Getting started with the MB panel VGA

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Control Systems and Components

Getting started with the MB Panel

Please touch the items below or the F-keys in order to navigate.

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Content

Project history

Date	Author	Modification
04/07/2008	TCS / cd	Creation of documentation (version 1) and project for PG5 1.4.300
25/01/2010	TCS	Updated project for VGA MB Panel and PG5 2.0.110 (V2)

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1 Introduction

This document serves as a simple introduction to the use of VGA MB panels (PCD7.D4xxV). This document in application with the associated PG5 2.0 project can be used as a guide for the creation of a web-based visualisation of a PCD application.

The information contained in this document is a summary of the corresponding Manuals and online Help and will make your getting started easy. For more information, please refer to the corresponding documents (see section "References").

2 Required hardware and software

Hardware

This project has been configured for the following hardware constellation:

- PCD3.M5540
  The controller which contains the web project and the program. The PCD firmware has to be 1.10.16 or later.
- PCD7.D4xx
  The VGA MB panel, to be equipped with firmware Version 1.12.01 or later.
- Ethernet cable (CAT5) for the connection between PCD3 and MB panel (there is no need for a crossed cable)
- PCD3.S100 (optional)
  The simulator unit for the inputs and outputs, so that modules don't need to be wired.
- A USB cable (max. 1.8 m) for programming the PCD

Software

For programming the PCD, the following softwares with valid licences are required:

- PG5 2.0.110 or later
  for programming the PCD.
- S-Web Editor 5.14.27 or Higher
  This version of the S-Web Editor can be installed together with PG5 2.0.110 (with the same installer) from the PG5 Controls Suite CD.

It is also possible to operate this project with other hardware. For that, specific adjustments have to be carried out according to the hardware (Device configuration in PG5, software settings in PG5, available memory for trending in Fupla and corresponding settings for the communication between PCD and MB panel).

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3 The Saia® S-Web system
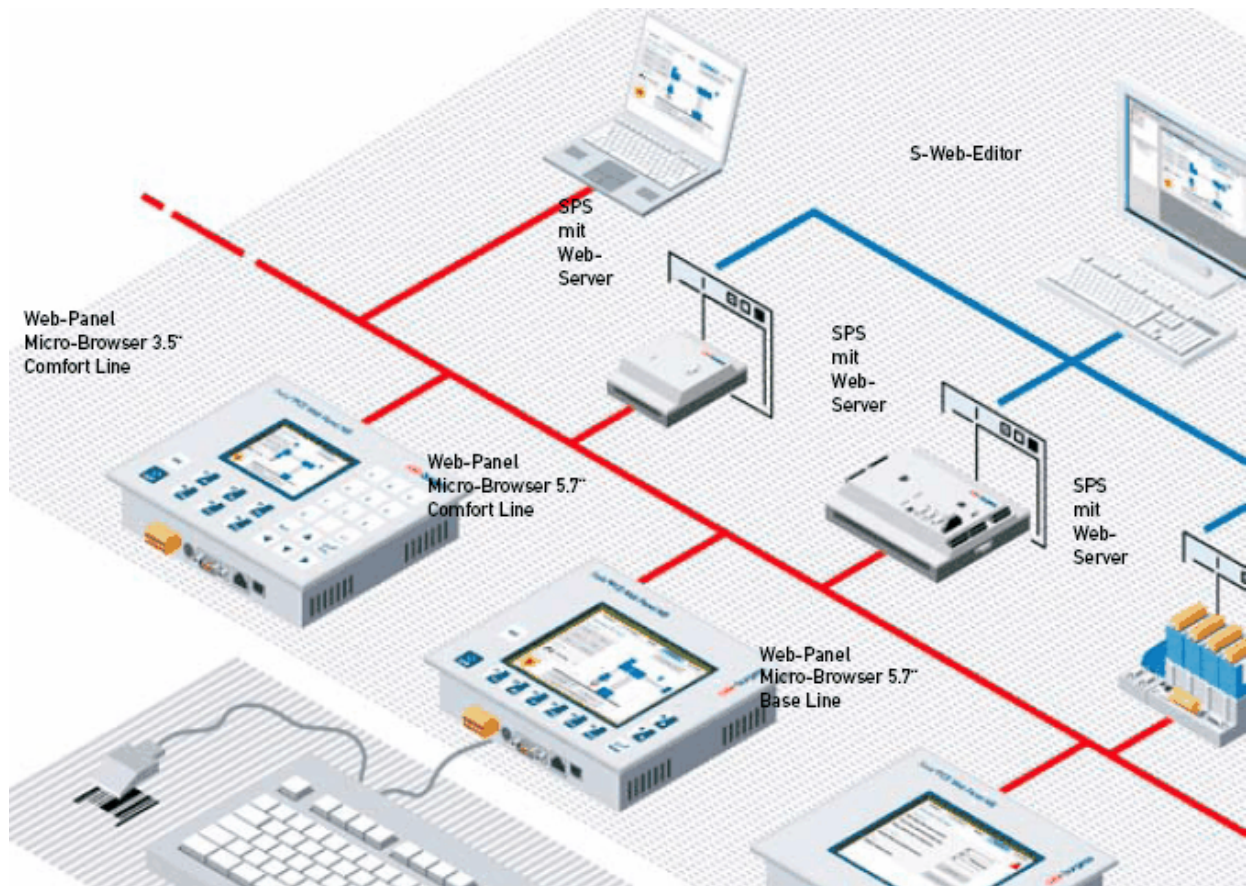
Basically a web-based HMI solution consists of one or more intelligent devices (e.g. PLC devices) with integrated web server as well as one or more HMI devices (an MB panel in this example) on which a web browser runs for the visualisation in each case. This web browser is already integrated in the operating system (firmware) of the MB panel. The information to be visualised (graphics, process data, etc.) is saved decentrally in the automation device (in the PCD3 in this example). This is fundamentally different from the classical HMI solutions, where the visualisation project is saved in the HMI terminal.

Once the connection between the web browser (e.g. MB panel) and the web server (e.g. the web server of the PCD3) is made, the web project (created with the S-Web Editor) of the web server is transmitted. This project contains the indicators and operating elements and continually loads the process data of the PCD.
The start and initialisation of the project take place automatically (after the communications parameter has been configured one time). After a short initialisation phase, the first visualisation page is thus already displayed and the reading/writing of the process data gets started. For it, the S-Web Editor project periodically calls up CGI functions of the web server in the PCD. The PCD converts the process data before the return to the web browser from the internal data format into a standardised web format.

Among other things, this concept offers the following advantages:
- The web project can be displayed both by the permanently installed web panel (e.g. MB panel, CE panel or eXP panel) and by a PC, laptop or PDA.
- An update of the PCD project does not require an update of the project of the panel, as all relevant data are saved on the PCD.
- By the application of standard web technology, anybody can view the visualisation (without additional runtime licences) using a browser (e.g. Microsoft Internet Explorer or Firefox) on a PC.

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4 Preparation of the sample project

To import the project into PG5, use the function "Restore" from the "Project" menu in the PG5 Project Manager.

For the live viewing of this sample, the PCD just needs to be configured and programmed. Moreover the communications parameter should be set on the MB panel and the PCD address configured.

4.1 Programming the PCD

To prepare the PCD, 3 steps are necessary:

Creating an online connection to the PCD
Before a connection can be made, the PG5 should "know"through which medium/cable the PCD should be accessed. This is defined in the "Online settings" of the PG5 project tree:

Here the "S-Bus USB"is selected as "Channel", as the IP configuration is not yet loaded. For being able to configure and program the PCD the option "PGU" has to be set to "Yes":
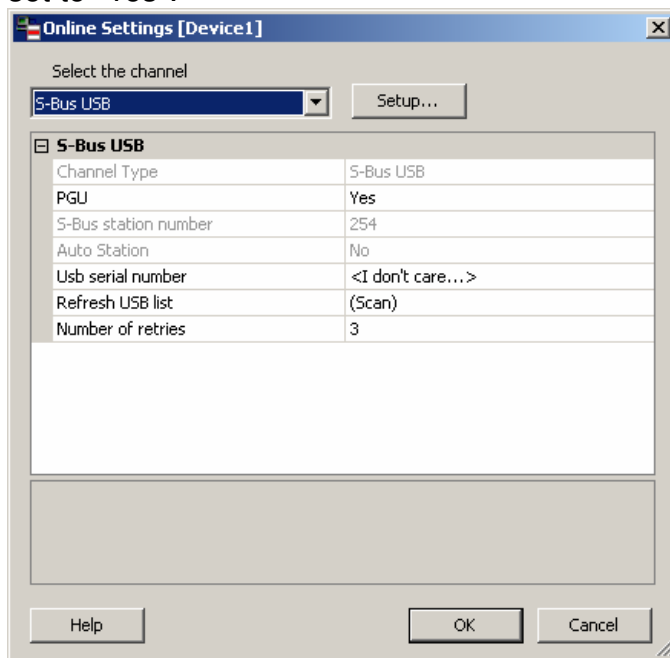
After these settings, it can be checked with the "Online Configurator" whether the communication works.
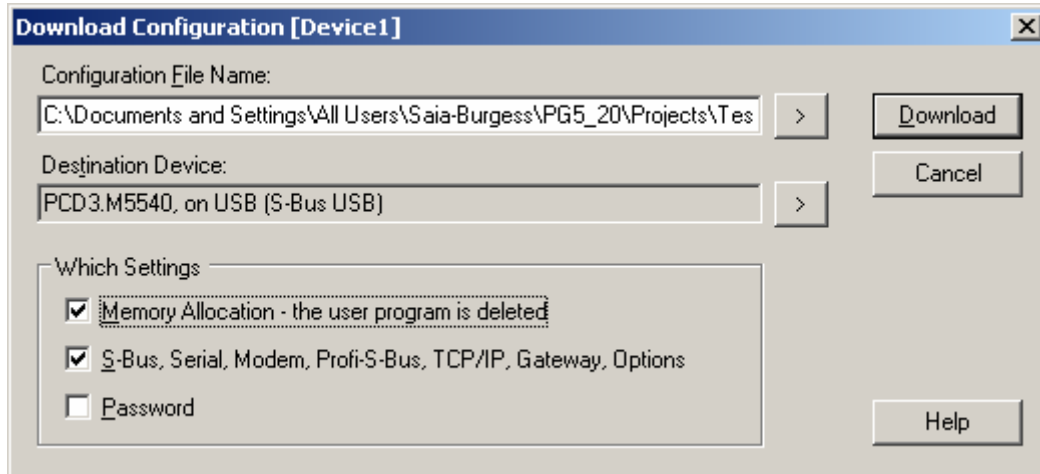
Configuring the hardware
Settings such as the IP address, usage of memory and activation of the "Run/Stop" switches of the PCD are configured using Device Configurator. The Device Configurator can be opened from PG5 project tree directly under the "Online settings".

