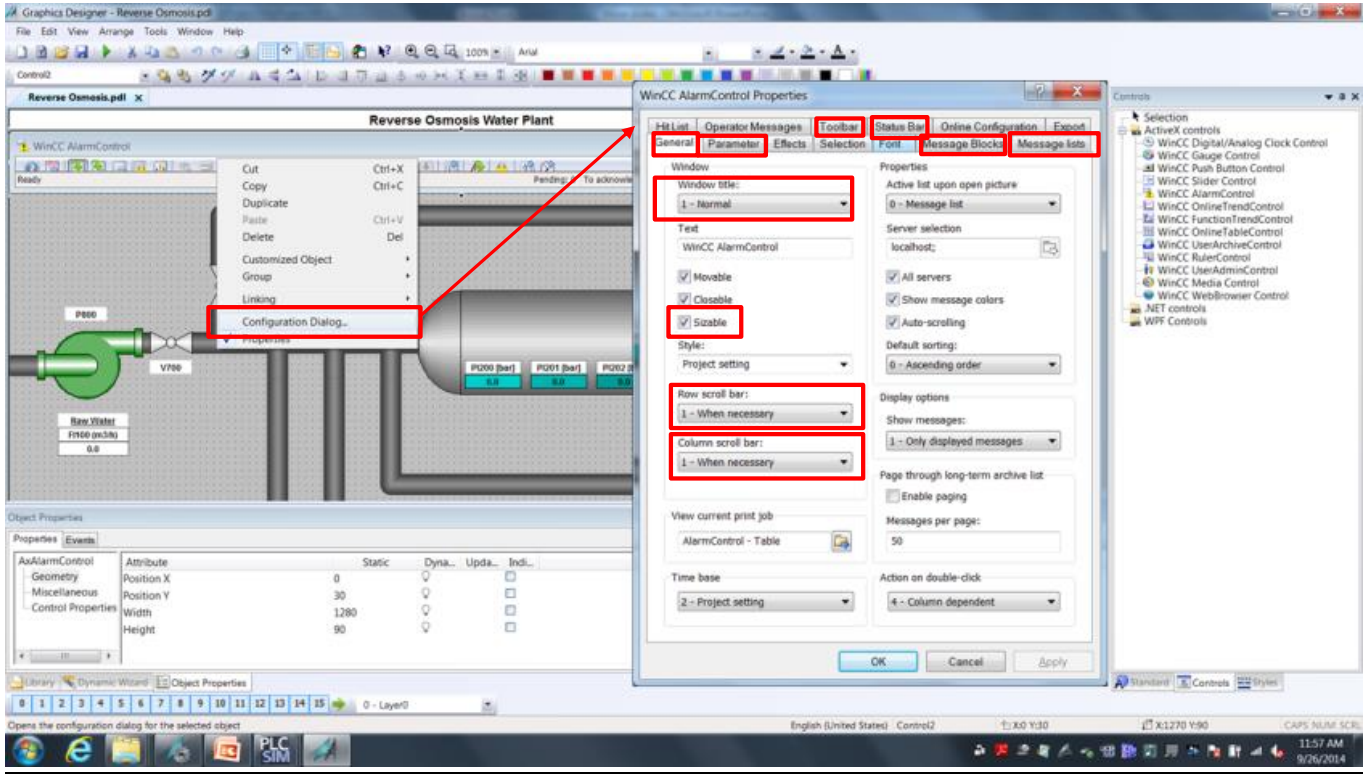
Status Bar –	Show status bar	Uncheck

Message Blocks Tab:

Apply project settings (Lower Left)		Uncheck
Date –	Length in chars	10
Time	Length in chars	20

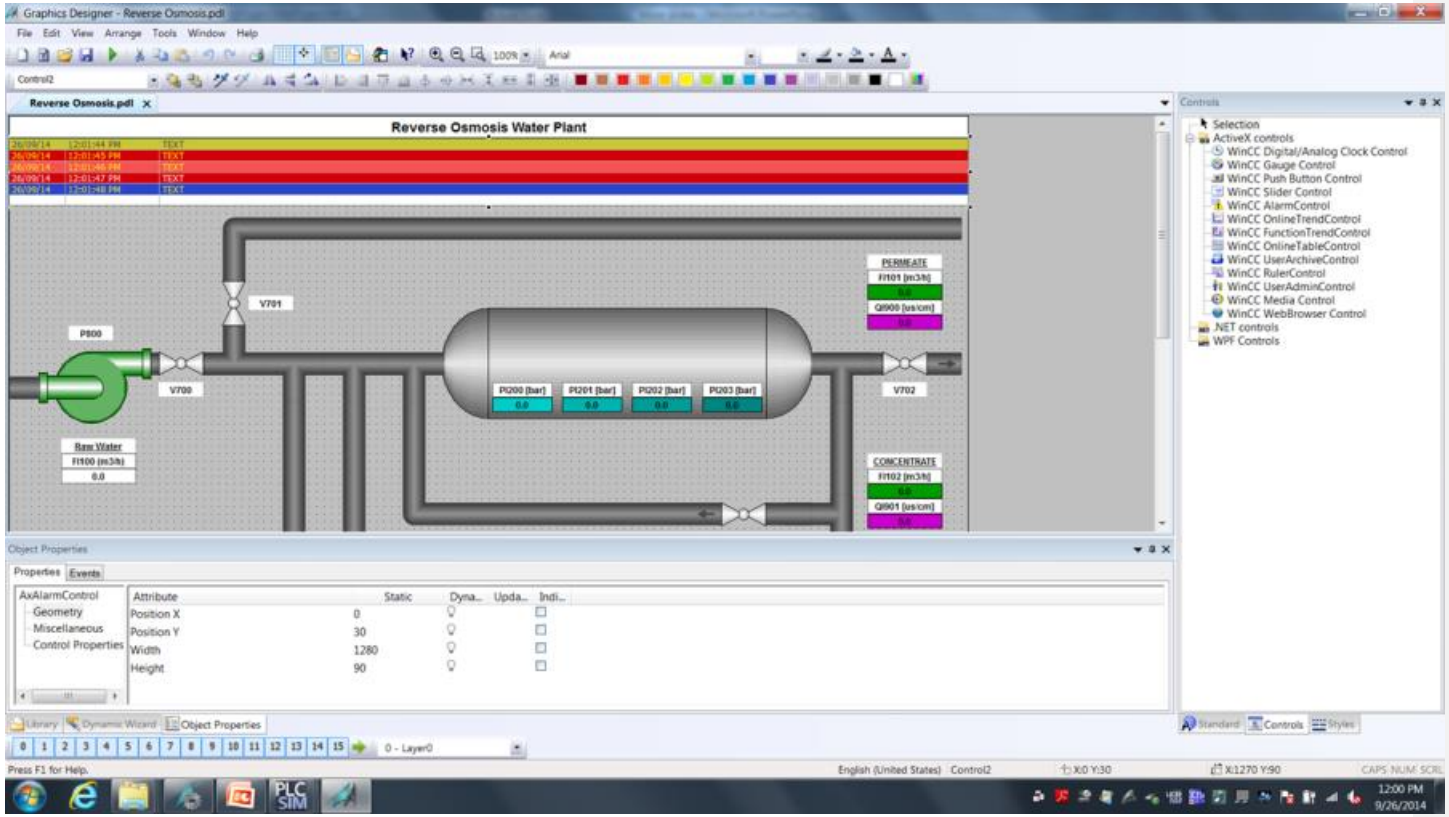
Message Lists Tab:

Selected message blocks	Date, Time, Message Text


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
Reverse Osmosis Water Plant
WinCC AlarmControl
Cut Ctrl+X
Copy Ctrl+C
Duplicate
Paste Ctrl+V
Delete Del
Customized Object
Group
Linking
Configuration Dialog...
Properties
P800
V700
PI200 [bar]
PI201 [bar]
Raw Water
WinCC AlarmControl Properties
Hit List
Operator Messages
Toolbar
Status Bar
Online Configuration
Export
General
Parameter
Effects
Selection
Font
Message Blocks
Message lists
Window
Window title:
1 - Normal
Text
WinCC AlarmControl
Movable
Closable
Sizable
Style:
Project setting
Row scroll bar:
1 - When necessary
Column scroll bar:
1 - When necessary
View current print job
AlarmControl - Table
Time base
2 - Project setting
Properties
Active list upon open picture
0 - Message list
Server selection
localhost;
All servers
Show message colors
Auto-scrolling
Default sorting:
0 - Ascending order
Display options
Show messages:
1 - Only displayed messages
Page through long-term archive list
Enable paging
Messages per page:
50
Action on double-click
4 - Column dependent
OK
Cancel
Apply
Controls
Selection
ActiveX controls
WinCC Digital/Analog Clock Control
WinCC Gauge Control
WinCC Push Button Control
WinCC Slider Control
WinCC AlarmControl
WinCC OnlineTrendControl
WinCC FunctionTrendControl
WinCC OnlineTableControl
WinCC UserArchiveControl
WinCC RulerControl
WinCC UserAdminControl
WinCC Media Control
WinCC WebBrowser Control
.NET controls
WPF Controls
Object Properties
AxAlarmControl
Geometry
Miscellaneous
Control Properties
Attribute
Static
Position X 0
Position Y 30
Width 1280
Height 90
Opens the configuration dialog for the selected object
11:57 AM
9/26/2014

Result

Save the file. You have created the alarm configuration to view operation messages for the process of the Reverse Osmosis Water Plant.

