# Quick Instruction Guide

## Concept for these instructions

A FUPLA timer program (part of the "Boiler"-Program out of the Basic-Workshop) that has already been created will act as a data supply for this "HMI quick start". Thus, here are some words of explanation.

The FUPLA-Program "Timerswitch" turns a flag called "ClkContact" on or off at a certain time every day. When the "ClkContact" is on or off, you can specify "OnTime" and "OffTime" through the register. For example, on at 7pm, and off at 6am.

Additionally, it is also possible to switch from a timer operation to a manual operation "ManualAutom" using a PCD input (I 0), and then switch on or off the "ClkContact"-flag per PCD input "ManualOnOff" (I 1)

## Program "Timerswitch.FUP"

The solution takes place in one particular FUPLA page.
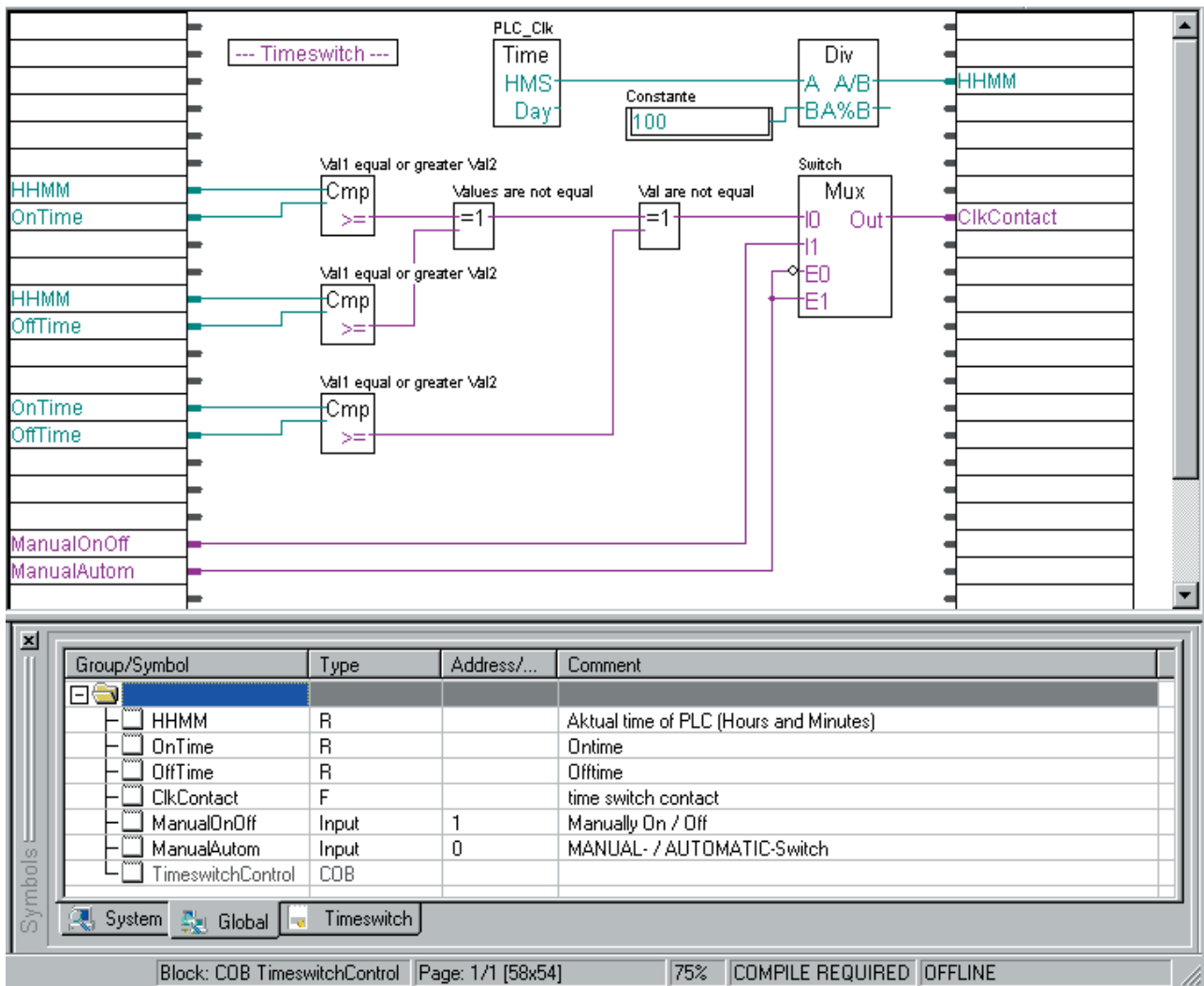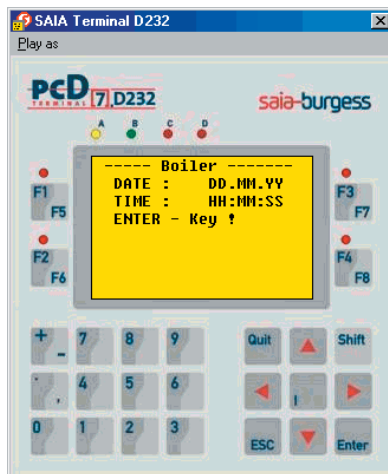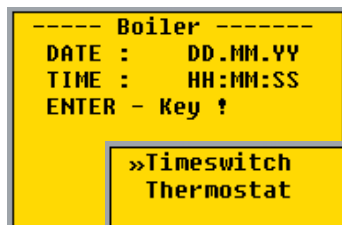


[Fig. 1]

Where you will find this PG5 project as zip file and how this is installed on your PC is described in the appendix of this Guide.
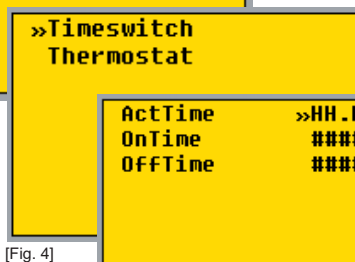
# Quick Instruction Guide
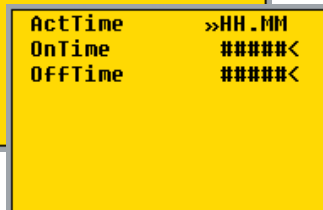
## HMI-Editor
up from HMI V1.3
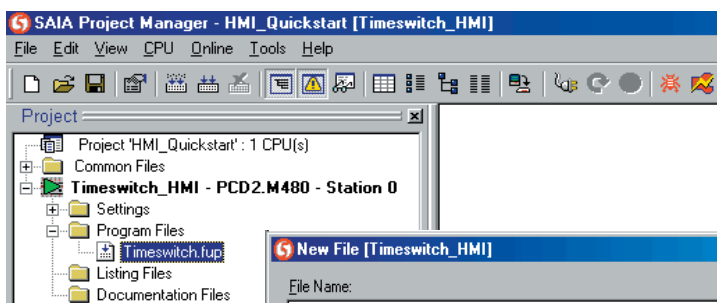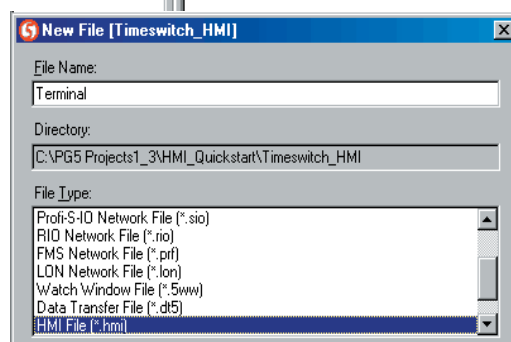


[Fig. 2]



[Fig. 3]

[Fig. 4]

[Fig. 5]



[Fig. 6]

[Fig. 7]

## Our Task

The FUPLA program "Timerswitch" (Fig. 1) should now be supplemented with a HMI program, in order that the current time and the ON- and OFF-circuit times (Fig. 3-5) per terminal PCD7.D232 (Fig. 2) can be inputted.

