Deployment of the CPC6 control application

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CERN EN-ICE

UCPC
UNICOS-CPC

General steps to create a S7 UNICOS-CPC6 project

1. Specification file
2. Generation
   a) Instance
   b) Logic
   c) WinCC OA
   d) Touch panel
3. Importation into S7
4. Logic completion
5. Downloading
6. WinCC OA project
7. Importation into WinCC OA
8. Design of panels for supervision

Specification file

User templates   Generation tool

S7 Instance Generator   S7 Logic Generator   WinCC OA Instance Generator   Touch panel Instance Generator

Instances source files   Logic source files

WinCC OA importation file   Touch panel Importation files

Logic completion

SCADA   Touch Panel

PLC

Software requirements
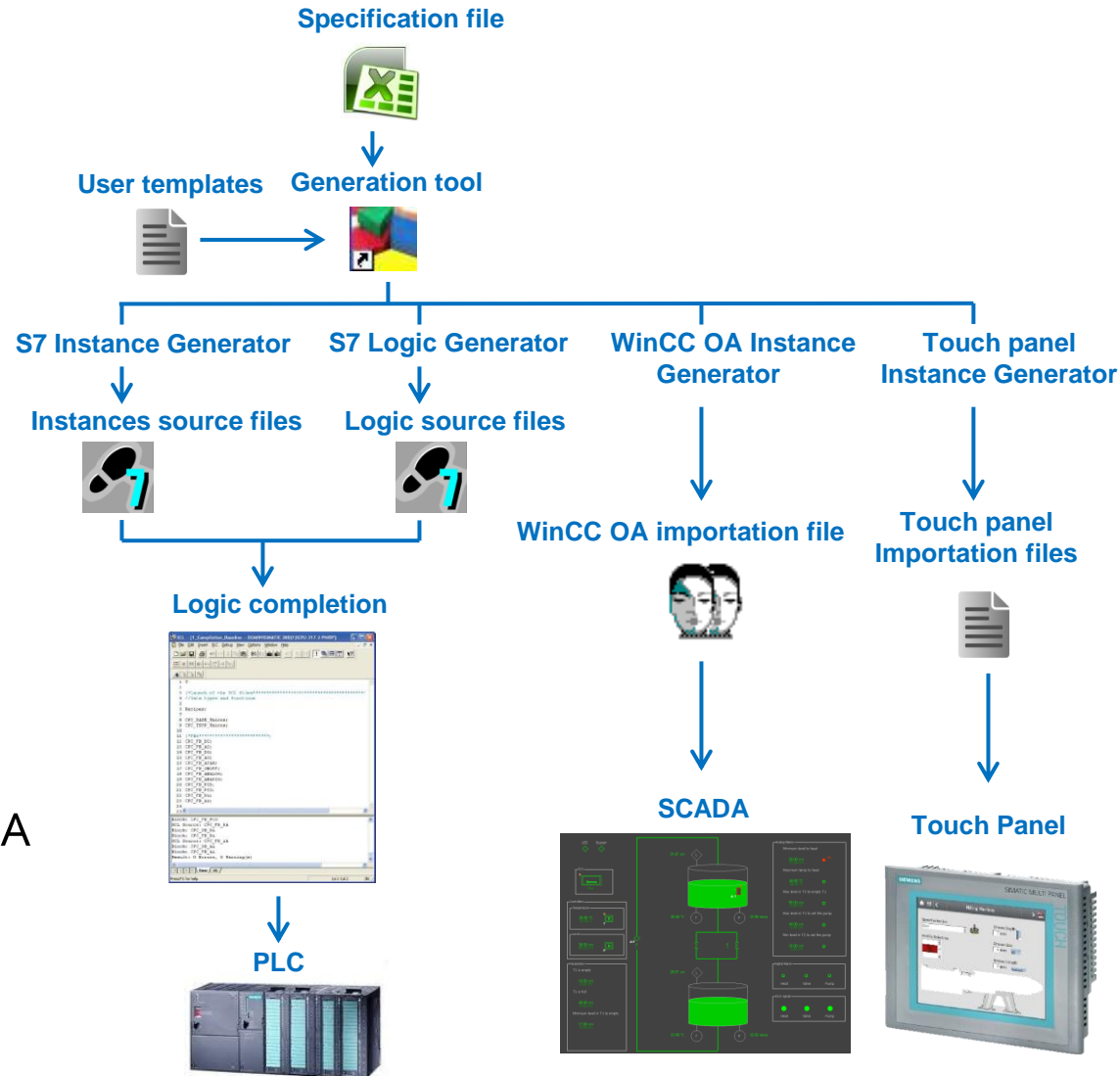
- ✓ Specification and generation tools: MS Office (Excel v2008), Java SE Runtime Environment (v6) and UAB (v1.6.x)

- ✓ PLC: Simatic Step 7 (v5.5)

- ✓ SCADA: PVSS(v3.8) / WinCC OA (v3.11)

- ✓ Touch panel: WinCC Flexible (v 2008 SP3) / TIAPortal (v12/v13)

Note: The software used for the supervision **PVSS** is nowadays known as **WinCC Open Arquitecture** (WinCC OA)

Creation of a Siemens S7 UNICOS-CPC 6 application

Creation of a Siemens S7 UNICOS-CPC 6 application

UAB Generation Tool

CPC-Wizard

- S7 Instance Generator

- S7 Logic Generator

- WinCC OA Instance Generator

- WinCC Flexible Instance Generator

Creation of a Siemens S7 UNICOS-CPC 6 application
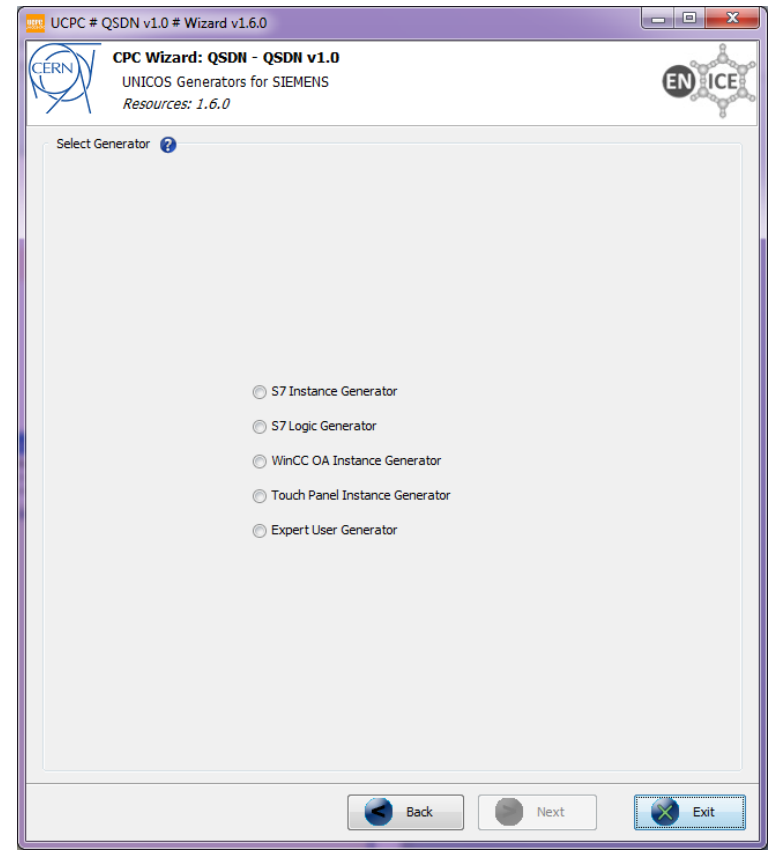
1. Run the CPC-Wizard from the UAB Bootstrap by clicking on cpc-wizard.
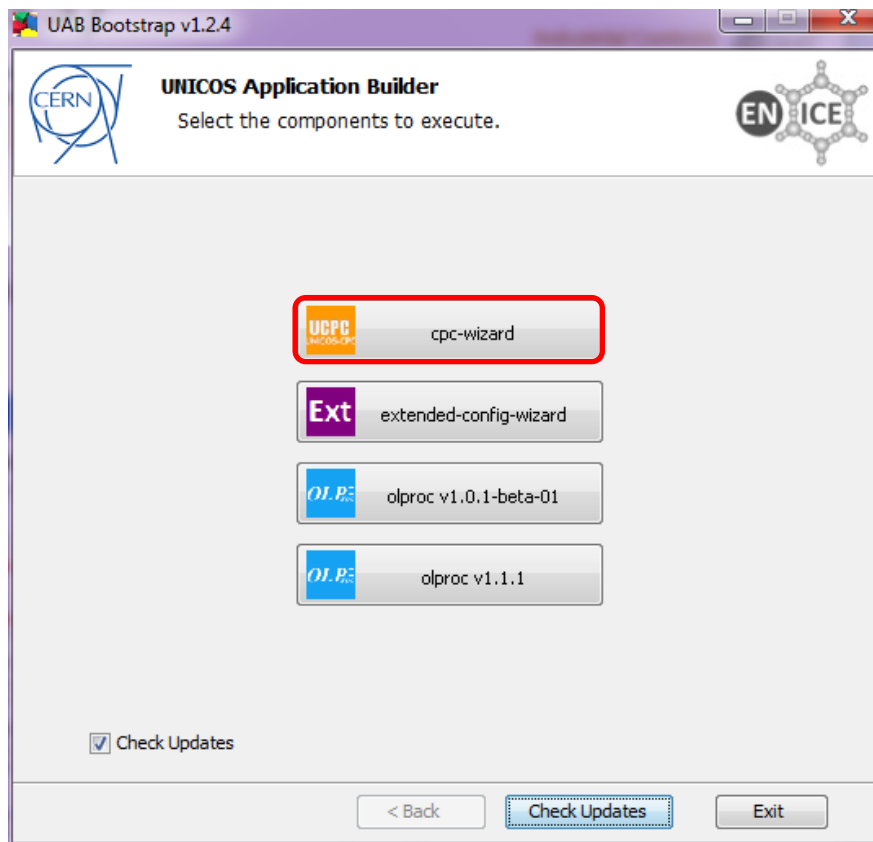
2. Create a new UNICOS application for Siemens platform

