



# 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® WebEditor 5 (included in PG5 Core)
- Java at least Version XXX



### Lessons required

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

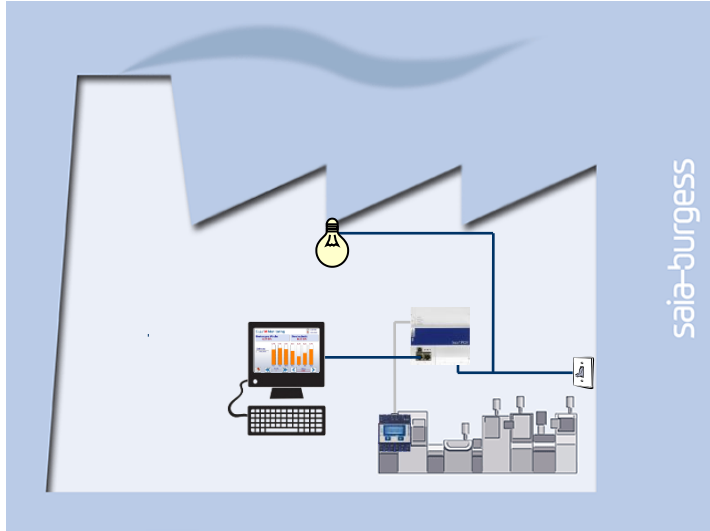
### Aims of the file system application

- 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)

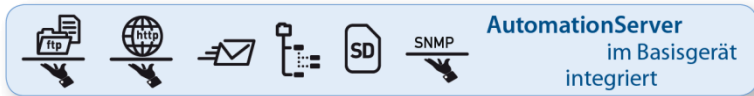
Microsoft Excel - Export\_De.xls

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

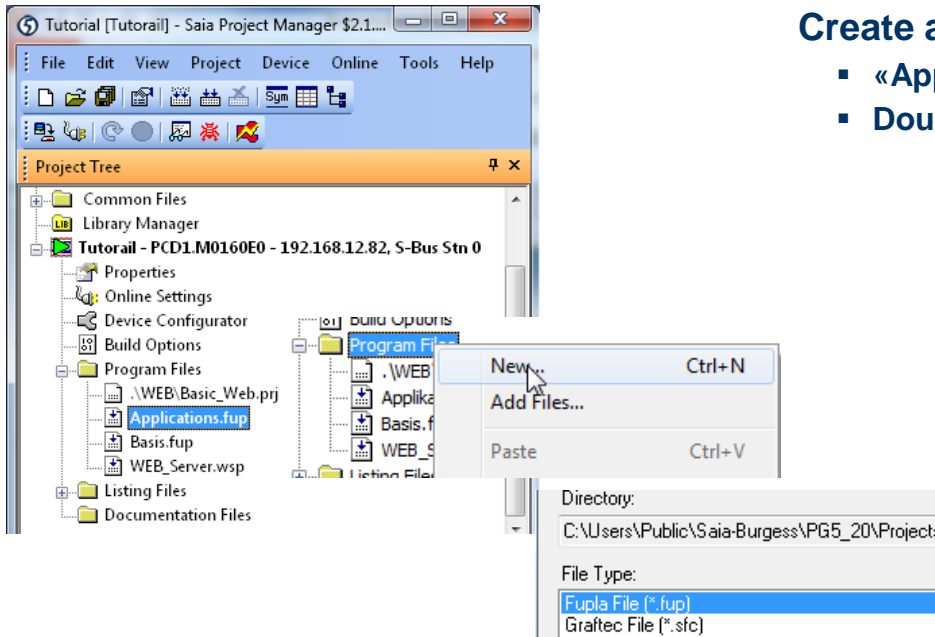
File Edit View Insert Format Tools Data Window Help

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 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.