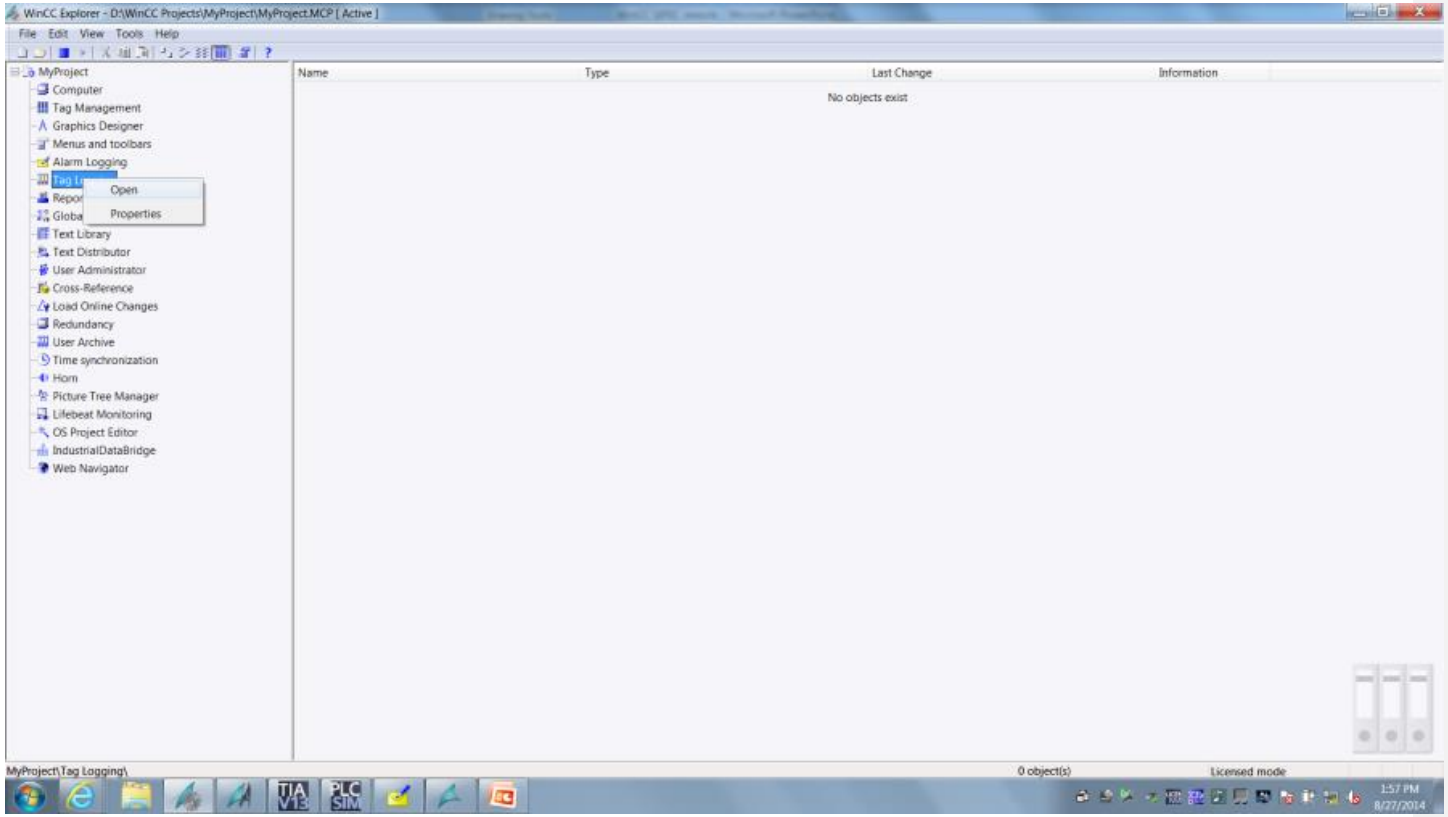

Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
Reverse Osmosis Water Plant
PERMEATE
V701
P800
V700
V702
Raw Water
CONCENTRATE
Controls
Object Properties
Properties
Events
AxAlarmControl
Geometry
Miscellaneous
Control Properties
Attribute
Static
Position X
Position Y
Width
Height
0
30
1280
90

Configure Trends

We will now create a trend view so that we can graphically show historical values for some of the process connections. The following steps will show you how to configure tag logging and the trend view.

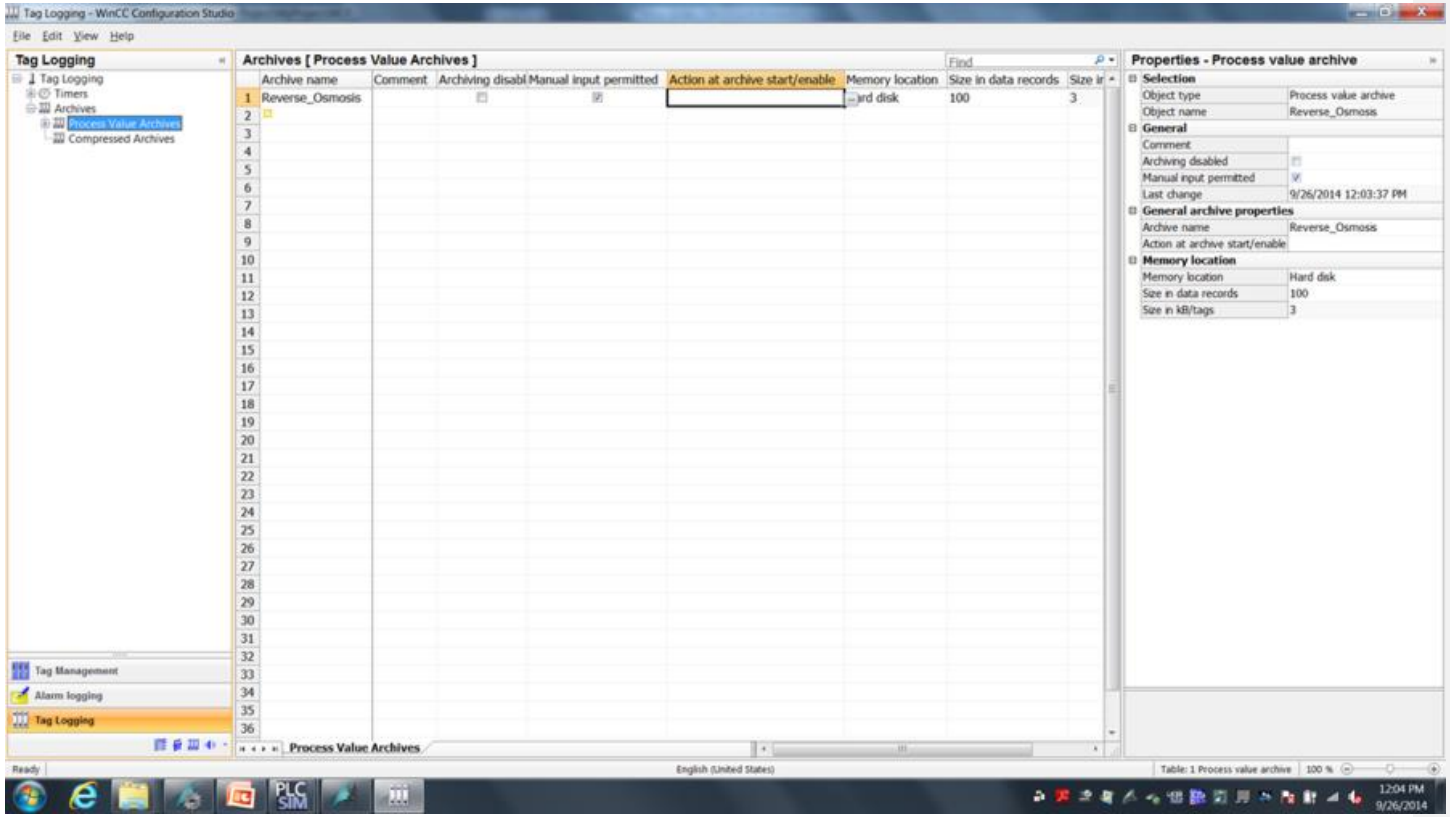
Procedure

1. In WinCC Explorer, open the tag logging configuration dialog.


WinCC Explorer - D:\WinCC Projects\MyProject\MyProject.MCP [Active]
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Open
Properties
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
Last Change
Information
No objects exist
MyProject\Tag Logging\
0 object(s)
Licensed mode

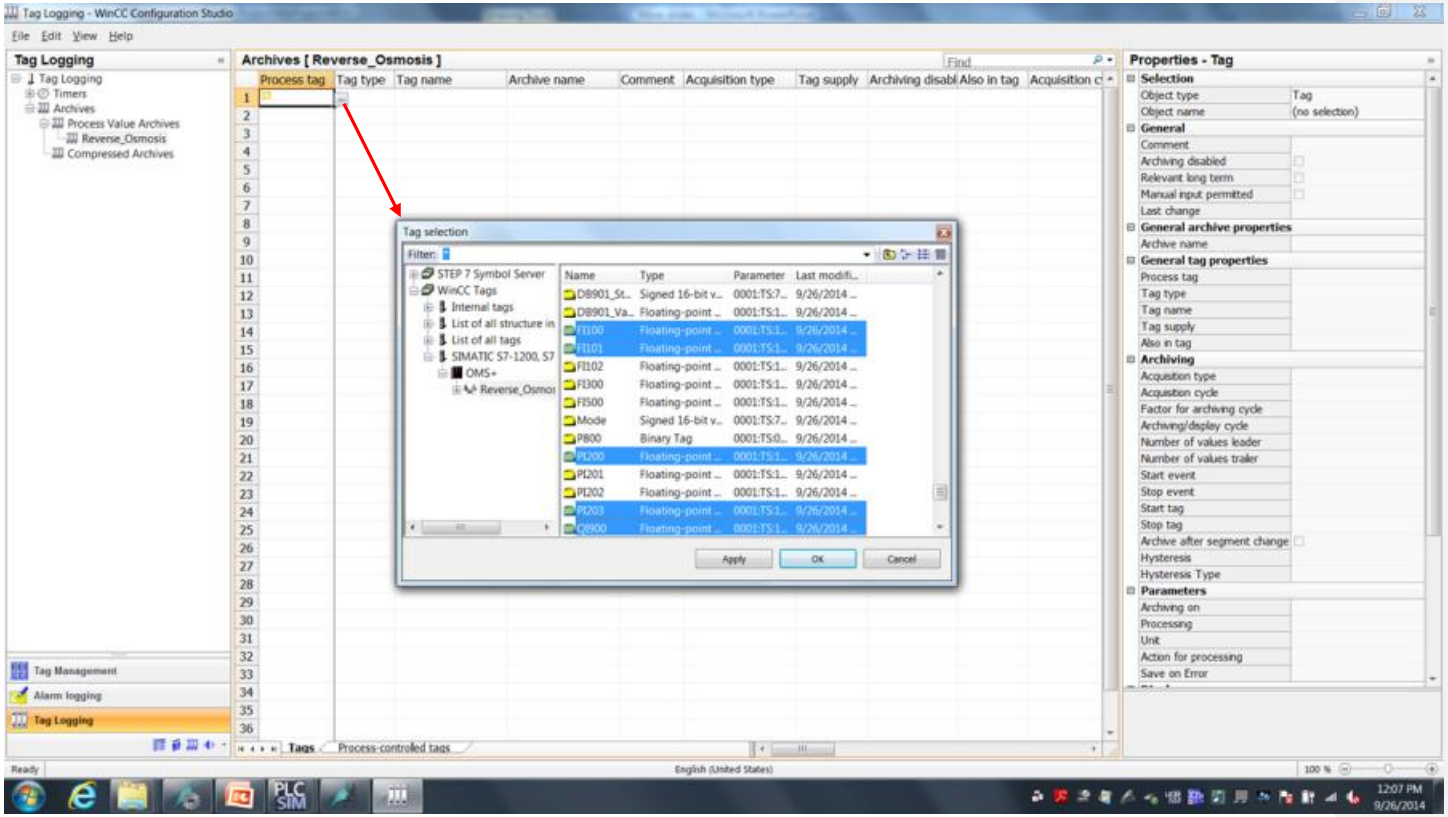
2. In the WinCC Configuration Studio Tag Logging, click on the **process value archiving** and create a new archive by typing the name in the column.