In the attachment to this report, you will find where the finished FUPLA program "Timerswitch" can be obtained.

## Preparation

We will approach the situation as follows:

1) The terminal is connected to the RS232 serial interface / Port 1 of the PCD.
(See in attachment or in Chapter 10 of Handbook 26/746 under "Interface Connection cables")

2) You have already started the PG5, and now you will select from the following menu entries in the Project Manager menu "**File** -> **Restore** -> (Savedirectory) -> **Project HMI-Quick Guide**".

In doing so, the whole project with both CPU's "Timerswitch" and "Timerswitch_with_HMI" is saved in the computer's hard drive, and is opened in PG5.

Using the right mouse button and Select from Properties, please name the CPU's "Timerswitch" to "Timerswitch_HMI".
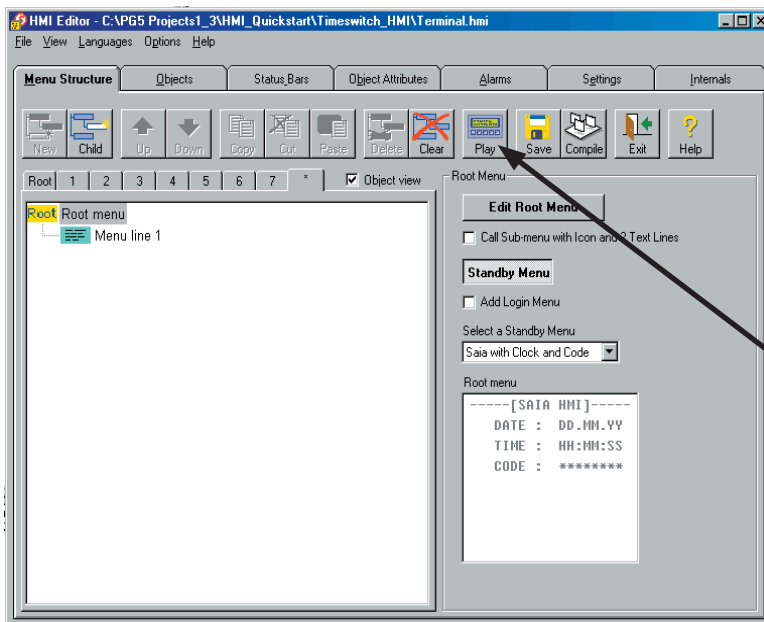
Important:
Do not forget to adjust the CPU's settings on your computer accordingly!

3) Open up a new file type (.HMI) (Fig. 7) called "Terminal" in the "Timer_HMI" CPU, which is subsequently located in the HMI Editor (Fig. 8) .

# Quick Instruction Guide

## Settings Tab



[Fig. 8]

Because the HMI editor is used for various non intelligent SAIA terminals, the PCD7.D232 is given as the editor's first setting.
Click on [Settings] and select PCD7.D232 from Terminal Type. Please confirm the following questions with "Yes".

You can check if you have selected the correct device, by changing to [Menu Structure] and pressing the <Play> button. [Fig. 8]

If everything works, you should see the terminal on the screen (Fig.2). If that is not the case, check the previous steps.
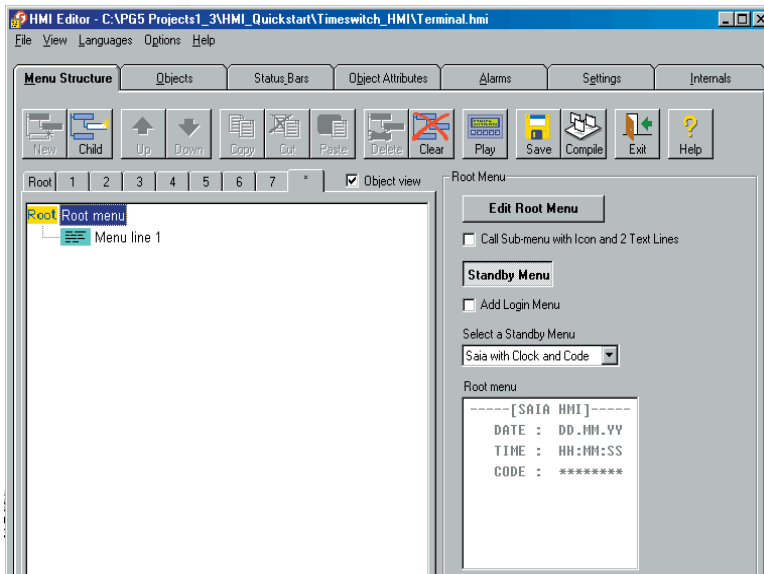
Go back to [Settings].
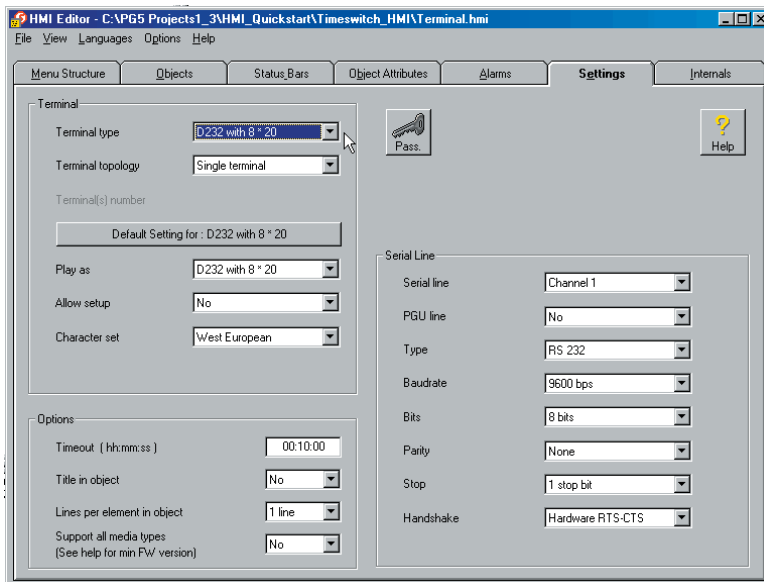


[Fig. 9]

Check the fields based on Fig. 9.
All communication-relevant parameters are defined in this field.

