



# PG5 Starter Training *File system application*

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# File system application

## Introduction



### Material required

- Notebook or computer
- PCD1 E-Controller
- USB cable
- Training board
- Ethernet cable
- (Energy Meter starter box)

### Software required

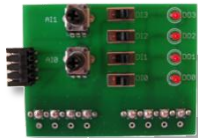
- PG5 Core at least Version 2.1.027
- Saia® Web Editor 5 (included in PG5 Core)
- Java at least Version XXX

### Lessons required

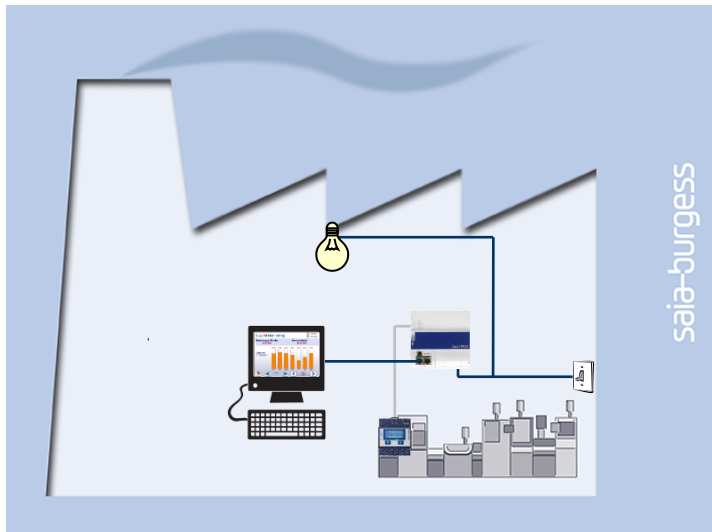
- Lesson 1
- Lesson 2
- Lesson 3 PG5 Core
- Lesson 4 Web Editor
- (Energy Meter application)

### Aims of the file system application

- Create a CSV file with Energy Meter data or other data
- Basic understanding of the file system function



# File system application Introduction



## Explanation / Introduction

- The Energy Meter variable must be written to a file, so that the course of energy generated can be displayed visually. (If the Energy Meter application has not been completed, any variable can be written to the file instead.)

## What is necessary to achieve this?

- Program produced in Lessons 3 and 4
- Ethernet connection to Saia® PCD1 E-Controller
- Monitor with web browser
- (Energy Meter starter box)
- (Program from Energy Meter application)

Microsoft Excel - Export\_De.xls

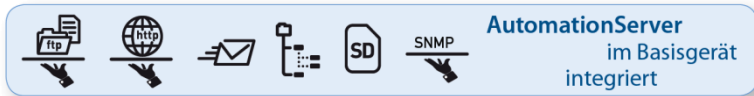
File Edit View Insert Format Tools Data Window Help

C:\temp\Belimed\Version\_1.2.7\Export\_De.xls

|   | A | B | C      | D                                 | E    | F       |
|---|---|---|--------|-----------------------------------|------|---------|
| 4 |   |   |        |                                   |      |         |
| 5 |   |   | Nummer | Parameter-Name                    | Wert | Einheit |
| 6 |   |   | 1      |                                   | 1    | -       |
| 7 |   |   | 2      |                                   | 1400 | °C/10   |
| 8 |   |   | 3      | Türfreigabe: 1=Seite 1/ 2=Seite 2 | 2    | -       |
| 9 |   |   | 4      | Manteltemperatur                  | 1300 | °C/10   |

# File system application

## Introduction



### AutomationServer

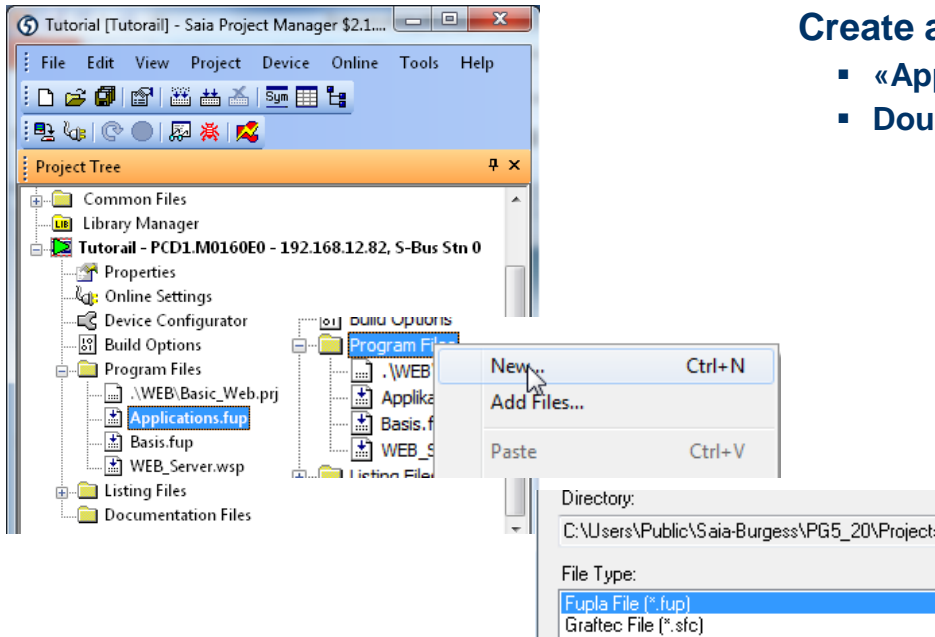
- The PCD's integral AutomationServer includes, among other things, a file system with which the user can store files.
- With this feature the PCD can, for example, log stored data in a CSV file (Excel-compatible) and then access these CSV files from a PC using TCP/IP.
- As a result values can, for example, be saved cyclically in the PCD and displayed using MS tools, such as Excel