   Archive Name Reverse_Osmosis

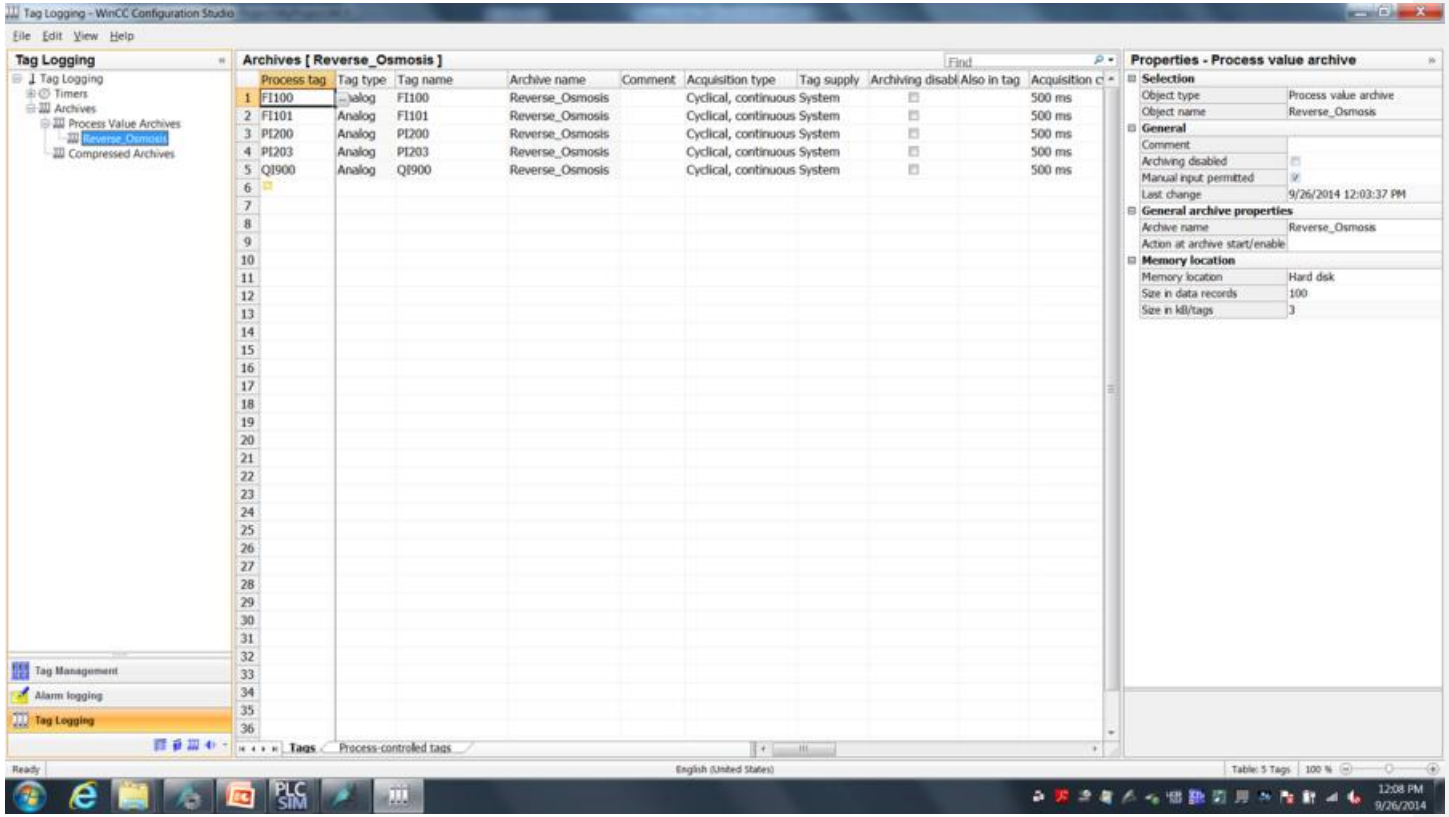

Tag Logging - WinCC Configuration Studio
File Edit View Help
Tag Logging
Tag Logging
Timers
Archives
Process Value Archives
Compressed Archives
Tag Management
Alarm logging
Tag Logging
Archives [Process Value Archives]
Find
Archive name
Comment
Archiving disabl
Manual input permitted
Action at archive start/enable
Memory location
Size in data records
Size ir
1
Reverse_Osmosis
rd disk
100
3
Process Value Archives
Properties - Process value archive
Selection
Object type
Process value archive
Object name
Reverse_Osmosis
General
Comment
Archiving disabled
Manual input permitted
Last change
9/26/2014 12:03:37 PM
General archive properties
Archive name
Reverse_Osmosis
Action at archive start/enable
Memory location
Memory location
Hard disk
Size in data records
100
Size in kB/tags
3
Ready
English (United States)
Table: 1 Process value archive
100 %
12:04 PM
9/26/2014

3. Open the Process Value Archive and select Reverse Osmosis. Add the following tags to the archive

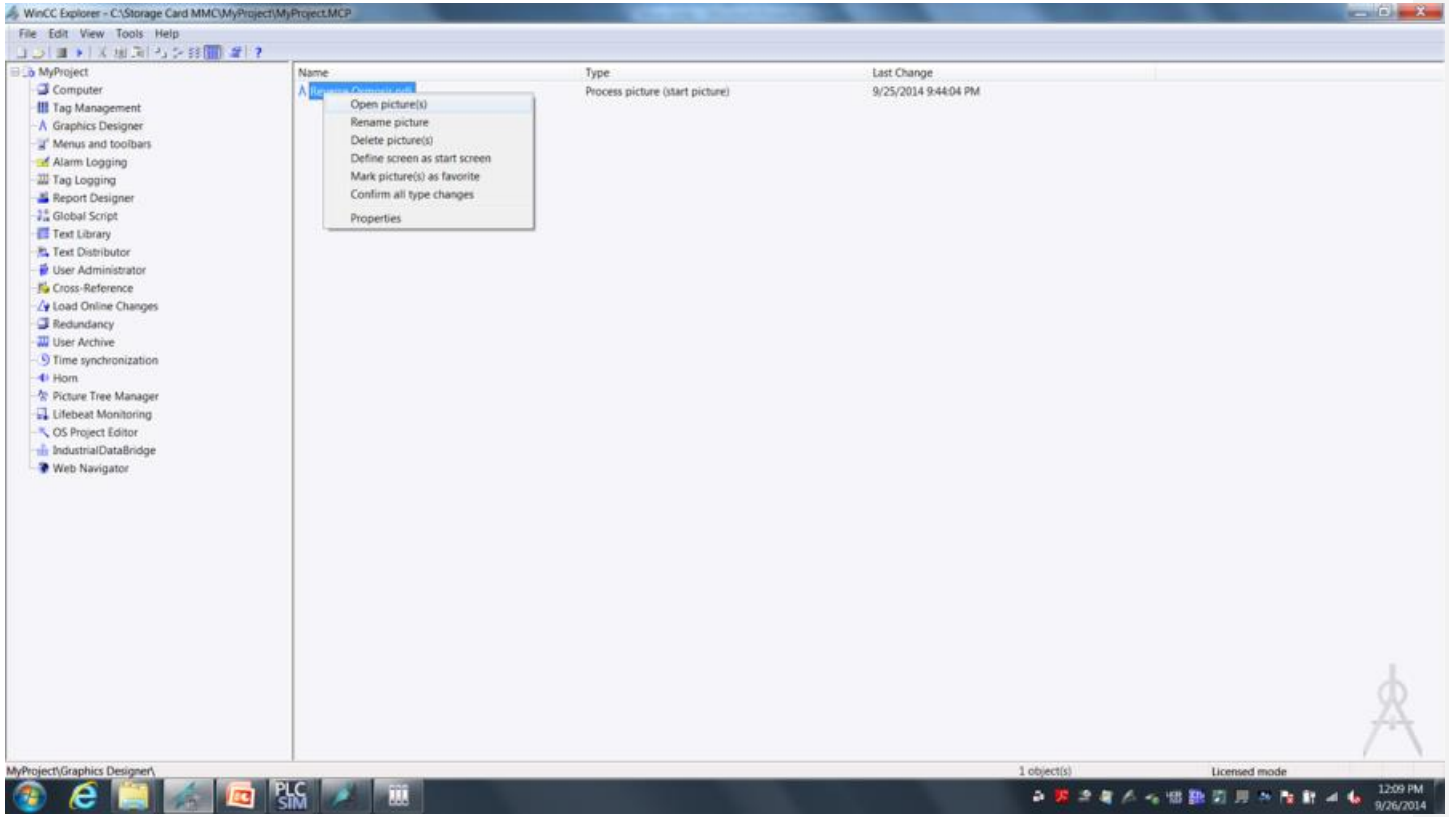
   Select these from the Tag Manager FI100, FI101, PI200, PI203 & QI900


Tag Logging - WinCC Configuration Studio
File Edit View Help
Tag Logging
Tag Logging
Timers
Archives
Process Value Archives
Reverse_Osmosis
Compressed Archives
Archives [Reverse_Osmosis]
Process tag
Tag type
Tag name
Archive name
Comment
Acquisition type
Tag supply
Archiving disabl
Also in tag
Tag selection
Filter:
STEP 7 Symbol Server
WinCC Tags
Internal tags
List of all structure in
List of all tags
SIMATIC S7-1200, S7
OMS+
Reverse_Osmos
Name
Type
Parameter
Last modifi...
Apply
OK
Cancel
Properties - Tag
Selection
Object type
Tag
Object name
(no selection)
General
Comment
Archiving disabled
Relevant long term
Manual input permitted
Last change
General archive properties
Archive name
General tag properties
Process tag
Tag type
Tag name
Tag supply
Also in tag
Archiving
Acquisition type
Acquisition cycle
Factor for archiving cycle
Archiving/dsplay cycle
Number of values leader
Number of values trailer
Start event
Stop event
Start tag
Stop tag
Archive after segment change
Hysteresis
Hysteresis Type
Parameters
Archiving on
Processing
Unit
Action for processing
Save on Error
Tag Management
Alarm logging
Tag Logging
Tags
Process-controlled tags
Ready
English (United States)
12:07 PM
9/26/2014