## Menu Structure


[Fig. 10]

First of all, we configure the "Standby menu" (1st terminal screen page after the PCD start).

Function description:
As soon as the terminal is activated, and the function test has been successfully executed, the terminal displays its start-up screen.

If a menu has been loaded in the PCD already created with the HMI Menu Editor, the "Standby Menu" is displayed (unless the PCD is located in RUN).

The content of the currently selected "Standby Menu" is displayed below right in the HMI Editor (Fig. 10).
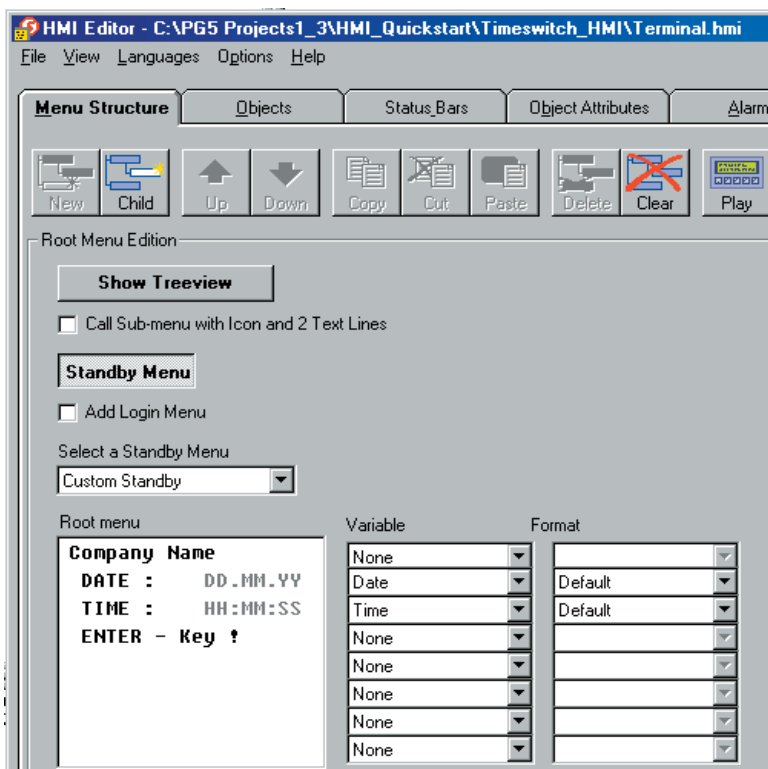

[Fig. 11]

If you would also like to change the display of this "Standby Menu", click on the button labelled <Edit Root Menu> (Fig. 11).

In the "Root Menu Edition" field, various displays in the selection field "Select a standby menu" can be chosen.

The "Customer Standby" selection enables you to interchange entries line-by-line from both Variable and Format columns beside the larger input field, which is Root Menu.

Free text is also possible in the "Root Menu" field.
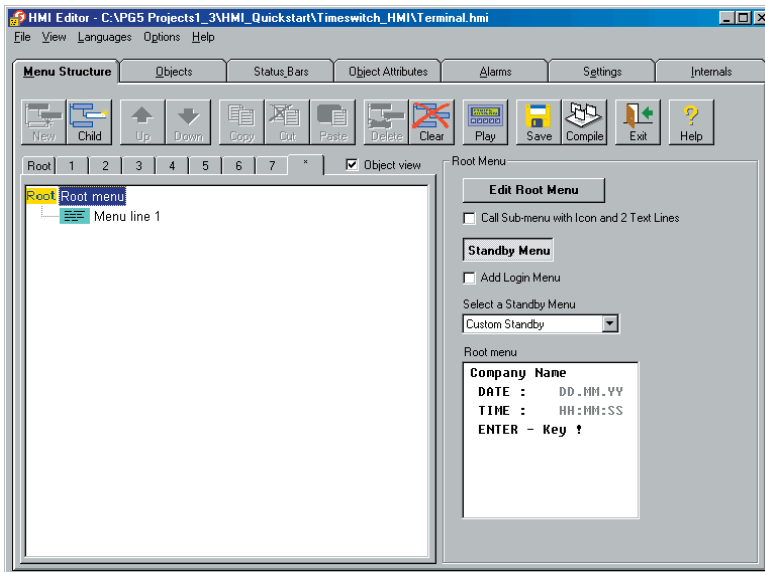In order to use this facility, select "None" from the corresponding line in the Variable column.

Edit the fields as shown in Fig. 11.

You go back to the Menu Structure via the <Show – Treeview> button.

## Defining the Menu Structure



[Fig. 12]

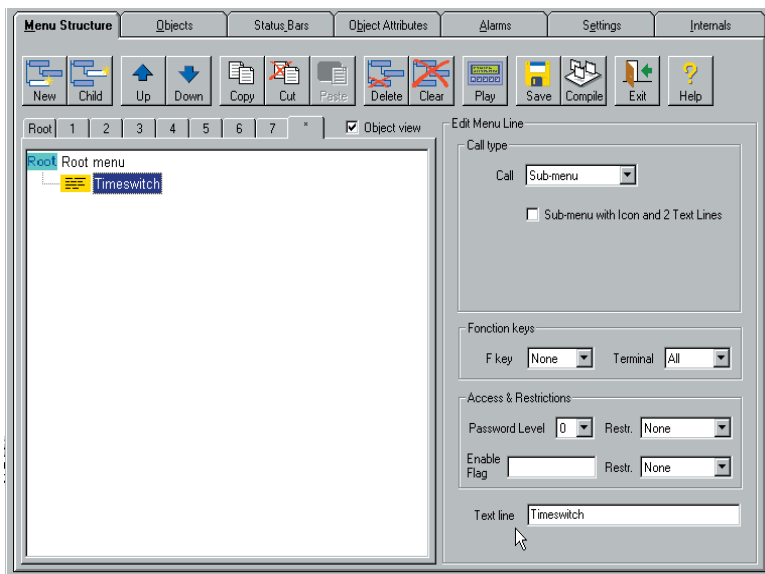We have shown the following starting position in Fig. 12.
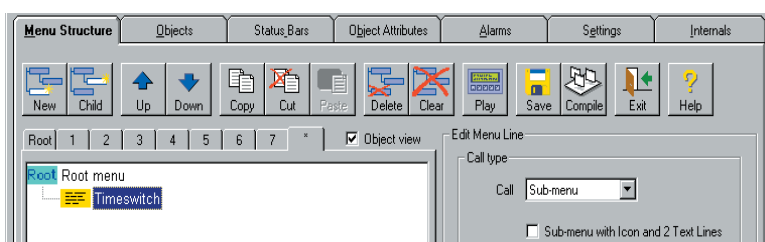
Below right the "Root Menu" can be seen (Standby Menu).



[Fig. 13]

As soon as the "Menu line 1" entry is clicked, the properties of this line appear on the right side of actual window.