Microsoft Excel - Export\_De.xls

|   | A | B | C      | D                                 | E    | F       |
|---|---|---|--------|-----------------------------------|------|---------|
| 4 |   |   |        |                                   |      |         |
| 5 |   |   | Nummer | Parameter-Name                    | Wert | Einheit |
| 6 |   |   | 1      |                                   | 1    | -       |
| 7 |   |   | 2      |                                   | 1400 | °C/10   |
| 8 |   |   | 3      | Türfreigabe: 1=Seite 1/ 2=Seite 2 | 2    | -       |
| 9 |   |   | 4      | Manteltemperatur                  | 1300 | °C/10   |



# File system application Project Manager



## Create a new Fupla file

- «Applications.fup»
- Double click to open the file

If this step has already been done in another application tutorial, it may be skipped.

# File system application Project Manager

## Create a new Fupla page

- Select tab «Page»
- Right click and select «Insert Page»
- Rename the page as File\_System
- Enter comment «Log in CSV»

If you do not want connectors to be created automatically in a new Fupla page, this can be disabled with: View → Options → New page with side connectors = No

| Options                       |       |
|-------------------------------|-------|
| Workspace                     |       |
| Snap to grid                  | Yes   |
| Keep default ratio            | No    |
| Horizontal move               | Yes   |
| New page with side connectors | No    |
| Adjust dialog and 2D drawing  | No    |
| Label size                    | 12; 9 |

The screenshot shows the Saia Fupla Editor interface. The 'Page Navigator' on the left shows a tree structure with 'COB Applications' containing three pages: '1: Energy\_Meter; Capture data', '2: File\_System; Log in CSV', and '3: Email; Send Data'. The 'Properties' window on the right shows the selected page 'File\_System' with the comment 'Log in CSV'. The 'Symbol Editor' at the bottom shows a table of symbols.

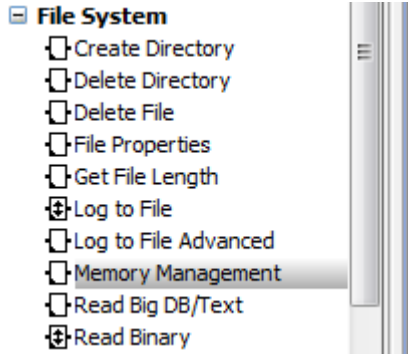
| Symbol Name      | Type  | Address/Value | Comment | Actual Address | Tags | Scope |
|------------------|-------|---------------|---------|----------------|------|-------|
| Applications.fup | ROOT  |               |         |                |      |       |
| SEnergy          | GROUP |               |         |                |      |       |
| Application      | GROUP |               |         |                |      |       |
| Communication    | GROUP |               |         |                |      |       |
| Applications     | COB   |               |         | 1              |      | Local |

The screenshot shows the context menu for 'Insert Page' in the Saia Fupla Editor. The menu options are: 'Open Page' (Enter), 'New Block', 'Insert Page' (Ins), 'Delete' (Del), and 'Cut'. The 'Page Navigator' on the left shows the tree structure with 'COB Applications' containing three pages: '1: Energy\_Meter; Capture data', '2: File\_System; Log in CSV', and '3: Email; Send Data'.



# File system application

## Program the file system

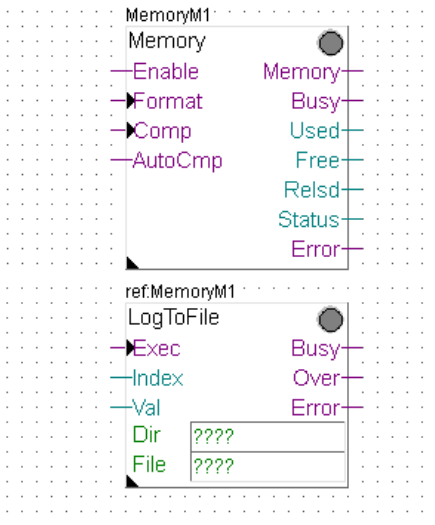


### File system

- To save data to the file system, the file system must be initialized
- It may also be necessary to create the directory structure in the file system. Subsequently, PCD data can be stored in a file on the file system