> Please enter a not yet assigned IP address and subnet mask suitable to your network in the "Device Configurator"before you proceed further.

To load the configuration in the controller select 'Download configuration' from device configurator or from Right Click context menu in Project Tree. When asked what should be loaded on the controller, the option "Memory allocation" should also be selected during the first download in order to correctly configure the memory.

> If the exact type of the PCD is unknown, or if the existing configuration of the hardware should not be changed, the "Upload" button in the "Hardware settings" window can also be used. Consequently the existing configuration of the PCD is assumed in the PG5 project.

Loading the program on the controller
What is still missing is the programming of the PCD. For this, first of all, the programme is compiled ("built"). For this purpose, you can use the "Rebuild all" button ⊞ .
After the "build" of the programme is correctly carried out, the programme can be loaded on the PCD using the "Download programme" button ⊞ . The PCD is prepared after this step.

## 4.2 Configuring the MB panel

There is no user programme as such on the MB panel, it is only configured so that the web project data can be called from the PCD. The function for the display of the project is already integrated in the firmware (operating system). Thus, it is not necessary to load the file "ImasterSaia5_xx_xx.jar"on the PCD, so that the project can be viewed with a PCD7.D4xx panel. This file is anyway available in this project, and therefore the project can be viewed on a PC.

MB panel is configured in the Setup Menu. To enter into the setup menu press the empty area on the screen for about 3-4 seconds. The Setup menu can also be accessed by pressing configuration button on welcome screen during start-up.
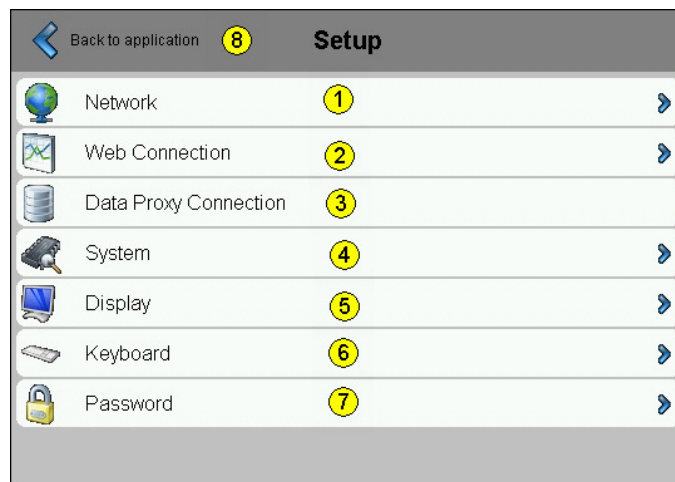
- From the "NETWORK"(1) menu the IP address of the MB panel can be set. This address must be located on the same network as the PCD and is not allowed to be used by another device (not even by the PCD itself).
- Under "Web Connection" (2) the address of the PCD as well as the html page of the web editor project should be entered.
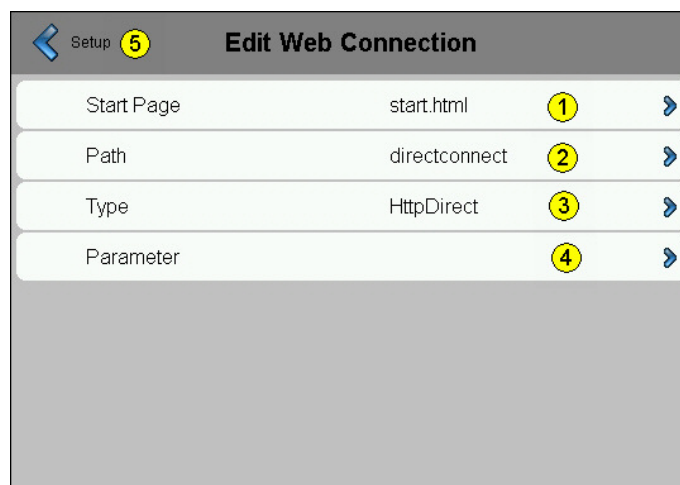
Therefore, please adapt the address of the PCD under "parameters" (4) according to your PCD configuration.:

- The name of the start page (1) in this example project is "**start.htm**" (without "l")
- For a http direct connection, the "path" (2) can be left empty
- As Type (3), select "HttpDirect"
- Change to "Parameter" (4) and configure the IP address of the PCD (172.16.1.11). The Remote port should be kept (80).

- To leave this page, click on the "Setup" button (5) and then again "Back to application" button (8) in the upper picture).

The panel is now restarted and then the web project of the PCD is displayed (given that all settings are correctly made and the PCD is connected with the MB panel).

4.3 Starting the application

After the configuration of the MB panel took place and is saved, this panel automatically tries to find the web project on the configured PCD. In case it doesn't succeed (because, for instance, the PCD was not yet programmed or due to a missing connection, etc.), the MB panel offers the possibility to get the Setup menu again and then retries to connect the PCD in an endless loop).

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Now that the project can be viewed, we turn to the creation of this application. The following pages illustrate the principles of the web editor project and the nexus between the PCD application (e.g. Fupla programme) and the web project (created in the web editor).

5 Programming the PCD

As the web application is mainly intended for the visualisation of the PCD application (PCD programme), a programme should first of all be created accordingly which can be subsequently visualised. The interface between the user programme and the web visualisation is realized over the public (global) symbols (and hence also the system and application symbols) of the PG5 project.
Special FBoxes are available for advanced methods like for instance the display of alarms or trends.

This example doesn't contain any actual application but in fact a Fupla programme that simulates values (e.g. dynamic analogue values for an illustration as trend) and processes some information for the web project (e.g. to feature clock time in the correct format):

- **Page 1: I/Os**
  Connection of some digital and analogue I/Os to alarms. Therefore the first two analogue values are compared with a maximum value for generating an over range alarm later on.
  The I/O are read by the PCD firmware (the mapping to which media is configured in the Device Configurator).
- **Page 2: ReadClock**
  Here the clock of the PCD (RTC) is exported and saved in a Register, so that these values can be displayed in the web visualisation.
  Moreover the first analogue input is copied on the first output and the output values are converted to percentage for displaying them in the Web Project.
- **Page 3: Alarming**
  The alarms for the web project are recorded on this page. More on this subject in the section "Alarming".
- **Page 4: Trending**
  The trend data for the web project are recorded on this page. More on this subject in the section "Trending".
- **Page 5: Simulation**
  This part of the programme serves to generate some values which are logged using the trending FBoxes.
- **Page 6: Heavac**
  This page contains the "7-day clock" which can be directly imported into the web project from a HVC template.
  In case you have no licence for the HLK library, you should delete this page as well as the page "10-HVCTemplate.teq" in the web editor, for that you can use this project.

> In order to use PCD media (Register, Flags, etc.) in the S-Web Editor, the symbols should always be public. To declare a symbol as public its scope is to be switched to '*Public'* in the Symbol Editor.

6 Creating the web project with the web editor

The Saia® S-Web-Editor is a simple-to-use software tool for the creation of HMI web pages.

With the S-Web-Editor, Java-based web pages are simply and efficiently created by the placing and parameterising of objects specially adapted for the PCD web server. The operation of the editor is intuitive and requires no HTML or Java programming skills.

With the integration of the S-Web-Editor in the Saia® PG5 2.0 Controls Suite and the direct access enabled with it to the public symbols and numerous other useful functions for the efficient creation of web pages, the engineering expenditure can be distinctly reduced compared to other editors.

In order to work with the Saia® S-Web-Editor, it should first of all be installed (selected during the installation of PG5 2.0) and the required licence (registered in PG5 with "Help"--> "Register Software") is to be registered.

Once the Saia® S-Web-Editor is installed and registered, one can create a new web editor file with the extension *.prj in the PG5 project by clicking the right mouse button on "New …" in the "Program files" folder in the project tree. Then the S-Web Editor automatically opens (if a file already exists, you can open the web editor by double clicking on this file). The web editor project file is not linked to the PG5 project, and the necessary files are incorporated in the user programme of the PCD with the tool "Web Builder".

In the creation of a new web editor file, the editor inserts a new folder with the name "WEB" in the PG5 project. This file contains all files specific to the web editor. By clicking on the "Build all" in the S-Web Editor, the S-Web Editor project is compiled and the generated files are copied to the (likewise created) folder "HTML" of the PG5 project. The S-Web Editor generates these files, but does not insert them in the user programme of the PCD! For this purpose, the software Saia® Web Builder is used (see next section).

In case there is not enough memory space in the PCD for storing all these files, all files located in the "HTML" folder **except the *.tcr file** can be directly copied on the Flash File system of the PCD (optional, by the use of PCD3/7.R55x or PCD3.R600 on PCD3 or a PCD2.R6000 on a PCD2.M5xxx) or on the MB panel itself.

Alternatively, the same files can be stored locally on a PC or a CE or eXP panel in the "WebPages" folder if the free software Saia® .Net WebConnect is used (also part of the Saia® Controls Suite). This device should then be used as "Proxy Server" or "Web-Gateway" for this web project.
More on this topic in the Saia® .Net WebConnect manual (if this method is used, the files also need to be copied to the MB Panel if one is used).