4. Exit tag logging configuration studio, auto saved upon exit.

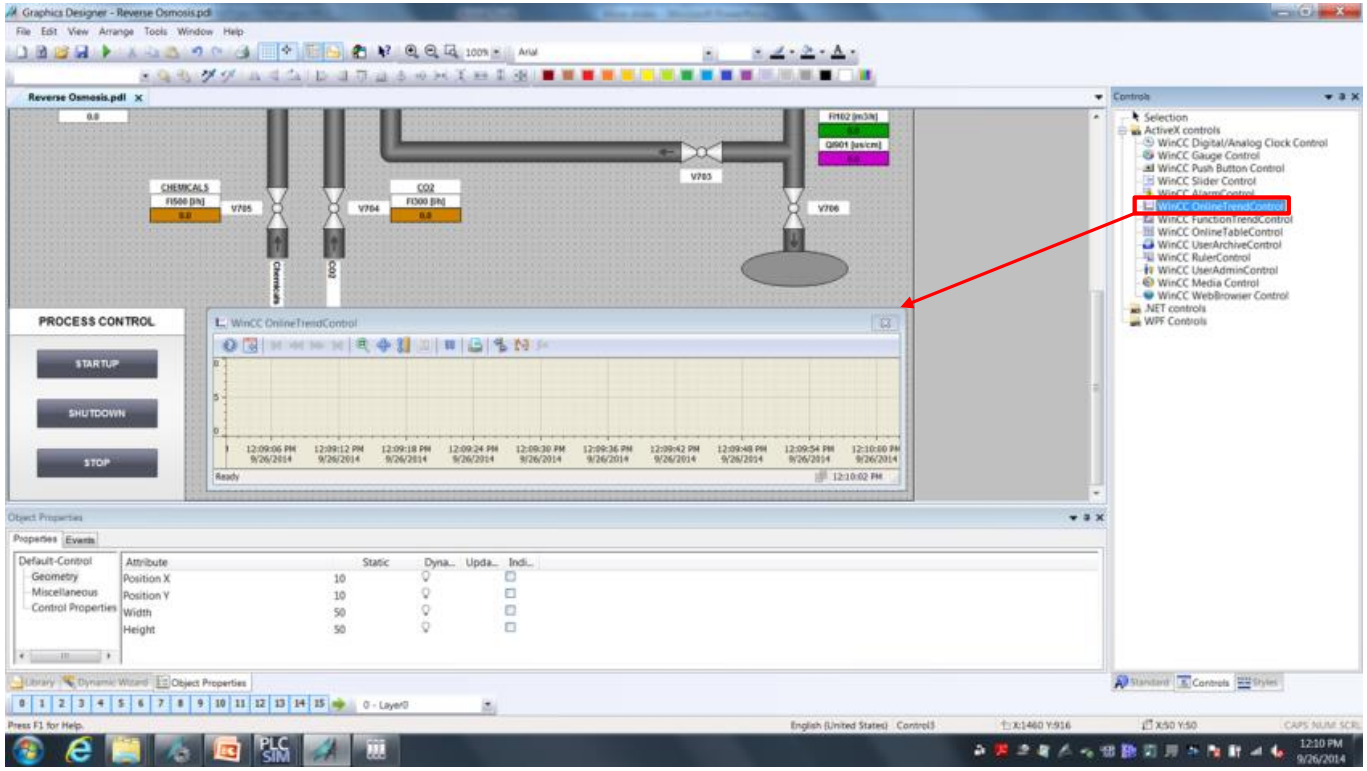

Tag Logging - WinCC Configuration Studio
File Edit View Help
Tag Logging
Tag Logging
Timers
Archives
Process Value Archives
Reverse_Osmosis
Compressed Archives
Tag Management
Alarm logging
Tag Logging
Archives [Reverse_Osmosis]
Find
Process tag | Tag type | Tag name | Archive name | Comment | Acquisition type | Tag supply | Archiving disabl | Also in tag | Acquisition c
1 FI100 | Analog | FI100 | Reverse_Osmosis | | Cyclical, continuous | System | | | 500 ms
2 FI101 | Analog | FI101 | Reverse_Osmosis | | Cyclical, continuous | System | | | 500 ms
3 PI200 | Analog | PI200 | Reverse_Osmosis | | Cyclical, continuous | System | | | 500 ms
4 PI203 | Analog | PI203 | Reverse_Osmosis | | Cyclical, continuous | System | | | 500 ms
5 QI900 | Analog | QI900 | Reverse_Osmosis | | Cyclical, continuous | System | | | 500 ms
Tags
Process-controlled tags
Properties - Process value archive
Selection
Object type: Process value archive
Object name: Reverse_Osmosis
General
Comment
Archiving disabled
Manual input permitted
Last change: 9/26/2014 12:03:37 PM
General archive properties
Archive name: Reverse_Osmosis
Action at archive start/enable
Memory location
Memory location: Hard disk
Size in data records: 100
Size in kB/tags: 3
Ready
English (United States)
Table: 5 Tags
100 %
12:08 PM
9/26/2014

5. Open the screen “Reverse Osmosis.pdl” from WinCC Explorer to configure the Trend ActiveX control in WinCC Runtime.


WinCC Explorer - C:\Storage Card MMC\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
Last Change
Process picture (start picture)
9/25/2014 9:44:04 PM
Open picture(s)
Rename picture
Delete picture(s)
Define screen as start screen
Mark picture(s) as favorite
Confirm all type changes
Properties
MyProject\Graphics Designer\
1 object(s)
Licensed mode
12:09 PM
9/26/2014

6. The trend control is a preconfigured ActiveX control. Insert ActiveX control “WinCC OnlineTrendControl” into the picture.

   To insert the “WinCC Online TrendControl” object, select the ActiveX control in the controls area of the object palette tool and place on the screen area.


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
CHEMICALS
CO2
V705
V704
V703
V706
PROCESS CONTROL
STARTUP
SHUTDOWN
STOP
WinCC OnlineTrendControl
Controls
Selection
ActiveX controls
WinCC Digital/Analog Clock Control
WinCC Gauge Control
WinCC Push Button Control
WinCC Slider Control
WinCC OnlineTrendControl
WinCC FunctionTrendControl
WinCC OnlineTableControl
WinCC UserArchiveControl
WinCC RulerControl
WinCC UserAdminControl
WinCC Media Control
WinCC WebBrowser Control
.NET controls
WPF Controls
Object Properties
Properties
Events
Default-Control
Geometry
Miscellaneous
Control Properties
Attribute
Static
Position X
Position Y
Width
Height
Press F1 for Help.

7. Just like the Alarm Control the Online Trend Control is freely configurable. For our project please configure the Online Trend control as follows.

General Tab:

Window Title	0 - No	
Sizable	Uncheck	
Scroll Bar :	0 – No	

Trend Window:

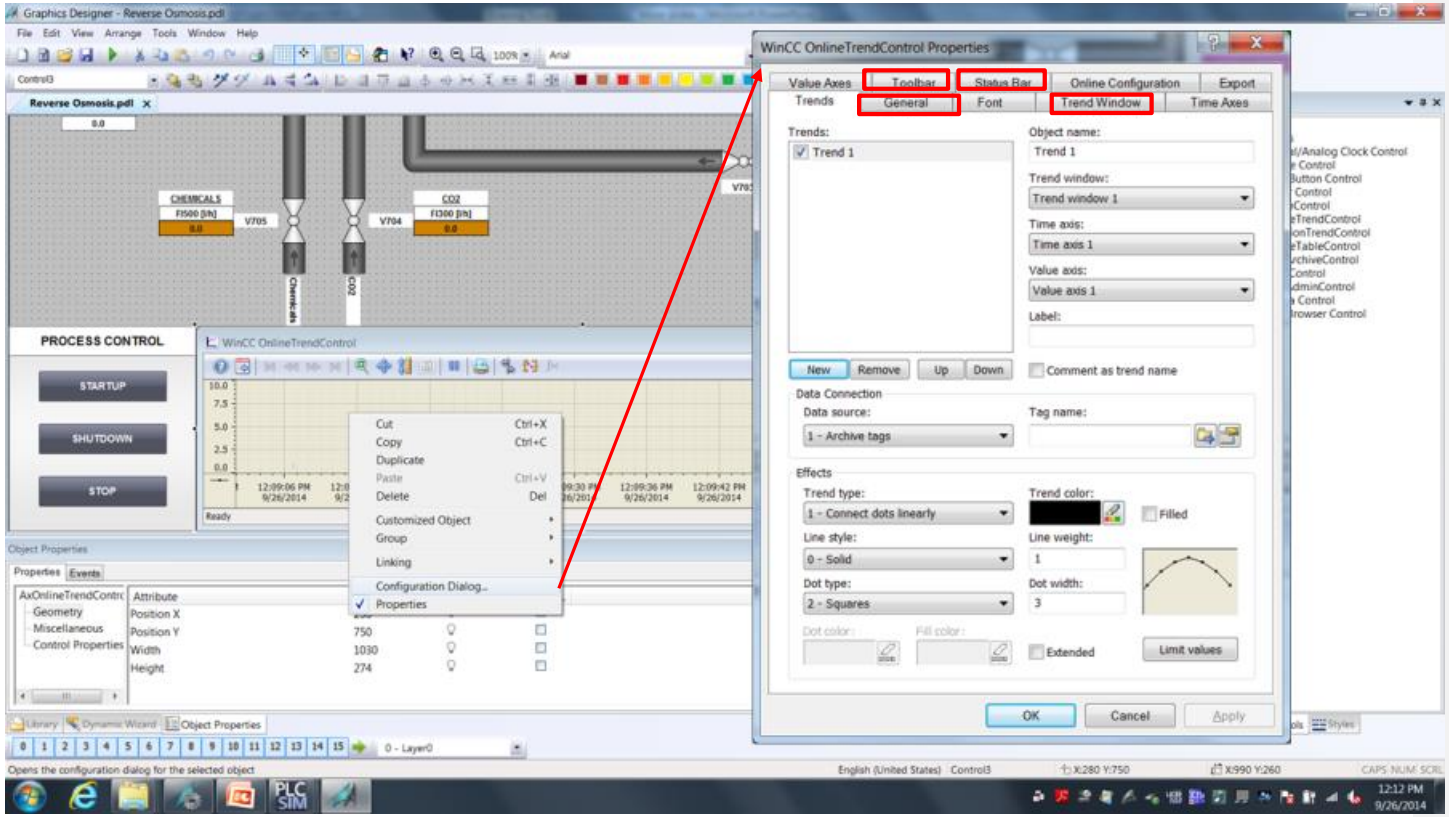
Grid Lines –	Main Gridlind	Uncheck
Grid Lines –	Auxiliary Gridlind	Uncheck

Status Bar:

Status Bar	–	Show Status Bar	Uncheck

Time Axes:

Effects	Show Date	Uncheck


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
PROCESS CONTROL
STARTUP
SHUTDOWN
STOP
WinCC OnlineTrendControl
Cut Ctrl+X
Copy Ctrl+C
Duplicate
Paste Ctrl+V
Delete Del
Customized Object
Group
Linking
Configuration Dialog...
Properties
WinCC OnlineTrendControl Properties
Value Axes
Toolbar
Status Bar
Online Configuration
Export
Trends
General
Font
Trend Window
Time Axes
Trends:
Trend 1
Object name:
Trend window:
Trend window 1
Time axis:
Time axis 1
Value axis:
Value axis 1
Label:
New
Remove
Up
Down
Comment as trend name
Data Connection
Data source:
1 - Archive tags
Tag name:
Effects
Trend type:
1 - Connect dots linearly
Trend color:
Filled
Line style:
0 - Solid
Line weight:
Dot type:
2 - Squares
Dot width:
Extended
Limit values
OK
Cancel
Apply

8. Configure the trends in the OnlineTrendControl configuration dialog. We will configure a total of five trends to be used for monitoring of the process. Create 2 Value Axes with the following **Object name** and **label:**