Choose Siemens platform and last version of the resource package

Choose a path for the application folder:

C:\UAB_QSDN

Click on Run
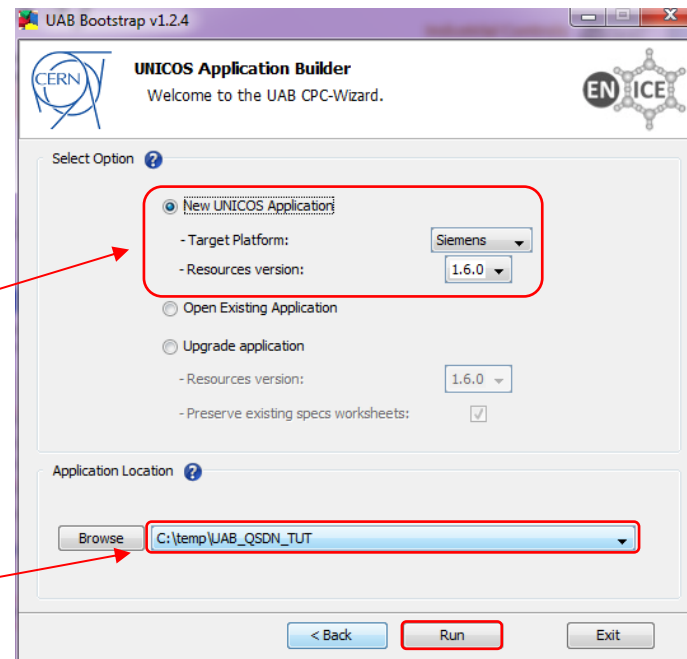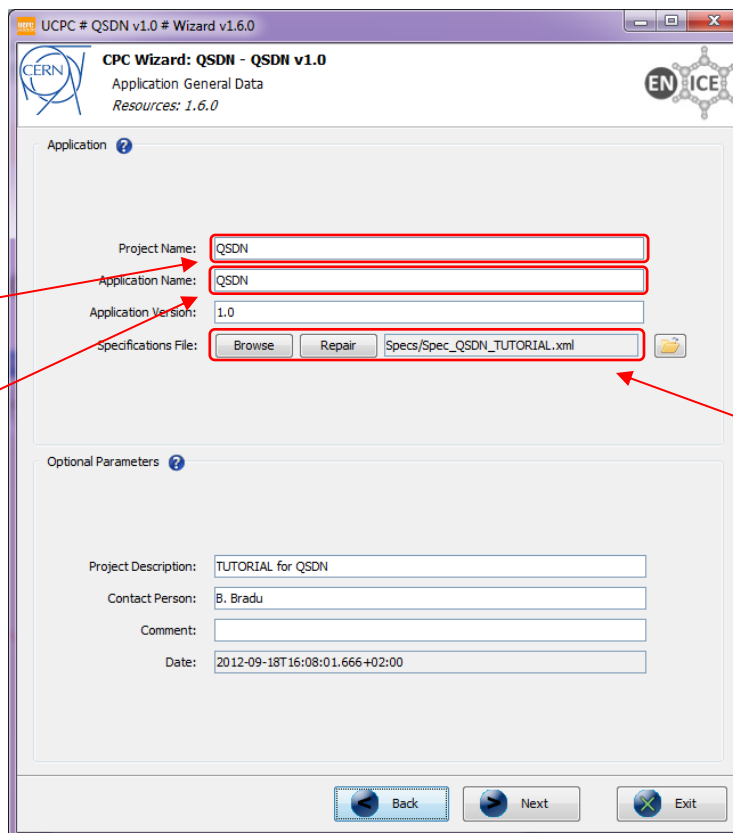
Creation of a Siemens S7 UNICOS-CPC 6 application

3. Fill in the "Application General Data" window

Write a project name:
UCPC6_course

Write an application name:
QSDN

Select your specification file

4. Fill in the "SIEMENS PLC Specifications" window according to your PLC configuration

Write a PLC name: *DEVICER17x*

Write the corresponding IP address

Choose the corresponding PLC type

Set WinCC OA configuration

Set PLC connection configuration

UNICOS Generators for Siemens

5. S7 Instance Generator

Communication and TSPP files to generate

Baseline compilation file

Symbols file to generate

To select all object types

It means the specification file has changed

Instance compilation file

Organization blocks compilation file to generate

To generate the IO commissioning file

To open and edit the specification file

To reload the specification file in the table

6. S7 Logic Generator

It generates the compilation file

It generates the files for Error/Simu conditions

It generates the file for the PID execution

It generates a function to call all logic functions

To generate all logic files

Creation of a Siemens S7 UNICOS-CPC 6 application

7. WinCC OA Instance Generator

To run the semantic rules

To select all the objects

8. Touch Panel Instance Generator

Generated files

UAB_project\Output

- S7InstanceGenerator

- S7LogicGenerator

- TouchPanelGenerator

- WinCCOAInstanceGenerator

UAB User Report

Configuration   Fine   Debug

Severe

Warning

Information

To copy messages to clipboard

To clear the report

Creation of a Siemens S7 UNICOS-CPC 6 application

Create a new S7 project

1. PLC configuration
   a) Hardware
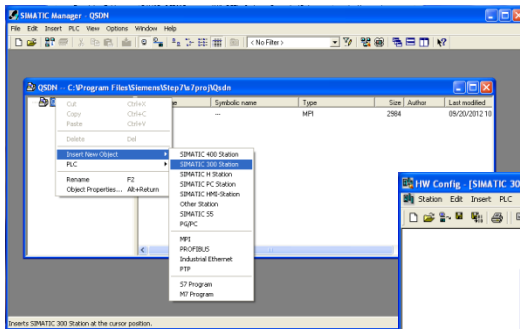
4. Configure CPU properties

1. Insert 300 station

2. Insert rack
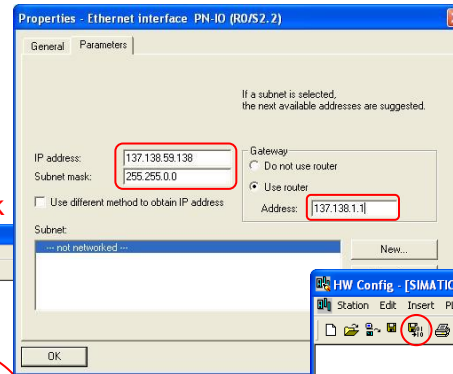
5. Save and compile
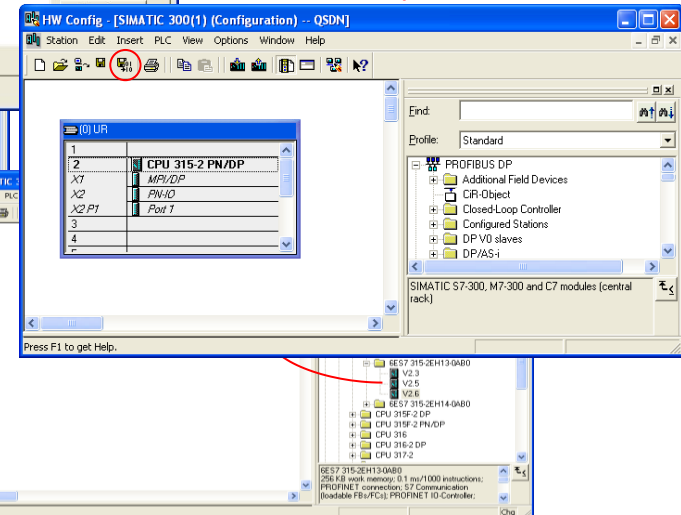
b)   Connection