7 Creation of the Web Builder files

As described above, at least the file with the extension *.tcr should be loaded in the user programme of the PCD.
In order to load this *.tcr file to the right location (in a special DBX) in the PCD, this file must be inserted in a "Web Builder"file. For this purpose a new web builder file (with the extension *.wsp) is created (right-clicking on the "Programme files" folder and selecting "New …") in the PG5 project.
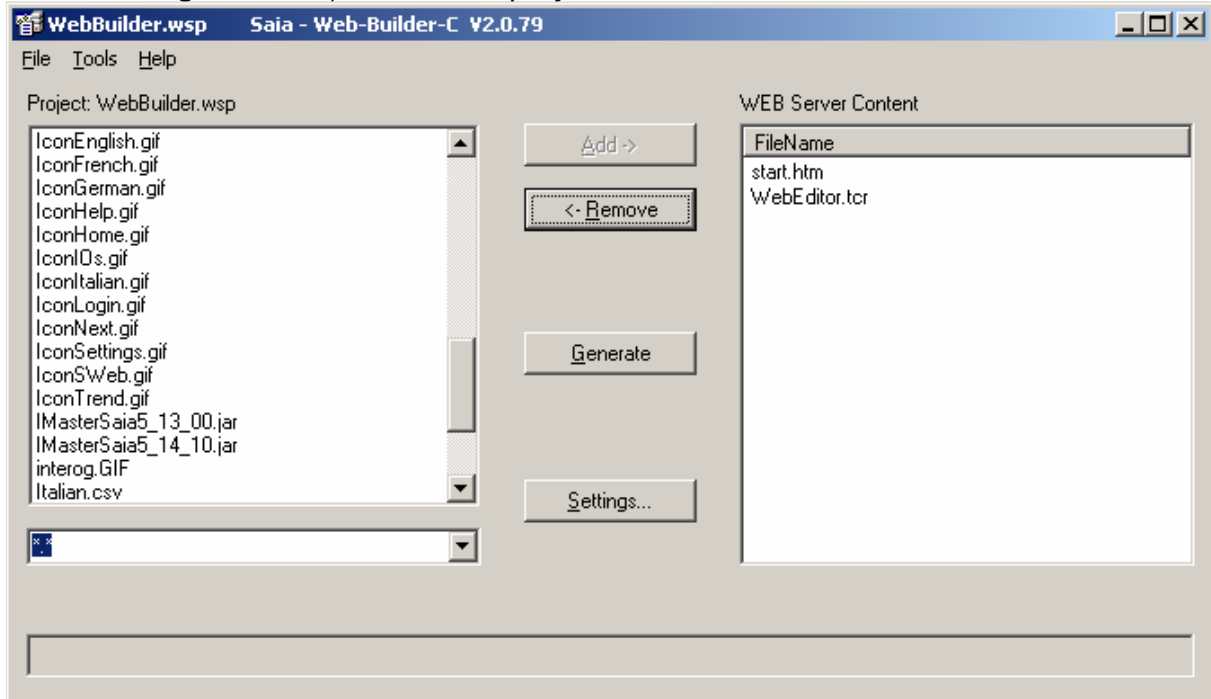
All files in the "HTML" folder of the relevant PG5 project are displayed on the left side of the web builder. Displayed on the right side are those files included in the user programme of the PCD and accordingly transferred to the PCD with a "Download programme".
Moreover, the RAM disc size of the PCD can (and should) be configured under "Settings" (32 kbyte for all PCD systems featuring a Web-Server, 5 kbyte for PCS systems).

For the display of a web editor project, in principle all existing files shown on the left side are required. It is however possible to save all files except the *.tcr file in the Flash File system of the PCD or the MB panel or on another device using WebConnect.
In order to avoid the requirement of any additional hardware (like a memory module for the Flash File system), all web editor files in this sample project are included in the web builder.

> The file "ImasterSaia5_xx_xx.jar" is only required if the project is to be viewed on a PC or an eXP panel with a web browser (Microsoft IE or Firefox ,etc.).
> Neither an MB panel (PCD7.D4xx) nor the browser of CE panels PCD7.D5xxx require the ImasterSaia5_xx_xx.jar, as the ImasterSaia file is already integrated in these devices/software.

8 The S-Web Editor project in detail

The Saia® S-Web-Editor enables to create web pages and to configure the so-called painter objects in them. Graphical web pages can be animated with the painter objects. A **painter** is a graphical object programmed in Java. All available painter objects are saved in the applet "IMaster.jar". The basic painters (e.g. description fields, graphic objects, buttons, input and output fields, etc.) have predefined features and functions which can be parameterised in the S-Web-Editor by the user. Thereby the appearance and conduct of the objects in runtime in the web browser are determined. The conduct of the objects in runtime can also be dynamically controlled via PCD resources.

The interface between the S-Web Editor project and the user programme of the PCD is created via the so-called "**PPO**" (Process Point). These correspond to the public or system symbols of the PG5 project (and can be both read and written in runtime). In addition there are also "**containers**", which can also be read and written, but are saved only locally on the panel/browser.

Templates
For facilitating the visualisation of HVC FBoxes like for instance a weekly clock timer, templates which can be directly imported into the S-Web project (comparable with the HVC objects of the HMI editor) are available.

Macros
For more complex functions like the display and management of alarm lists or trends, macros are available, which can be likewise imported into the S-Web Editor project and thus easily allow the connection of the specific FBoxes (the S-Web Editor requires the "advanced licence" for this usage).

Web editor files
The following files are found in a web editor project. While naming the files please note that the maximum length of the file names is limited to 23 characters (including the extension and the dot). This rule is valid for all files inserted in the project (or saved on the Saia file system of the PCD). Special characters like "ä", "é", Cyrillic character etc., are to be avoided.

- **Web pages (*teq files)**
  Each page of the project is saved in a *.teq file. A new page is created with the first button on the left in the button bar.
- **htm/html file**
  This file is accessed from an MB panel or other browser to load the project. Parameters specific to the web project are located in it. To create this file, click on the "HTM" button in the button bar.
  Hint: If this page has the name "start.htm" (not "html"), the PCD will return this page if no specific page is requested (e.g. http://172.16.1.11/)
- **ImasterSaia5_xx_xx.jar**
  This file is the Java applet and contains all "painters" (graphical Java objects). It does not need not be loaded on the PCD if only an MB panel is connected (but is required if a PC has to display the project).

- **tcr file**
  This file contains the formatting of the PCD media (index, flags, etc.) as well as the address information for these media which are read by the web browser. This file must be integrated in the PCD project with the tool Web Builder.
- **itq file**
  This file contains the initialisation for "containers". These are medias (similar to Registers on the PCD) which are only locally available on the panel/browser.
- **gif files (optional)**
  Images that should be displayed are to be inserted in the project as *.gif. Please note that animated *.gif are not supported by the MB Panel (at least not up to firmware 1.12.xx.
- **csv files (optional)**
  Multilingual projects can be created with the aid of *.csv files. In this case, each *.csv file contains the corresponding texts in a specific language.

Please note that *.gif images must not exceed the size of the display minus 2 pixels. The maximum size of a picture displayed by a VGA MB Panel therefore is 638*478 pixels.

8.1 Configuration of the S-Web Editor project

Basic configurations of the S-Web Editor project like the page size, which page should be displayed first, refresh rate of the values, etc., are defined in the project configuration. It is recommended to define basic settings like the page size at the beginning of the work on a new project.

The configuration is carried out under the menu "Projects"--> "Project configurations ...". For a project with a QVGA MB panel, the width and height of the pages have to be adjusted:

- For a VGA MB panel to 640*480 pixels
- For a QVGA MB panel:320 * 240 pixels

Once the initial pages like the start page and the background page are created, they can also be accordingly configured in the project configuration.

Note that the option "Encode special chars" in the 'Project-Applet advanced' tab is only allowed to be used for PCD3 and PCD2.M5xxx systems.

8.2 Text and graphic objects (basic painter objects)

The text and graphic objects of the Saia S-Web-Editor are comparable with the drawing tools of the Microsoft Word:

Whereas the initial objects do not require any explanation, the last 4 objects are briefly described:

Input/Output field (Edit box)
This field is used to edit data   1234 s

Button
Known from the Internet Explorer or other programmes ...

Bar graph
With it a progress bar or a fill level can be visualised.

Macro selector
Using this button the library of the existing templates and macros of the Saia S-Web-Editor can be accessed.

After a painter object has been used on a web page, the properties and functions of this object can be edited. To reach the corresponding input mask, you must double click the object.
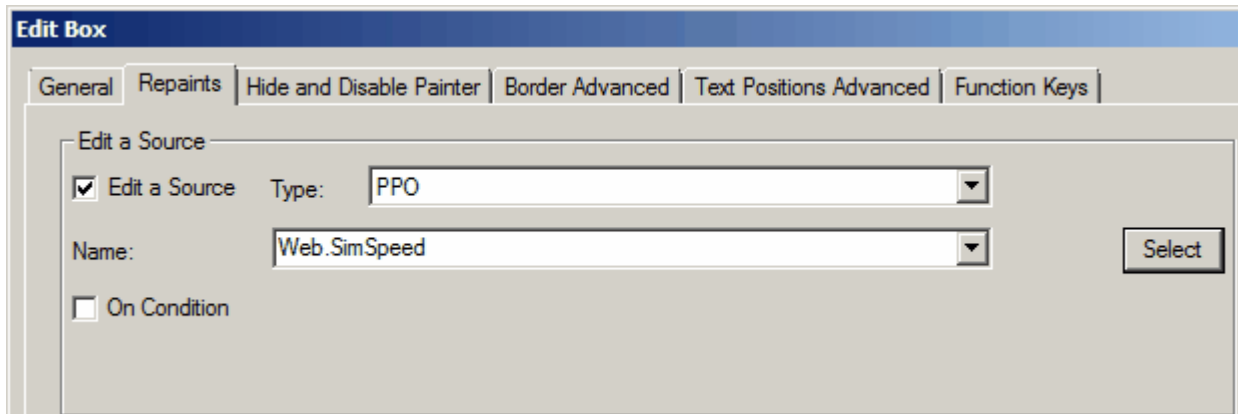
Depending on the painter object, tabs with corresponding features are available. The most frequently used are the following:

- **General**
  Basic properties like the font type and font size on this painter, size of the painter, position, colour, etc., can be defined on this tab.
  Also X, Y position offsets of objects can be dynamically changed by configuring 'Painter Position offset settings'. Assign each variable to X and Y offsets and values of these variables then can be changed during runtime.
- **Repaint**
  It can be defined on this tab what should be displayed and edited with this painter. Thereby several possibilities are available for selection:
 - **PPO**   Process Point, corresponds to a global or system symbol from PG5.

- ○ **Container**   A panel-local variable (can be a value or a text)
- ○ **String**   A static text (e.g. for labelling a button)
- ○ **HTML Tag**   Used for a multilingual project. In a *.csv
                        file, a corresponding text can be stored for each HTML
                        tag. Then this text is displayed instead of the HTML tags
                        themselves in runtime (see section "Multilingual web
                        projects") in the runtime
- ○ **File**   Used for graphics and buttons. The file to be displayed
                        must be a GIF graphic.

- **Hide and disable painter**
  It is also possible to deactivate, or to not display at all, a painter due to a
  condition. This condition is defined in this tab.
- **Border advanced**
  If a modification of for instance the colour of the painter or a container is
  required, this can be configured in this tab.
- **Action ... (for buttons)**
  Buttons usually execute a type of action (toggle or setting of values and/or
  jump to another page). The respective action is set on one of the "Action ..."
  tab.
- **Function keys (for buttons)**
  If an MB panel features F-keys, the equivalent of the button is defined here as
 F key.