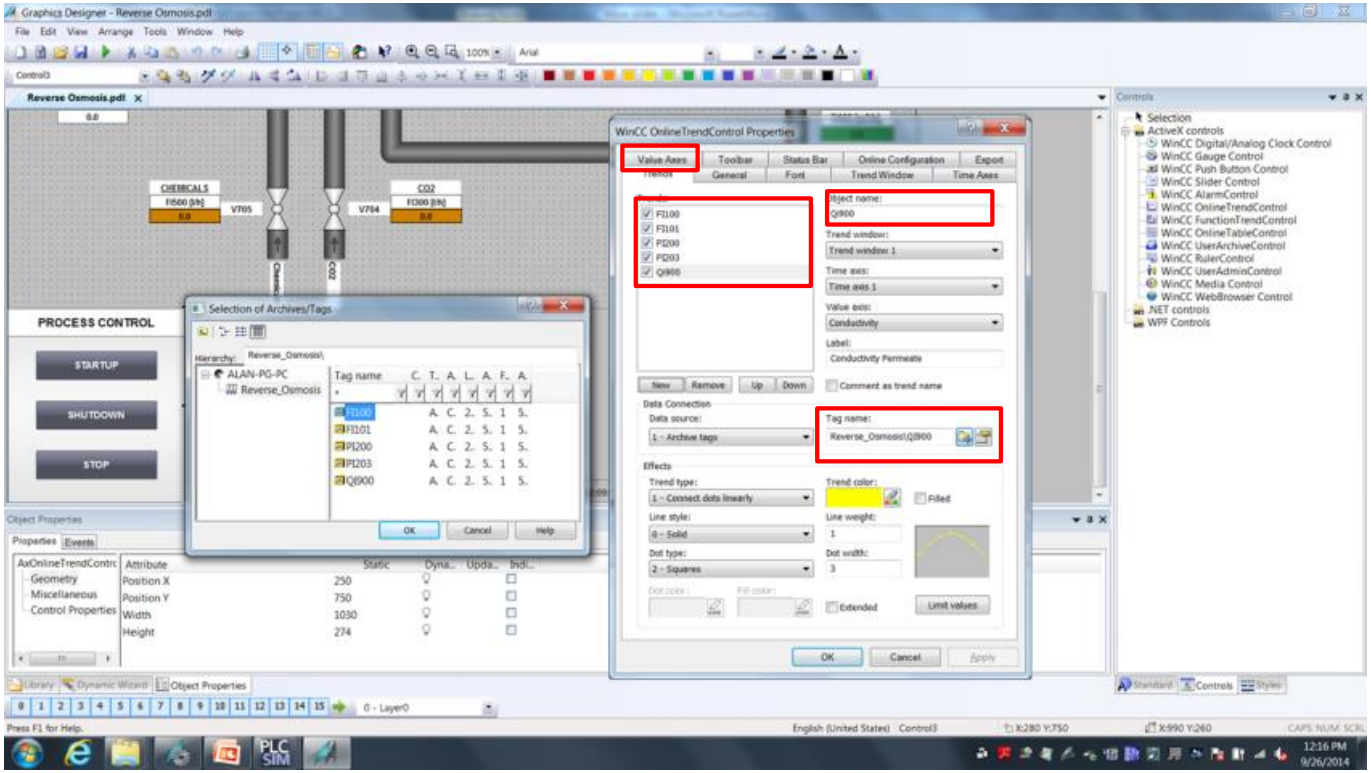
Value Axis 1	Flow/Pressure
Value Axis 2	Conductivity

In the Trends tab of the configuration dialog, configure existing trend for flow meter FI100. Name this first trend to ”Raw Water Flow” and assign trend to created value axis labeled Flow/Pressure.

Match trend color with object on the screen, and select none for Dot type.

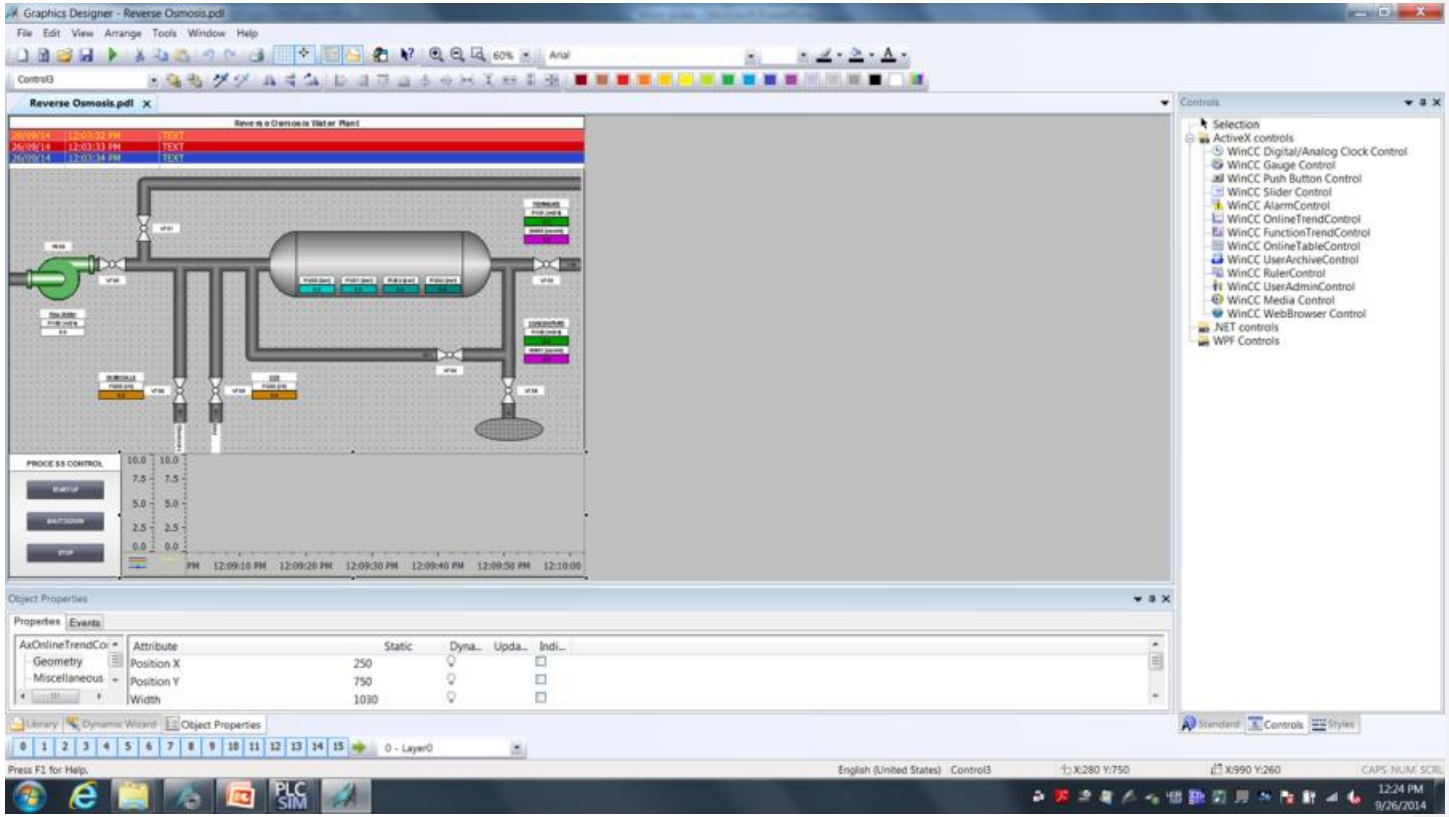
Add four additional trends, and make setting below;

Trend	Tag	Value Axis	Name
Trend 1	FI100	Flow/Pressure	Raw Water Flow
Trend 2	FI101	Flow/Pressure	Flow Permeate
Trend 3	PI200	Flow/Pressure	Pressure PI200
Trend 4	PI203	Flow/Pressure	Pressure PI203
Trend 5	QI900	Conductivity	Conductivity Permeate


Graphics Designer - Reverse Osmosis.pdl
Reverse Osmosis.pdl
PROCESS CONTROL
STARTUP
SHUTDOWN
STOP
CHEMICALS
CO2
V705
V704
Selection of Archives/Tags
WinCC OnlineTrendControl Properties
Value Axes
Toolbar
Status Bar
Online Configuration
Export
General
Font
Trend Window
Time Axes
Object name:
Trend window:
Time axis:
Value axis:
Label:
Data Connection
Data source:
Tag name:
Effects
Trend type:
Trend color:
Line style:
Line weight:
Dot type:
Dot width:
OK
Cancel
Apply
Controls
Selection
ActiveX controls
WinCC Digital/Analog Clock Control
WinCC Gauge Control
WinCC Push Button Control
WinCC Slider Control
WinCC AlarmControl
WinCC OnlineTrendControl
WinCC FunctionTrendControl
WinCC OnlineTableControl
WinCC UserArchiveControl
WinCC RulerControl
WinCC UserAdminControl
WinCC Media Control
WinCC WebBrowser Control
.NET controls
WPF Controls

Result

You have created the tag logging and trend view configuration to view trends for the process of the Reverse Osmosis Water Plant.


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
Reverse Osmosis Water Plant
PROCESS CONTROL
Controls
Selection
ActiveX controls
WinCC Digital/Analog Clock Control
WinCC Gauge Control
WinCC Push Button Control
WinCC Slider Control
WinCC AlarmControl
WinCC OnlineTrendControl
WinCC FunctionTrendControl
WinCC OnlineTableControl
WinCC UserArchiveControl
WinCC RulerControl
WinCC UserAdminControl
WinCC Media Control
WinCC WebBrowser Control
.NET controls
WPF Controls
Object Properties
Properties
Events
Attribute
Static
Position X 250
Position Y 750
Width 1030
Press F1 for Help.
English (United States) Control3
X:280 Y:750
X:990 Y:260
12:24 PM
9/26/2014

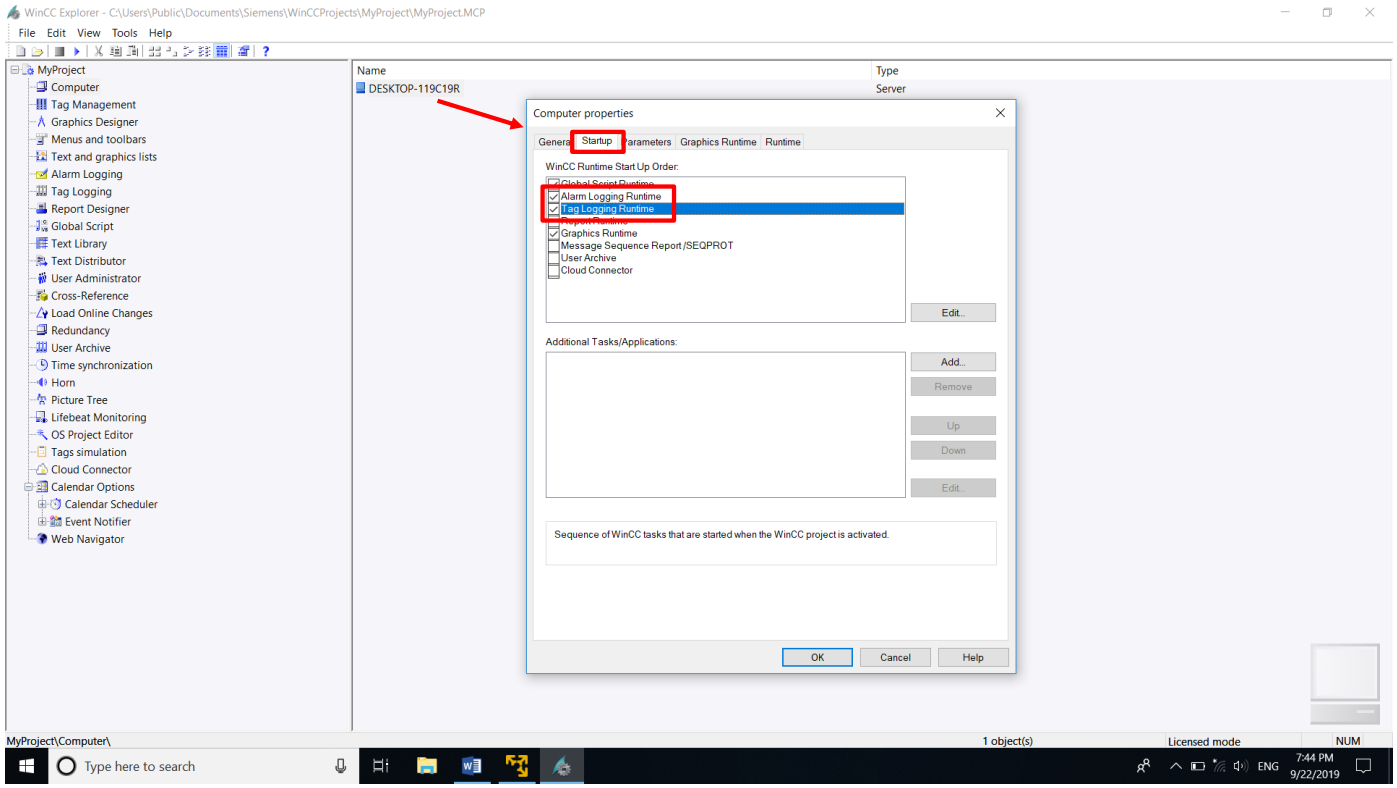
Configure WinCC Runtime

The following steps will show you how to configure WinCC runtime for alarm and tag logging.

