DDC Suite 2.7

Manual

Project and system templates

Table of Contents

Version management

Version	Date	Name	Change
1	21.10.2015	Stephan Hintze	Manual issued

Migration of projects from DDC Suite 2.5 to 2.7

The DDC Suite 2.7 is installed in parallel with version 2.5, an update of the FBoxes in Fupla is not possible!

Transferring existing projects to version 2.7 should generally be avoided.

For projects that use BACnet, manually replacing the FBoxes should be strictly avoided, as the object types have changed for some FBoxes and so inconsistencies in the BACNet configuration may arise.

It is therefore recommended to continue using the DDC Suite 2.5 for existing projects.

Start with a template project

The FBoxes of the DDC Suite support functions to generate SWeb alarm lists, BACnet configuration, IO lists and documentation of the FBoxes used, including all parameters.

The definition of how this information is generated is saved in AddOn files. These are included for the build of the device so that customer-specific adjustments, particularly for BACnet, can be considered.

With the DDC Suite 2.7, these AddOn files for SWeb Alarming and BACnet are installed along with the FBox library (folder C:\Users\Public\SBC\PG5_21\Libs\App). This ensures that the mandatory AddOn files are always available even if a project has been started without an SBC project template.

The AddOn files for the IO list and documentation are also included in a project template. These are located in the project directory in the folder “\AddOn\AddOn” (for the IO list) and “\AddOn\Documentation” (for the documentation).

The original files used for the documentation and which may be modified if required are in the folder “\AddOn\Documentation\HTML”.

The folders “\AddOn\Alarming” and “\AddOn\BACnet” are empty, as these AddOn files are installed with the FBox library in the PG5 and are therefore supplied automatically. If a project-specific adaptation is required, the files with the prefix “ALM_DDC” and/or “BAC_DDC” should be copied from the folder named above to the folder in the PG5 project. The AddOn files from the project are then used for a build. This then applies for all devices in a project.

If different AddOn files are to be used for individual/all devices in the project, the complete folder “\AddOn” can be copied from the project to the device.

The FBoxes search for the AddOn files according to the following rule (for SWeb Alarming and BACnet, for the IO list and documentation only search criterion 1 and 2 apply):

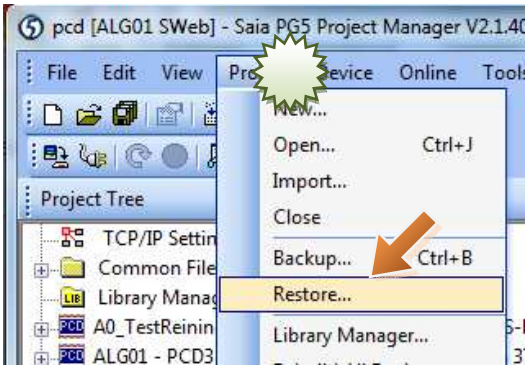
1. In the subfolder “\AddOn\...” of the current device, if not contained there
2. In the subfolder “\AddOn\...” of the current project, if not contained there
3. In the folder of the FBox library

The highest flexibility for customer-specific adaptations of the AddOn files is therefore guaranteed, while ensuring that the mandatory AddOn files are always used from the library for standard projects.

It is recommended NOT to start a new project with “Project – New” but with a DDC Suite 2.7 project template.

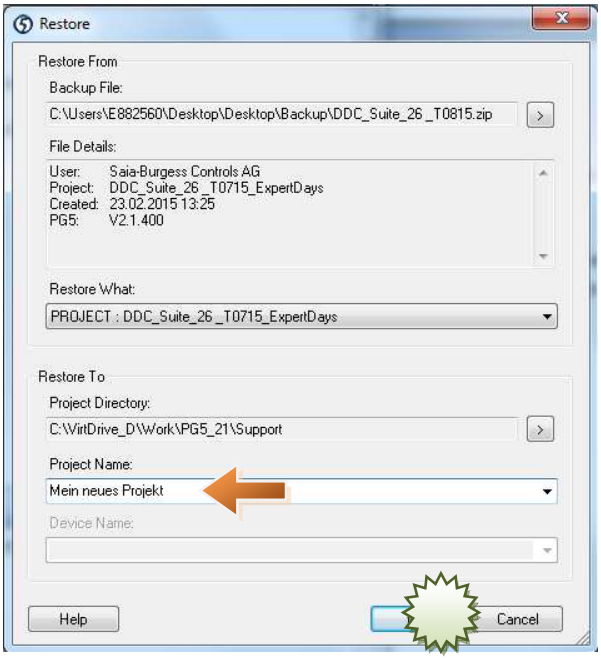
You can find template projects at www.sbc-support.com under Software – PG5 2.1 Suite – DDC Suite 2.7.