8.3 Connecting PCD media to the S-Web Editor project

--> See page "04-Settings.teq"of the sample project

To display a PCD media (e.g. a Register or a Flag) or to modify its value, select as type "PPO"(Process Point) in the field "Edit a source"(in e.g. an edit box). Then you can select a symbol from the global symbols of the PG5 using the "Select" button.
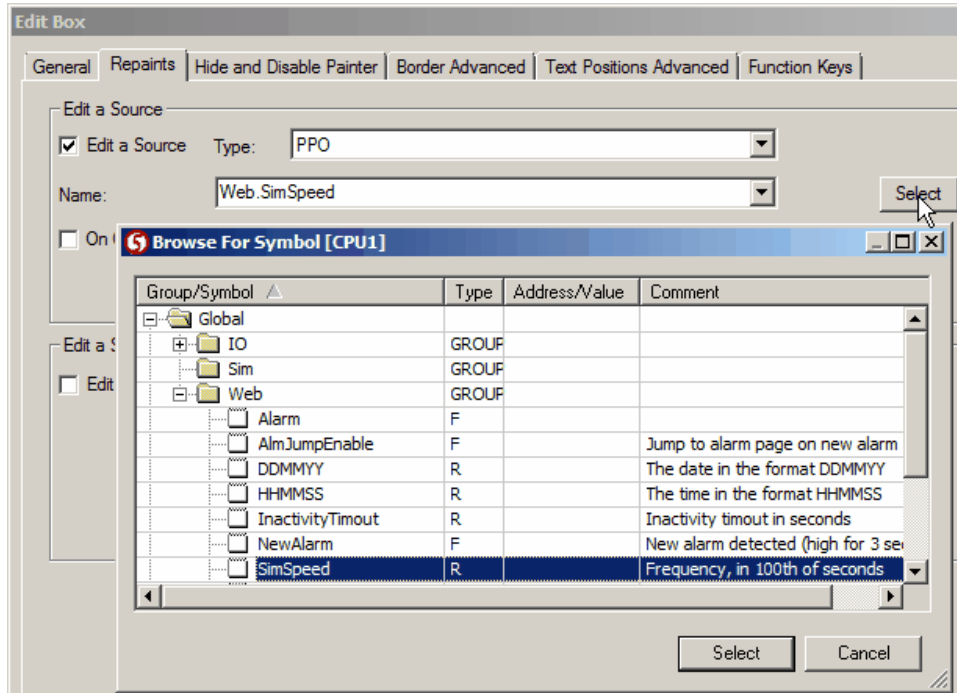
As next step, the format of PPO as well as the limits (optional) and the unit (optional) are to be configured. This is done in the "Init PPO"window:
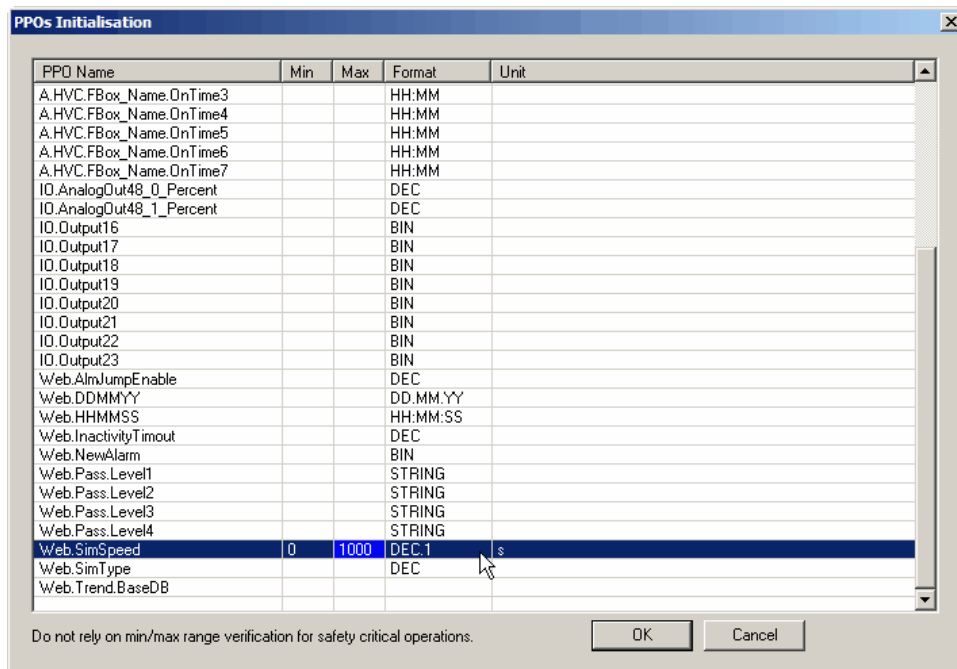
8.4 Buttons

--> See page "00-Background.teq" of the sample project

Besides the possibility to write the PCD medias (PPO), (and to obtain another appearance depending on PPOs or container), buttons can also activate page changes. Several combinations of these features can be configured in parallel.

Actions jump options
To jump from one page (view) to another of the same web project with a button, in the tab "Actions jump" select the option "**View jump**" and then in the field "View name", define an existing teq page (if the page is renamed, the jump is not automatically adapted!).
If the option "**Back button**" is selected, the jump back will be done to the last viewed page (in the process the panel remembers only the last page and not the one before the last).
To jump to a page outside the web project, the option "URL jump" is used. With it one can jump to the web project of another PCD. It doesn't constitute any problem with http direct (in this case the URL is specified with http://IP-Address/HTMLpage.htm). If the panel is connected to the MB panel via S-Bus, the connection must also be configured on the MB panel):
http://127.0.0.1/ConfiguredConnection/HTMLpage.htm (see manual of the MB panels; Note that the "ConfiguredConnection" is case sensitive!).

> Instead of the "normal" grey appearance of a button, it can be provided with a graphic (this is the case in the navigation of the sample project). To achieve that, under "Repaints", select the type "File" and then specify a graphic (with "Browse").

8.5 Container

--> See page "05-Login.teq" of the sample project

Containers are comparable with PPOs, but are located locally in the web panel and have no connection with the PCD. It is possible for example to toggle a container with a button (between 0 and 1) and to display an object (or more objects) depending on the value of this container. That way the visibility of the passwords is created on the Login page, which can be displayed with the Help button.

ID= The containers can be initialised (values which they get during the new loading of the project) in the window "Containers initialisation"

8.6 Cross-reference lists

--> See page "03-IOs.teq" of the sample project

If several painters are to be placed and configured with similar functions, the same settings are undertaken several times. To save time while doing so, the configured painter can be respectively copied and newly set.
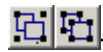
An additional reduction in effort can be achieved by grouping several painters. The group window can be opened by double clicking on the grouped painters. In its tab "Cross Ref", the respectively configured PPOs, containers or texts can be modified in a window:
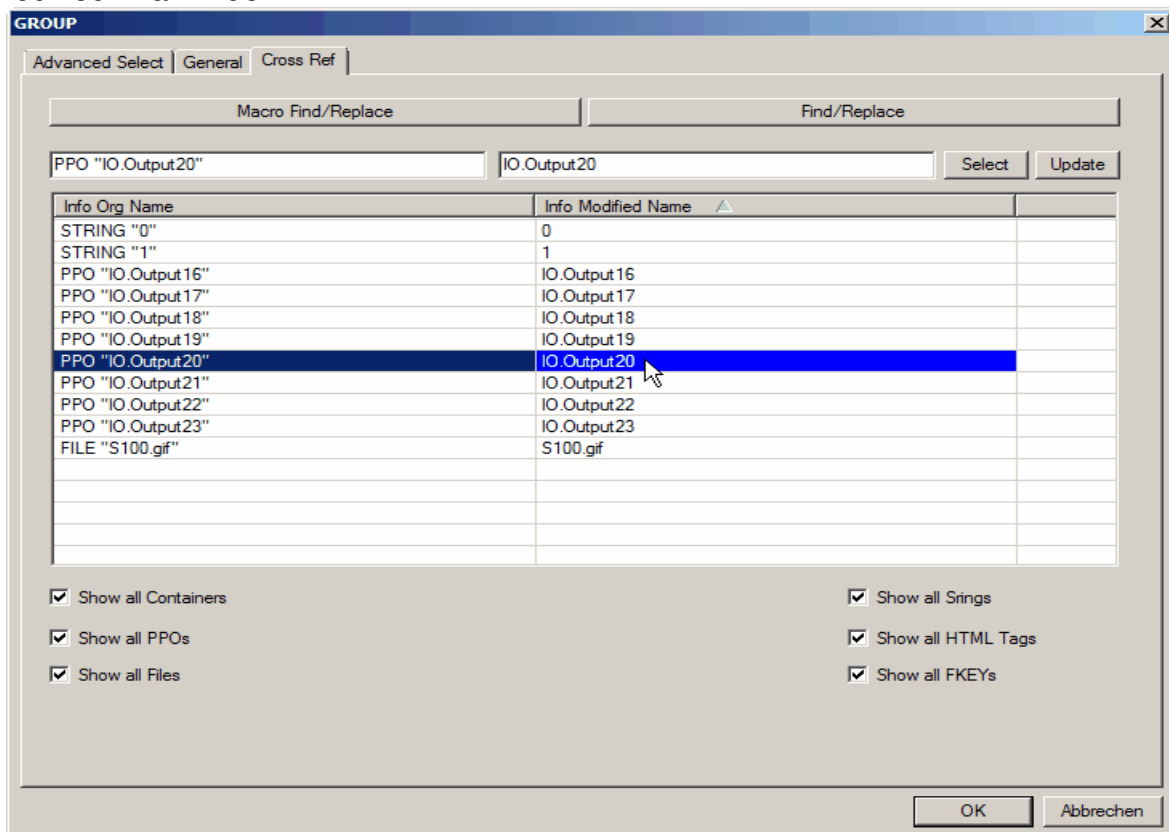

If for example the painter for the visualisation should be created on the I/O 0..8, a painter can be placed and configured for the first data point. This is doubled by copy/paste and configured. Then these painters can be grouped, and the group redoubled by copy/paste. By double clicking on this group, the "Cross Ref" tab can be opened, in which the PPO can be adapted (an "update" must be carried out in the upper edit boxes after every adaptation!).