### Set up file system FBoxes

- Position the FBoxes: Memory Management and LogToFile
- Point search function in Navigator FBox
- Connect FBox inputs and outputs
- Connect a value that has been read by the Energy Meter

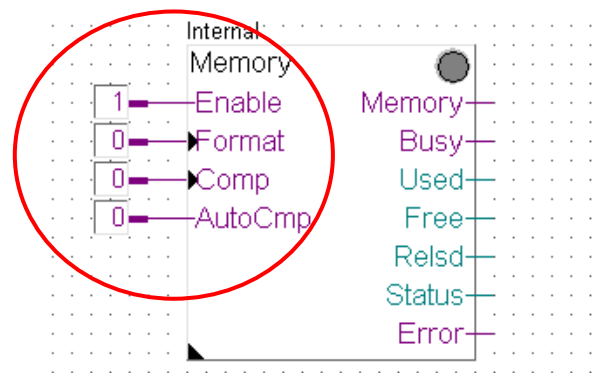
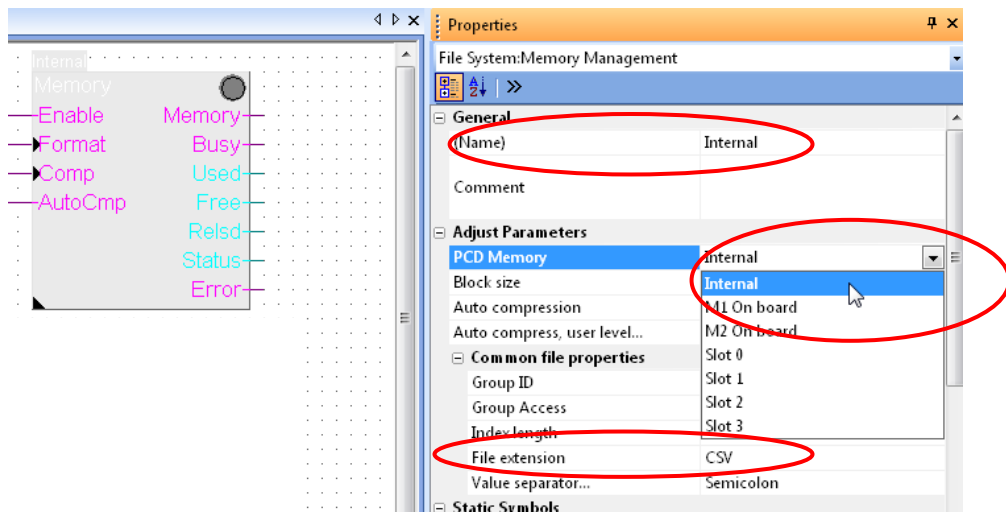


# File system application

## Program the file system

### Set up initialization

- In the FBox Memory options, select «Internal» (for internal memory)
- Rename FBox as «Internal»
- Select file extension «CSV»
- Connect FBox inputs (FBox Enable = 1)