1. Insert Industrial Ethernet
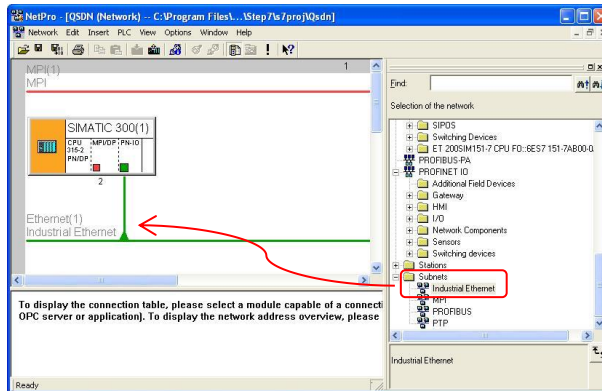
2. Insert a new connection

Creation of a Siemens S7 UNICOS-CPC 6 application
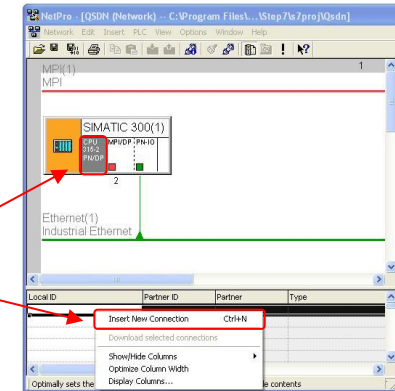
3.Set the S7 connection properties for the supervision
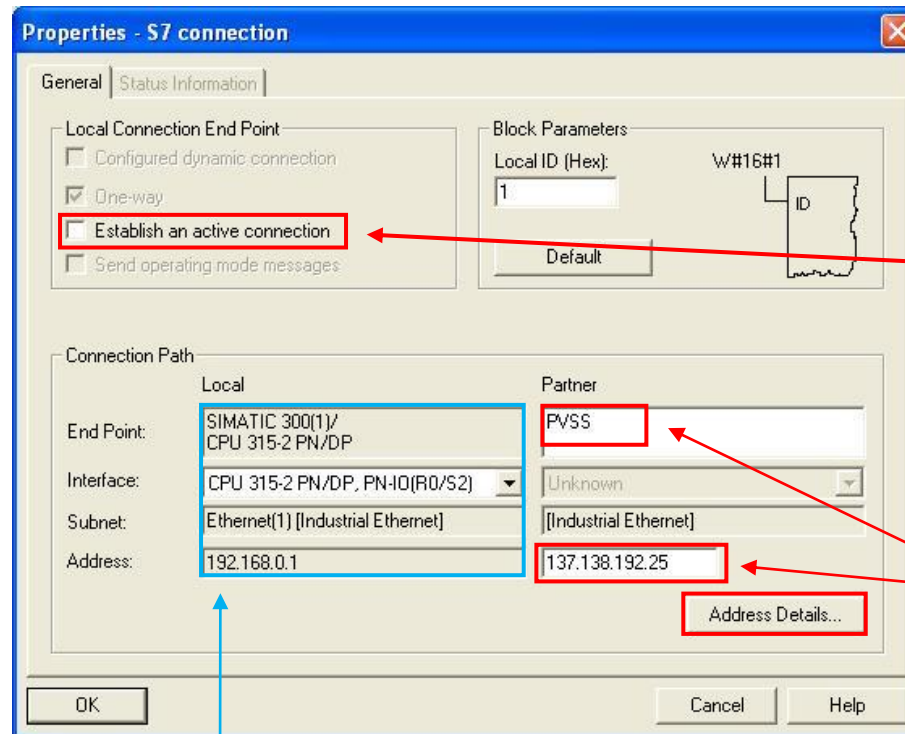
The connection must **NOT be active.** Uncheck this box

The partner must be the PVSS machine with its IP number

PLC information

4. Fill in the different fields according to the hardware which has been specified for your application

Rack/Slot and Connection Resource of PLC

Rack/Slot and Connection Resource of WinCC OA

3. Open the PN-IO properties
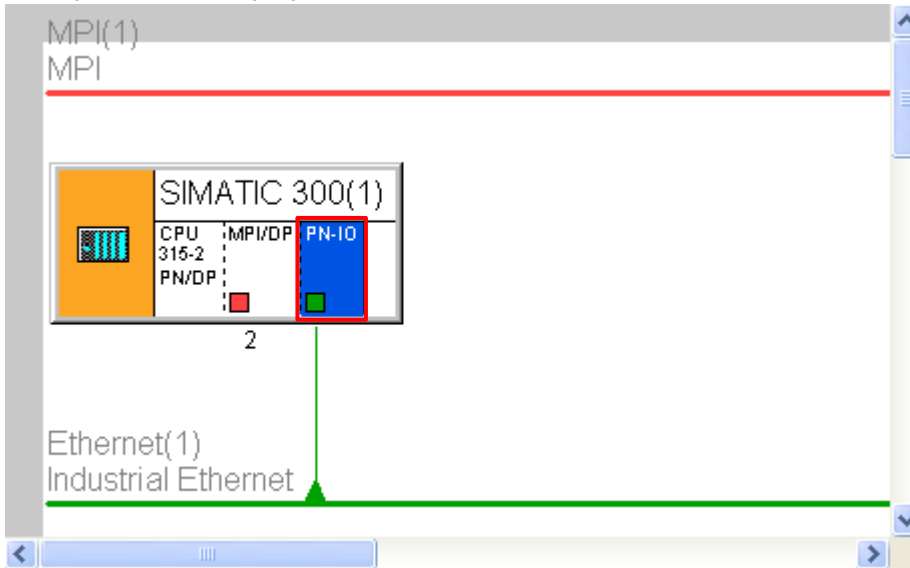
4. Enable and add the NTP Server Addresses

137.138.16.69

137.138.17.69

5. Save and compile
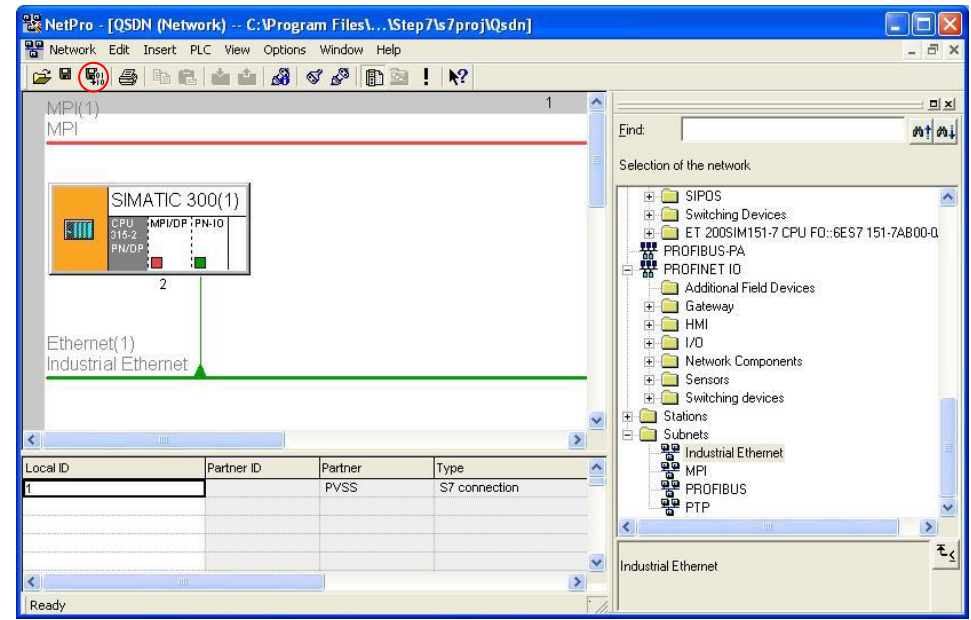
The parameters chosen have to match with the ones used in the UAB CPC wizard

Creation of a Siemens S7 UNICOS-CPC 6 application

Importation into Siemens S7

1. ### Baseline importation

Select libraries
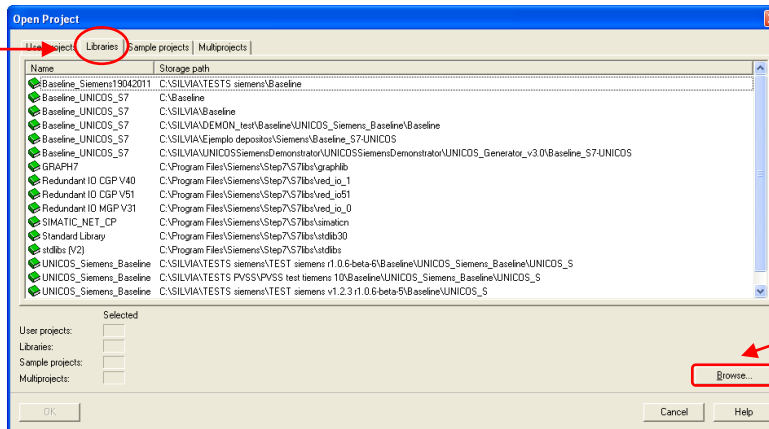
Browse UNICOS baseline in the project folder

Creation of a Siemens S7 UNICOS-CPC 6 application
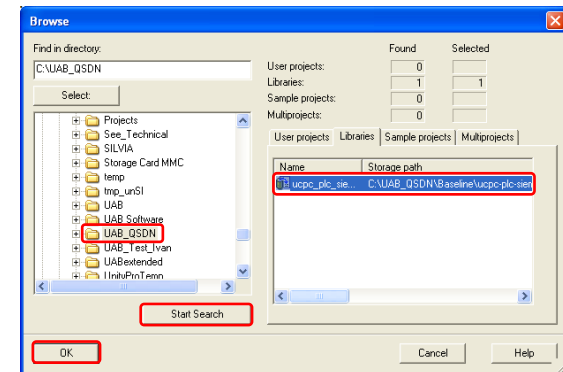
Creation of a Siemens S7 UNICOS-CPC 6 application
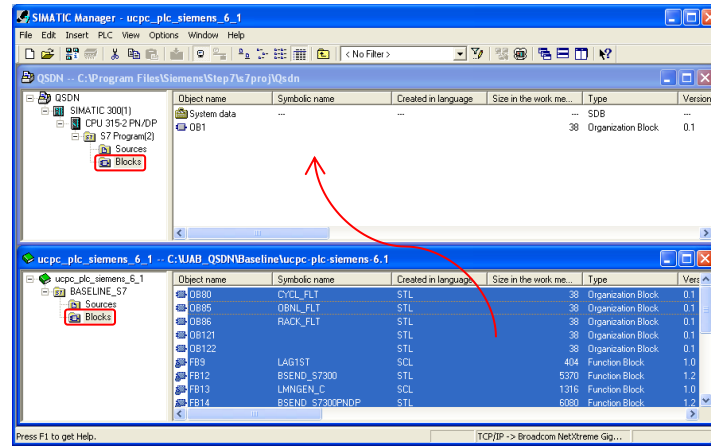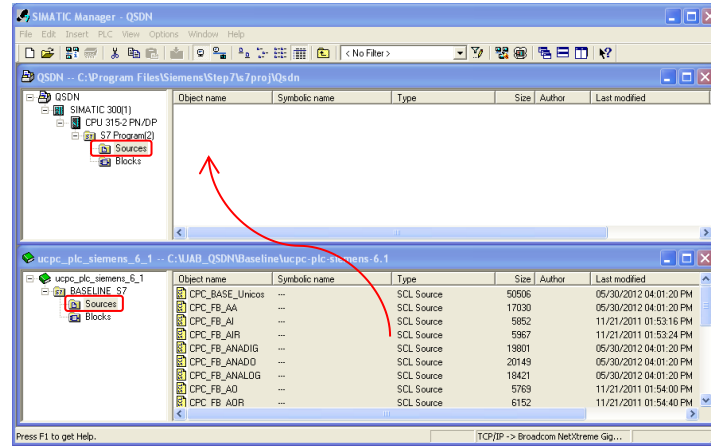
2. Instance importation