8.7 Multilingual web projects

--> See page "02-Home.teq" of the sample project

To switch between several languages, you can work with HTML tags in combination with several CSV files. Instead of the normal "strings", the HTML tags are selected in the Repaint tab of the respective painter. During the runtime of the project, the respective translations of the HTML tags (taken from the CSV files) are then displayed. The decision, from which CSV file the texts are chosen, is determined via the special container "@LANGUAGE". This container is written using a button (the value should correspond to the name of the according CSV file).
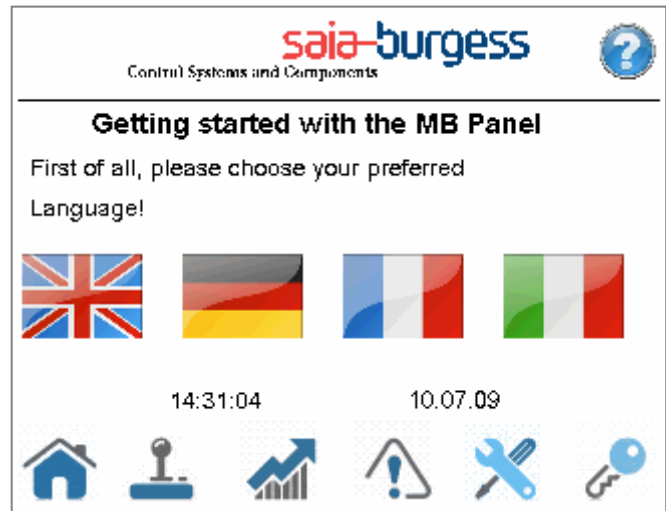
Procedure for the use of CSV files
- Select the type "HTML TAG" instead of strings in the painter to be translated.
- Generate a first CSV file using the ⬚ button (assign a suitable name, e.g. "English.csv")
- Open this file (double click). Every HTML tag corresponds to a line in the generated CSV. Thereby the HTML tag itself is first, and is separated from the translation by a semicolon (;). The part **after the semicolon** shall now be translated into the corresponding language.
- In the window "Project configuraton" (menu "Project" --> "Project configurations...") under "Advanced", activate the option "HTML parameters in csv file" and select the generated file as CSV file.

Adding a new language
- If a CSV file already is translated, this file can be copied from the project and translated to another language (always only the part after the semicolon!).
- Rename the new translated file (e.g. in "German.csv") and import it into the project with "Project" --> "Add to project" --> "File..." (set eligible file type accordingly).
- In the "Project configurations..." in the first tab under "csv files:" add the new language version with "Add".
- Place a button on one side of the project, and specify with this button the container "@LANGUAGE" with the file name of the new CSV file. (Of course, now a second button is required to choose the first language.)

8.8 Background and foreground views

--> See page "00-Background.teq" of the sample project

As some objects should be present in all the pages in most projects (e.g. the company logo or the time), a background page can be configured for every page. In this sample project it is almost always the page "00-Background.teq".
By right-clicking on a page (directly in the editor in which the painter is set) the option "Teq view configurations..." can be selected from the context menu. The background and foreground pages can be selected in this window.

The foreground pages can be configured in the same way. These are frequently used to display alarm messages (which are normally hidden, by virtue of a PPO).

> Please note that a background or foreground page must not contain a background or foreground page.

8.9 Flashing objects

--> See page "00-Background.teq" of the sample project

If an element is to attract special attention, this can be attained by the flashing of this painter. Thereby a colour change of a painter can be used, or two different images (of the same size) which can be alternatively displayed.

To announce an upcoming alarm, a button with two icons with the alarm symbol (one with white and the other with yellow background) is shown in the sample project. The two versions of the images are configured in the tab "Repaints".
The blink frequency thereby is generated by the internal container (@BLINKCO) which changes the value between 0 and 1 each time the view is refreshed, corresponding to the "refresh period" stated under "Project configurations".

The button is only shown if the PG5 symbol "Web.alarm" is not active. This flag corresponds to the output "Alarm" of the "Alarm S-Web" FBox and is configured in the tab "Hide and disable painter",.
Note that there is a second button behind the "flashing, sometimes hidden" button, which is always displayed, but without flashes.

8.10 Templates for HVC FBoxes

--> See page "10-HVCTemplate.teq" of the sample project

Whereas simple functions can be configured very quickly, the creation of pages with several functions takes more time. For this reason there are templates which enable the import of the visualisation of entire FBoxes directly into a web editor project.

Such a template is used in the page "10-HVCTemplate.teq" to display the weekly clock timer of the HVC library. The requisite for it is that the corresponding FBox has a name (because the applications symbols (A-symbols) are thereby automatically generated in the tab "System symbols", which enables it to generate a connection between the web project and Fupla).

Procedure for the insertion of an HLK template

● Provide a project-wide unique FBox name (without space and special characters) to the FBox which will be visualised. Select the FBox in Fupla page and properties window will display the "FBox properties...".
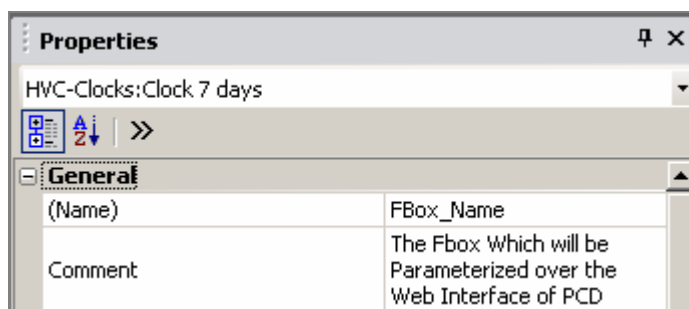

● Save the Fupla file and execute a "Rebuild all..." (the A-symbols are generated during the "Build").
● In the S-Web-Editor, open the page in which the template is to be used.
● In the menu "Library" --> "Get object from library" select the appropriate template from the folder "SWeb Templates":
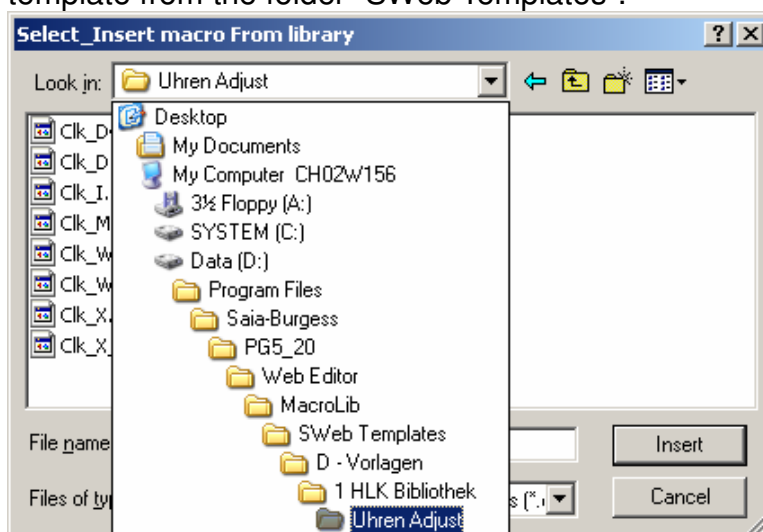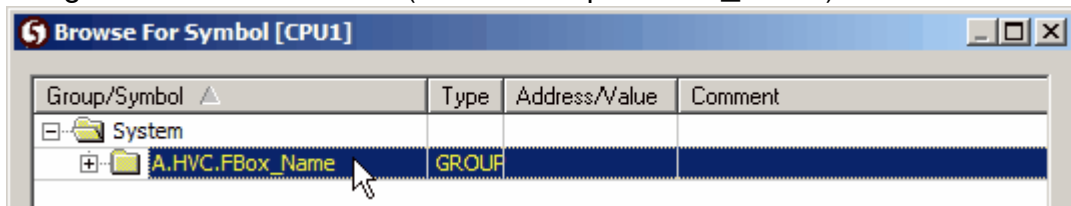

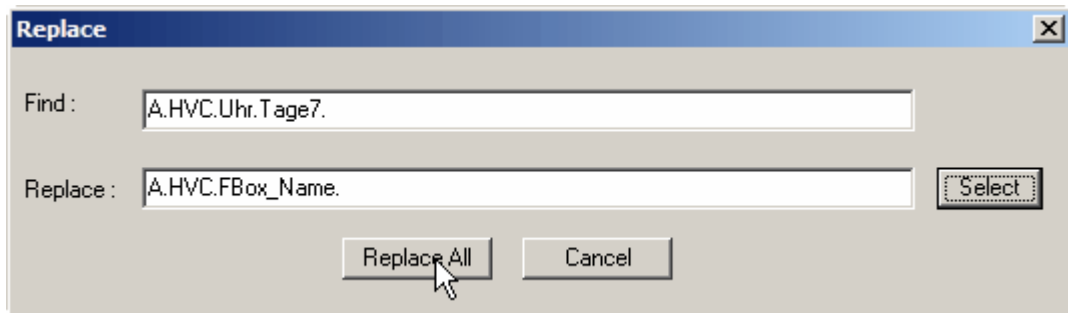For the weekly clock timer, the template "Clk_W7.esm" is to be selected.

- In the window that appears, select the function "Macro Find/Replace":
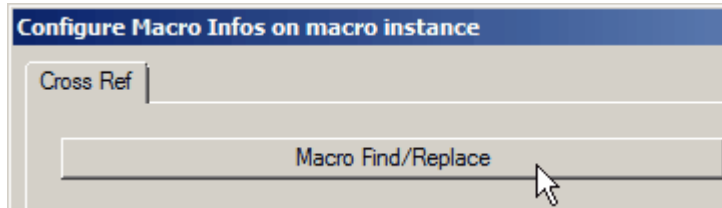
- Click the "Select" button and then select the group which contains the assigned name of the FBox (in this example: FBox_Name):

- Now the entire template can be adapted to the appropriate FBox using "Replace all".

- The procedure can be confirmed by "OK" and the template is inserted in the page. As it is a group of painters, the size can also be defined by dragging.

8.11 Advanced functions

In the following some macros are explained, which are used for functions that cannot be implemented with simple painters. In contrast to the templates, macros frequently possess own integrated functions.

 In this project macros are respectively used with HTML tags. For this reason this function should be configured. See chapter "Multilingual web projects" and follow the steps for "Procedure for the use of CSV files".