In the field "Text Line", we enter the word „Timerswitch", and confirm it with the „Enter" key.
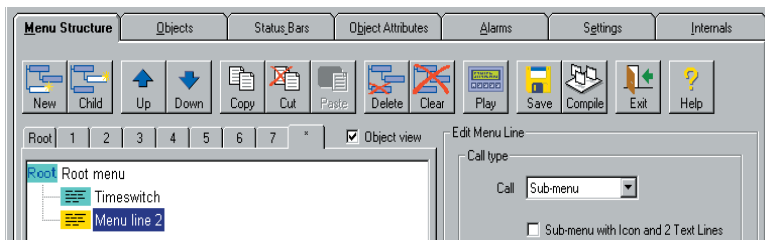


[Fig. 14]

Now we have entered the first menu item.

# Quick Instruction Guide
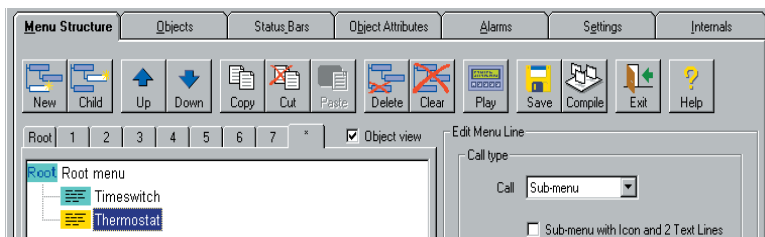
## HMI-Editor
up from HMI V1.3



[Fig. 15]

For the purpose of viewing, we will add to our "Menu" the button <New> with a new menu item for further expansion.

A further "Menu line.." appears.

We will call this menu entry "Thermostat" (Fig. 16) in the same way as previously described.



[Fig. 16]

Remarks:
If you would like to insert another menu structure under the current "Timerswitch" menu item, apply the <Child> button (maximum 8 levels are possible from the root seen here).

Note that the description of adding a line just now has nothing to do with the actual display and entry of values, but only with the menu structure. Displays and value entries will be described later on.

### Review

We have:
- specified and configured a terminal.
- specified a "Standby Menu" or also a "Root Menu" (first display screen), and possibly made adjustments.
- created first menu using the "Timerswitch" and "Thermostat" selection lines.

## Creation of objects

A menu line is what is meant by an object (so in our case the menu item "Timerswitch"), which is subordinate to a terminal page, which can accept up to 20 display and entry lines or further submenus. These lines are called "Elements" in the HMI Editor.
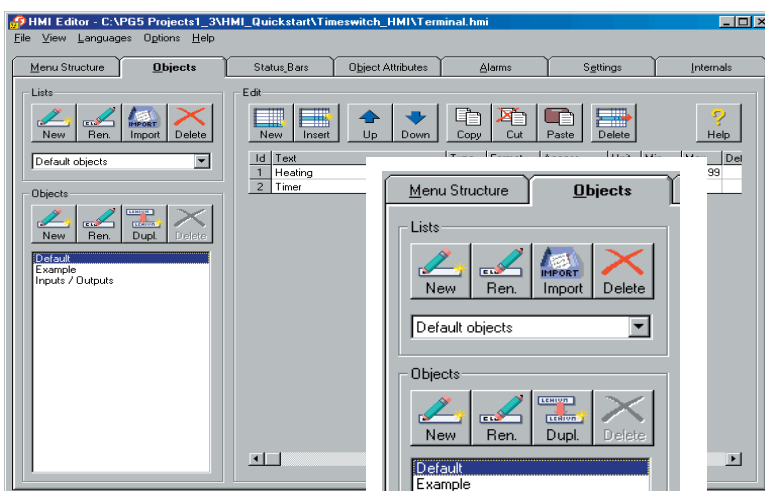


[Fig. 17]



[Fig. 18]

### Procedure

Change to the Objects tab. (Fig. 17)

You see pre-defined objects displayed in the lower field, which could be applied. These are assigned to a list called "Default Objects" (Fig. 18)

We want to create a separate list with the timerswitch and thermostat objects. So we have a clean overview for our project "Boiler" from the "Basic workshop".

Why Project Boiler?
We have already spoken about a timerswitch at the beginning of this guide !
This is a component of the "Boiler" exercise from the "Basic-Workshop" (Murten, Switzerland), which among other things, is composed of the FUPLA pages "Timerswitch" and "Thermostat". In order to give you an understanding of the HMI's working methods, we will expand the HMI program in the "Thermostat" menu item to show you how it would look with an extra menu item.  In this guide we will put one's mind on the "Timerswitch".

If you like, you can add "thermostat"-related data to the project. In this way, this guideline stays as short as possible, and still shows a menu with sufficient selection on the terminal display screen.
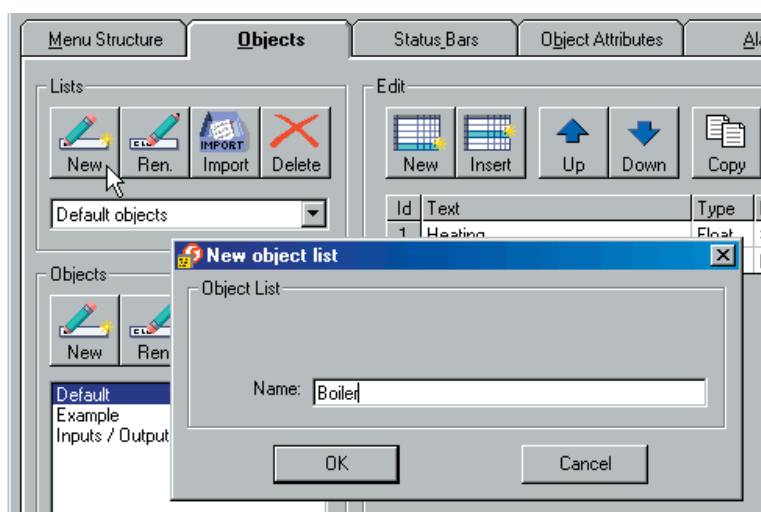


Click on the "New" button in the framed lists field in order to compile a new list called "Boiler" (Fig. 19)
As you may now observe, we get an empty "Object List".

[Fig. 19]
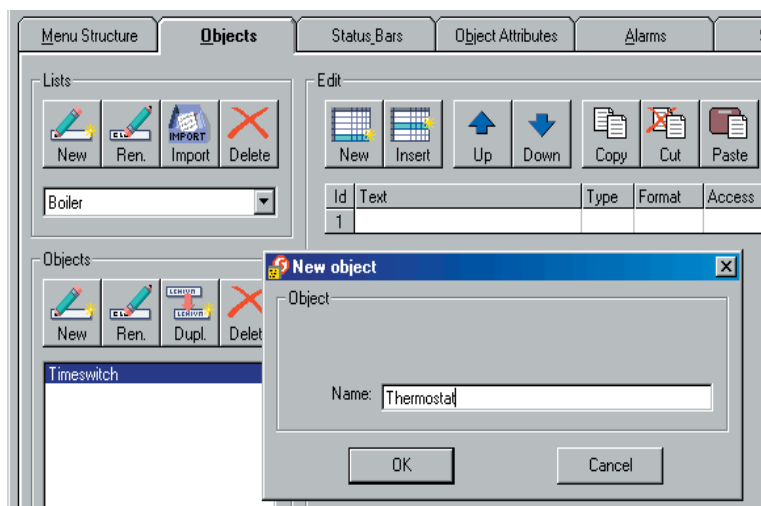


Now we define the "Timerswitch" object and then the "Thermostat" with the "New" button in the framed "Objects" field. (Fig. 20)

[Fig. 20]

At the latest now, storage would be advisable.
You will find the button for this under the TAB [Menu Structure].
Further facilities: Window menu under **File** -> **Save** or with the <CTRL> + <S> shortcut.