Use of a template project occurs with **Project - Restore**



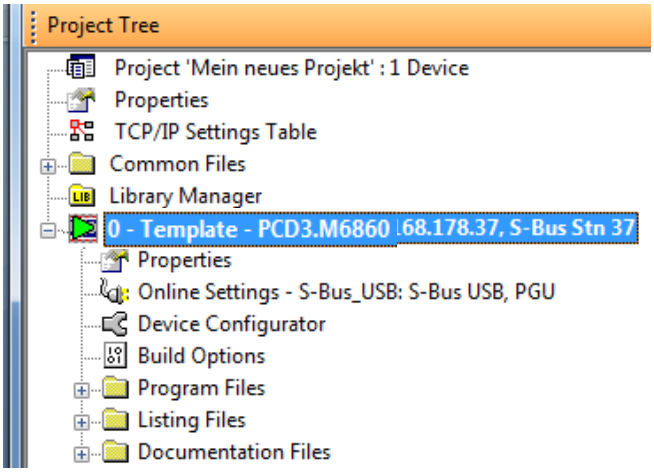
The name of the template projects are supplied with the suffix **Txxyy**, **T** stands for Template **xx** for the calendar week and **yy** for the year in which the template was created.

To restore a project, you can enter the correct name of your project.

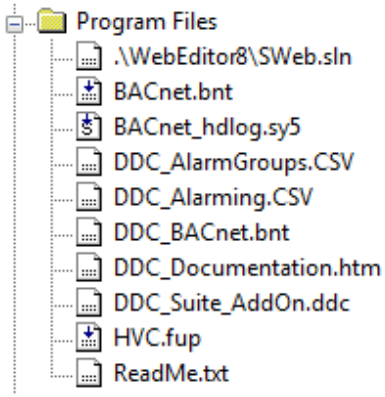


You will then access the new project in the PG5 **Project manager – Project Tree**.

A **device** with the name **Template** is included with it.



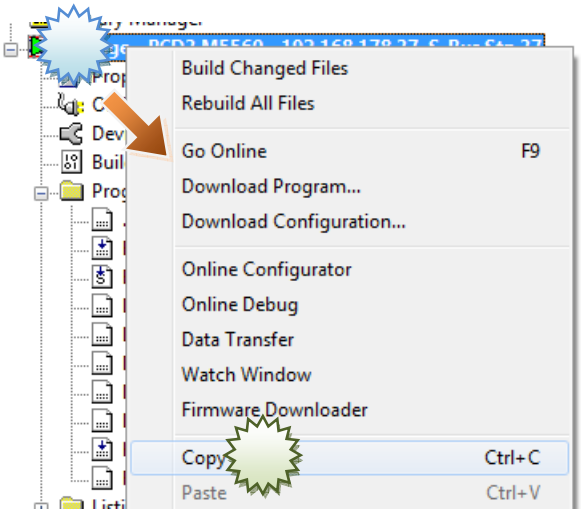
In this template, a Fupla (HKLS.fup) is already created along with a WebEditor 8 template and preparations for BACnet.



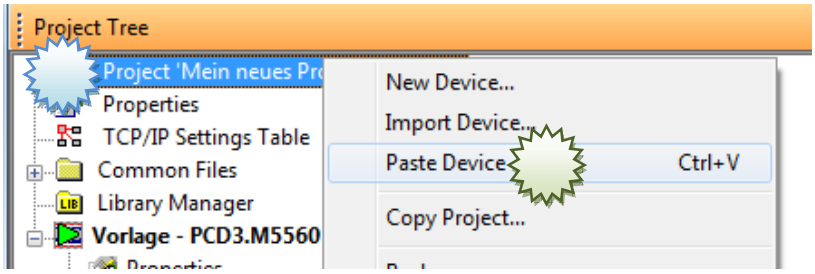
Tip: You can adapt/expand them if required, e.g. if you always want to use a 2nd alarm list for BSK in your projects. This ensures that all devices use the same basic functions. Save the project if necessary as a new template for future projects.