Select all the instance files
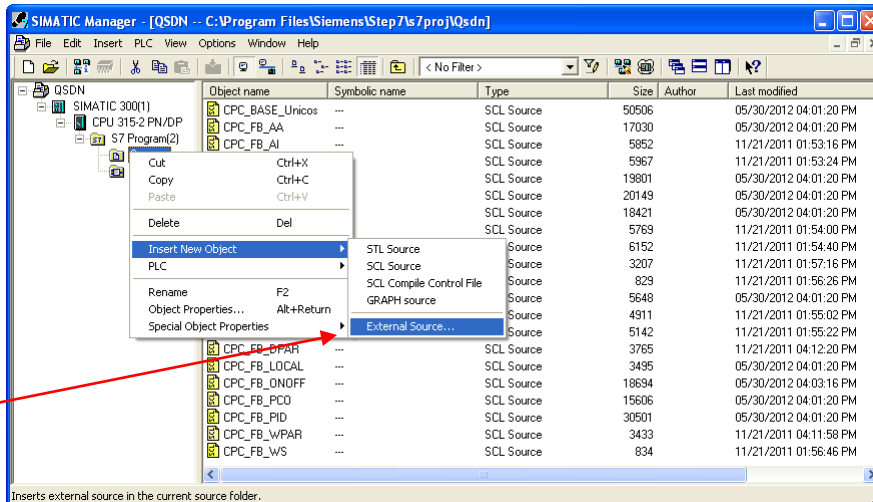
Insert the instance sources
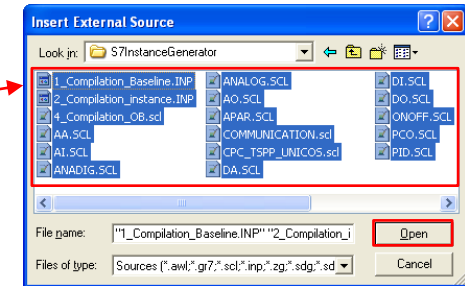
3. Symbol table importation

1. Open the symbol table
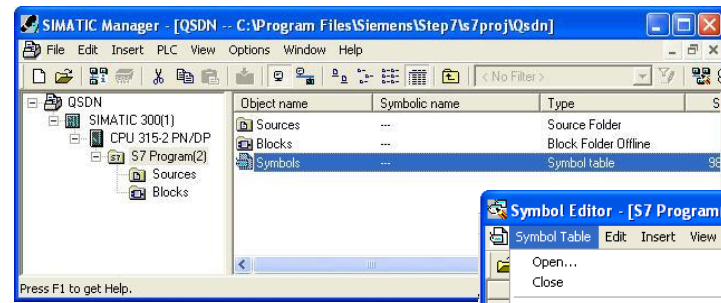
2. Import the symbol table generated
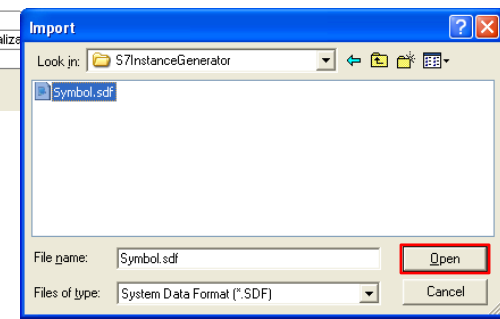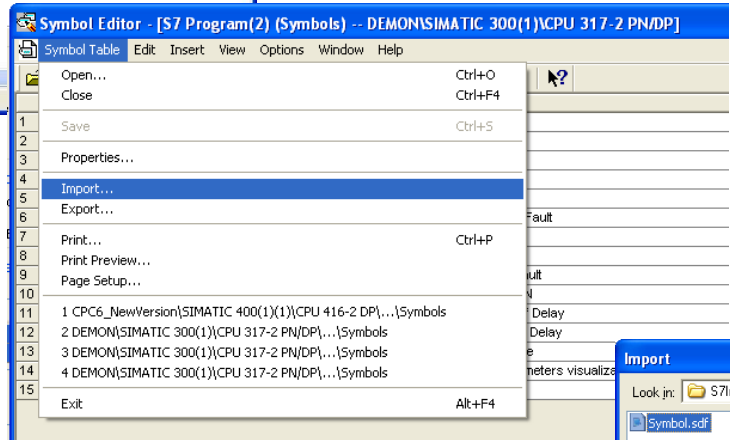
4. Logic importation
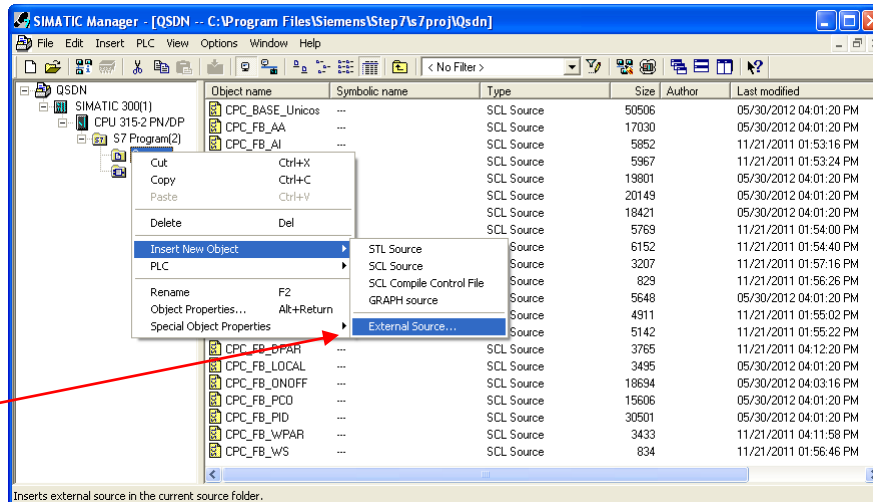
Insert the logic sources
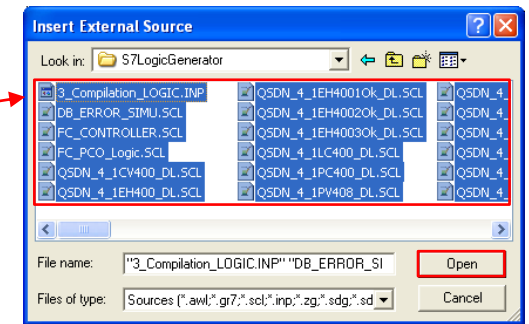
Select all the logic files

4. Compilation

Compilation

Downloading the application to the PLC

Creation of a WinCC OA UNICOS-CPC 6 application
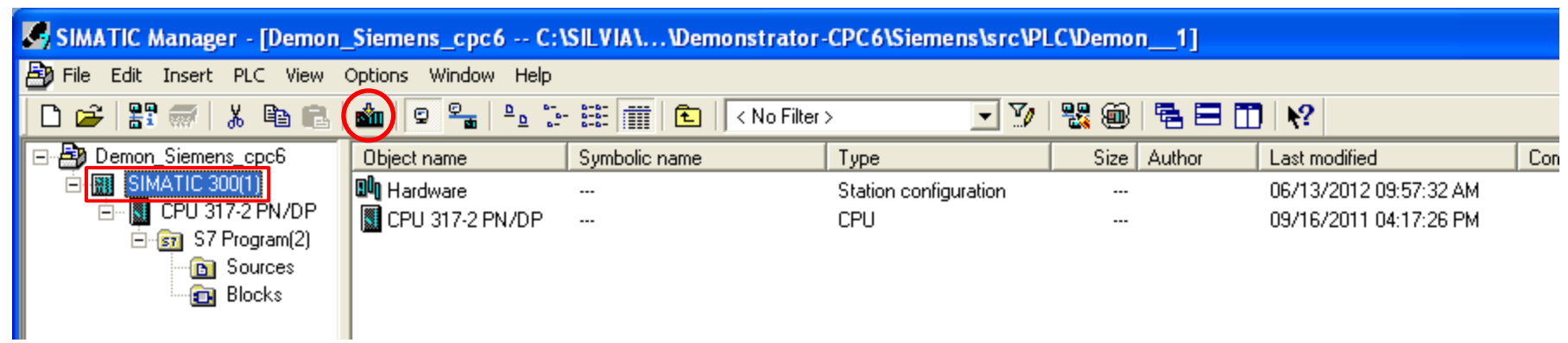
Creation of a WinCC OA UNICOS-CPC 6 application

Creating a WinCC OA project

1. Start the WinCC OA Project Administration with administrator privileges
2. Click on "New Project"

New project

Creation of a WinCC OA UNICOS-CPC 6 application
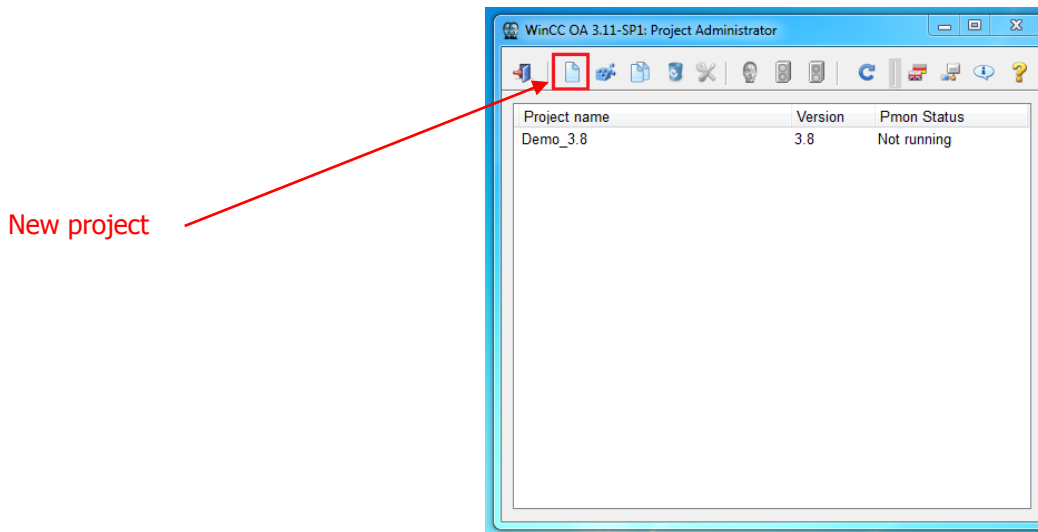
3. Set the project as "Distributed project"
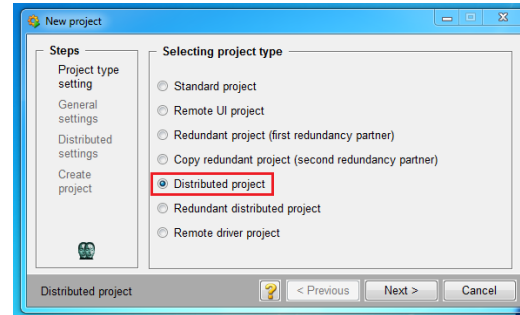
4. Set the general settings