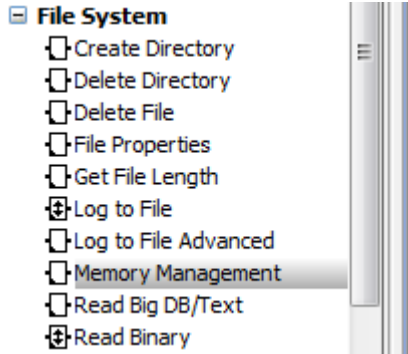
Symbol Name	Type	Address/Value	Comment	Actual Address	Tags	Scope
Applications.fup	ROOT					
SEnergy	GROUP					
Application	GROUP					
Communication	GROUP					
Applications	COB			1		Local

The screenshot shows a context menu for the 'Page Navigator' with the following options: 'Open Page' (Enter), 'New Block', 'Insert Page' (Ins), 'Delete' (Del), and 'Cut'. The 'Insert Page' option is highlighted.



# File system application

## Program the file system

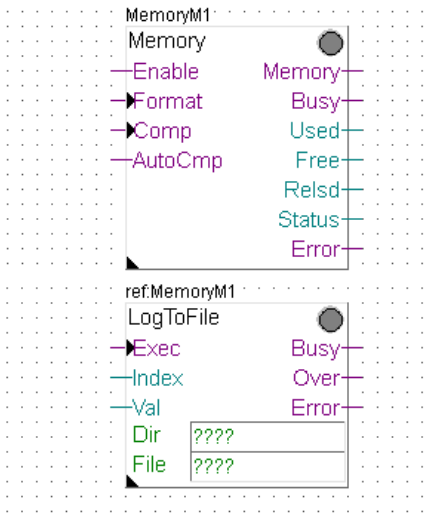


### File system

- 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

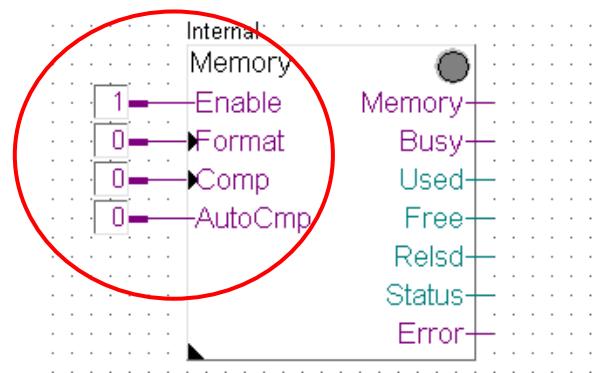
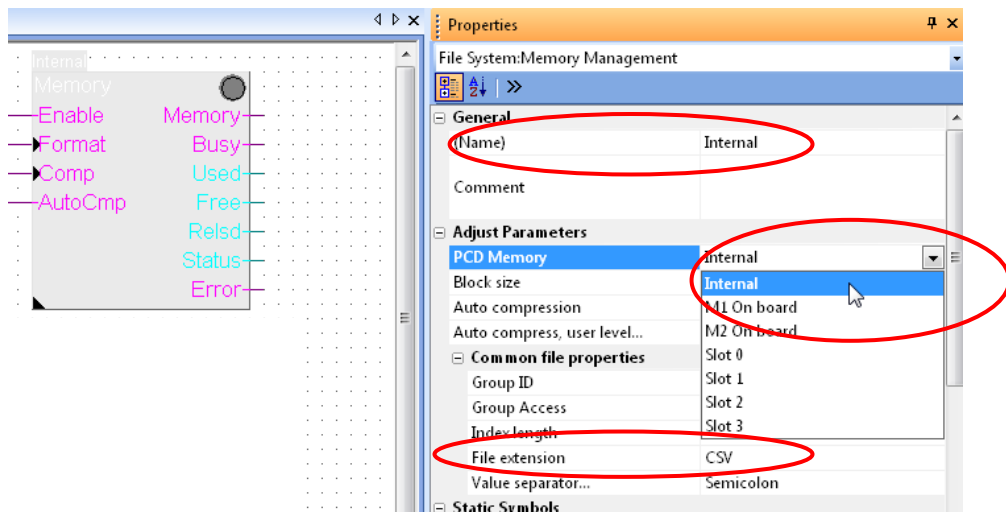