You should not use this template device directly as the first device, use it as the original for each new device you create in this project.

To do this, left-click the device in the project tree and select **Copy** in the context menu.

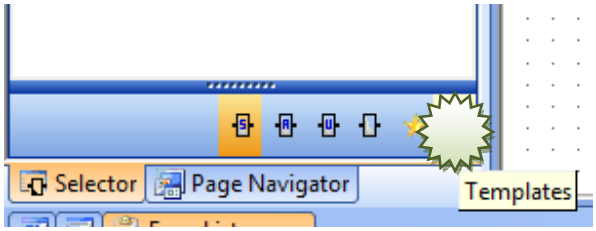


Then right-click the line of the project designation and then **Paste device**. Enter the name of the device (e.g. ISP01). Repeat this for each device you add to this project.

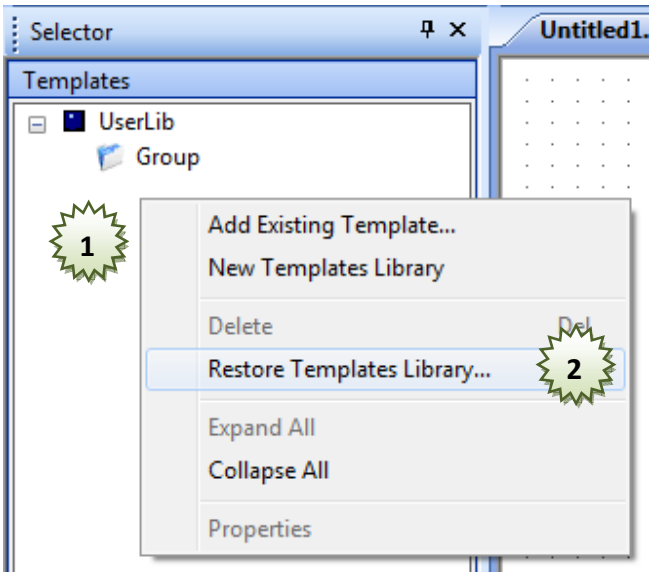


Installation of the templates for the Fupla Editor

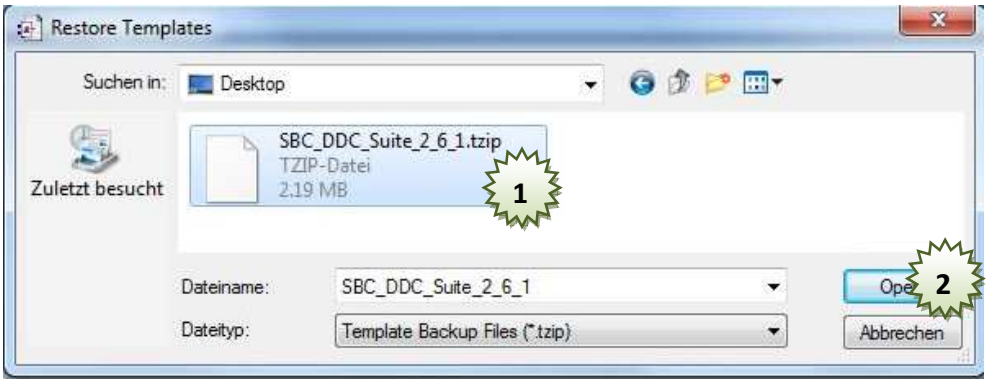
The templates are currently not part of the PG5 installation or the Update Manager (in preparation) and must be installed manually. To do this, open the **Fupla Editor** and, in the **Selector window,** activate the **Templates** tab.



In the **Selector** view **Templates**, **double-click** (1) to call up the **Context menu** and select the option **Restore Templates Library…** (2) there.