8.11.1 Pull down (or "drop down") macro

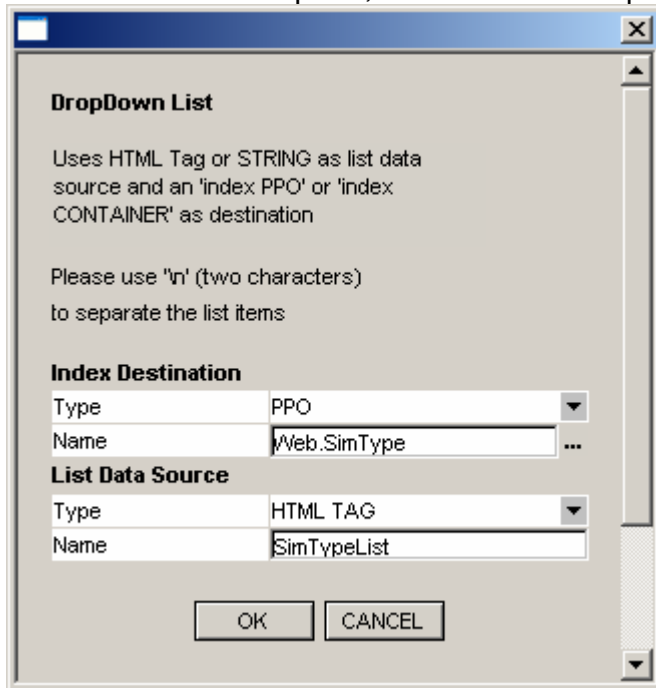-> See page "04-Settings.teq" of the sample project
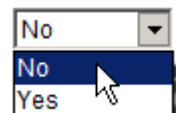
The pull down (or "drop down", according to definition) macro of the web editor offers the possibility for the user to set a numerical value (0, 1, 2,..) by selecting a meaningful text.
A speciality of this macro is the list of texts to be displayed, which should be separated with character (\n).

Procedure for the insertion of a pull down element:

- Open the teq page in which the pull down macro is to be inserted.
- From the menu "Library" select "Get object from library..." and in the folder "SaiaGeneral" browse the "DropDownList"
- Select the macro "DropList_HtmlTagList_5_xx_xx.esm".
- In the window that opens, undertake the required adaptations.

DropDown List

Uses HTML Tag or STRING as list data source and an 'index PPO' or 'index CONTAINER' as destination

Please use '\n' (two characters) to separate the list items

Index Destination

Type	PPO
Name	Web.SimType

List Data Source

Type	HTML TAG
Name	SimTypeList

OK   CANCEL

In this case, these are:
- ○ Index Destination :- Select PPO or container variable
- ○ List Data Source: - Select HTML Tag or Static String

HTML TAG   Give a meaningful name
PPO   Select the PG5 symbol to be written

- From the menu "Project", execute the function "Generate HTMLTAGS CSV file".
- In the CSV files search for the entered names for the list of the values (in this example "SimTypeList") and enter the text after the semicolon separated with the character "\n":
  SimTypeList;Sine\nLinear\nRandom
- Save and build web project, execute a "Rebuild all" in PG5 and download all relevant files on the PCD.

The same macro is also available as "static string" if no HTML tags are to be used.

8.11.2 Password management

-> See page "05-Login.teq" of the sample project

The S-Web-Editor also provides a password macro. Thereby the password entered by user is compared with a PPO (Register or text). If the entered password corresponds with the saved password on the PCD, a container with the password level that corresponds to the entered password is loaded. Using the value of this container, painters can be shown or kept hidden. In addition there is the possibility to jump directly to a teq page if a password was entered correctly.
As the user level is saved in a container, several users can display the same project on various browsers at the same time and thereby can have different password levels.

Procedure for the insertion of a password macro:

- From the menu "Library" --> select "Get object from library..." and browse in the folder "SaiaGeneral".
- Double Click on macro "PasswordDialog_UserLevel_5_xx_xx.esm". From the dialog it opens configure the password PPOs "levelxPW PPO" for all levels. These PPOs must contain the passwords in the PCD.
- Also configure the name of .teq views for Start button and Logout button click actions. For both buttons jumps can be disabled by configuring empty strings.
- For start button configure the name of .teq view where it will make jump after successful entry of password.
- For Logout Button configure the name of .teq view where it will make jump after logout.
- Close the window with "OK".
- Select the newly inserted group and "ungroup" it.
- Select the painters and resize them to the required size.
- Double click the Start button and Observe "Hide painter", start button is visible only when userlevel is greater than 1.
- If a different number of password levels other than 4 is required, the corresponding (hidden in runtime) pointer "EventP" can be either deleted or copied (adapt "levelxPasswordPPO" and the string which defines the password level to be set).
- Re-position the painters to desired locations, and group them again.
- In the "PPO initialisation window" correctly configure the type of the "levelxPasswordPPO".
- Using the container "userlevel", painters can be hidden and deactivated.
- Save and build the web project, execute a "Rebuild all" in PG5 and download all relevant files on the PCD.

8.11.3 Automatic logout

--> See page "00-Background.teq" of the sample project

To automatically reset the user level after a certain time and to jump to a defined page at the same time, a macro is also available.

Procedure for the insertion of the auto-logout macro:

- Open the teq page, ideally the background page(s), as the macro is active only if it is placed in a displayed page.
- From the menu "Library" select "Get object from library..." and in the folder "SaiaGeneral" browse "View jumps".
- Double Click the macro "EventPLogoutOntime_5_xx_xx.esm".
- In the "Teq view" property
   - ○ Adapt the name of .teq page to jump after a logout.
   - ○ Modify the "PPO_MaxValue" in the PPO, which contains the inactive period in seconds till logout.
- In the "PPO initialisation window" correctly configure the type of the "PPO_MaxValue".
- Save and build web project, execute a "Rebuild All" in PG5 and download all relevant files on the PCD.

8.11.4 Automatic jump to a certain page

--> See page "00-Background.teq" of the sample project

To automatically jump to a defined page after a certain time, the macro "EventP_ViewJump_onTimeout_5_xx_xx.esm" is available.

Procedure for the insertion of the "Teq-Jump on inactivity" macro:

- Open the teq page, ideally the background page(s), as the macro is active only if it is placed in a displayed page.
- From the menu "Library" select "Get object from library..." and in the folder "SaiaGeneral" browse "View jumps".
- Double Click the macro "EventP_ViewJump_onTimeout_5_xx_xx.esm ".
- In the configuraiton dialog
   - ○ adapt the name of teq page to jump (TEQViewVar)
   - ○ Modify the "PPO_MaxValue" in the PPO, which contains the inactivity period until jump in seconds.
- In the "PPO initialisation window" correctly configure the type of the "PPO_MaxValue".
- Save and build the web project, execute a "Rebuild All" in PG5 and download all relevant files on the PCD.

8.11.5 Trending

--> See page "07-TrendOffline.teq" of the sample project

The S-Web-Editor provides 3 methods for trending:

- **Online trending**
  Thereby the current values of a PPO are selected and visualised, while the trend is displayed in runtime. The value of this PPO is saved only locally on the panel/browser, hence no special programme is needed in the PCD.
  As the MB panel doesn't have an internal clock, the online trending cannot be used on this hardware yet.
- **Offline trending**
  In offline trending, the trend data of the data points are saved on the PCD in a ring buffer. Thus it is also possible to view values which were already recorded before the web panel was started.
  Special FBoxes (HDLog FBox family) are available for the recording of the trend data on the PCD. These FBoxes automatically generate applications symbols (A-symbols) which can be used in the web editor project for linking.
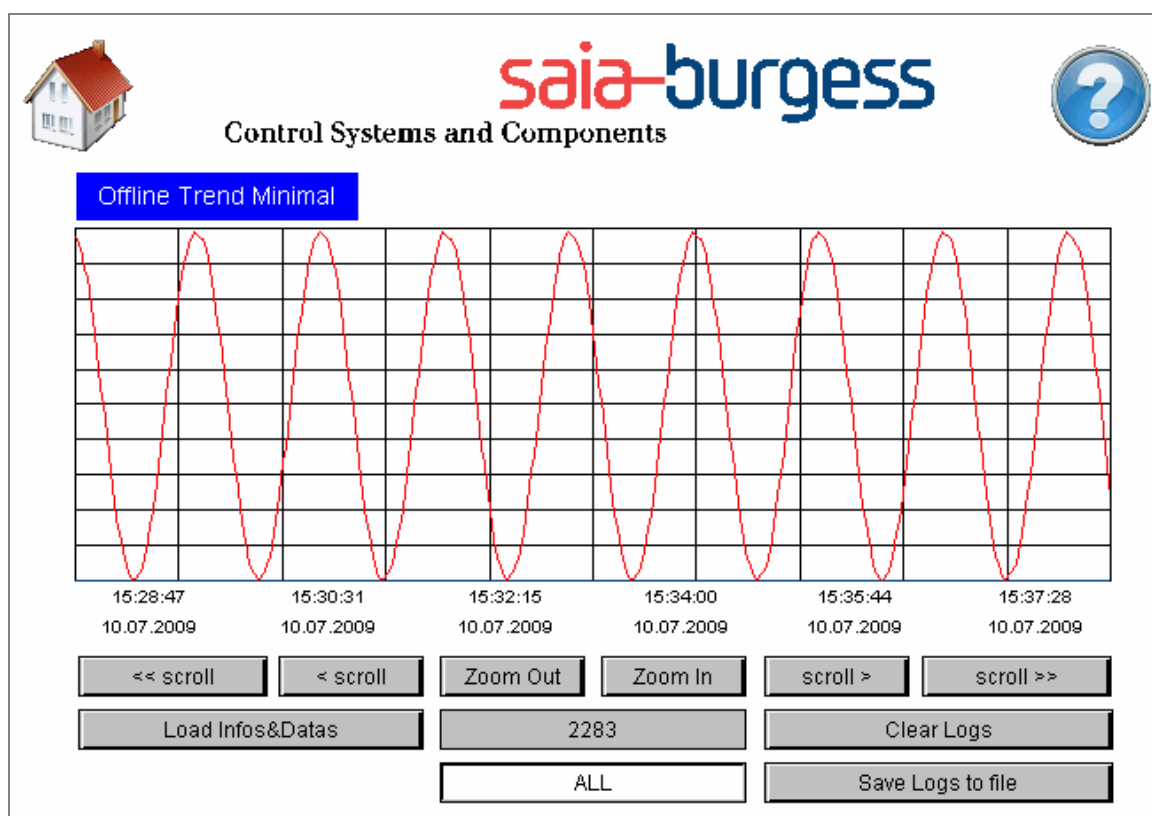

- **Loading trend from file**
  If the panel allows it, the above-mentioned trends can also be saved on the panel or the local PC in a *.csv file (comma separated file). It is possible to view such a file again as trend with the "Load trend from file" macros.
 As the MB panel family doesn't offer the possibility to save these data locally, these macros are not discussed in this example.