# Quick Instruction Guide

As discussed above, we will put one's mind on the "Timerswitch" menu item.

Right from the object list is a large framed field called "Edit". Control buttons are within its scope and a table with empty lines are to be seen. A separate line in this table is called "Elements". The displayed table represents the content in the "Objects" list of the selected object, and thus the content of the terminal display screen.

With the help of the overlying buttons, the table can be extended to 20 lines or elements. An element consists of assembled "Object Attributes" as well as Properties. Such attributes have already been defined. You can view Fig 21 for an example of "Object Attributes".

Before we use the existing "Object Attributes" to create elements, we want to see one of these first, and if necessary, add to our "Timerswitch".

## Creation of Object Attributes

An element (Terminal line) consists of assembled "Objects Attributes", means properties. Such an "attribute" (property) can, for example, be **Text** and/or a **PCD resource**. In order to understand the below mentioned better, we set an imaginary screen line as it should appear. The turn-on time for the timer function should be entered. For example: "Turn-on time: 15.30".

So that an incorrect entry cannot be made, a field monitoring from 0 to 2359 should be available, corresponding to 24 hours. HMI always processes numbers in INTEGER format (also called whole numbers) during entry.

The concept of the HMI editor is not only the fastest figures of terminal display lines, but also to facilitate efficient assembly of display lines for following projects. Hence the idea of assembling attributes in different lists like a construction kit system. To create a list, the standard text is included, and other formats are made available. A further list can include possible field monitoring.

As you can see, your HMI project is developing a small library of texts, controlled entry values etc. Should values for example (e.g. PCD register) can not be amended by any person at the terminal, they can be locked with user rights (see HMI Editor's Handbook or corresponding help pages).
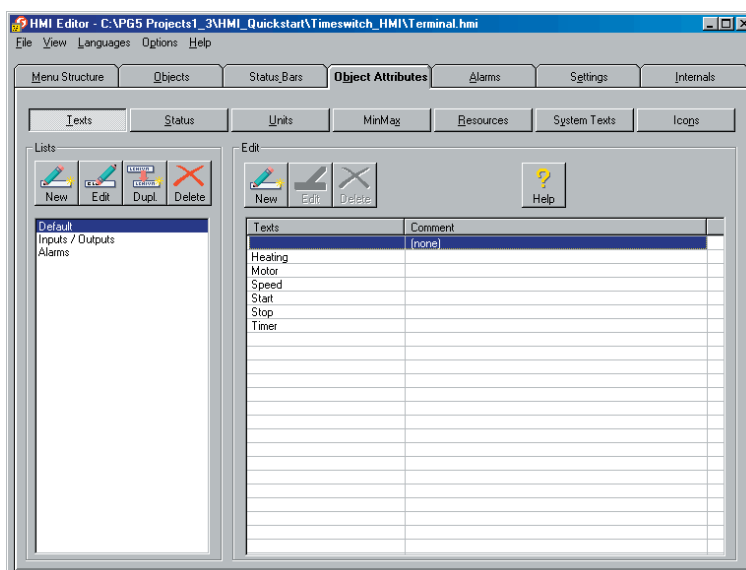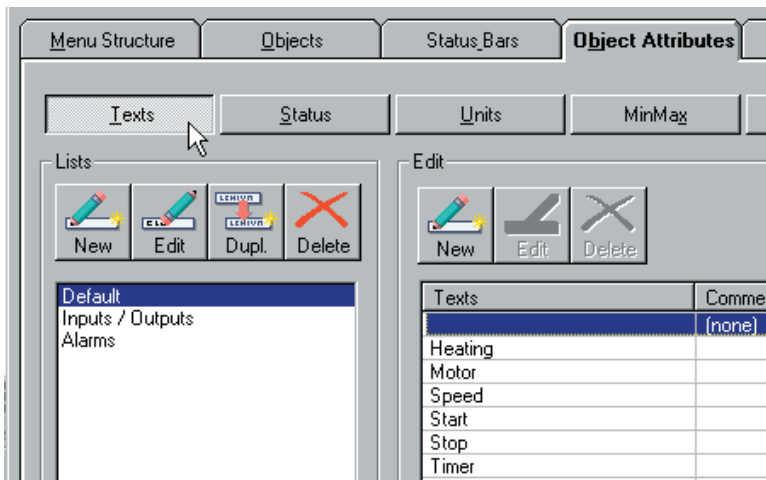


[Fig. 21]

**Procedure**
Change to the
TAB [Objects Attributes] (Fig. 21).

First of all, we extend the seven buttons labelled in the upper area of the window width (<Texts>, <Status>, etc.). The pre-named lists can be selected with these buttons.

Click on these seven buttons one after the other, in order to explore the content and then to come back to <Texts> (Fig. 21).

[Fig. 22]

**<Texts>**

The <Texts> button is also pressed, and displays the predefined text lists below on the left hand side of the framed "Lists" field and its contents on the right side in the „Edit" field.

The content of the framed "Lists" areas can be expanded or reduced with the appertaining buttons.

A comment can be added to each text, which you can use to write out the terms with a text code. This is often the case if the width of the terminal screen is too narrow. The comment is not displayed on the terminal, and is only for the purposes of documentation for the programmer.
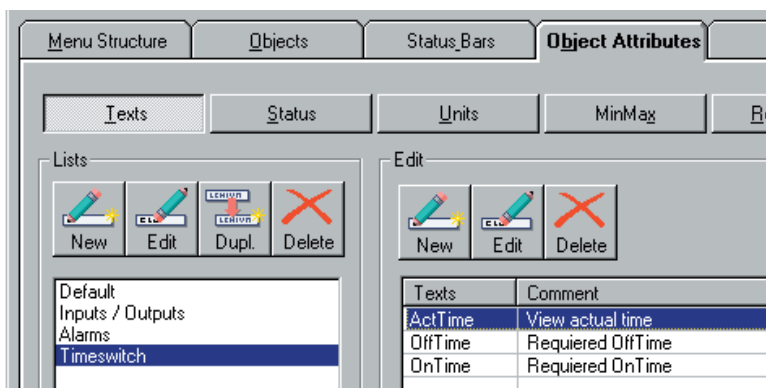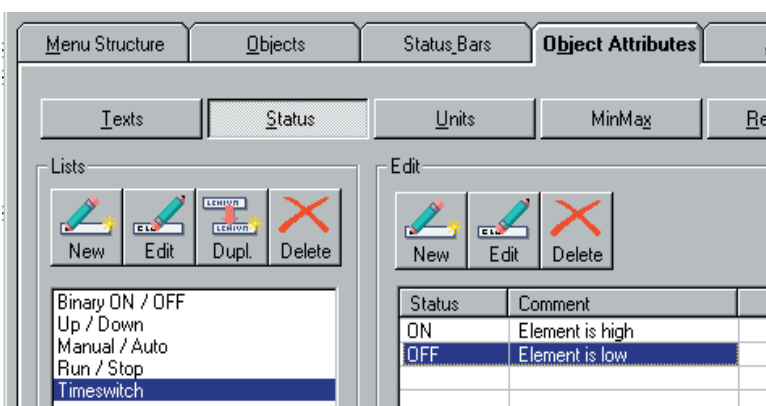


[Fig. 23]

**Define the "Timerswitch" texts**

For our "Timerswitch", we will define the following list entry using the <New> button [Fig. 23] and entry of "Timerswitch".