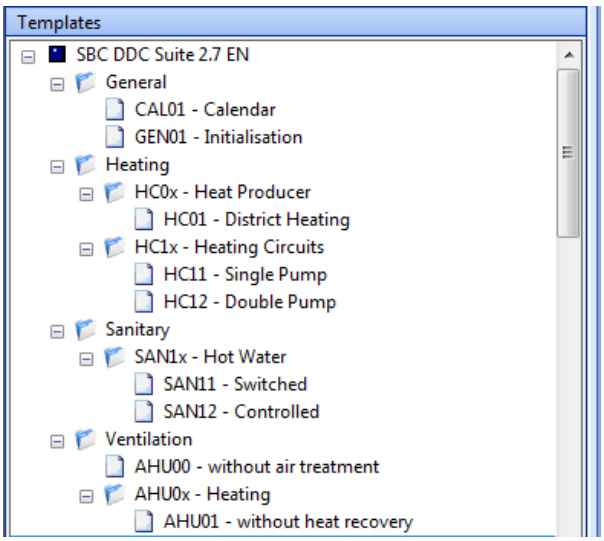
In the **Restore Templates** dialog, you must then change to the folder in which the Template Backup (.tzip file extension) is saved. Select the file **SBC_DDC_Suite_2_7_1.tzip** (1) and start the restore process with **Open** (2).



Then in **Selector** you will see a group **SBC DDC Suite 2.7**, and below it various subgroups for the different systems such as

- General
- Heating
- Ventilation
- Sanitary

These system groups contain other subgroups to summarise systems according to certain types.

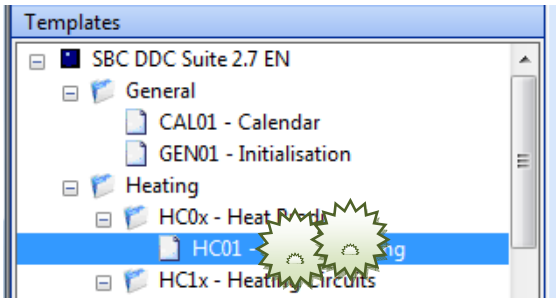


The installation of the DDC Suite templates must only be performed once, they are therefore not available in this project but are generally available in the PG5.

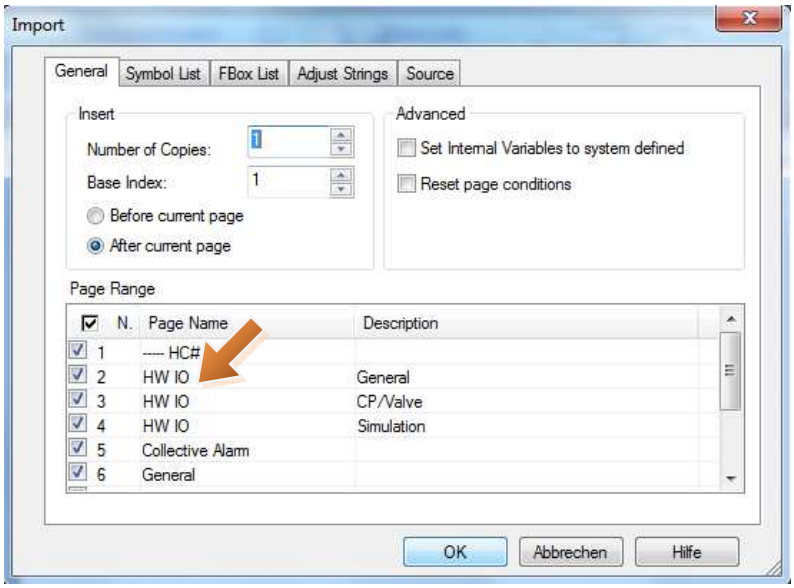
Use of templates

The use of the DDC Suite 2.7 templates is identical to all other templates, i.e. no special features have to be considered.

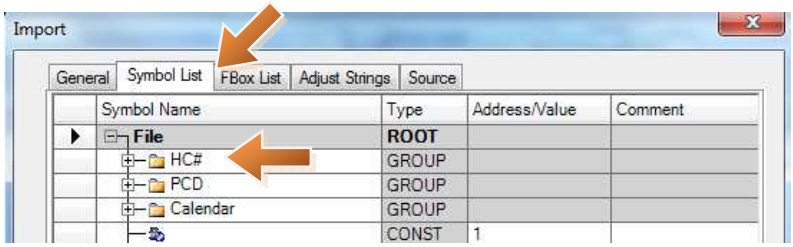
Double-click to select the template that should be used.



