Procedure

CREATION OF A WINCC OA 3.11SP1 - CPC 6 APPLICATION

Abstract

This procedure explains how to create a WinCC OA UNICOS CPC 6 application from the specifications using the UAB (UNICOS Application Builder) generation tool.
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<td>First version (Silvia Izquierdo)</td>
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1. **INTRODUCTION**  
   The goal of this document is to describe how to create a WinCC OA 3.11 SP1 project either for Siemens or for Schneider PLC.

2. **REQUIREMENTS**  
   The needed software is WinCC OA v3.11 SP1.

3. **PLC SETUP**  
   The date and time of the PLCs must be set to UTC time (GMT): at Geneva: local time -1 (winter) or -2 (summer) hours. Whenever possible configure the PLC to be NTP (Network Time Protocol) synchronized. For more information about the PLC setup check the "Procedure S7-UCPC Application.docx" or "Procedure Sch-UCPC Application.docx".

4. **WinCC OA SETUP**  
   Refer to WinCC OA web:  
   [http://j2eeps.cern.ch/wikis/display/EN/WinCC-OA+Service](http://j2eeps.cern.ch/wikis/display/EN/WinCC-OA+Service)  

   **Note:**  
   - The user login name you use to start WinCC OA must be in the administrator group of the DS\(^1\) computer.  
   - A WinCC OA project must be created on the DS.  
   - The WinCC OA software product is installed in a local disk of the computer in "C:\Siemens\Automation\WinCC_OA\"

   The most convenient way to install WinCC OA is by installing the “WinCC OA 3.11 SP1 CERN Silent” package from CMF.

   If CMF is not available:  
   - Download the software and save the compressed file in a local area.  
   - Run executable file (**Setup.exe**).  
   - As user/organization you could use NICE/CERN.  
   - **Note:** Under **Windows 7**, the installation has to be started in Administrator mode.  
   - WinCC OA folder “C:\Siemens\Automation\WinCC_OA\” is reserved for WinCC OA tools and it should not contain any project.

5. **PROJECT STRUCTURE**  
   The standard for the project structure is as follows: you create a folder with the project name in “C:\Projects\” and then inside that folder there will be two folders, one of them with the

\(^1\) Data server.
project name and the other one called “installed_components”. The final structure is presented in the Figure 1.

![Figure 1 - Standard project structure](image1)

To prepare the project, create the folder with the project name in “C:\Projects”. **Do not create the other folders mentioned before** – they will be created automatically with the following steps.

6. **CREATING A WinCC OA PROJECT**

1. A WinCC OA project must be created on the DS. Start WinCC OA Project Administration with administrator privileges (see Figure 2).

![Figure 2 - Starting WinCC OA Project Administration](image2)
In order to create new project click on *New project* (see Figure 3).

![Figure 3 – WinCC OA Project Administration](image)

2. Set the project as **distribuated project** (see Figure 4).

![Figure 4 – Set distribution project](image)
3. Type a project name. For this document, the project name will be “Tutorial”.

Select the language **English US**.

Select a path (“C:\Projects\<ProjectName>”).

For the project name use the following convention:

- Do not use the ` ' and `-` character in the folder and path name, use instead the `_` character or capital letters.
  
  _Note:_ it is recommended to create a folder called “Projects” or “WinCC_OA_Projects” in C:\

- Do not create a project anywhere inside the WinCC OA installation folder (“C:\Siemens\Automation\WinCC_OA”).

![Figure 5 – Setting language and project name](image)

4. Select a system number and a system name for the project. These values should be unique within all linked distributed systems. For the production systems it could be other requirements for these values (for example, from monitoring system). Leave it as it is if the project won’t be connected to any distributed machine.
5. Go to the last window and check all the settings, then click OK (see Figure 6).
6. Launch the **project console** and **remove** Archive Managers from 1 to 5 (Figure 7). The result should look like presented in Figure 8.
7. **FRAMEWORK COMPONENT INSTALLATION**

1. The latest compatible **Framework Component Installation package** is automatically downloaded to the Baseline/ folder of your UAB project, e.g.: fw-installation-tool-7.1.1.zip. This package will allow you to install WinCC OA packages to the project. Unzip it on top of the project directory (“C:\Projects\Tutorial\Tutorial”) and make sure it overwrites existing files (Figure 9).

![Figure 10 – Unzip package](image)

2. Start WinCC OA project from the project console.

![Figure 11 – Project before and after starting](image)
3. To obtain “Framework Installation Tool” create a User Interface with the following configuration (Figure 11):

   -p fwInstallation/fwInstallation.pnl

   ![Figure 12 – User interface for fwInstallation.pnl](image)

4. Run “Framework Installation Tool” by starting the User interface you have created.
5. Choose a destination directory (check *create directory* and choose the name “installed_components” to create the folder inside your project folder):

   `C:/Projects/Tutorial/installed_components`
Next window will appear asking if you want to set up a connection to the FW System Configuration DB, click Yes if you need to be connected to the Data Base. Normally you don't need it in your test or development setup.

![Figure 15 – Connection to the FW System Configuration DB](image)

After this step you will have the whole project structure explained in section 5.

8. **INSTALLATION OF UNICOS PACKAGES**

8.1 **Installation of CORE packages**

1. The latest compatible **UNICOS Core package** is automatically downloaded to the Baseline/ folder of your UAB project, e.g.: unicos-framework-wincc-oa-6.1.1.zip.