# File system application

## 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

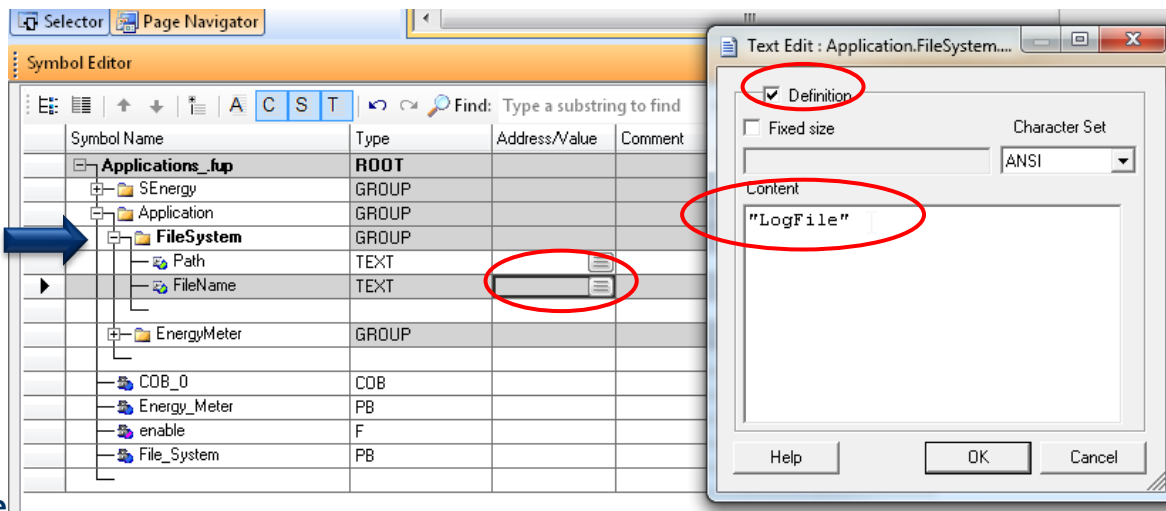
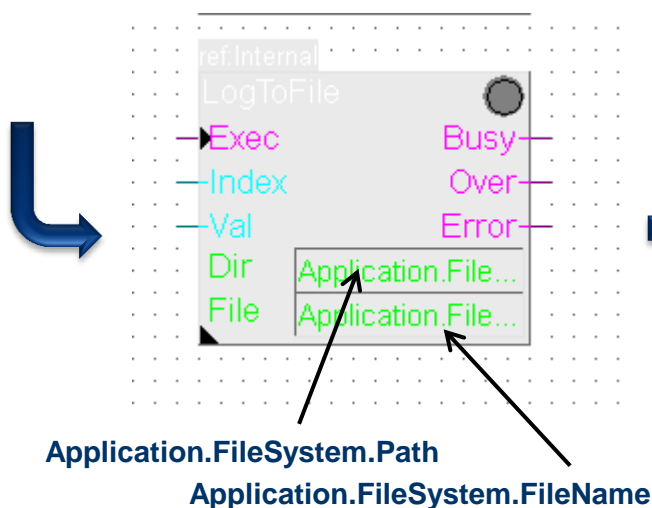
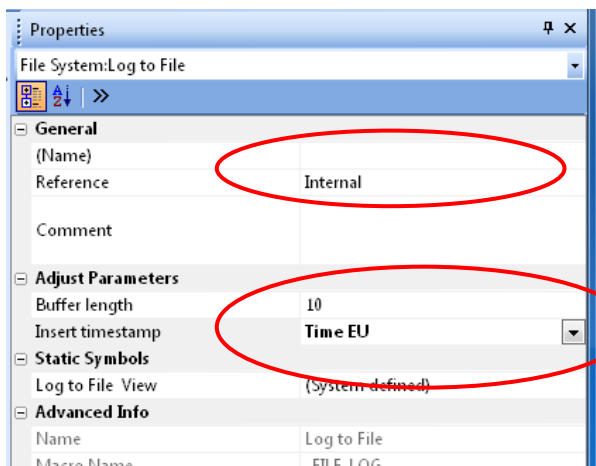