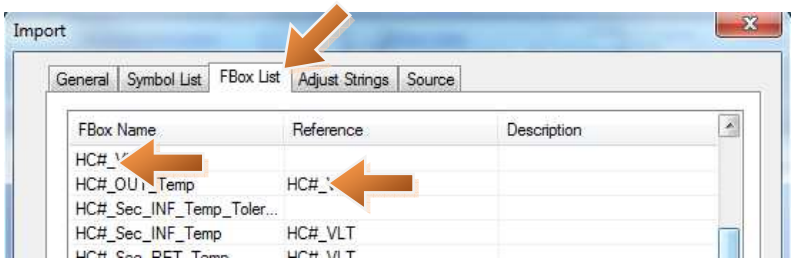
In the following **Import** dialog, the usual adaptations should be made, i.e. the system designation of the template should be changed. Templates are prepared for multi import (or any number). For example, the designation is **HC1**:



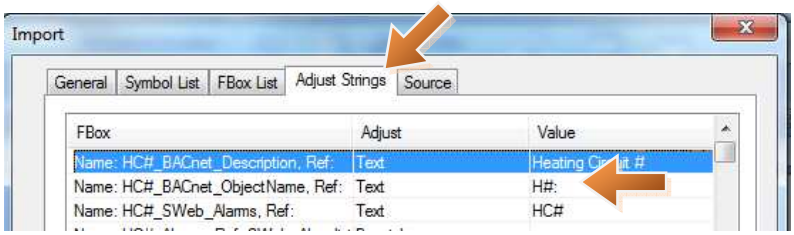
- In the **General** tab, the **name** of **page 1** can be adjusted



- In the **Symbol List** tab, the **Group name** of the system is modified



- In the **FBox List** tab, the **prefix** of all **names** and also **references** are modified, ideally the same as the group name of the system as in the Symbol List tab. Use the context menu Find&Replace to do this.

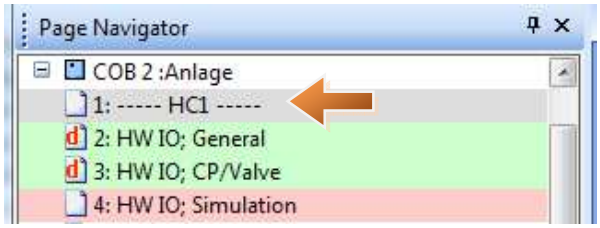


- In the **Adjust Strings** tab, the **text** for SWeb alarming and BACnet plant coding system has to be adapted too. In general only the first 3 texts.

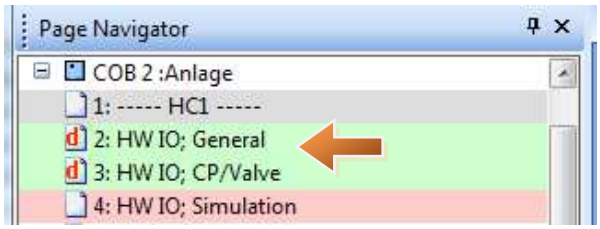
Pages with colour background - functions

As the templates can include extensive functions, some of which are optional, the option to highlight pages in colour in the **Page Navigator** was used. Details on the following templates can be found in the template description.

Pages with a **grey background** mark the first page of a system. This is also apparent by the text that is provided with "--- System –".

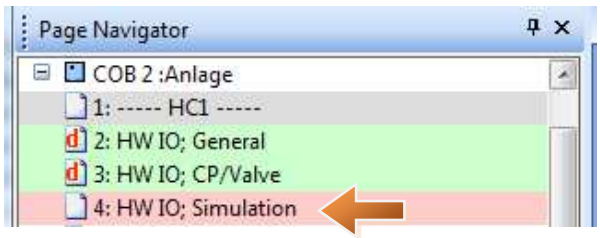


Pages with a **light green background** are **optional** and **deactivated**, but are frequently used i.e. the pages for the connection of the IO data points of the system with the physical data points from the media mapping of the device configurator.



These pages must be activated when used, i.e. set **Disabled** to **No** in the page properties. If these pages are not used, they can be deleted without hesitation.