Type a project name
QSDN

Select English

Type a path for the project
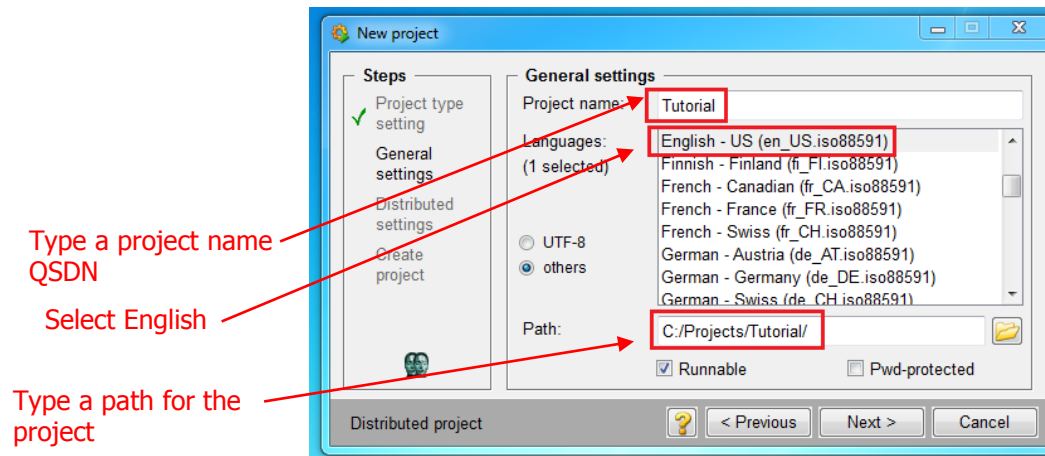
5. Set the "Distributed settings"

Select a system number
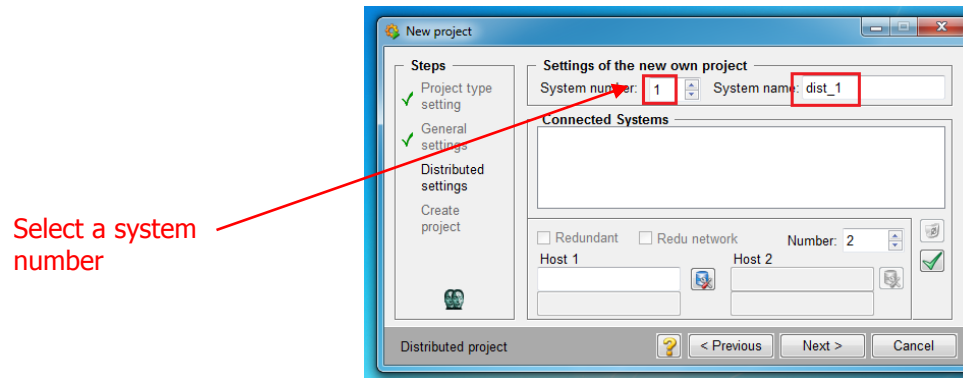
6. Check all settings and click "OK"

Creation of a WinCC OA UNICOS-CPC 6 application
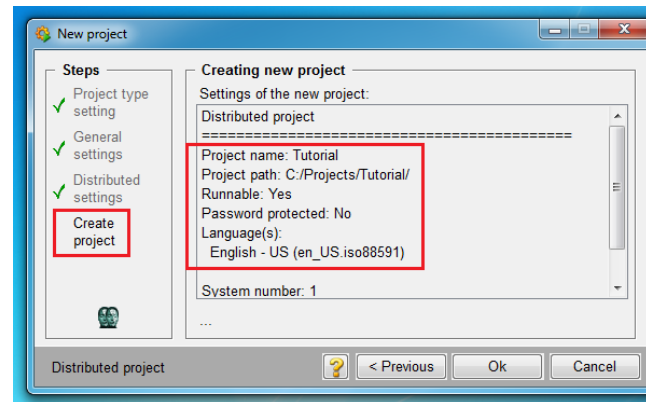
7. Launch the project console and remove Archive managers from 1 to 5
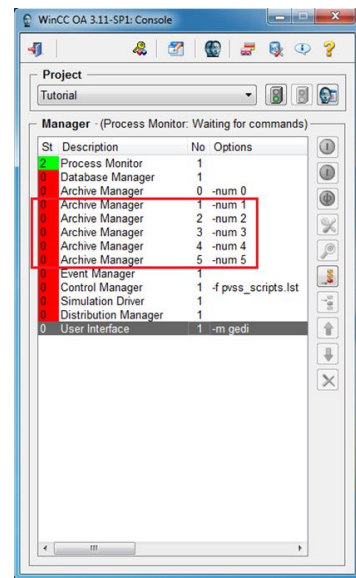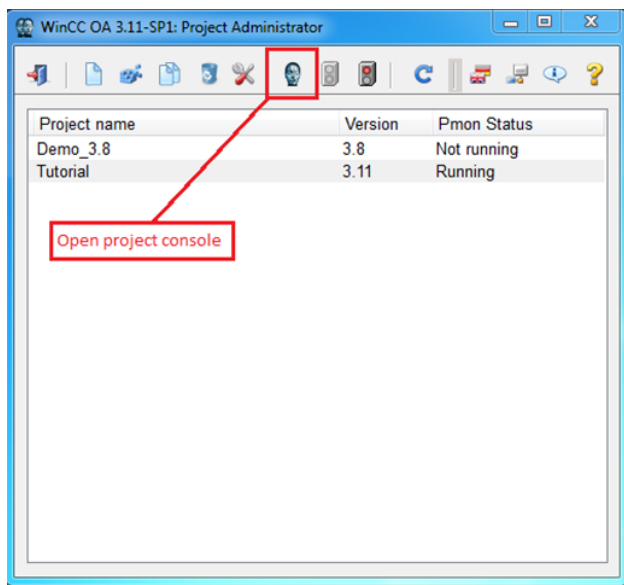
Framework component installation

1. Unzip the Framework Component Installation package on top of the project directory (fw-installation-tool)

2. Start WinCCOA project

Creation of a WinCC OA UNICOS-CPC 6 application
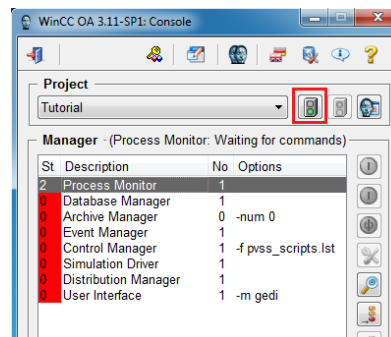
3. Create the user interface for the installation with the following configuration: *-p fwInstallation/fwInstallation.pnl*
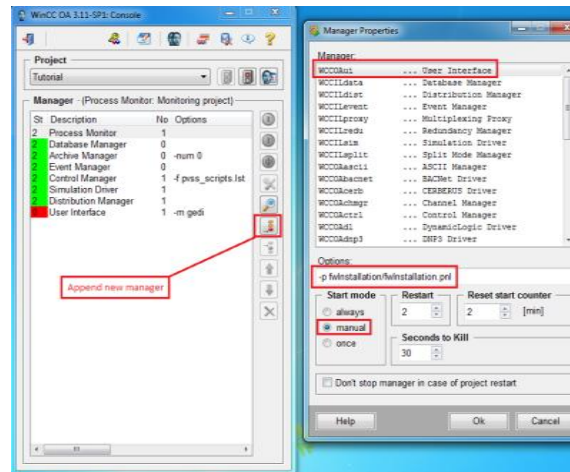
3. Run the User Interface created for the installation
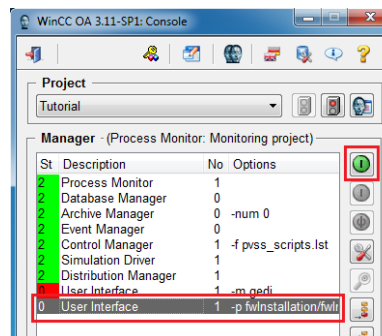
5. Choose a destination directory
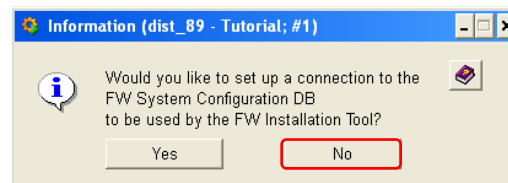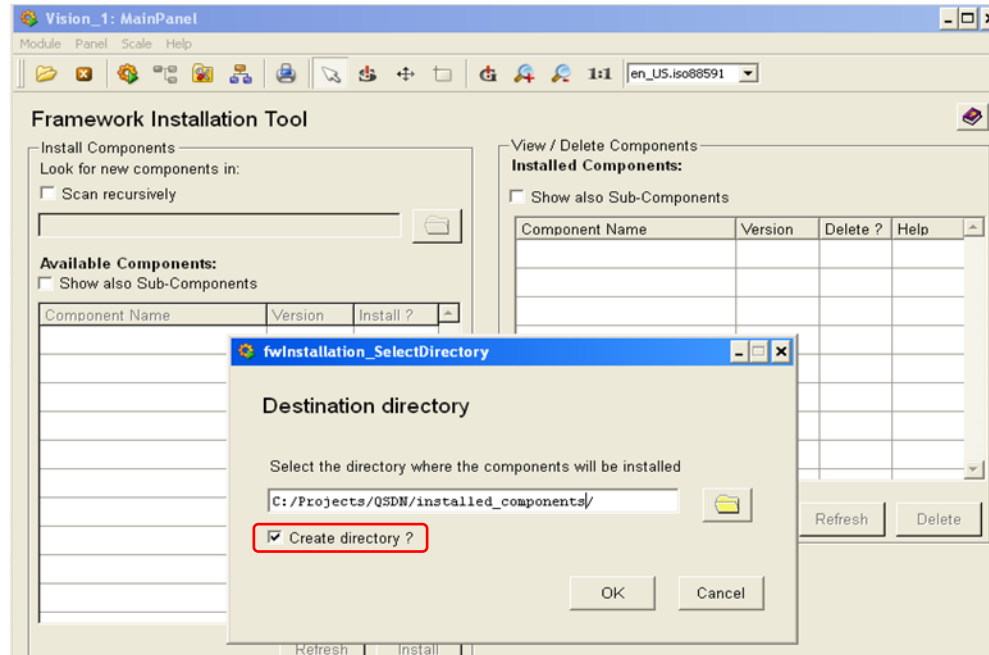
Installation of UNICOS packages