FBox inputs must always have a signal applied

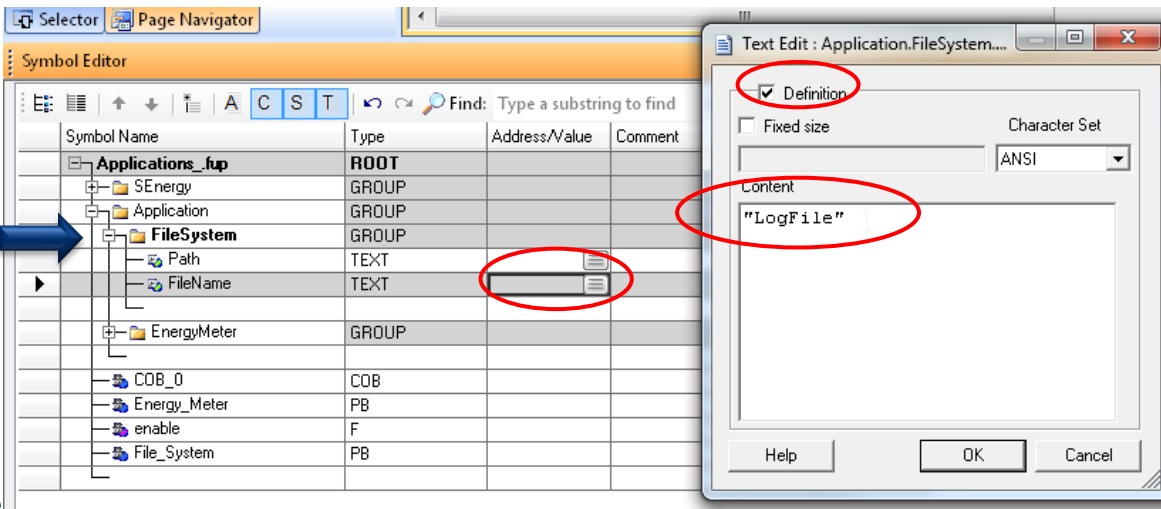
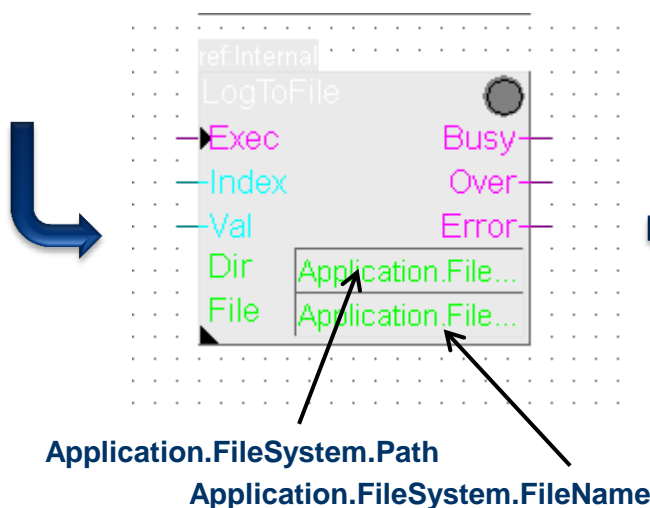
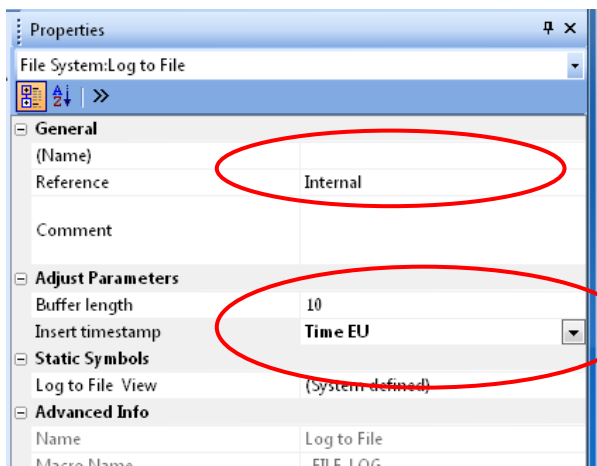


# File system application

## Program the file system

### Configure the LogToFile FBox

- The LogToFile FBox writes data to the file
- Set Reference «Internal»  
This FBox must reference the Memory FBox name! (In this example: Internal)
- Set timestamp to EU time
- Enter symbol «Application.FileSystem.Path» in DIR field
- Enter symbol «Application.FileSystem.FileName» in File field
- Enter filename «LogFile» in symbol «FileName»

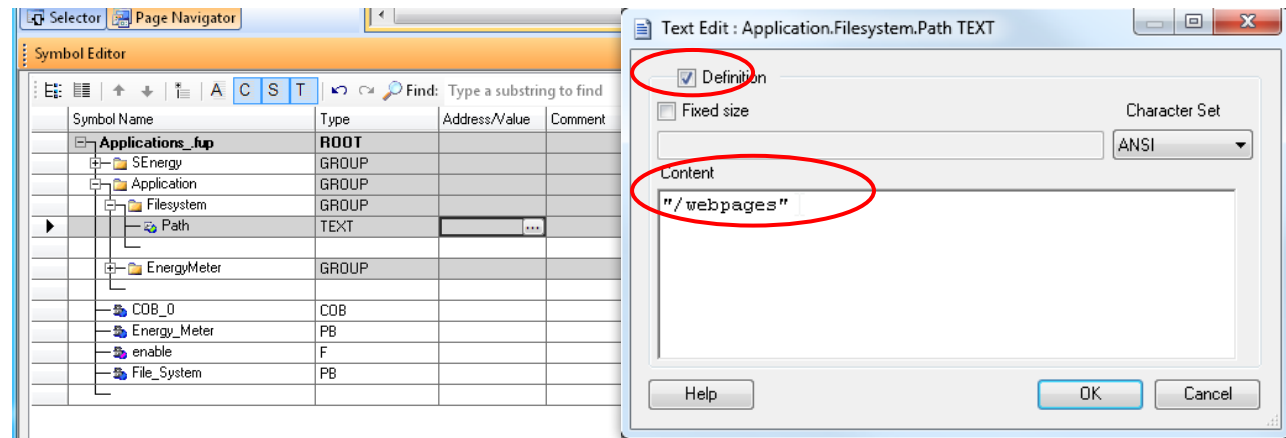


# File system application

## Program the file system

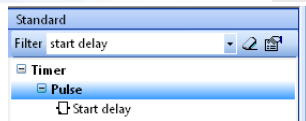
### Configure the LogToFile FBox

- Enter path «/Webpages» in symbol created: «Application.FileSystem.Path»
- The path «/Webpages» is now created. It contains all web pages. It cannot therefore be created first.