Procedure for the insertion of an offline trend

- In the Fupla file of the project, insert the FBox "HDLog Init". This FBox organises the essential memory for all trends on this PCD.
  - o Hand over a DB on the front side of the FBox. It is important that this DB doesn't contain a definition (the small block before the name in the symbol editor must be empty). In this example this is the DB "Trend.InitDB"
  - o At the output "DataDB", a global symbol (Register) must be linked. In this example, this is the "Web.Trend.BaseDB".
  - o In the "Adjust parameters" of the FBox (opens by double clicking the FBox) the memory requirements of all trends are defined.
    As the time stamp is also logged beside the respective value of a data point, a trend data point requires 8 bytes. So 1 kbyte memory is required to store 128 data points of a trend.
- For every trend data point, an FBox should be placed respectively (HDLog Integer Simple for Registers, HDLog Binary Simple for e.g. flags).
  - o This FBox must have a project-wide unique name (in this example, "AnalgoIn0").
  - o The data point (e.g. an index) to be recorded is linked as FBox input.
  - o A text is to be consigned to the front of the FBox. This text contains the designation of this trend track.
  - o In the "Adjust parameters", the maximum num ber of logs and conditions are defined for the recording.
    --> The "Size for logging" multiplied by 128 results in the number of data points which can be recorded.
    --> The "Minimum change of value to log" defines for which value modification of the data point a log is to be made (the setting "0.1" corresponds to the integer value 1 of the Register, as with the HVC library)
    --> The "Minimum delay between 2 logs" defines the shortest interval of the log in seconds.
    --> The "Store cyclically" parameter defines when a periodical recording is to be made (even if no value modification was registered).
- Save the Fupla and execute a "Build all" (A-symbols are generated during the build).
- In the S-Web-Editor, open the page in which the trend is to be inserted.
- From the menu "Library" select "Get object from library..." and in the folder "SaiaTrendMacro" browse and select a suitable macro (e.g. "OfflineTrendMinimal_5_xx_xx.esm ").
- Insert and place the macro with "OK".
- With a double click open the "GROUP" window and open the tab "Advanced select".
- Select (double click) the painter "…Macro_Offline_Trend__Repaint:...".
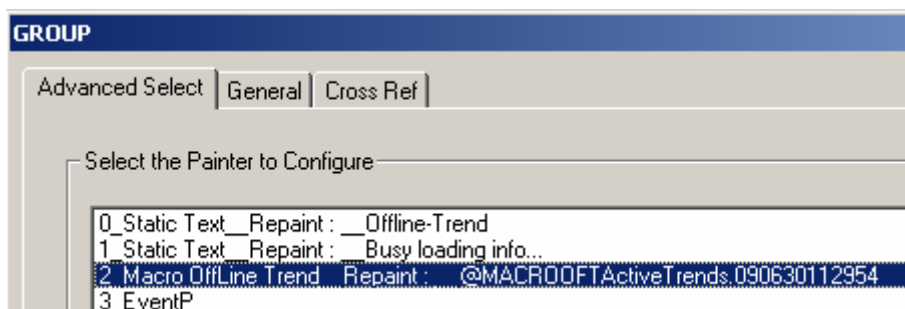
- In the window "Macro offline trend" select the tab "Macro offline trend". The trend tracks are configured in this window:
  - The "Trend's PPO name" corresponds to the names of the FBox "Integer simple" in this example A.HDLog.AnalogOut1 (in which "AnalogOut1" is the name of the FBox).
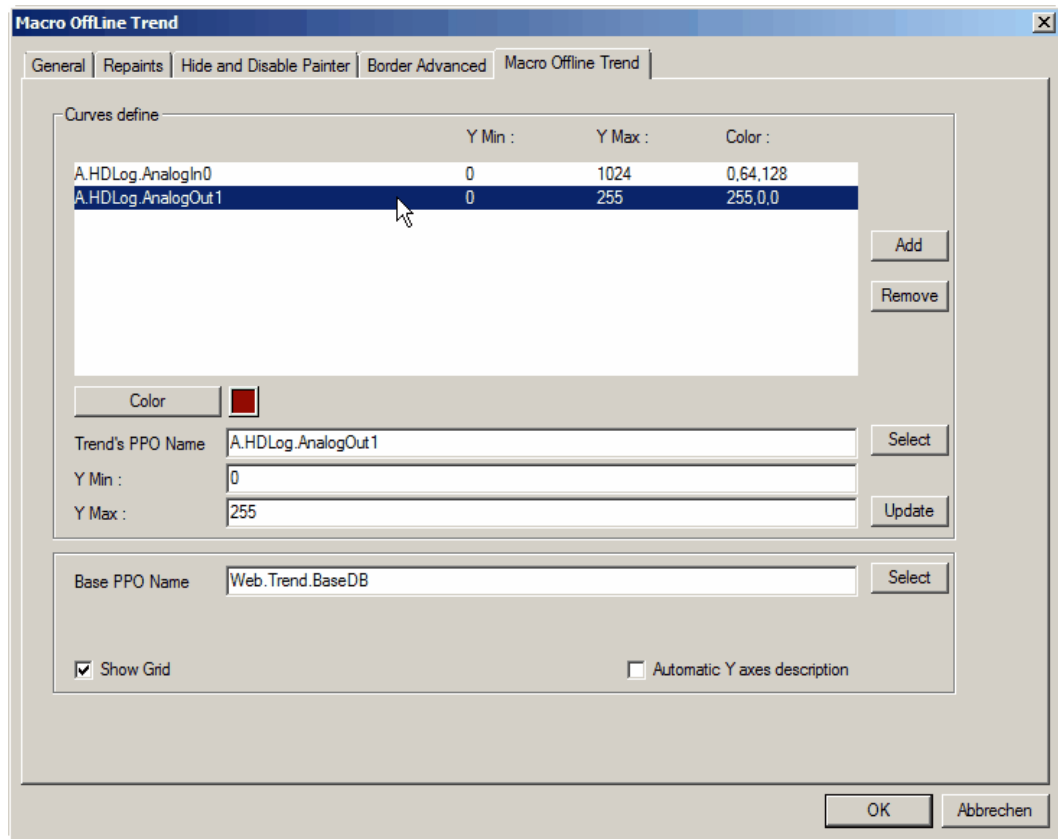

  - The "Base PPO name" corresponds to the output "DateDB" of the FBox "HD Log Init".
  - The "Y min" and "Y max" serves the calculation of the Y axis of the trend.
  - With the "Colour" button the colour of the trend mark can be defined.
- After the above settings have been made, this trend mark is taken into the above list with the "Add" button (in case of modifications, a selection has to be first made in the upper part of the window, then the modification are to be entered and stored with the "Update" button).
- Close the window with "OK".
- In the "PPO initialisation window" correctly configure the type of the PPOs "A.HDLog.FBoxName".
- Save and build the web project, executed a "Rebuild All" in PG5 and download all relevant files on the PCD.

> During the runtime of the web project the button "Load Infos&Data" must be operated for offline trends, for that the trend data are loaded from the PCD (thereby a progress bar appears). Moreover the number of the logs is displayed (right of the button "Load info&data").

8.11.6 Alarming

The Saia S-Web alarming functionality provides the display of alarms. Each alarm can be confirmed and has two time stamps (appear and disappear). The S-Web-Editor basically offers two alarming macros:
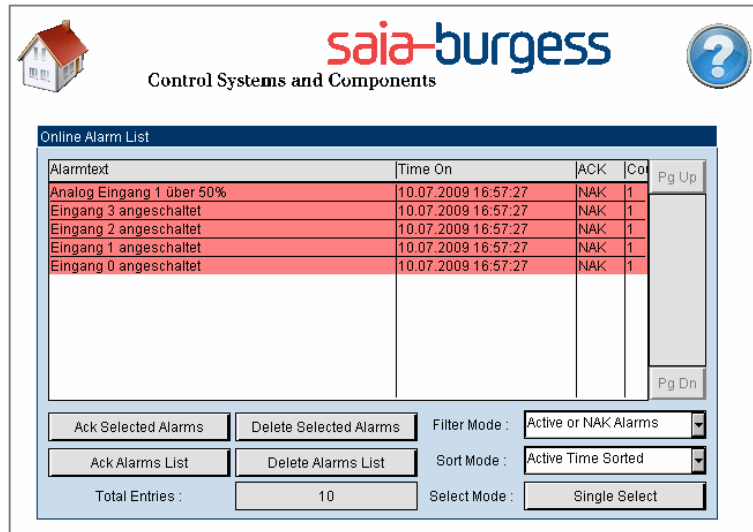
- **Online alarm list**
  In the alarm list, a line is reserved for each alarm. In this line, the alarm is shown with:
  - time stamps of the last appearance and disappearance,
  - the present status
    Active and confirmed (ACK)
    Active and not confirmed (NAK)
  - with a counter which displays how frequently this alarm has occurred.
- **Offline alarm list**
  In the offline alarm list, every new alarm is specified in a new line (with the same status as above, but without counter) and can for instance be chronologically sorted.

The alarming function must be supported by the PCD firmware (PCD operating system), as the alarm lists are managed in the PCD.

In this example, the configuration of an online alarming macro is presented.

Procedure for the insertion of an online alarming
- In the Fupla of the project, insert the FBox "Alarm SWeb Init" and configure it. There it can be determined whether it is possible to delete alarms directly from the user programme of the PCD or whether the confirmation of the alarms is used. Moreover the total number of the various alarms can be defined, as well as the length of the history (for the offline alarming).
- Insert an alarm FBox (e.g. "10 alarm"). The alarms are registered during the running time with this FBox. Here the index of the first alarm is to be consigned to the front of the FBox (beginning with 1, so the 2nd FBox obtains the index 11 after a "10 Alarm" FBox).
- Save Fupla and execute a "Build all" (for that the A-symbols are generated).
- In the S-Web-Editor open the page in which the alarm list is to be inserted.
- From the menu "Library" select "Get object from library..." and in the folder "SaiaAlarmingMacro" browse and select a suitable macro (e.g. "MacroAlarmingDefOnline_5_xx_0.esm ").
- Insert and place the macro with "OK".
- With a double click open the "GROUP" window and open the tab "Advanced select".