# File system application

## 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»



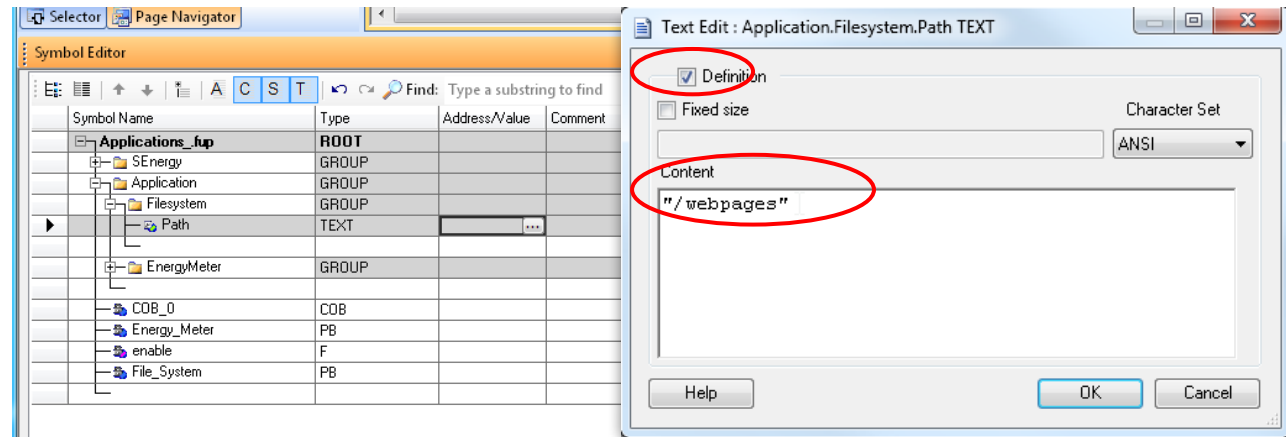


# File system application

## Program the file system

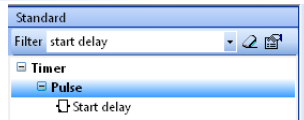
### Configure the LogToFile FBox

- 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.

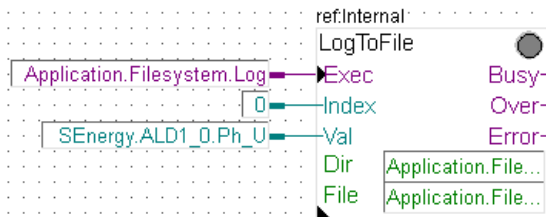
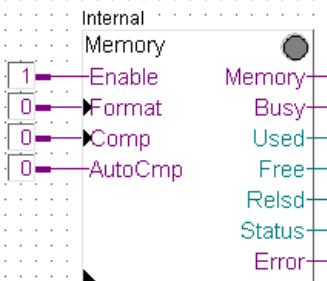