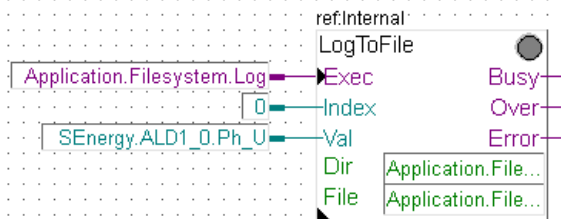
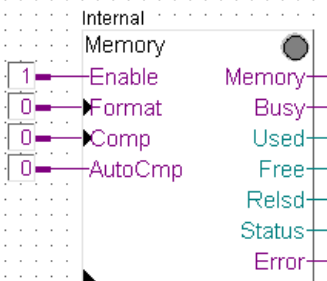


# File system application

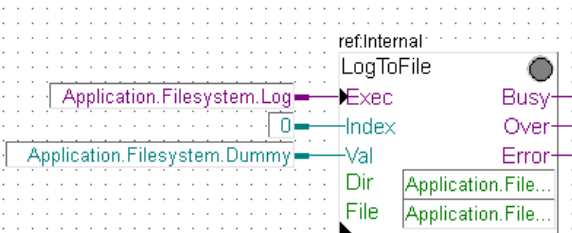
## Activate file system FBoxes



FBoxes can be found directly with the filter function.



Energy Meter application found



Energy Meter application not found

### Activation of FBoxes

- Define symbol «Application.Filesystem.Log» as a flag (F) to trigger the «Write» command
- The «Application.Filesystem.Log» symbol must be public, as it will be accessed later by the web project

|  |  |                  |   |  |  |  |  |        |
|--|--|------------------|---|--|--|--|--|--------|
|  |  | TotalConsumption | R |  |  |  |  | Local  |
|  |  | Log              | F |  |  |  |  | Public |

If the «Energy Meter application» lesson has already been completed:

- Apply symbol «SEnergy.ALD1\_0.Ph\_U» to input «Val» → The content of this symbol (i.e. Voltage in this case) will be written to the file

If the «Energy Meter application» lesson has not yet been completed:

- Define symbol «Application.Filesystem.Dummy» as a register (R) → The content of this symbol will be written to the file

Compile and download project

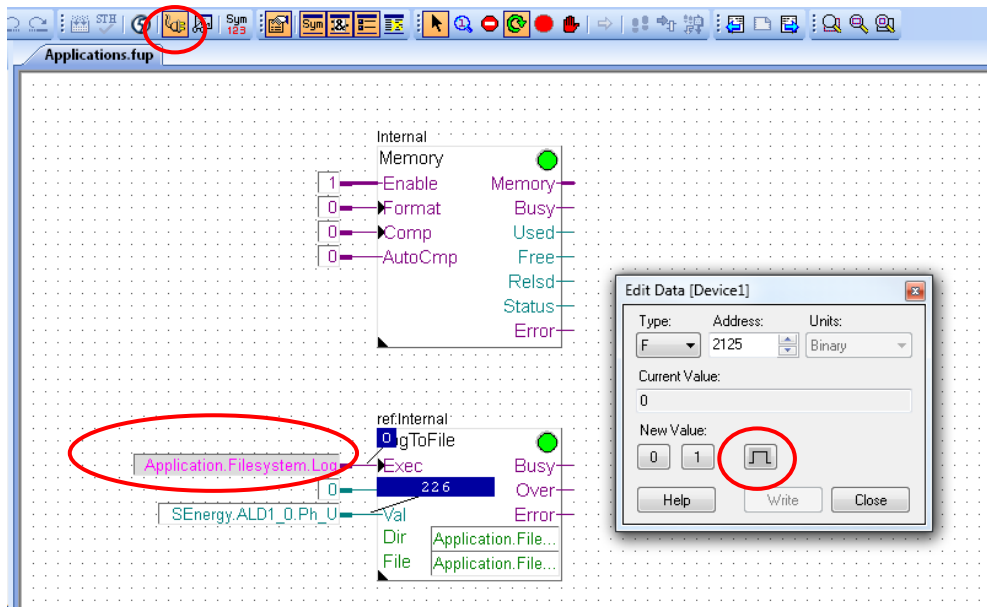


# File system application

## Compile and download project

### Generate first log entries

- Go online
- Use zoom to view value at «Value» input
- Double click on «Application.FileSystem.Log»
  - With the pulse symbol, a value can be written into the file. By repeatedly pressing, multiple values can be written.