Installation of CORE packages

1. Unzip the UNICOS Core package (unicos-framework-winccoa) in a temporary location

2. Select the directory where the package has been unzipped in the Framework Installation Tool
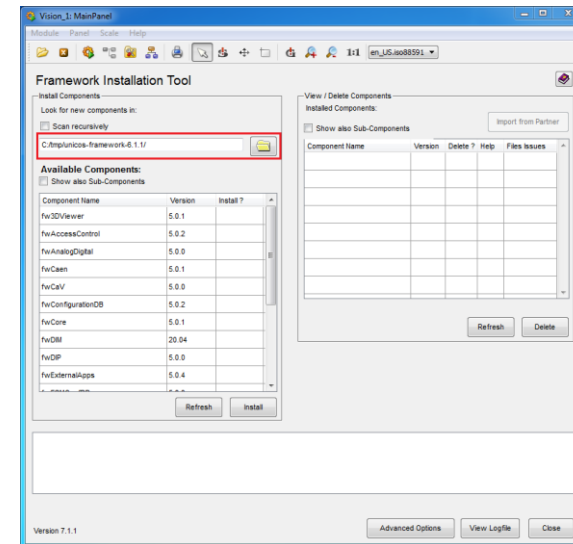
3. Install the following components

- fwAccessControl

- fwCore

- fwTrending

- unCore

- fwConfigurationDB
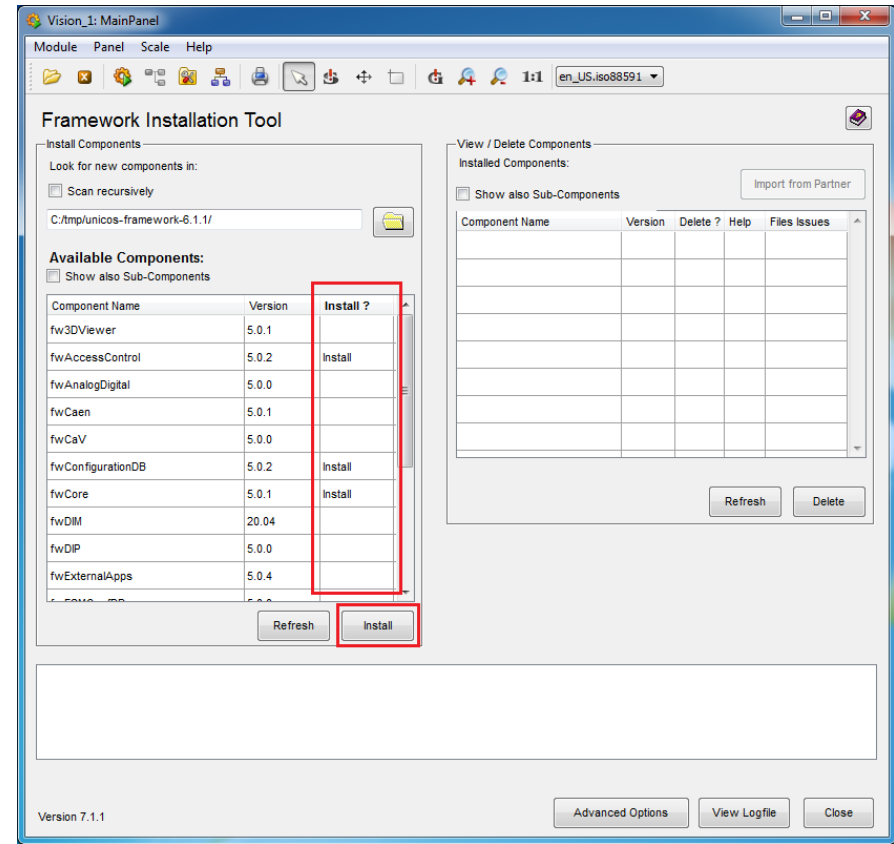
4. Restart the project
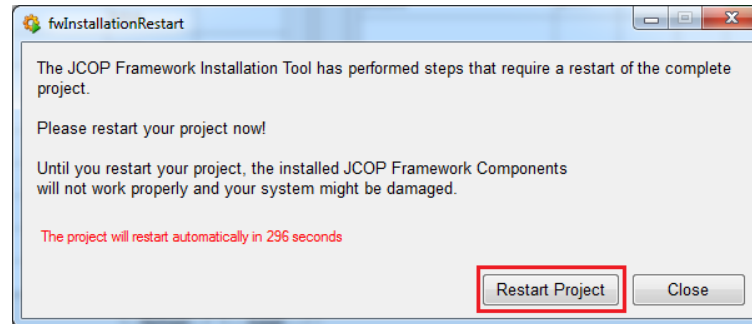
5. Launch fwScripts.lst
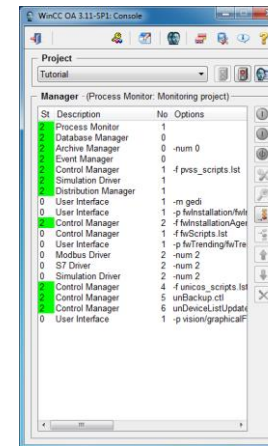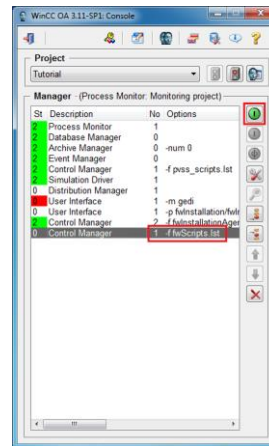
Installation of CPC package

1. Unzip the UNICOS CPC package in a temporary location (ucpc-wincc-oa)

2. Select the directory where the package has been unzipped in the Framework Installation Tool

3. Start the User Interface (fwInstallation) Manager in the console

4. Install the components

   - unCPC6

   - unRecipe

5. Restart the project

6. Launch fwScripts.lst

Setting up archives

1. Launch HMI by launching the User Interface

    "-p vision/graphicalFrame/unicosHMI.pnl"

2. Log in as "admin" (no password)

3. Open "Value Archive"
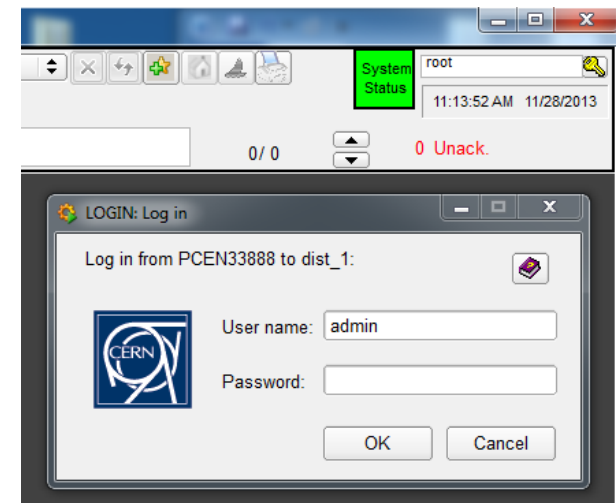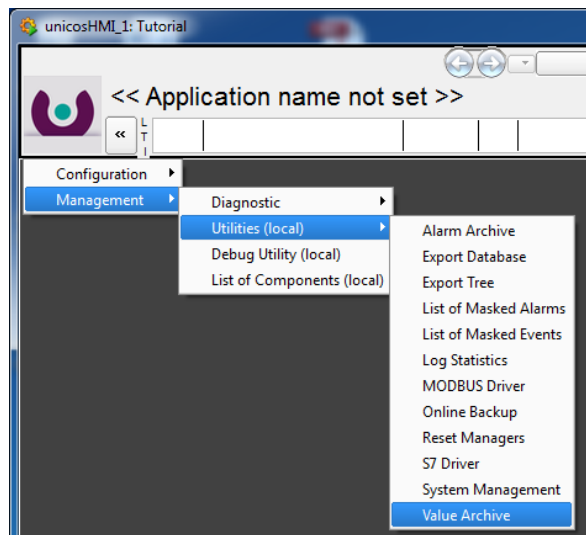
4. Create a "boolean", "analog" and "event" archive