● Open by double clicking the painter "…_Macro_DefOnlineAlarm__Repaint...".
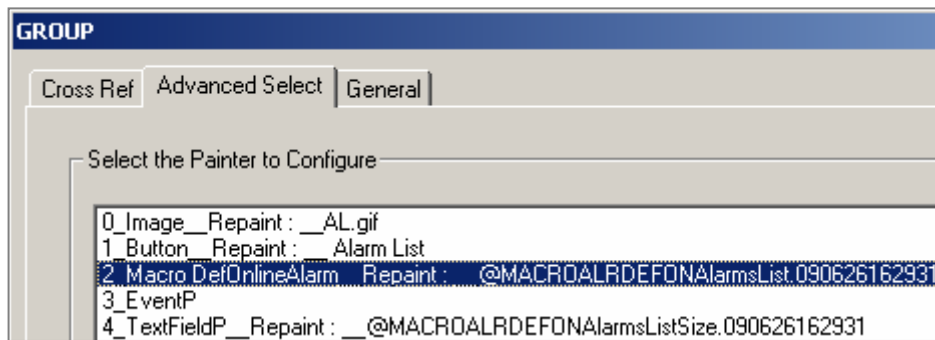
● The properties of the macros are configured in the window "Macro DefOnlineAlarm" in the tab "Macro alarming":
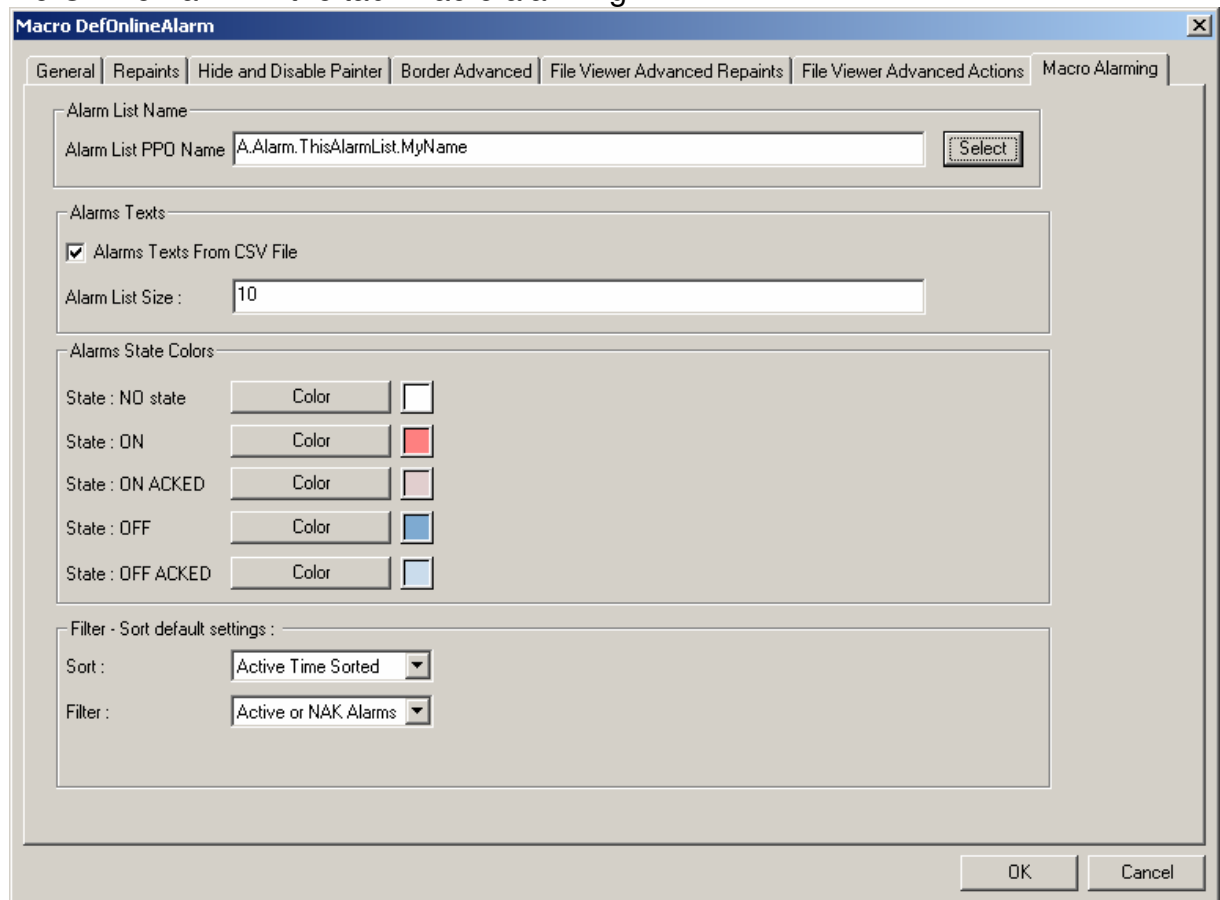
The name of the alarm list can be selected using the "Select" button from the symbols of the symbol editor. There the text (MyName) must be selected in the group "A.Alarm.ThisAlarmList" respectively.

● To display the texts multilingually, the option "Alarm texts from CSV file" must be activated (if this option is not to be used, the FBox "Alarm PCD Init" should have been used in the Fupla).
  ○ The "Alarm list size" is used to generate an adequate amount of texts with a "Generate HTML TAG CSV file".
● After the settings have been undertaken, close the window with "OK".
● In the "PPO initialisation window", configure the type of the PPO "A.Alarm.ThisAlarmList.MyName" as STRING.
● In the menu "Project" execute the function "Generate HTML TAG CSV file".
● In the *.csv files, enter the correct alarm texts:

A.Alarm.ThisAlarmList.MyName_2;Input 1 switched on
A.Alarm.ThisAlarmList.MyName_1; Input 0 switched on

...
- Save and build the web project, execute a "Rebuild all" in PG5 and download all relevant files on the PCD.

Modifying column width in alarming macro

In case the specified width of the columns in the alarming macro is visually not fitting, these widths can also be modified.

- In the S-Web-Editor open the page with the alarming macro
- Double click the alarming macro, so that the window "GROUP" opens.
- Select the tab "Cross Ref". In the cross reference list select entry "STRING "#sp;....."".
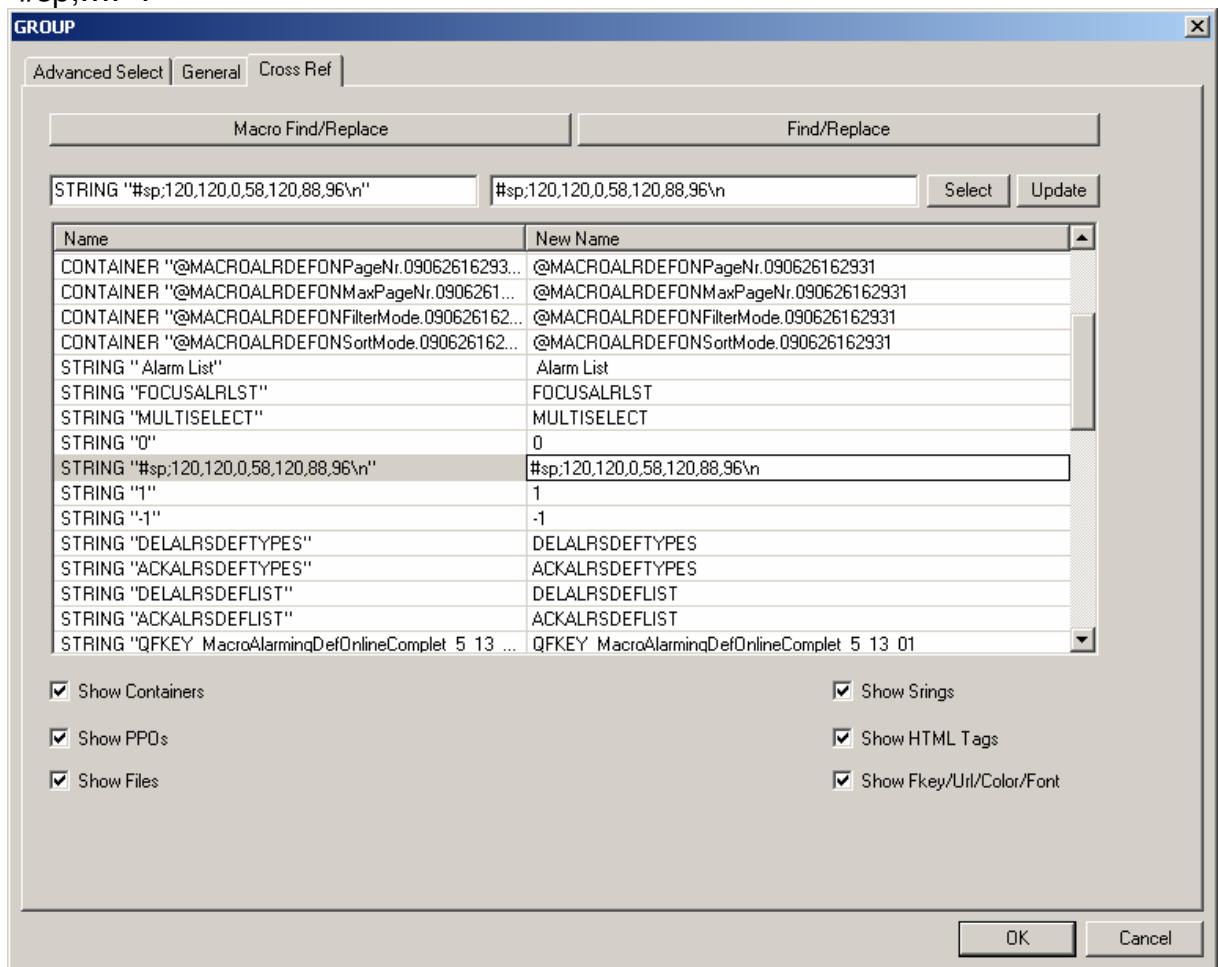
The start position of the individual columns are defined in this string (in the order: **StateColour, ID, Alarm text, Time on, Time off, ACK/NAK, Counter**).

- Adjust column width. The numerical values correspond to the percentage of the entire width, according to which the column is to begin. If a column is to be hidden, the value "120" is to be entered.
So if the first two values are "120", the columns "StatusColour" and "Alarm ID" are not displayed. The column "Alarm text" starts at the beginning (with 0% of the width), followed by "Time on" with 58% of the width etc.

9 References

Topic	Document	No.
S-Web system	Flyer Saia® Web Panels with Micro-Browser Technology	26/435 E7
MB panel configuration	Manual PCD7.D4xx	26/851 E2
S-Web-Editor	Technical Information Saia® S-Web-Editor	26/453 E2
WebConnect	Manual Saia®.Net & Web-Connect	26/800 E3
Macros	Online Help – Saia® S-Web-Editor	-
Diverse	Saia® FAQ Manager www.sbc-support.ch/faq	-

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