# File system application

## Download CSV file

### Download csv file with browser

- Enter path in browser  
<IP Controller>/<Filename.csv>
- In this example:  
192.168.12.82/logfile.csv
- Save and open file
- For each pulse, the value at the «Val» input has been written to the file

The screenshot shows a Firefox browser window with the address bar containing '192.168.12.82/logfile.csv'. A download dialog box is open, asking 'Wie soll Firefox mit dieser Datei verfahren?' (How should Firefox handle this file?). The options are: 'Öffnen mit Microsoft Excel (Standard)' (selected), 'Datei speichern', and 'Für Dateien dieses Typs immer diese Aktion ausführen'. Below the dialog, a Microsoft Excel spreadsheet is shown with the following data:

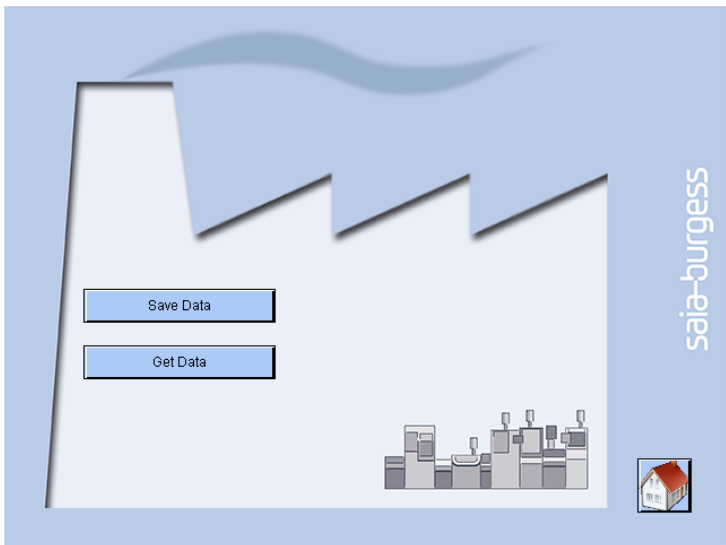
|    | A        | B    | C | D | E | F | G |
|----|----------|------|---|---|---|---|---|
| 1  | 02:28:11 | 6507 |   |   |   |   |   |
| 2  | 02:28:11 | 6507 |   |   |   |   |   |
| 3  | 02:28:12 | 6507 |   |   |   |   |   |
| 4  | 02:28:12 | 6507 |   |   |   |   |   |
| 5  | 02:28:13 | 6507 |   |   |   |   |   |
| 6  | 02:28:13 | 6507 |   |   |   |   |   |
| 7  | 02:28:13 | 6507 |   |   |   |   |   |
| 8  | 02:28:14 | 6507 |   |   |   |   |   |
| 9  | 02:28:14 | 6507 |   |   |   |   |   |
| 10 | 02:28:14 | 6507 |   |   |   |   |   |
| 11 | 02:28:15 | 6507 |   |   |   |   |   |
| 12 | 02:28:15 | 6507 |   |   |   |   |   |

# File system application

## Create web project

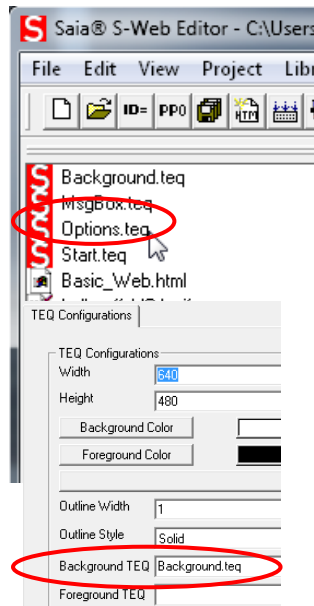
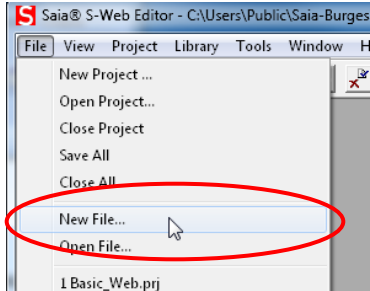
Writing a value to the file should be possible via the web interface

In addition, it must be possible to download the file in the browser



# File system application

## Create web project



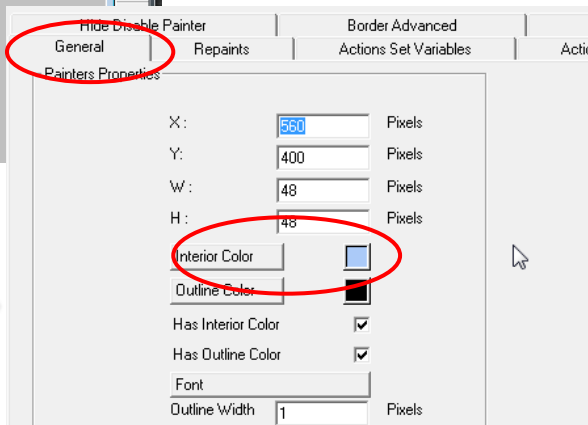
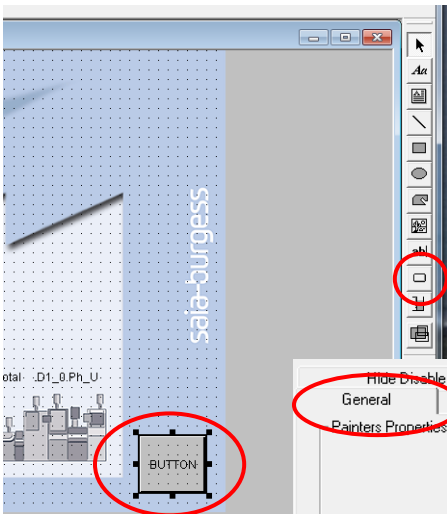
Open the old web project from Lesson 4