# File system application

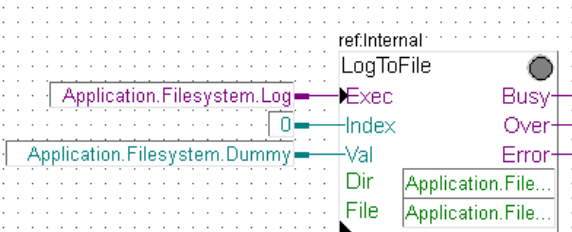
## Activate file system FBoxes



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

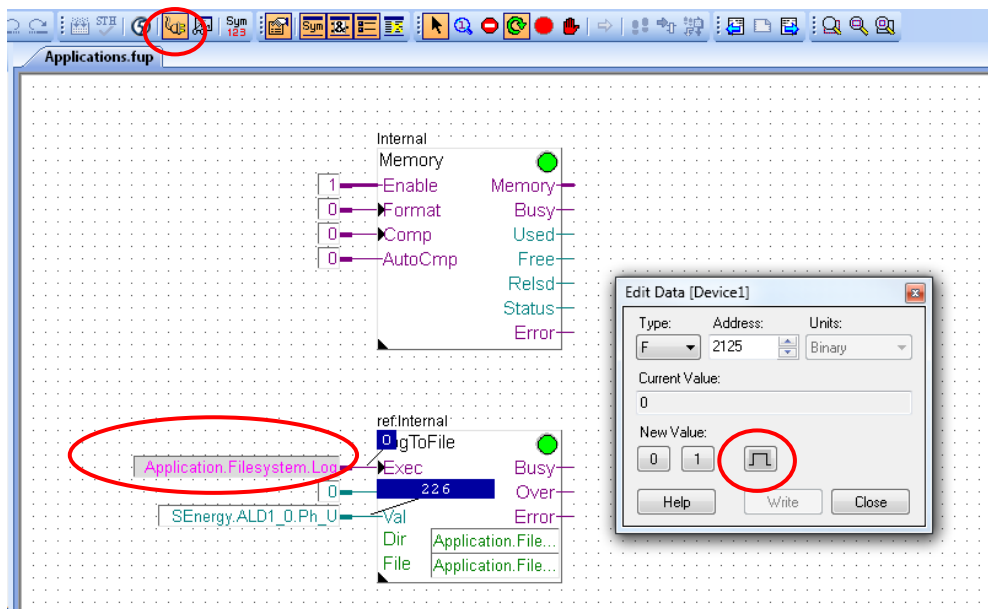


# File system application

## 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, titled 'Öffnen von logfile.csv', asking how to handle the file. The file is identified as 'logfile.csv', a Microsoft Excel Comma Separated Values File (405 Bytes) from 'http://192.168.12.82'. The dialog offers three options: 'Öffnen mit' (selected) with a dropdown menu set to 'Microsoft Excel (Standard)', 'Datei speichern', and 'Für Dateien dieses Typs immer diese Aktion ausführen'. 'OK' and 'Abbrechen' buttons are at the bottom.

A blue arrow points from the dialog to an Excel spreadsheet. The spreadsheet has a table with 12 rows and 7 columns (A-G). The data is as follows:

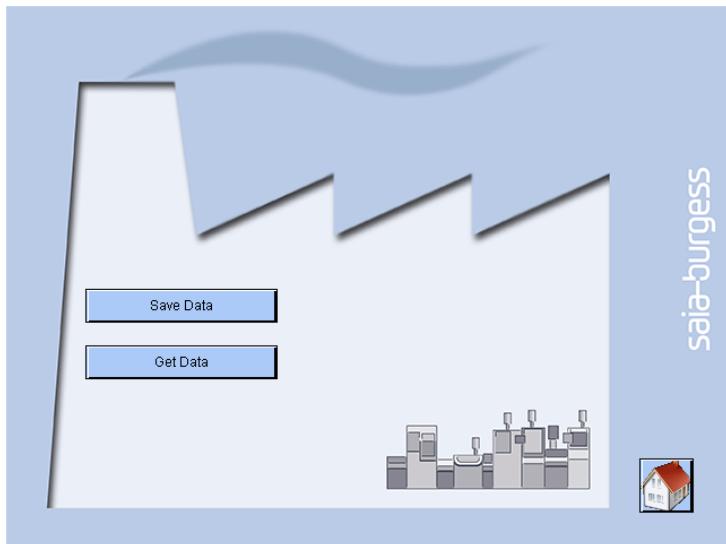
	A	B	C	D	E	F	G
1	02:28:11	6507					
2	02:28:11	6507					
3	02:28:12	6507					
4	02:28:12	6507					
5	02:28:13	6507					
6	02:28:13	6507					
7	02:28:13	6507					
8	02:28:14	6507					
9	02:28:14	6507					
10	02:28:14	6507					
11	02:28:15	6507					
12	02:28:15	6507					

# 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



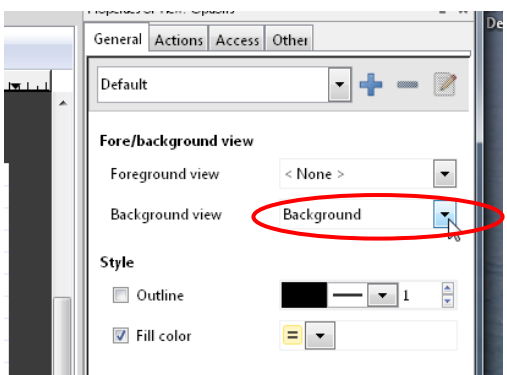
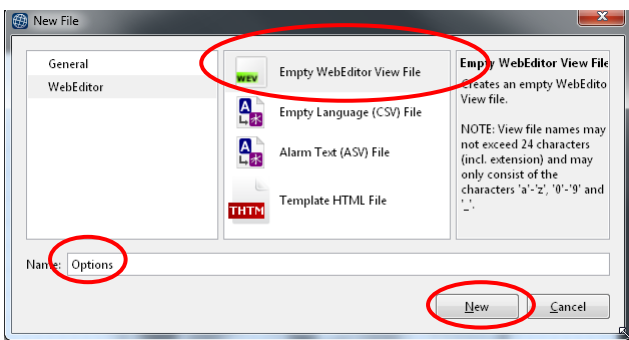
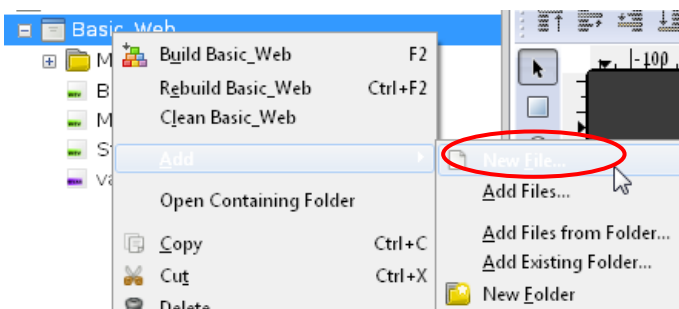
# File system application