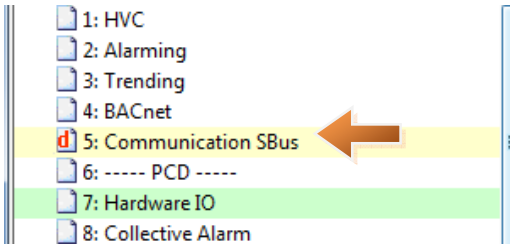
Pages with a **light red background** are only designed and activated for the **pre-test** in the office.



Feedback is simulated on these pages so that you can import the system for deactivated HW IO pages (see previous section) and activated HW IO simulation to test the program in a PCD without having to consider the hardware (exceptions, i.e. FileSystem or BACnet must be taken into account).

The IO data points can then even be directly manipulated via the Fupla or the Watch Window. These pages should be deactivated, or ideally deleted, once the program is operational.

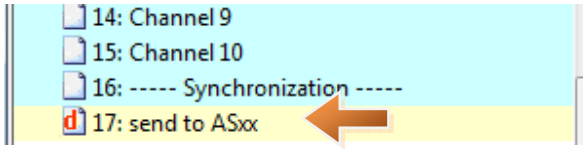
Pages with a **light yellow background** are **optional** and **deactivated**, they are used for **S-Bus communication** between PCDs.



For example, in the template **GEN01 – General** there is a page that initialises the communication via TCP/IP.

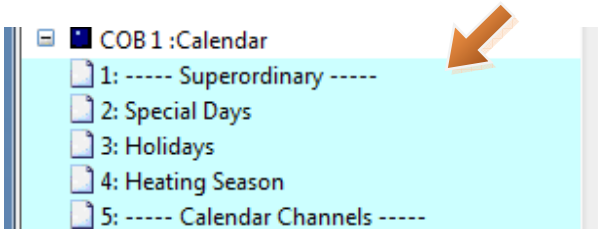
This page can be deleted if this PCD does not communicate independently with other controllers. If communication is required, activate the page, if necessary this must still be adjusted if communication takes place via another interface, e.g. RS485.

The template **CAL01 – Calendar** includes a page that sends the active data to another PCD. This is also optional and deactivated and, if used, this page and the page to initialise communication must be activated.

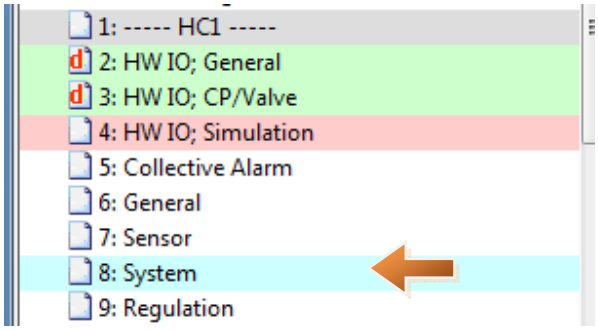


The yellow background colour therefore indicates a dependency between these pages.

Pages with a **light blue** background are provided for using the template **CAL01 – Calendar**. This calendar offers extensive switching options that can be used in the individual systems.



A release page that is also marked with a light blue background is generally found in the templates of the systems. This page then refers to information from the calendar.



If this function is used (is provided in the templates), the calendar must be used (or a modification of such).

If the switching function of the calendar is not used in the system, the calendar is not required. The switching functions must then be carried out using other FBoxes (clock, holidays, etc.).

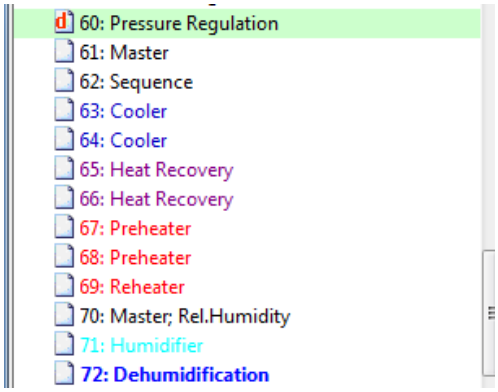
Pages with colour text control components

Along with the pages with a colour background, there are also pages with **colour text**. However they do not represent any functions similar to the previous chapter, but are primarily used for easier orientation during commissioning.