   Unzip it in a temporary location (after installation you can delete this folder).

2. In the “Framework Installation Tool” select the directory in which you unzip the UNICOS-WinCC OA package.

   Note: components could be in the subfolder so you need to select this folder instead.
3. Select all the following components and press the “Install” button:
   - fwAccessControl
   - fwCore
   - fwTrending
   - unCore
   - fwConfigurationDB (if unRecipe needed)
4. Press “Restart Project” in the popup window that appears after a successful installation and wait until the project is completely restarted.

   NOTE: it may take a while to restart the project after you click 'Restart Project' – be patient!
5. Launch `fwScripts.lst`. Execution will add new managers to the console.
8.2 Installation of CPC package

1. The latest compatible **UNICOS CPC package** is automatically downloaded to the Baseline/ folder of your UAB project, e.g.: `ucpc-wincc-oa-6.2.0.zip`. Unzip it in a temporary location (after installation you can delete this folder).

2. Similarly to 8.1.2, select the CPC temporary directory from the “Framework Installation Tool”.

3. Similarly to 8.1.3, select following component and click “Install” button:
   - `unCPC6`
   - `unRecipe` (if needed)

4. Same as 8.1.4.: After installation project restart is necessary.

5. Same as 8.1.5.: Launch fwScript.Ist.

8.3 Setting up archives.

1. Launch HMI by launching User Interface “-p vision/graphicalFrame/unicosHMI.pnl”.

2. Log in as “admin” (no password by default).

3. Click on UNICOS logo and select ’Management > Utilities (local) > Value Archive’.

Figure 20 – Log in as admin
4. Create a “boolean”, “analog” and “event” archives using “New...” button.
● “Configure” the **boolean** archive as follows (Figure 22):

- Max. number of DP elements: 2000
- Max. number of value entries: 500
- Compression
- Deletion: 2
- Free entries after compression: 40

![Figure 23 – Boolean configuration](image)

● “Configure” the **analog** archive as follows (Figure 23):

- Max. number of DP elements: 2000
- Max. number of value entries: 500
- Compression
- Deletion: 2
- Free entries after compression: 40

![Figure 24 – Analog configuration](image)
• “Configure” the event archive as follows (Figure 24):
  - Max. number of DP elements: 2000
  - Max. number of value entries: 500
  - Compression
  - Deletion: 2
  - Free entries after compression: 40

Figure 25 – Event configuration

5. Close the window and create corresponding archive managers in the WinCC OA console. See Figure 25 for an example of archive creation and Figure 26 for the final configuration.

Figure 26 – Creating Archive manager number 6.
9. **SPECIFICATION**

The PLC and DS hostnames and ip numbers and the PLCs modbus address (unit address) must be set accordingly to the value collected before. The spare UNICOS variables must also be specified.

10. **IMPORT INTO WinCC OA**

This step must be done for each PLC (application). However it is not necessary to redo all the WinCC OA project setup described before.

1. Start the `unicosHMI.pnl` interface.

   User Interface –p vision/graphicalFrame/unicosHMI.pnl

2. Login as `admin` and start the **Import Database** panel from by clicking on ‘UNICOS icon > Configuration > Import Database’ (Figure 27).
3. Select a proper driver number. Normally it should not be the same number for both S7 and Modbus PLCs.
   
   For S7 (Siemens PLC) pick up the next unique number (increment it).
   For Modbus (Schneider PLC) you could have only one active driver.

4. Set the Front End type to ‘S7’ for Siemens or ‘MODBUS’ for Schneider.

5. Stop the Driver (if it is created and is running) and start the Simulation Driver choosing start option from menu associated with SIM control (see Figure 28).

6. Select the archive class for Bool, Analog and Event. It is possible to use the same archive for all the PLCs. In that case, the size of the archive must be adjusted taking into account the total number of devices. Any change in the size implies a file switch of the archive.

7. Select the importation file ‘wincc_oa_db_file.txt’ generated by the generator.

8. Do a check (Figure 28) and then an import if there were no errors. The ‘view log file’ button shows the details of the errors or warnings of the check of the data.

   Notice: During check procedure Distribution Manager should be stopped. As its start mode is set to “always”, for the check procedure you should change it to manual (right click on manager > Manager Properties) and then turn it off manually.

   After check and import restore Distribution Manager’s initial settings.
9. Stop the Simulation Driver and start S7 Driver/Modbus Driver.

10. Open the Front End Diagnostic and enable the communication (Figure 29).
11. **TROUBLESHOOTING**

The time in the PLC and the SCADA application (WinCC OA) must be synchronized otherwise the frames pushed by the PLC could be discarded by the WinCC OA driver. The recommendation is to synchronize NTP the PLC whenever is possible. Otherwise the time must be set by hand in the PLC (UTC time) to ensure proper synchronization.

12. **SUPPORT**

Please address your questions to IceControls.Support@cern.ch

13. **REFERENCES**

1. *UNICOS in Siemens S7 PLC*. Bradu, B., Gayet, Ph., Blanco, E.
2. *UNICOS Project, Object programming principles*. Gayet, Ph.
3. *TSPP Unicos Manager*. Grahy, J.