## Create web project

Open the old web project from lesson 4

Create a new page «Options»

- Create new file: Options.wev
- Click on workspace to open Options
- Select background at «Background»

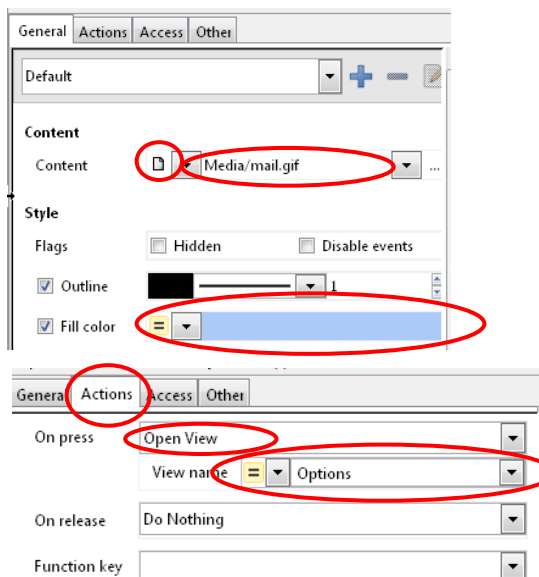
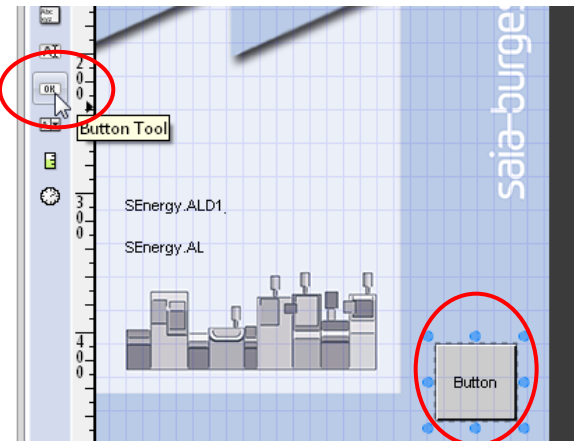


# File system application

## Create web project

### Set up jump to the new page

- Open the page Start.wev
- Place a button
- Click on the button to open options
- Select the General tab
  - At Content, select File and choose the file house\_VGA.gif
  - Change the colour of the button
- Select the Actions tab
  - Change the condition «On press» → Open view
  - Select View (website) Options
- Now the new Options page will be called when the button is pressed





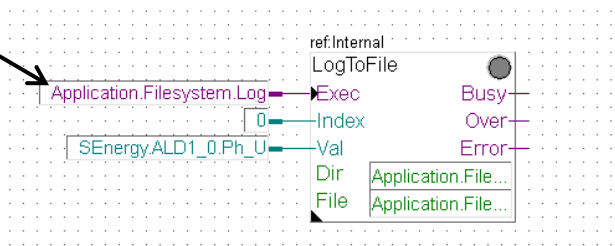
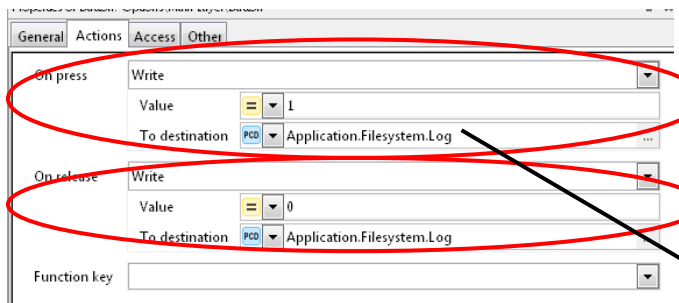
# File system application