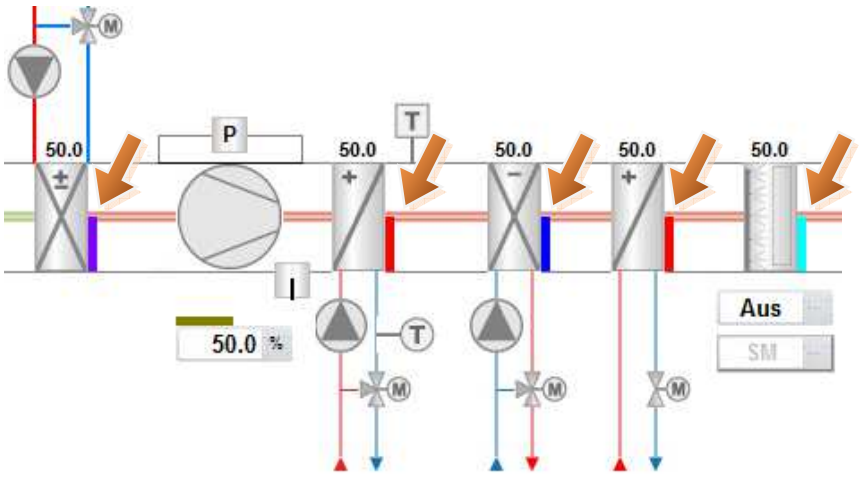
For larger systems, 20 or 30 Fupla pages quickly accrue and the page designation must be read precisely when searching for the heater.

The pages are identified with colours that are also generally used on the images of the SCADA or an SWeb application.

- **Blue** for pages that refer to the cooler
- **Lilac** for heat recovery, all types incl. mixed air
- **Red** for fan heaters, pre-heaters or reheaters
- **Turquoise** for humidification elements



The templates of the DDC Suite 2.7 for SWebEditor 8 and Visi.Plus represent a dynamic bar at the relevant control components that use the same colours. This should increase the legibility of the scheme as it can be immediately identified as being heated, cooled and/or humidified.



General templates

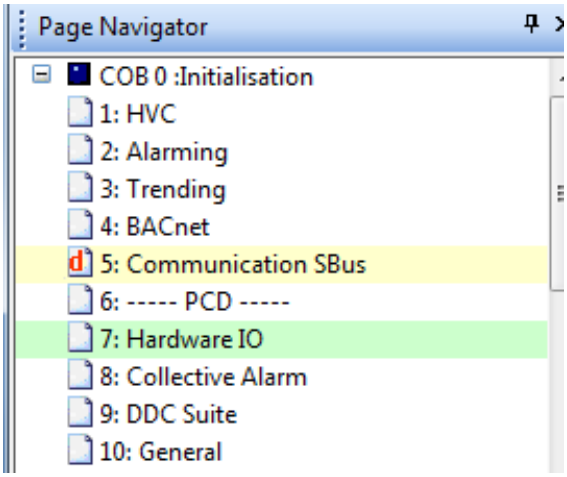
General templates are usually only required 1x per controller. There are currently 2 templates available:

- GEN01 – Initialisation, includes FBoxes for HVAC, DDC Suite, alarm lists, trending and S-Bus communication
- CAL01 – A calendar program with 10 switching channels, holidays and holiday function

Function	PCD Initialisation	Calendar
	 GEN01	 CAL01 

GEN01 – General

The template GEN01 – Is generally already included in the template device of a DDC Suite 2.7 template project in **COB 0:Initialisation**. Generally always start with a template project and the device included in it started as here additional AddOn files for SWeb Alarming, BACnet or the creation of the document are already included.

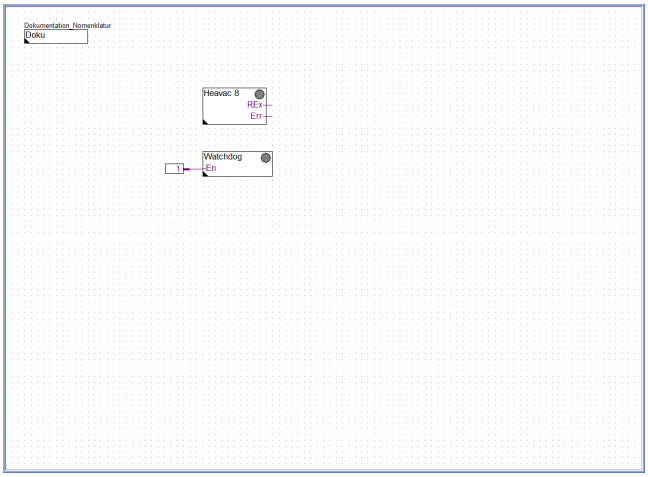


If you start with a new, empty device and use the template ALG01, you must remember to transfer the AddOn files from another project. When using the template GEN01, no adjustments should be made during the import.