Procedure

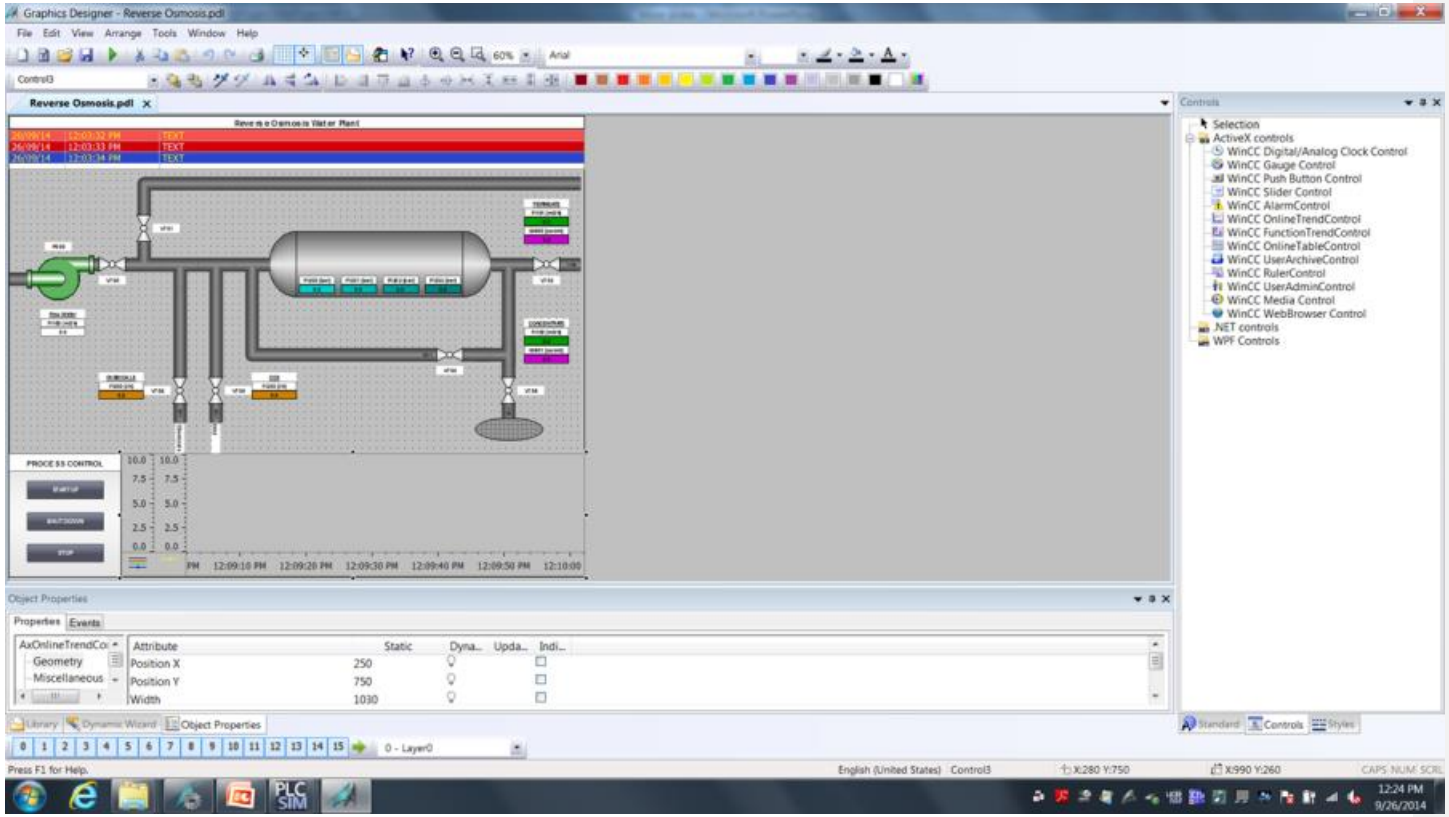
1. In WinCC Explorer, configure computer properties to start alarm and tag logging services

   Check startup selections for Alarm Logging Runtime and tag Logging Runtime.


WinCC Explorer - C:\Users\Public\Documents\Siemens\WinCCProjects\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Text and graphics lists
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree
Lifebeat Monitoring
OS Project Editor
Tags simulation
Cloud Connector
Calendar Options
Calendar Scheduler
Event Notifier
Web Navigator
Name
Type
DESKTOP-119C19R
Server
Computer properties
Startup
Graphics Runtime
Runtime
WinCC Runtime Start Up Order:
Alarm Logging Runtime
Tag Logging Runtime
Graphics Runtime
Message Sequence Report /SEQPROT
User Archive
Cloud Connector
Edit...
Additional Tasks/Applications:
Add...
Remove
Up
Down
Edit...
Sequence of WinCC tasks that are started when the WinCC project is activated.
OK
Cancel
Help
MyProject\Computer\
1 object(s)
Licensed mode
NUM
Type here to search
ENG
7:44 PM
9/22/2019

Result

You have created the WinCC project for the Reverse Osmosis Water Plant, and are ready to test your project.


Graphics Designer - Reverse Osmosis.pdl
File Edit View Arrange Tools Window Help
Reverse Osmosis.pdl
Reverse Osmosis Water Plant
PROCESS CONTROL
Controls
Selection
ActiveX controls
WinCC Digital/Analog Clock Control
WinCC Gauge Control
WinCC Push Button Control
WinCC Slider Control
WinCC AlarmControl
WinCC OnlineTrendControl
WinCC FunctionTrendControl
WinCC OnlineTableControl
WinCC UserArchiveControl
WinCC RulerControl
WinCC UserAdminControl
WinCC Media Control
WinCC WebBrowser Control
.NET controls
WPF Controls
Object Properties
Properties
Events
Attribute
Static
Position X 250
Position Y 750
Width 1030
Object Properties
Press F1 for Help.
English (United States) Control3
X:280 Y:750
X:990 Y:260
12:24 PM
9/26/2014

Test the WinCC project

The following steps will show you how to activate WinCC runtime and the controller (PLCSIM) to test your project.

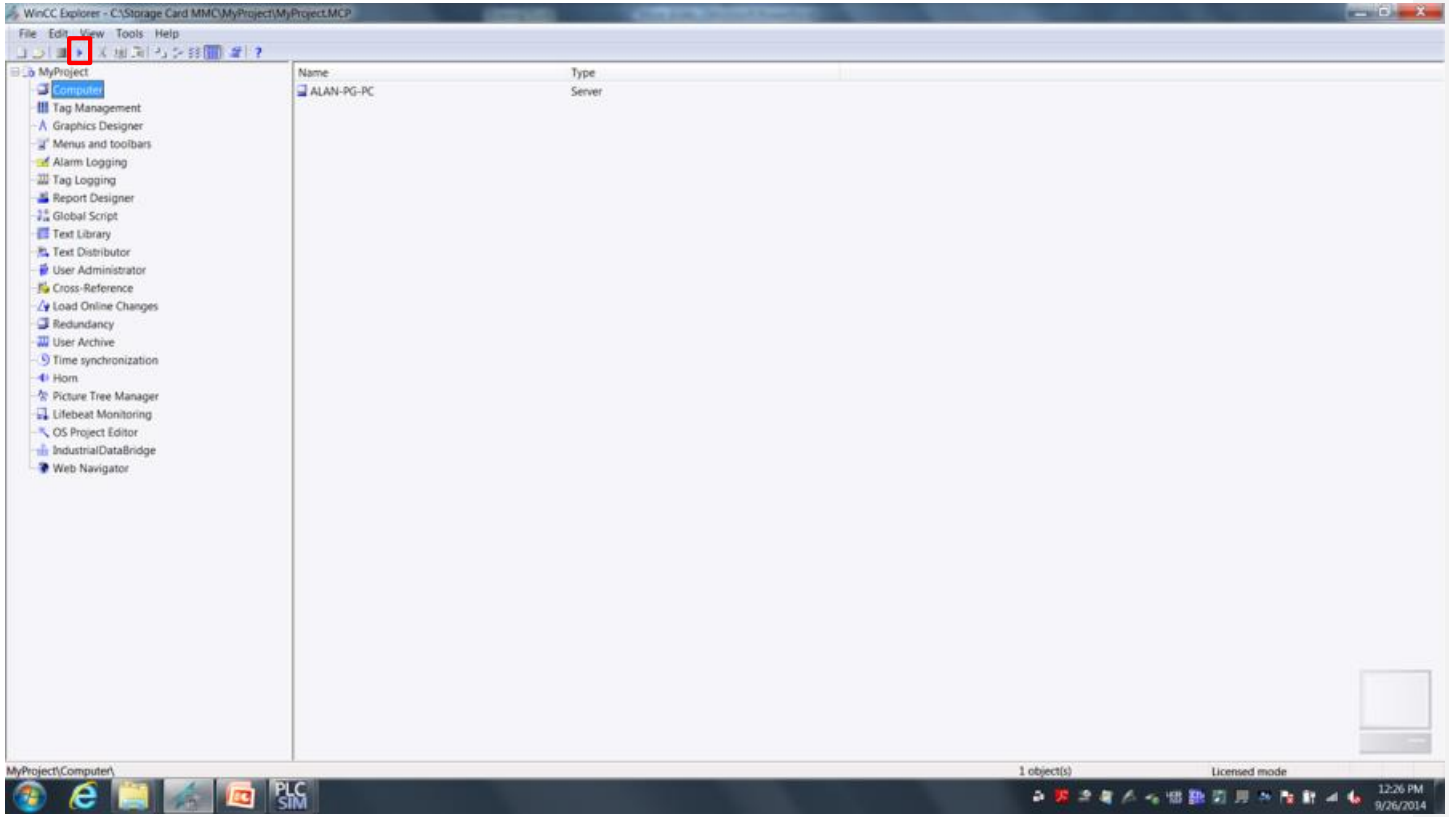
Procedure

1. Start the controller (PLCSIM) using the S7 simulation view.

   The controller file “Reverse Osmosis Water System” are located in the folder “WinCC V7.x Materials” on the desktop. First power on the CPU and then put the simulator in Run Mode.