Creation of a WinCC OA UNICOS-CPC 6 application
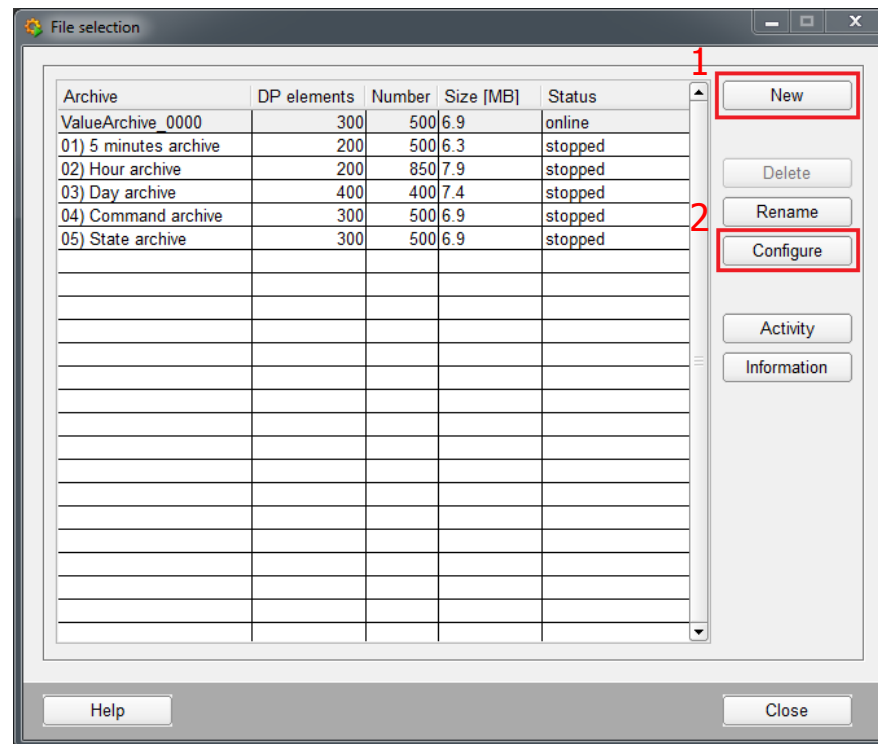
Parameterize the Boolean archive
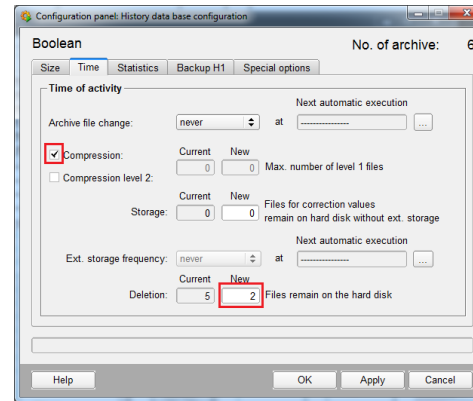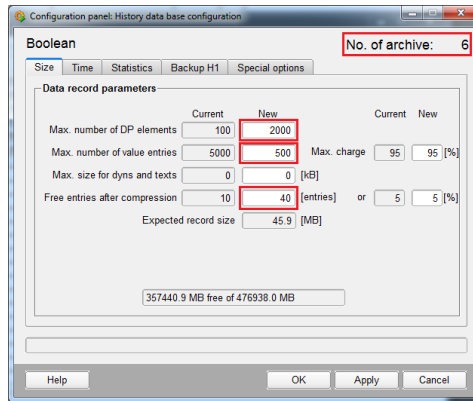
Parameterize the Analog archive

Creation of a WinCC OA UNICOS-CPC 6 application
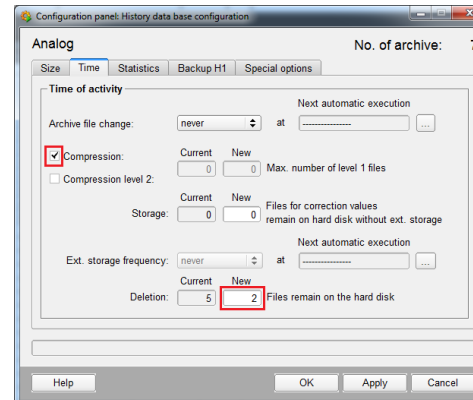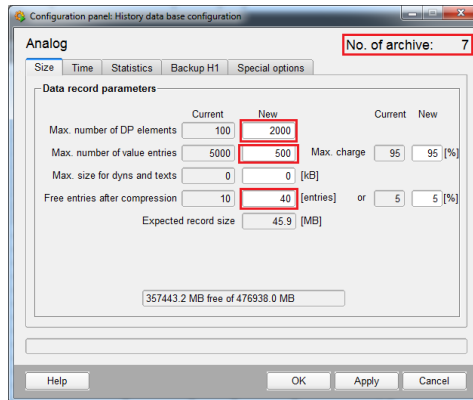
Parameterize the Event archive
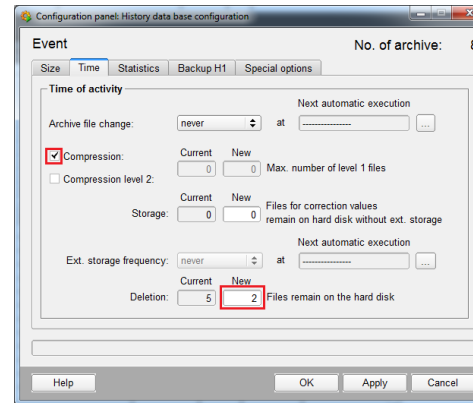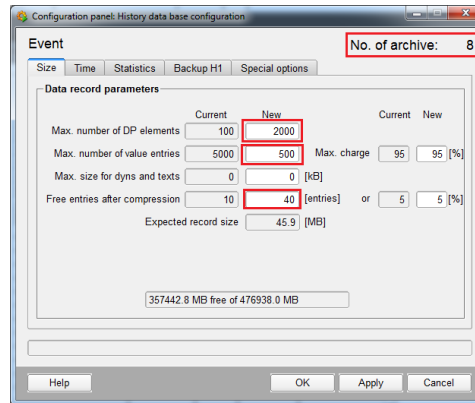
5. Create corresponding archive managers in the PVSS console
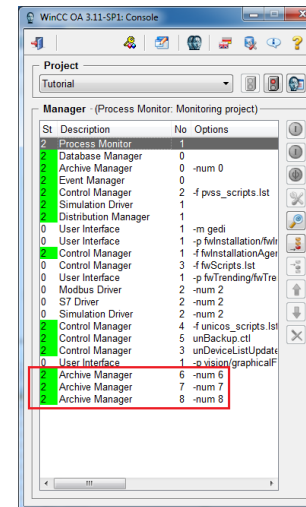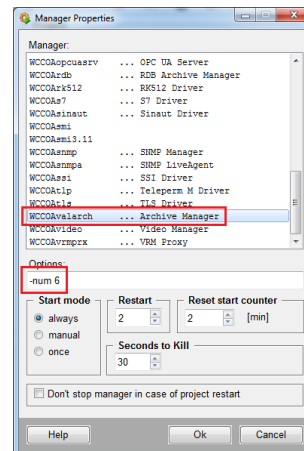
Importation into PVSS

1. Start the unicosHMI.pnl

   (–p vision/graphicalFrame/unicosHMI.pnl)

2. Log in as "admin" and start the "Import Database" panel
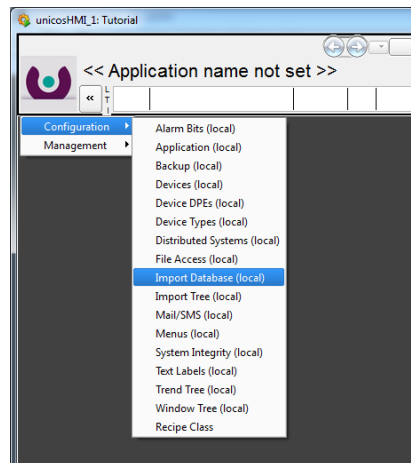
3. Stop Distribution Driver (change it from always to manual)

4. Copy the importation file to the PVSS project (C:\Projects\QSDN\QSDN\data)

Creation of a WinCC OA UNICOS-CPC 6 application

5. Select the proper Driver Number

6. Set the Front End type to "_S7Plc"

7. Stop the S7 Driver and start the Simulation Driver

8. Select the archive class for Bool, Analog and Event

9. Select the importation file generated

   (copy it to C:\Projects\QSDN\QSDN\data)