Create a new page «Options»

- Create a new file «Options.teq»
- Right click on drawing area to open Teq View Configurations
- Select Background.teq as the background

Set up jump to new page

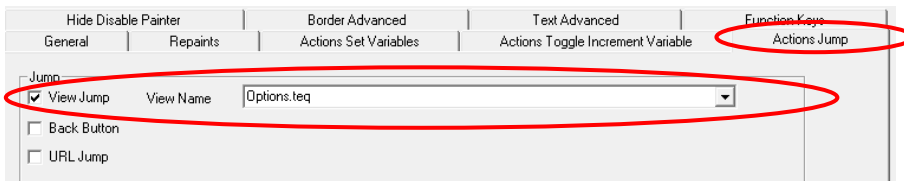
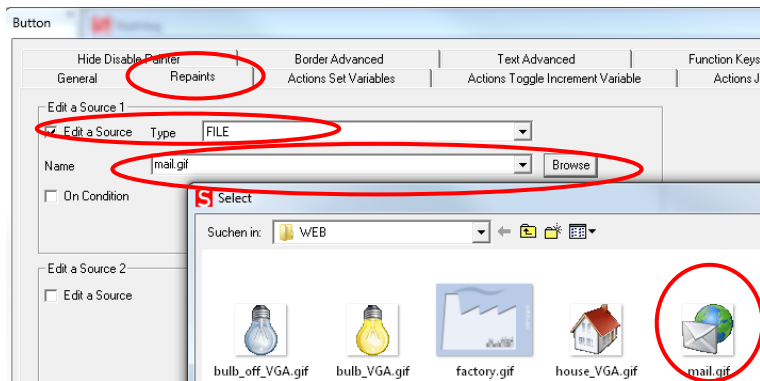
- Open page: Start.teq
- Place a button
- Open the options
  - Change the colour
  - Under «Repaints», select «Edit a Source» and link to file: mail.gif
  - Open tab «Actions Jump» and set up a «View Jump» to the new page: Options.teq



# File system application

## Create web project

- Open tab «Repaints»
  - Select «Edit a Source», Type = File
  - Browse to select file: mail.gif
- Open tab «Actions Jump»
  - Set up a «View Jump» to the new page: Options.teq



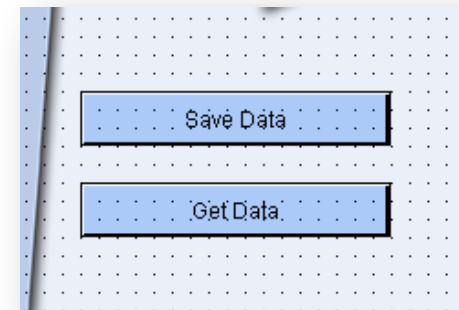
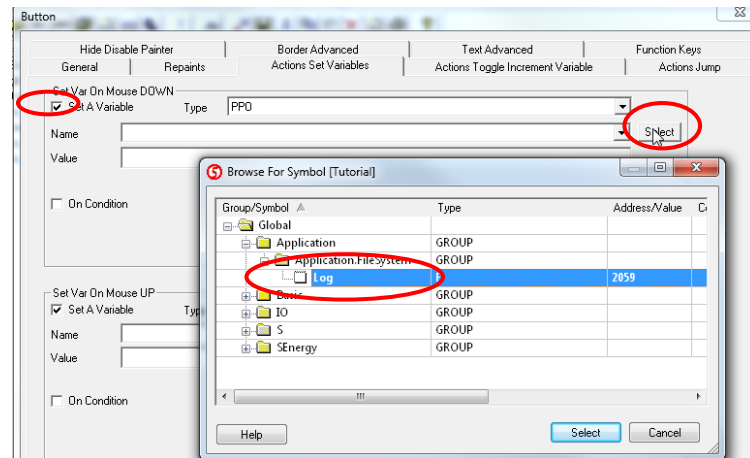
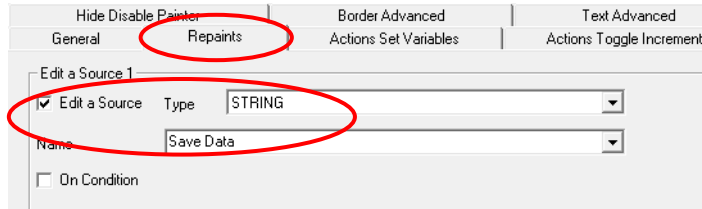


# File system application

## Create web project

### Write data at click of button

- Open page: Options.teq
- Insert a button and change colour
- Rename button as «Write Data»
- Select function «Set A Variable On Mouse Down» from tab «Actions Set Variables»
- Type PPO
- Select the «Log» symbol (triggers writing of log data)
- Enter Value = 1
- Do the same for «Set a Variable on Mouse Up», but enter Value = 0
- Exit with OK
- A mouse click on the button will trigger a pulse at the flag «Log» and the current value will be written to the \*.csv file