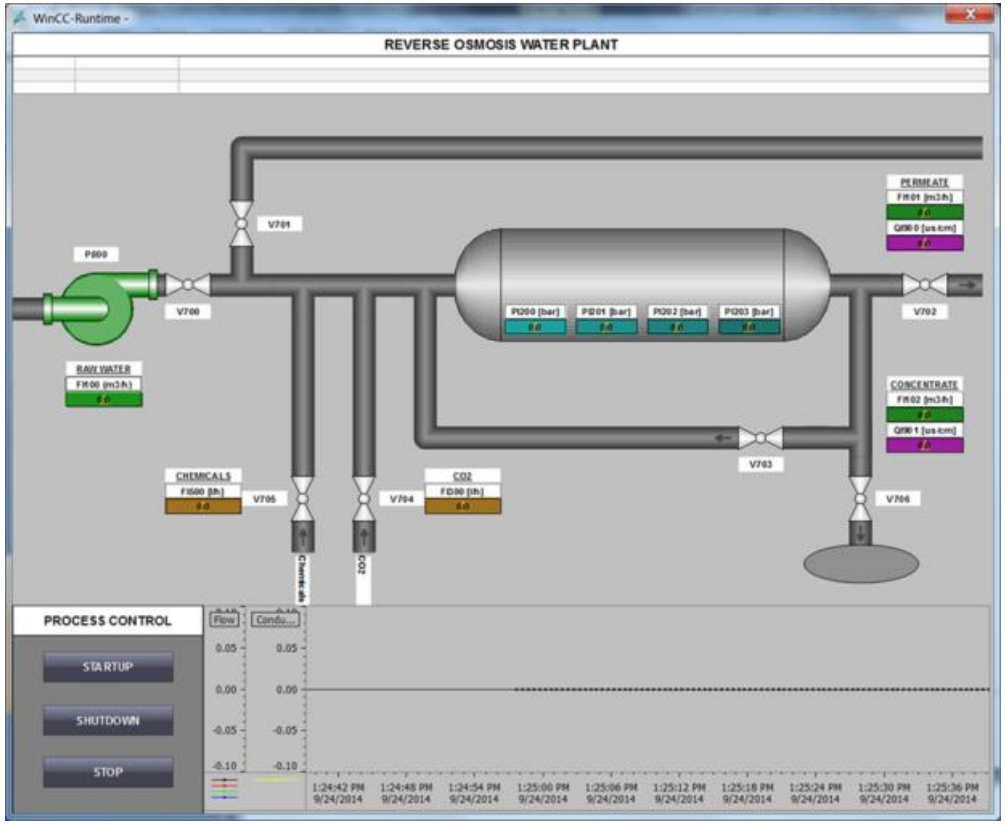
2. Start WinCC Runtime.

   - Startup starts process control of the Reverse Osmosis Water Plant.
   - Shutdown makes a controlled stop of the process.
   - Stop disables the process.


WinCC Explorer - C:\Storage Card MMC\MyProject\MyProject.MCP
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
IndustrialDataBridge
Web Navigator
Name
Type
ALAN-PG-PC
Server
MyProject\Computer\
1 object(s)
Licensed mode
PLC SIM
12:26 PM
9/26/2014

Result

You have completed and successfully tested the WinCC project for the Reverse Osmosis Water Plant.


WinCC-Runtime -
REVERSE OSMOSIS WATER PLANT
PERMEATE
V701
P800
V700
PI200 [bar]
PI201 [bar]
PI202 [bar]
PI203 [bar]
V702
RAW WATER
CONCENTRATE
V703
CHEMICALS
V705
V704
CO2
V706
PROCESS CONTROL
STARTUP
SHUTDOWN
STOP
Flow
Condu...
0.05
0.00
-0.05
-0.10
1:24:42 PM 9/24/2014
1:24:48 PM 9/24/2014
1:24:54 PM 9/24/2014
1:25:00 PM 9/24/2014
1:25:06 PM 9/24/2014
1:25:12 PM 9/24/2014
1:25:18 PM 9/24/2014
1:25:24 PM 9/24/2014
1:25:30 PM 9/24/2014
1:25:36 PM 9/24/2014

Advance RT Features

Working with Trends

We are now going to work with the Trend Control in runtime. With WinCC you can make changes to some of the controls without having to stop WinCC RT (RunTime) and opening the configuration environment. In RunTime you can open the configuration dialog and you have access in Runtime to the same configuration tool that you used in Configuration.

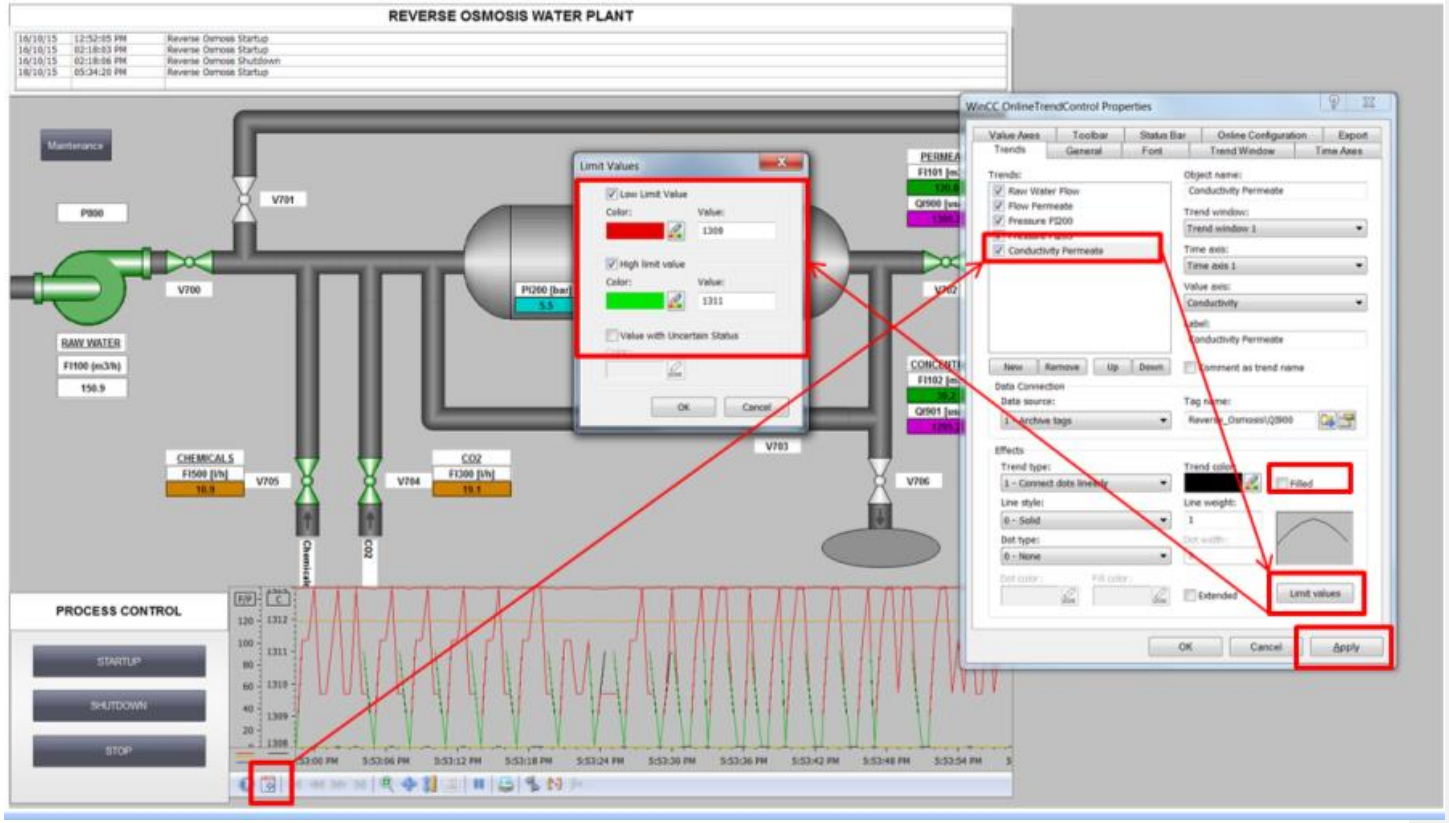
1. In WinCC RT click on the Configuration Dialog box. This will open up the Properties box.

2. Select Conductivity Permeate trend as the trend we are working with. We are going to set limits and change the trend color based upon these limits.

3. Click on the **Limit Values** button and set the lower limit to 1309 and the upper limit to 1311. Set different colors for each limit.

4. Apply these changes and view your trend.

5. You can also fill the graph to provide a more defined trend.


REVERSE OSMOSIS WATER PLANT
Maintenance
P800
V701
V700
RAW WATER
FI100 (m3/h)
150.9
CHEMICALS
FI500 [l/h]
V705
CO2
FI300 [l/h]
V704
V703
V706
PI200 [bar]
Limit Values
Low Limit Value
Color:
Value:
1309
High limit value
1311
Value with Uncertain Status
OK
Cancel
PROCESS CONTROL
STARTUP
SHUTDOWN
STOP
WinCC OnlineTrendControl Properties
Value Axes
Toolbar
Status Bar
Online Configuration
Export
Trends
General
Font
Trend Window
Time Axes
Trends:
Raw Water Flow
Flow Permeate
Pressure PI200
Conductivity Permeate
Object name:
Conductivity Permeate
Trend window:
Trend window 1
Time axis:
Time axis 1
Value axes:
Conductivity
Label:
Conductivity Permeate
New
Remove
Up
Down
Comment as trend name
Data Connection
Data source:
Archive tags
Tag name:
Effects
Trend type:
1 - Connect dots linearly
Trend color:
Filled
Line style:
0 - Solid
Line weight:
1
Dot type:
0 - None
Extended
Limit values
OK
Cancel
Apply

Reporting on Trends

WinCC can print trends on demand for use later. To print a report just set a default printer within the Windows operating system and click on the printer icon in the tool bar. Below is the report that will be generated.

