Procedure

CREATING AND DESIGNING A LOCAL PANEL WITH VIJEO DESIGNER

Basic procedure

This document explains the basic procedure to create an application for a Schneider Electric HMI in an UNICOS project.
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<th>DESCRIPTIONS OF THE CHANGES</th>
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<td>V1.0</td>
<td>2013-06-10</td>
<td>All</td>
<td>First Version</td>
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I. Hardware needed

To create an application in a Schneider touch panel you need:

- 1 Ethernet cable OR 1 USB cable (for data transfer)
- 1 Power supply for the touch panel (if you are not connecting it directly to the lab rack)

II. Software needed

A. Vijeo Designer

Install latest version of Vijeo Designer:
\vern.ch\dfs\Applications\Schneider\Vijeo Designer\6.1 or Higher

For the license, read:
\vern.ch\dfs\Applications\Schneider\Vijeo Designer\6.1\License.txt

Use the “Schneider Electric Software Update“ installed with Vijeo Designer, and installs the last updates

B. UAB Bootstrap

Install latest version of UAB Bootstrap
https://j2eeps.cern.ch/wikis/display/ENICECOL/UAB+Bootstrap

III. Constraints

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<td>DRAM / SRAM</td>
<td>64 Mo / 512 Ko</td>
<td>1Gb / 512 ko</td>
</tr>
<tr>
<td>Variables per display</td>
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<td>//</td>
</tr>
<tr>
<td>Variable per touchpanel</td>
<td>8000</td>
<td>12000</td>
</tr>
<tr>
<td>Alarms per Alarm Category</td>
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<td>//</td>
</tr>
<tr>
<td>Number max of line in a script</td>
<td>50 (Recommended)</td>
<td>//</td>
</tr>
<tr>
<td>Number max of displays</td>
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<td>//</td>
</tr>
<tr>
<td>Number max of objects per display</td>
<td>≈200</td>
<td>//</td>
</tr>
<tr>
<td>Number max of popup display</td>
<td>3</td>
<td>//</td>
</tr>
</tbody>
</table>

*Figure 1 - Contraints table*
IV. **Vijeo Designer – Basic configuration**

Open the template application from the baseline: ProjectFolder\Baseline\ucpc-vijeo-designer-1_04.zip\template_application_magelis.vdz

(This template have already implemented the login/logoff system, contains all the reference variables, and all the faceplate system with popup display)

A. **Communication**

**Panel Parameter**

Click on the “Application name” -> “Cible1” -> GENERAL:

Insert Name, HMI Model, & IP Address

![Image of General parameter panel](image)

For Application Transfert

*Figure 2 - General parameter*
Then, click on “Reseau” (“Network”) and configure the touchpanel Address and mask.

You can already test the connection with your HMI by clicking on “Generer” (Generate) then “Transferer Cible” (transfer target)

**PLC Parameters**

For the PLC Parameters, go on “Gestionnaire Entrées/Sorties” (Input/Output) and right click on “ModbusTCP/IP” -> “EquipementModbus01” for Schneider/Codesys PLC or “S7Ethernet” -> “S7300400Series01” for Siemens PLC, then click on “Configuration...”

**For Schneider & Codesys :**

This part is very important: make sure the following step are done

- Check “Syntaxe IEC61131” (Mapping with %MW, %M,...ect)
- Mode d’adressage (Mapping mode): Based on 0
- Double word order: low bit first
- Bytes order: low byte first
- Frame length: between 120 and 255 bytes

If you don’t check this part, you'll probably don’t understand the errors in the future (REAL different between PLC and HMI, impossible to write a DINT in the PLC...ect...)

- Write your PLC IP Address (Unit ID must be unique for each PLC)

**Figure 4 - Modbus communication**

**For Siemens:**

For Siemens, you just need to write the PLC information

**Figure 5 - S7 Communication**
V. Generation and import of variables

A. Generation of the variables file

Run UAB Bootstrap: choose “cpc-wizard”. Then, choose “New UNICOS Application” or “Open Existing Application” and select the application folder, then click “Run”.

- In the UNICOS Generators selector, choose “Vijeo Designer Instance Generator” and click on “NEXT”.

Figure 6 - UAB Procedure

Figure 7 - UAB Procedure - Select Vijeo
- You can choose the objects type you want by clicking on them (left CTRL + left click), or select all the object by clicking “Select All”. Then, click on “Generate”

![Figure 8 - Vijeo Instance Generator](image)

You can find the generated file “vijeo_variable.XML” in: “...\UAB_Project\Output\VijeoInstanceGenerator“.
This file contains all the variables that will be used in Vijeo Designer
VI. Import variable in Vijeo Designer

- In the project navigator, right click on “Variables” and select “import variables”

![](image)

**Figure 9 - Import variables in Vijeo Designer**

- Chose your variables file created before in UAB (vijeo_variables.XML)
  (Select "XML files" in "Files of type", if not, you’ll not see your file)

- Don’t DELETE the variable folder present on the baseline application, there are very important for the automatic process of the application! These files make the connection between the name you’ll put on your widgets and all the animations and faceplates

  - **Ref01**, **Ref02** and **Reg03** make the connection between widgets and faceplate (in popup display)
  - **Users** contain all the variables for the user access
  - **def** contains default values (it’s necessary if you don’t want many warning at the beginning)

Screenshot avec l’ampoule
VII. Import Vijeo baseline library

- First, you need to check if the library exists: Go in “Tools”, and click on “Objects Library”
- On the Library navigator, verify if “Utilisateur” or “User” folder exist with “EN-ICE-PLC” folder
- if these folders don’t exist, then right click on “Utilisateur” (User) and select “import”
Choose your library file present with the baseline

![Image showing the Library Import process in Vijeo Designer]

*Figure 10 - Import Library in Vijeo Designer*

The library is present in the same folder than the template application:

ProjectFolder\Baseline\ucpc-vijeo-designer-1_04.zip\vijeo_library_sept2013.ztc
VIII. Structure & Background

Before you start to put widget on your screen, you need to prepare the screens:
- How many screens do you need? Do you need an Alarm screen?