# File system application

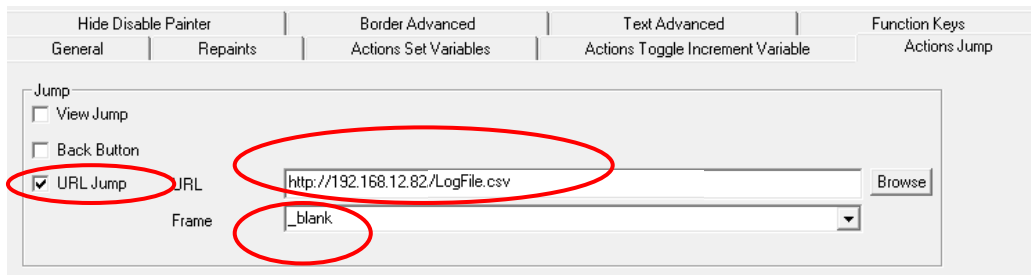
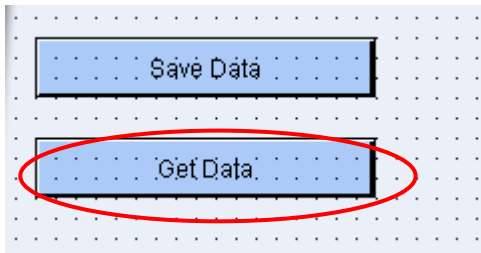
## Create web project

### Open CSV file at click of button

- Open page: FileSystem.teq
- Insert a button
- Rename button as «Get Data»
- Set up a URL jump to the file  
<http://<IP Controller>/<Path within web page Folder>/<Filename.csv>>  
<http://192.168.12.82/LogFile.csv>

### Set up a jump back to the start page

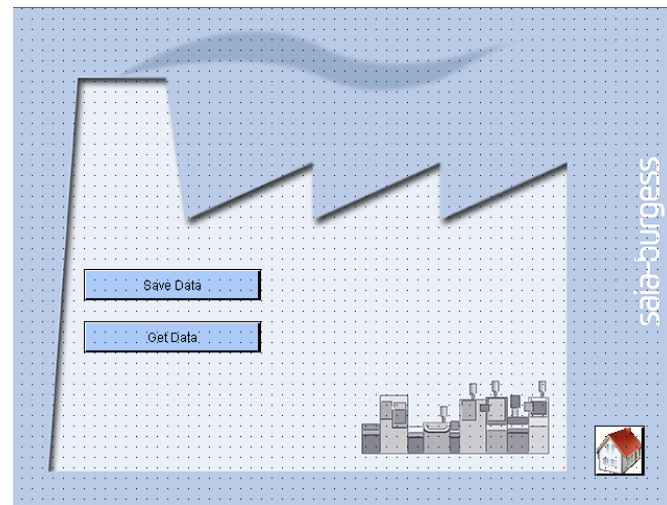
- Open page: FileSystem.teq
- Place a button and specify image: house\_VGA.gif
- Set up a «View Jump» to page: Start.teq



If the file is not stored in a Webpages subfolder, the absolute path must be indicated.

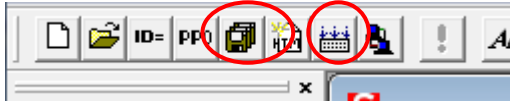
The absolute path is:

<http://192.168.12.82/INTFLASH:/WEBPAGES/LogFile.csv>



# File system application

## Download project

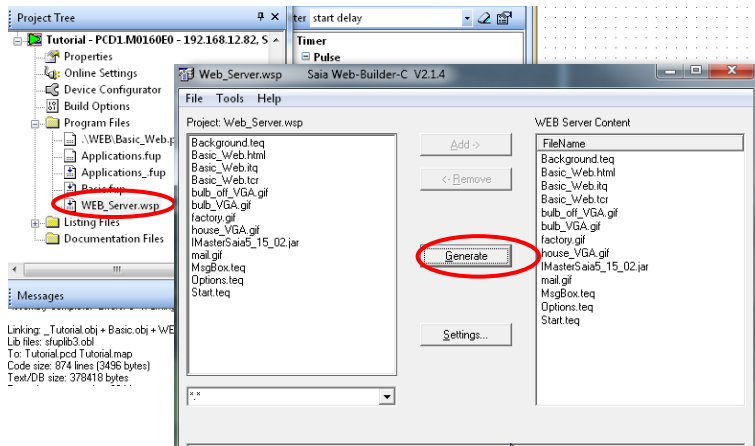


### Compile Web Editor project

- Save and compile with web project
- Exit the Web Editor

### Add new file to Web Build

- Open WEB\_Server.wsp
- Add all files to WEB Server Content
- Create with «Generate Build»
- Exit



### Compile and download project



# File system application

## Test the web visualization