Texts are also entered in the "Edit" field on the right with the <New> button and input is entered as shown. [Fig. 23]



[Fig. 24]

**[Status]**

These attributes are especially intended for binary signals. The status of a flag can be displayed as "ON" or "OFF" on the terminal, and not as "0" or "1".
The same procedure applies for processing lists and texts as discussed under "Texts".
Our "Timer contact" gets adjoining status display (Fig. 24). In which list you enter it in, or whether you create a new one is at your discretion.
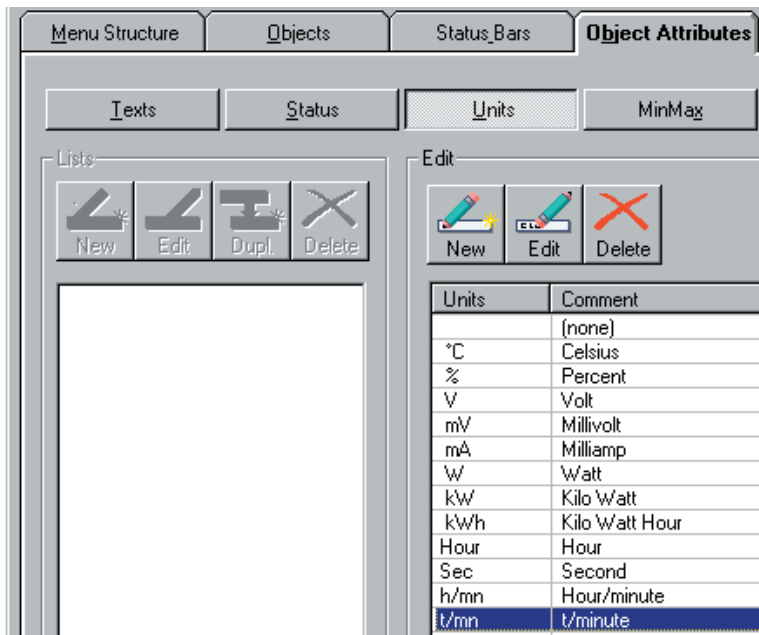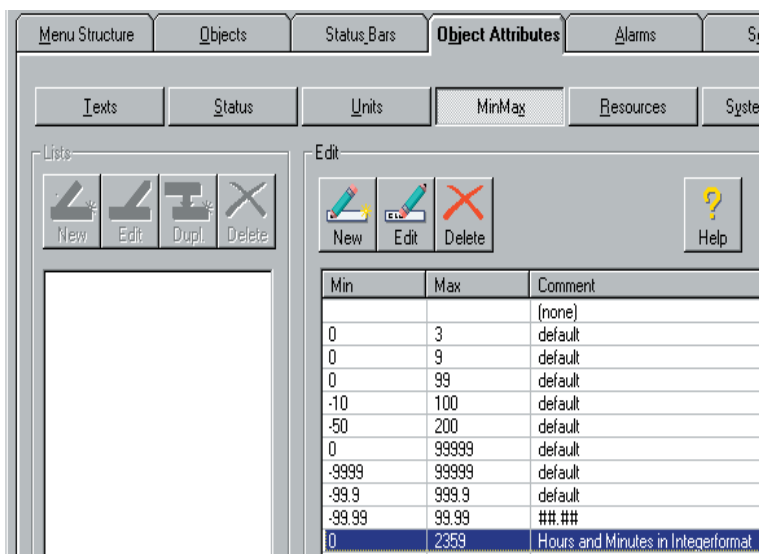
[Fig. 25]

**Units**

Unit data can be collected here.
The same applies to process the lists, as discussed under „Texts".

Our Timerswitch cannot display "Units", because there is no space available for it in the terminal. Therefore, we will leave the list as it is.



[Fig. 26]

**MinMax**

To limit the input of values, some are provided here.
The same applies to process the lists, as discussed under „Texts".

Our circuit time should be controlled by the input. Thus, we define the following: (Fig.26)

Comment:
Please remember that a register in HMI can only accept INTEGER values.

**[Resources]**

All global PCD resources are listed here with their symbols of the current CPU up from HMI software version 1.2. This has to be manually implemented in older versions.
The list provides you with a control whether all PCD resources for the screen display are available or not.

**[System Texts]**

This button exists up from version 1.2 of the HMI software. All standard texts required for the HMI Editor are listed, for example, to mark the beginning and the end of the alarm buffer, and much more.

## saia-burgess

# Quick Instruction Guide

# HMI-Editor
up from HMI V1.3

**Review**

All attributes for our timerswitch have been created, and we have viewed the ones already existing.
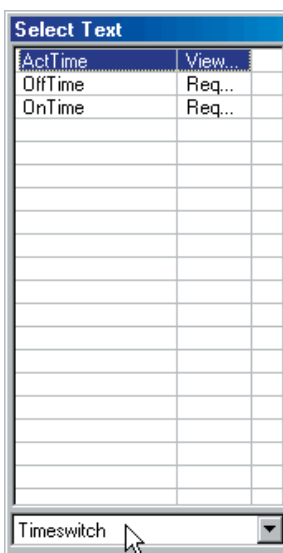
## Creation of Elements (Display and Entered Value Lines)
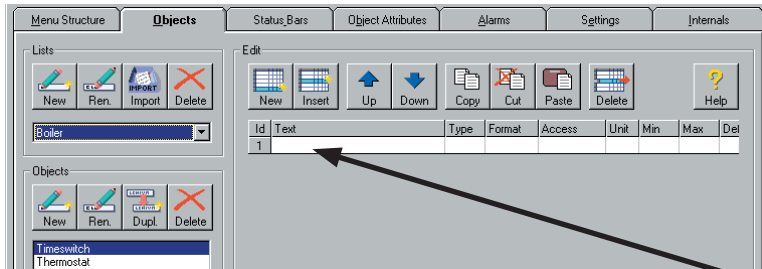


[Fig. 27]

The pressed TAB [Objects] is the starting point, the selected "Boiler" list and the "Timerswitch" object. (Fig. 27)

We will now assemble the elements (Terminal display lines) for our "Timerswitch" menu item from our "Objects Attributes".