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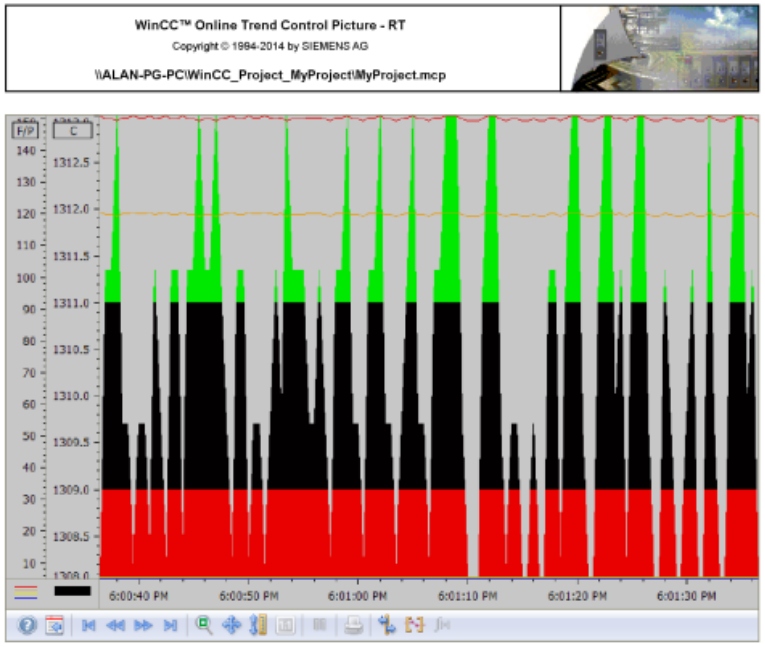
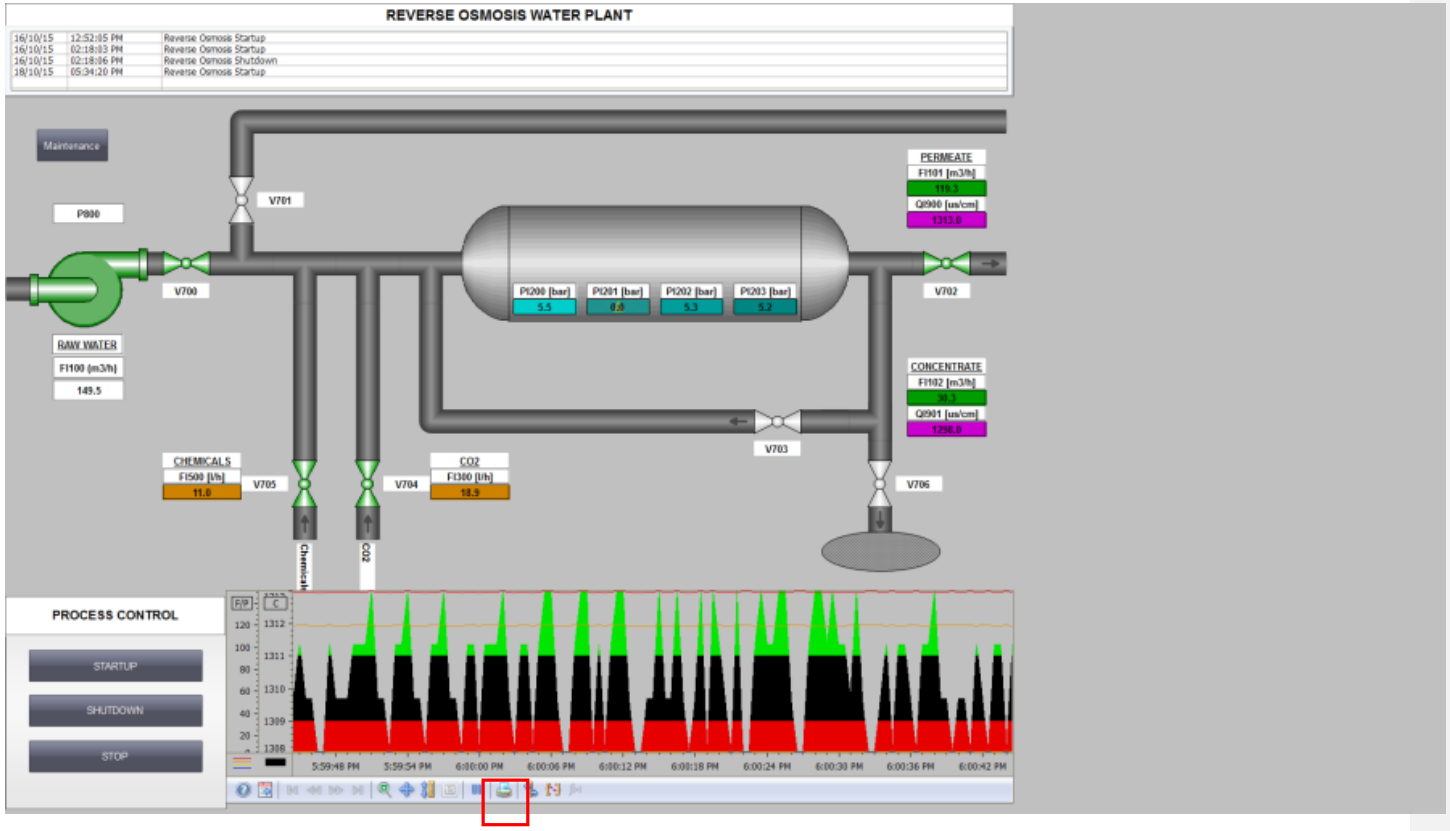



REVERSE OSMOSIS WATER PLANT
16/10/15 12:52:05 PM Reverse Osmosis Startup
16/10/15 02:18:03 PM Reverse Osmosis Startup
16/10/15 02:18:06 PM Reverse Osmosis Shutdown
18/10/15 05:34:20 PM Reverse Osmosis Startup
Maintenance
P000
V701
V700
RAW WATER
FI100 [m3/h]
149.5
PERMEATE
FI101 [m3/h]
119.5
QI900 [us/cm]
1313.0
V702
Pt200 [bar]
5.5
Pt201 [bar]
0.0
Pt202 [bar]
5.3
Pt203 [bar]
5.2
CONCENTRATE
FI102 [m3/h]
30.3
QI901 [us/cm]
1298.0
V703
CHEMICALS
FI500 [l/h]
11.0
V705
V704
CO2
FI300 [l/h]
18.9
V706
Chemicals
CO2
PROCESS CONTROL
STARTUP
SHUTDOWN
STOP
5:59:48 PM
5:59:54 PM
6:00:00 PM
6:00:06 PM
6:00:12 PM
6:00:18 PM
6:00:24 PM
6:00:30 PM
6:00:36 PM
6:00:42 PM

Web Features

WinCC can be web enabled to deliver the information to you over your network. We have 2 options to accomplish this, **Web Navigator** and **WebUX**, WinCC/WebNavigator provides you with the capability of operating and monitoring your plant via the Internet or the company-internal intranet or LAN without the need for changes to the WinCC project. WebUX was developed for the device-independent use of Smartphones, Tablets, PCs and other mobile devices which are HTML5 compatible. WebNavigator is fully functional with WinCC. WebUX is intended as an information portal and at this time, does not include all the functions of WinCC but we are working to improve functionality. We have scalable licensing from 1 to 150 clients.

To configure you project to us WebNavigator you need to publish the Screens for WebNavigator.

1. In WinCC explorer right click on WebNavigator and select Web View Publisher.

2. The introduction screen opens. Click on next.

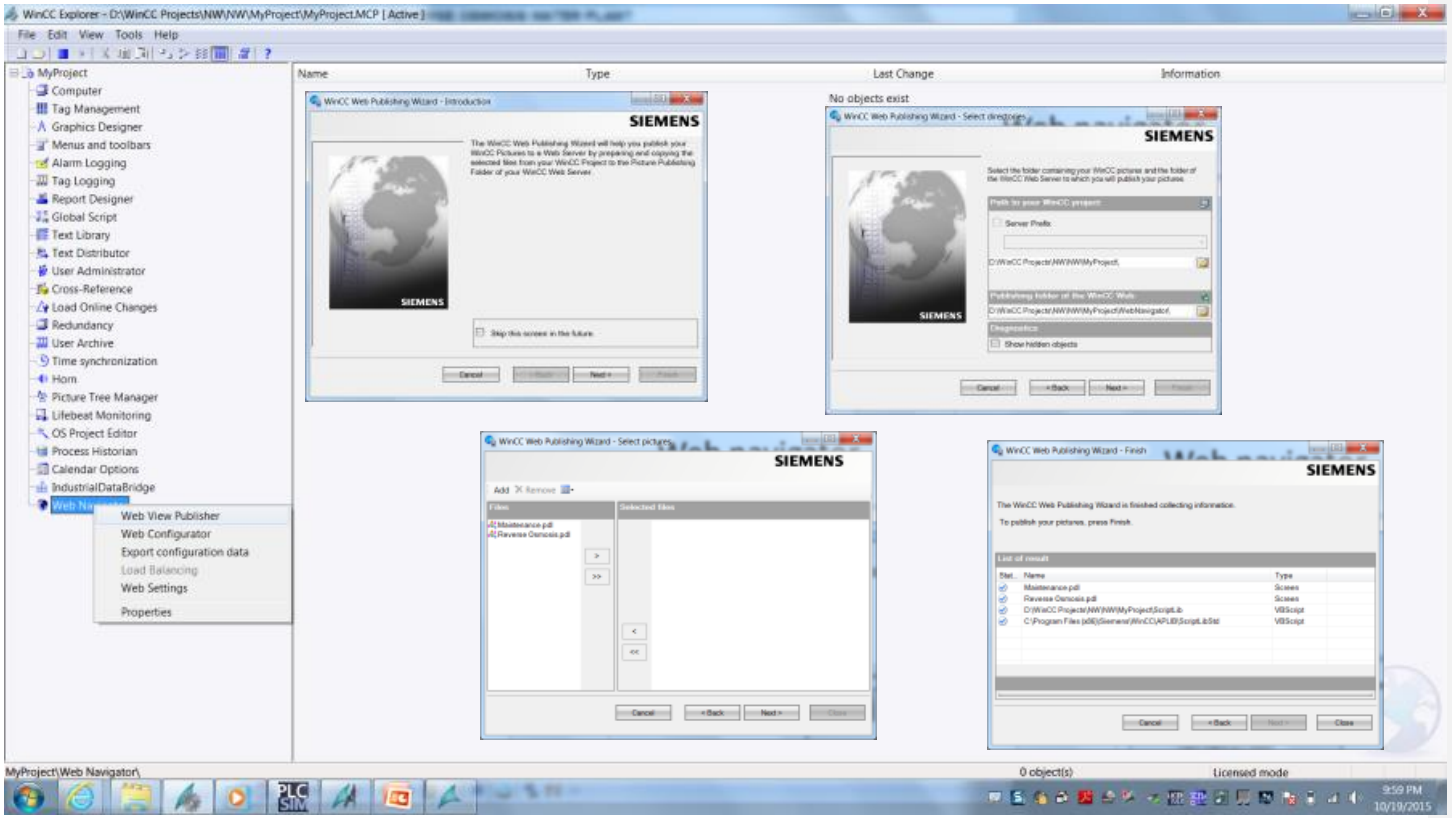
3. This screen is where you can verify the path to the project. Leave defaults and click on next…

4. On this screen you select which pictures you want to publish. Click next thru the next several windows.

5. Click on Finish to publish your project.

Results

You now have published you project to WebNavigator.


WinCC Explorer - D:\WinCC Projects\NW\NW\MyProject\MyProject.MCP [Active]
File Edit View Tools Help
MyProject
Computer
Tag Management
Graphics Designer
Menus and toolbars
Alarm Logging
Tag Logging
Report Designer
Global Script
Text Library
Text Distributor
User Administrator
Cross-Reference
Load Online Changes
Redundancy
User Archive
Time synchronization
Horn
Picture Tree Manager
Lifebeat Monitoring
OS Project Editor
Process Historian
Calendar Options
IndustrialDataBridge
Web Navigator
Web View Publisher
Web Configurator
Export configuration data
Load Balancing
Web Settings
Properties
Name
Type
Last Change
Information
No objects exist
WinCC Web Publishing Wizard - Introduction
WinCC Web Publishing Wizard - Select directories
WinCC Web Publishing Wizard - Select pictures
WinCC Web Publishing Wizard - Finish
SIEMENS
MyProject\Web Navigator\
0 object(s)
Licensed mode