10. Do a check and import

Creation of a WinCC OA UNICOS-CPC 6 application
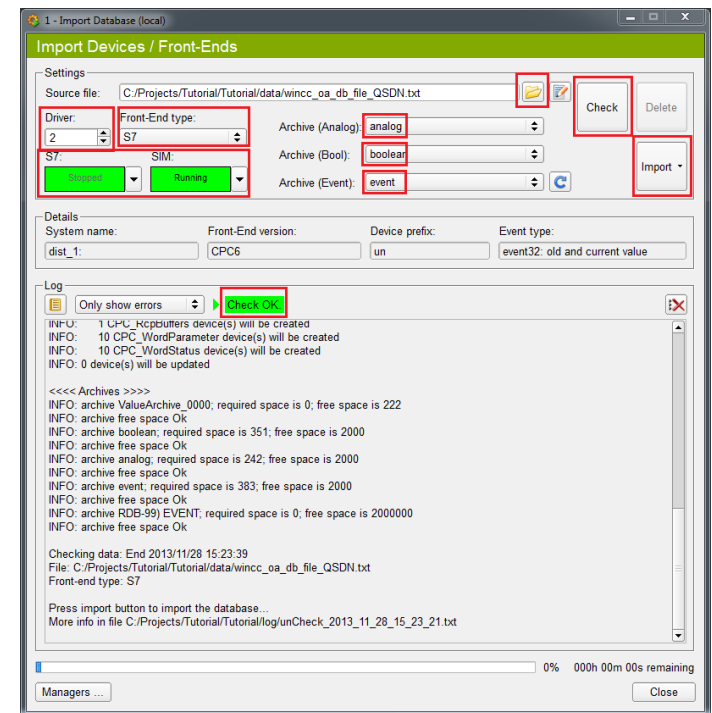
9. Stop the Simulation Driver and start the S7 Driver
10. Open the Front Ends Diagnostic and enable the communication
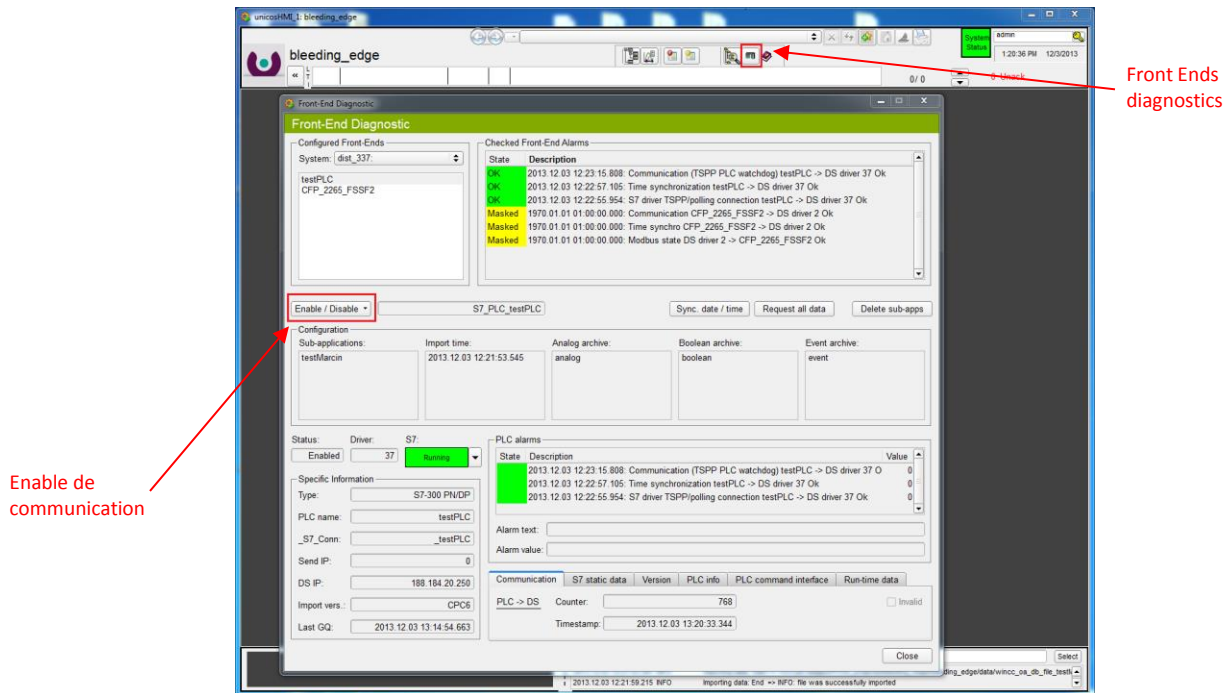
Front Ends diagnostics

Enable de communication

Creation and design of a local panel for a UNICOS CPC6 application

Creation and design of a local panel for a UNICOS CPC6 application

UAB generation for Touch panels

- Alarms

- Scripts

- Tags

- Text lists

Creation and design of a local panel for a UNICOS CPC6 application
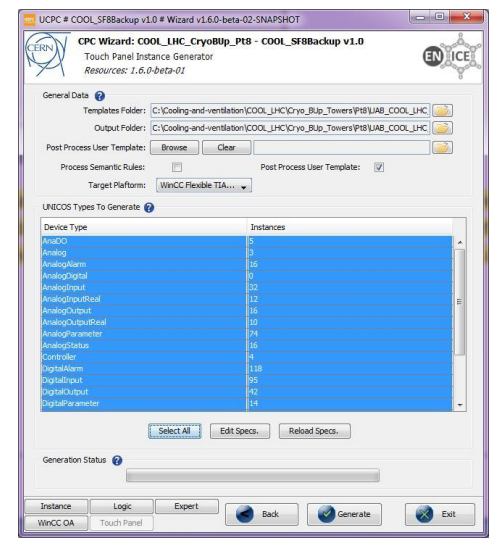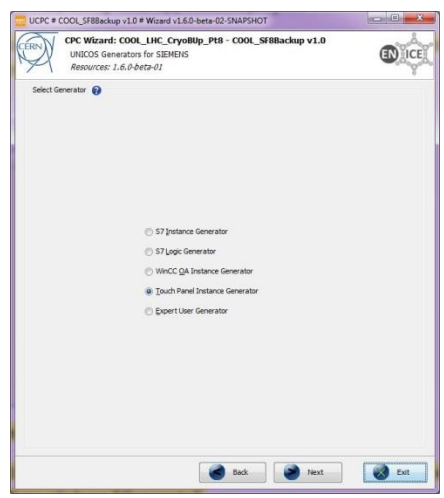
UNICOS library for touch panels
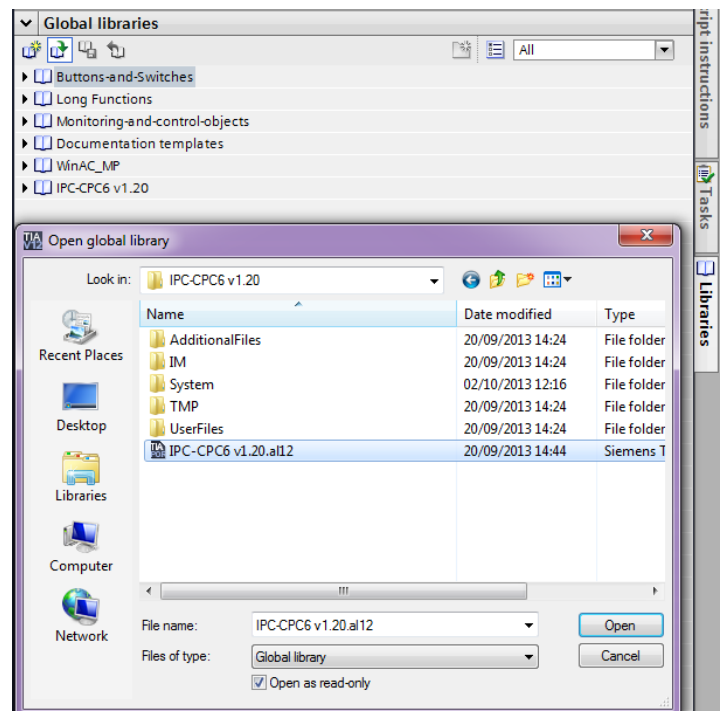
Touch Panel design

"...\UAB_Project\Baseline\ucpc-wincc-tia-vx.x"

Creation and design of a local panel for a UNICOS CPC6 application
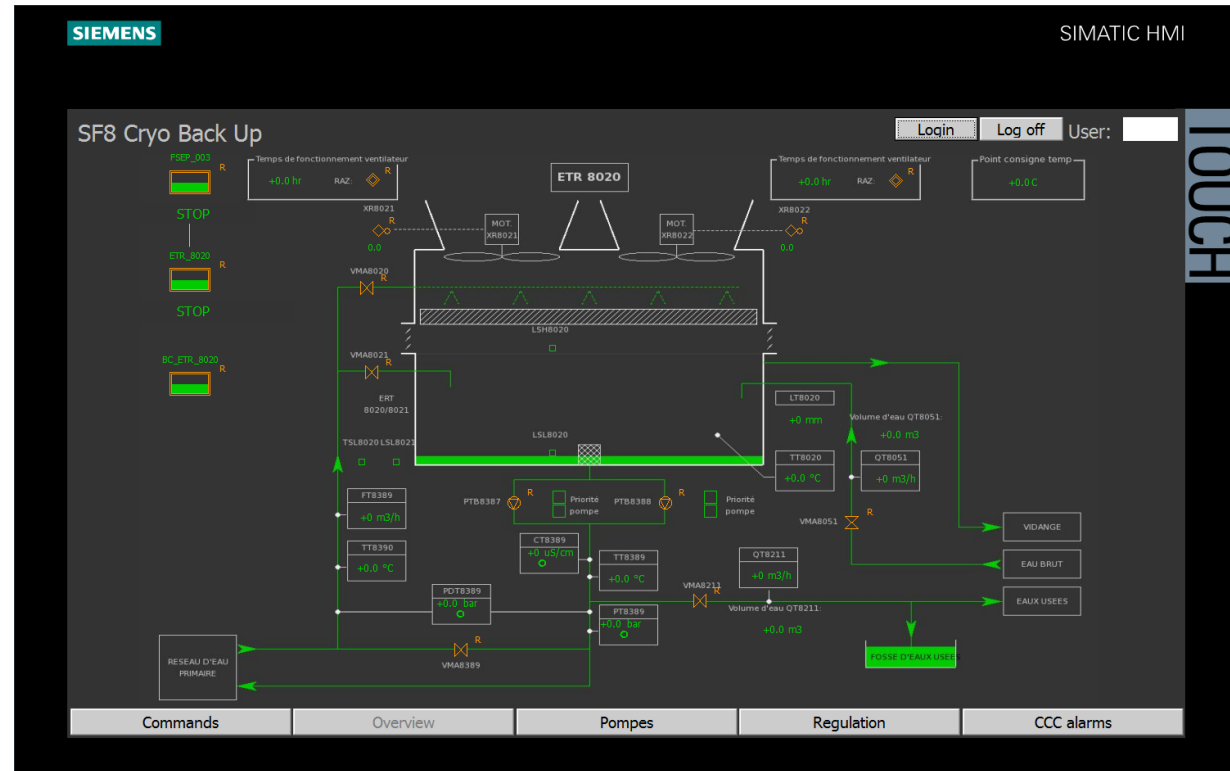
Connection

Type of communication TP-PLC: Ethernet

Specification file

User templates   **Generation tool**

S7 Instance Generator   **S7 Logic Generator**   **WinCC OA Instance Generator**   **Touch panel Instance Generator**

Instances source files   **Logic source files**

WinCC OA importation file   **Touch panel Importation files**

Logic completion

SCADA   **Touch Panel**

PLC