Double-click on the empty field in the first line/column of Text.



[Fig. 28]

It will show you a selection menu. (Fig. 28)
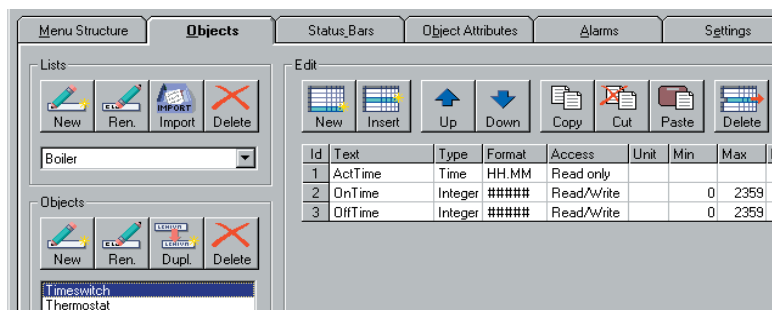
Select the "Timerswitch" list in the lower field.

Now double-click on "ActTime" and the text is inserted.

Define the remaining attributes in the line.

The specification lists in the column can be selected by double-clicking, and then the specifications are inserted with another double-click.

Subsequently, you use the <New> button in order to insert more lines for the "ONTime" and "OFFTime".

With this in mind, you can continue with this line's remaining columns. (Fig. 29)



[Fig. 29]



At the latest now, storage would be advisable.
You will find the button for this under the TAB [Menu Structure].
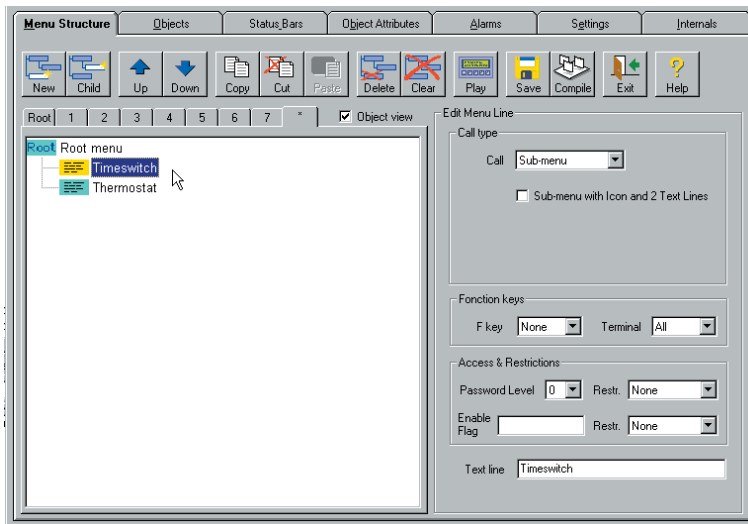Further facilities: Window menu under **File** -> **Save** or with the <CTRL> + <S> shortcut.

**HMI-Quick Instruction Guide**
27.9.2004

**SAIA-Burgess Controls AG**
HMI_Quick_start_e.indd / ak / TCS / Page 11 from 16
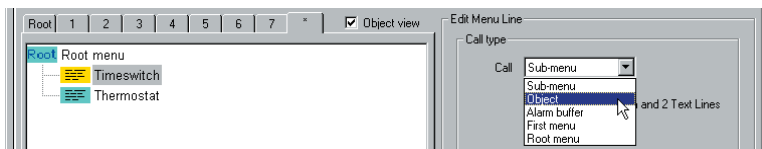
# Quick Instruction Guide

### Review

We have created the "Timerswitch" object's terminal display lines, which should correspond to a menu item.

## Arrangement of objects in the menu structure
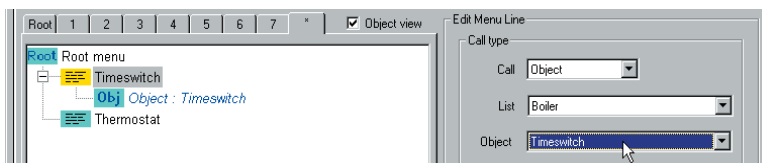


[Fig. 30]

Finally, we have to arrange the menu structure's timer object. Change to the TAB [Menu Structure], and click on the "Timerswitch" menu item. (Fig. 26)



[Fig. 31]

Which object should be called up on the terminal menu item when selected?

We can specify this from the "Call" selection field on the right-hand side of the "Call Type" box, and select "Object". (Fig. 31)



[Fig. 32]

As soon as this is done, the "Call-Type" field expands in order to define two more selection fields, as shown in Fig. 32.

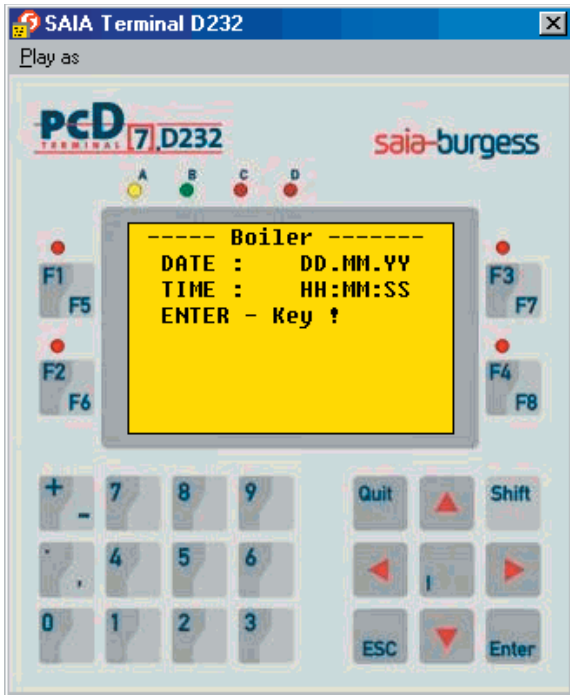In the right-hand menu structure, the object menu item has been arranged.



Don't forget to save!!!

## Display test

We will examine whether we have done everything correctly. Click on the „Play" button.



[Fig. 33]

You will be greeted with the first screen page.
[Fig. 33]

One can navigate over the cursor keys of the displayed terminals with the mouse.

By clicking the right cursor key, you will get to the self-created menu.

In order to get from a menu item in the previous level, click on <ESC> on the terminal [Fig. 33].

Comment:
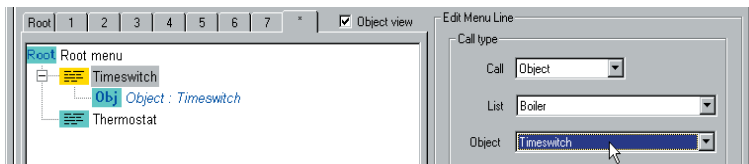Entries cannot be made here; you can only check the structure.

### Review

We have added the "Timerswitch" object to our menu structure, and successfully tested the design on the computer.