A. Structure

The baseline already contains 5 screens and the Navigation buttons. All of these screens use the "BasicPanel". You can change it if you want to put something new or add navigation button for example. You can create other "Model Screen" with integrated background for example.

![Basic Panel containing an Invisible Widget on the first plan allowing faceplate moving.](image)

This Basic Panel contains an Invisible Widget on the first plan allowing faceplate moving. Don't forget to always put it on the first plan if you modify something.

B. Background

Like on Siemens touchpanel, you can use a background from PVSS to simplify your application. Use a picture tools (like PAINT, Photofiltre...etc) to delete widget on the screen and use this picture in Model Screen (don't forget to put it in background). After that, use this Model on a screen and put your widget on it.

//!

Background picture must be on the LAST plan ! (you have the Touch Matrix on the first plan of every Model Screen)
Place your background by copy/paste on the model panel, and then click on the "Put in last plan" button.

Figure 12 - Background picture on Vijeo Designer
IX. Panels design

A. Select a panel template
The panel template contains all the background objects and picture. They contain the connections button. If you want to make a good application, you need to have, one panel template for each panel you want.

B. Put a widget on a screen
Take a widget in the library, and drag & drop it on the screen

C. Affect variable to the widget
When you drop your widget on the screen, a new window open, replace the name “def” by your object name.
Example for an AI widget:

Figure 13 - Drag and Drop a widget on a screen

Replace "def" with an AI Name

Figure 14 - Affect variable
D. Case: Analog Input / Output

It’s not possible to use a variable to change the format automatically in Vijeo Designer, so we use another system that consists to hide value with the wrong format. That works, but with this system, the system could be slower for big application.

In the library, you have AIAO: It’s the same widget for AI, AO, AIR, and AOR (every objects have a parameter “VijReg01” to do the difference)

SMALL_AIAO is an Automatic widget, it detects the format and use it, but it is slower than other. For exemple AIAO_3_3 use a format ###.### and AIAO_5_0 use a format #####
you can make your own widget.

For modify a widget, go in “Tools” and active “Graphic List”. Put your widget on the screen and go in the Graphic List.

Figure 15 - Analog widget
Modify the 2 elements “AffichageNumerique”. Modify the name of the widget and put it in the library

/ ! \ You don’t need to do it in the faceplate, they use the automatic system for the format.

![Image](image.png)

**Figure 16** - Change digit format of Analog value

**E. Simulation**

Before transferring your application, you can simulate it to check if there is something wrong. The simulation is connected to the PLC.

![Image](image.png)

**Figure 17** - Simulation
X. Downloading the application

The first time you start your Magelis touchpanel, you can choose an IP Address. (And skip the USB transfer by this way)

There are different ways to transfer an application:

- **Transfer via USB**
  
  Simple way if you’re not on the network, connect your touchpanel and your computer via USB and click on “Generate” -> “Transfer Target”

  You can configure your IP Address via USB, and use Ethernet transfer after that

- **Transfer via Ethernet**

  If your IP address is correctly configured on the touchpanel, you can directly transfer your application via the network. Click on “Generate” -> “Transfer Target”

- **Transfer via File System**

  This type of transfer is really interesting, you can put your application on USB Key of CF Card (Same as many Camera card) formatted in FAT32.

  - Application on USB Stick: Plug your USB Stick in the Touchpanel, the new application will be downloading on the touchpanel
  
  - Application on CF Card: Put OFF the touchpanel, plugs the CF Card, and put ON the touchpanel.

The CF Card transfer allow to RESET the touchpanel too, the procedure is explain in “Advanced Procedure” documentation

Figure 19 - Application transfert
XI. Miscellaneous

A. “Users” Variable

These variables stores in the variable folder “Users” are used for some applications

- Application Name: If you want to change the name of application, change the default value of Users.NameApplication

- Password: if you want to change the password, change the default value of Users.Password

- User : If you want to change the user login, change the default value of Users.UserName

B. Modify widgets

If you want to change a widget (to change the format of Analog Alarm for example). You just need to drag and drop the widget from the library on the screen and ungroup it by clicking on the Ungroup Button.
After that you can change all the elements of the widget. When it's finish, re-group the widget, name it and drag and drop it in the library.

C. “Additional information” widget

Every object had a description and a name, you can put it on a screen with the widgets store in the library EN-ICE-PLC -> Widget

![Image of widget]

*Figure 21 - Widgets for Alarm Screen*

D. Advanced documentation

This document is really basic, you can find more details in the Advanced Documentation for Vijeo Designer (In French)

E. Drawing objects

To add how to draw fluid lines, insert drawing, etc...use the Object tools included in Vijeo Designer. You can also copy/past picture