## Create web project



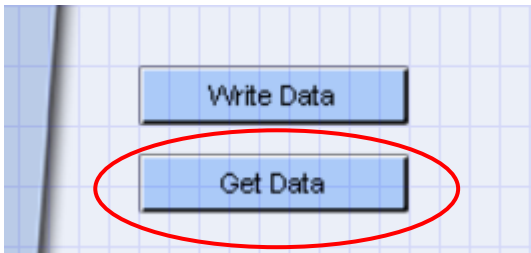
### Write data at click of button

- Open the page Options.wev
- Insert a button and change its colour
- Rename button as «Write Data»
- Select function «On Press» → Write
  - Value = 1
  - To destination PCD Application.Filesystem.Log
- Select Log symbol (triggers writing of log data)
- Select function «On Release» → Write
  - Value = 1
  - To destination PCD Application.Filesystem.Log
- Click OK to close
- Clicking the mouse on the button will trigger a pulse at the «Log» flag and cause the current value to be written to the \*.csv file



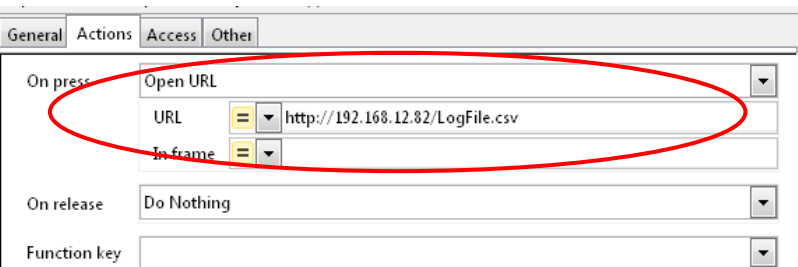
# File system application

## Create web project



### Load CSV file

- Open the page Options.wev
- Insert a second button and change its colour
- Rename the button as «Get Data»
- Set up a URL jump to the file  
<http://<IP Controller>/<Pfad innerhalb Webpages Ordner>/<Dateiname.csv>>  
<http://192.168.12.82/LogFile.csv>
- Clicking the mouse on the button will download the data file LogFile.csv in the browser



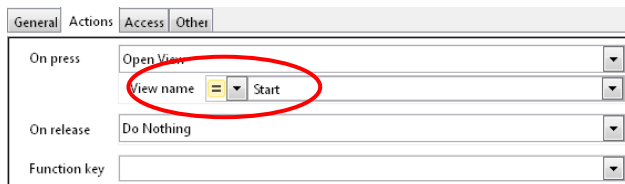
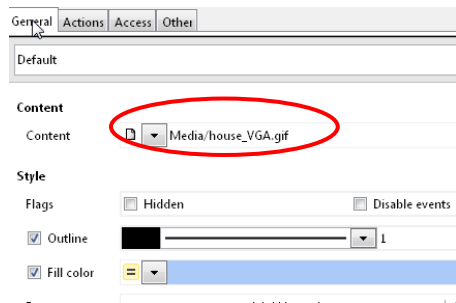
### Set up the jump back to the start page

- Place a button and save the image house\_VGA.gif onto it
- Set up an Open View to the page Start.wev

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

In this case, the absolute path is:

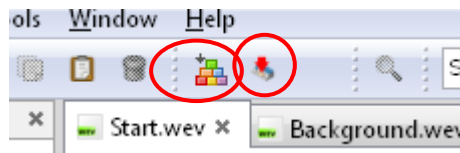
<http://192.168.12.82/INTFLASH:/WEBPAGES/LogFile.csv>





# File system application

## Download project



### Compile WebEditor project

- Save and compile web project
- Download web project
- Close WebEditor



# File system application

## Test the web visualisation