## Allocation of Resources

To close this guide, the PCD resources have to be allocated. Up until now, we have only attended to the view.
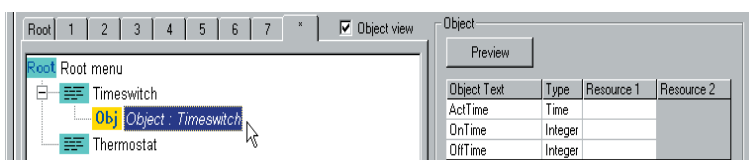The allocation is described in the following pages.



[Fig. 34]

The main view, as shown in Fig. 34 is the starting point.

As can be seen, the timer entry has be gotten an "Obj." sub-menu (Object). This is the screen page we created with all its lines.
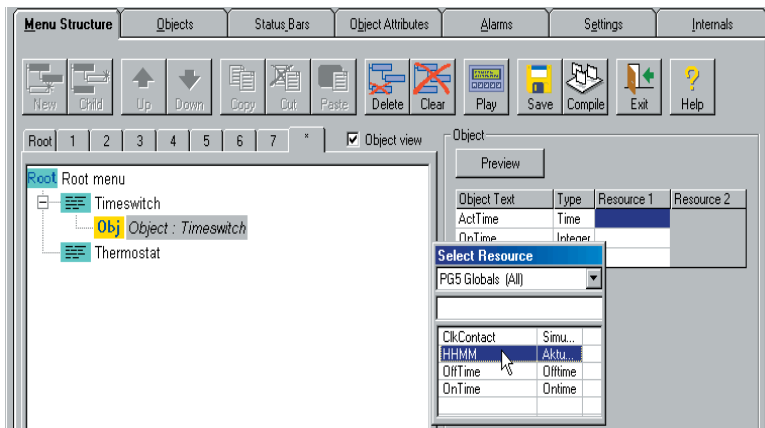


[Fig. 35]

As soon as the "Obj." is clicked (Fig. 35), the object text pertaining to it is listed on the right-hand side.

[Fig. 36]

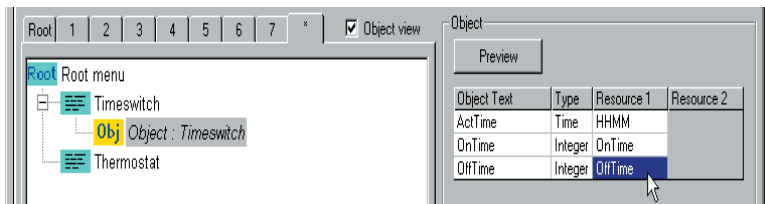By double-clicking in the "Resource 1" Fig. 36 column, the emerging list of the relevant symbol names is selected.

Use all lines with the corresponding resources.



[Fig. 37]

The completed "Object" table looks like Fig. 37.

**Review**

All work, figures, and resource allocations are completed.

## End of HMI Project

When everything is in order, the HMI project can then be compiled. The HMI editor creates the IL source program; PCD texts etc. (still not a loadable program).
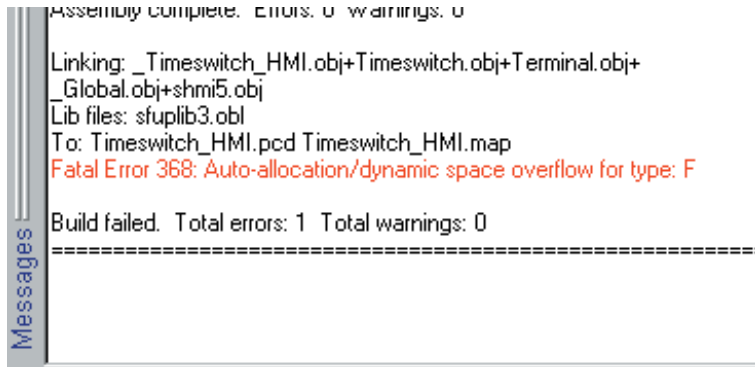
If no errors have occurred, the HMI editor can be closed. If not, check the whole of it, based on this guide.
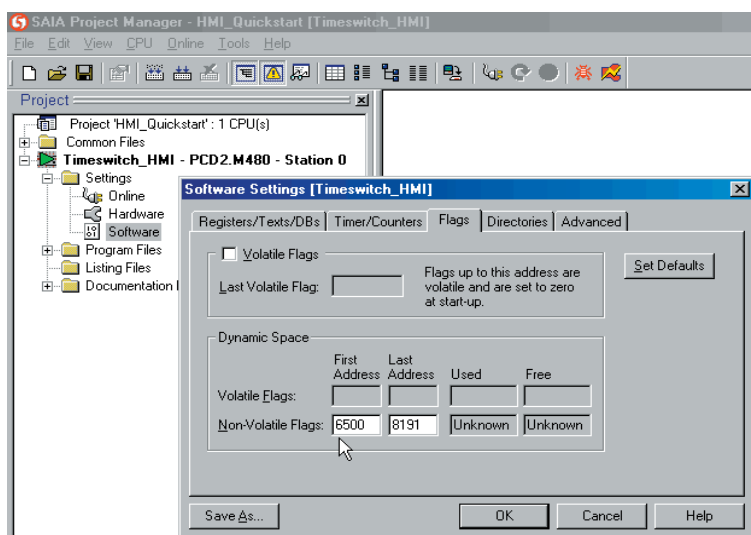
## Initial Operation of PCD and Terminal

Finally, this pre-compiled HMI file can be compiled with the remaining CPU data in the Project Manager ("Build All"), and can be loaded into the SPS.



[Fig. 38]

Appears at the compiling the accompanying error message (figure 38), then you should correct the dynamic Flag-Resources in the „Software Settings" of the CPU, as shown in figure 39.



[Fig. 39]

## Operation of Terminals

Lower menu level ...................... <ENTER> or <Left Arrow>
Upper menu level ..................... <Left Arrow>
Open/Confirm entry value ......... <ENTER>
Type value ............................... <Digits> and <.>
Abort entry ............................... <ESC> or <Left Arrow>

## That is the end of this Quick Guide

The HMI editor offers password protection and alarm handling. Look it up in the corresponding manual and in the HMI Editor's help.

## Where can I find examples for this Guide?

The "HMI_Quickstart" PG5 project (from version 1.2) is stored on the Basis Workshop CD or online at http://www.sbc-support.ch as "Project HMI_Quickstart.zip".

The PG5 project contains two CPUs.

- The "Timerswitch" FUPLA program, without HMI files, so that they can you created step-by-step with this guide.
- The finished "Timerswitch_with_HMI" FUPLA program with HMI files.

Save this ZIP file **unopened** in any directory.

Please start with this Guide on page 2.

## Connection cables between the PCD and the terminal

### PCD7.K423: for interface RS 232 (with handshake RTS/CTS)

#### *Recommended*

Connection between terminal PCD7.D23x and CPU's of the series PCD1, PCD2, PCD3, PCS1 or PCD4.

Free cable ends  (with sleeves) in 2.5 m lengths.

**Terminal PCD7.D23x**

**"PGU" or ser. interface**
at PCD1, PCD2, PCS1 and PCD4    PCD3.Mxxxx