HVAC

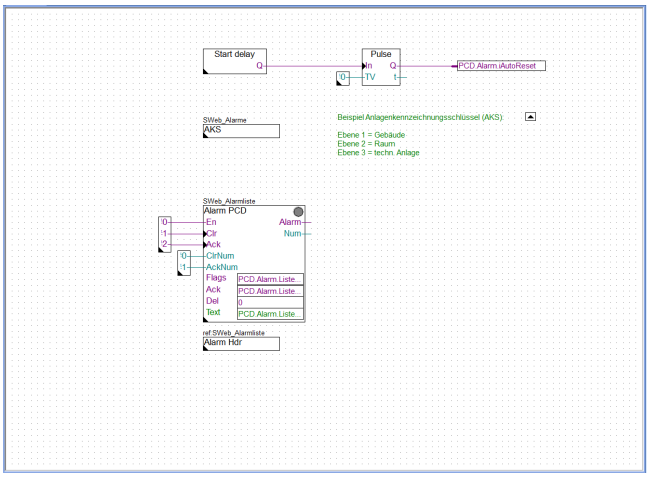
Includes FBoxes that are generally mandatory, e.g.

- **Docu** – For the introduction of the documentation through DDC Suite FBoxes
- **Heavac 8** – Initialisation of the HVAC and DDC Suite FBoxes after download of the program, summer/winter time, etc.
- **Watchdog** – Configuration of the PCD for triggering the software watchdog independently to initiate a restart



Alarming

In many cases a web visualisation is used, this also includes an alarm list.



- FBox **Start Delay** > After Power On of the PCD, error messages may occur that are recorded too early by the PCD due to time delays in the switch cabinet (locks). After starting the PCD, an auto reset is therefore carried out after 10 seconds to reset all pending alarms.

- For the web visualisation, an alarm list with the name **SWeb_Alarming** is configured and set such that an acknowledgement of the alarms is also sent back to the Web visualisation in the PCD. The FBox **Alarm PCD** was used here as the address ranges for the alarm and users can define the acknowledgement flags. These have been assigned to the addresses 10,000 to 11,999 to avoid occupying any resources in the lower range (0-9999).

- FBox **PCS** > For the automatic generation of the alarm texts, a system identification key is provided that uses the first 3 levels (building/room/system)

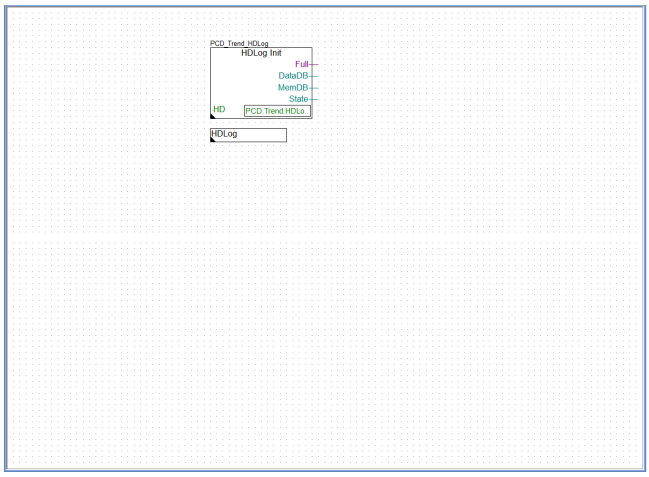
- FBox **Alarm Hdr** > The first alarm begins with alarm number 1, an acknowledgement of alarms in the web visualisation should also involve an acknowledgement of the alarm in the FBox (see also Alarming manual)

Trending

Preparation for independent trend capture from Suite FBoxes is deactivated in the system templates, mostly only used for small controllers like the PCS1.

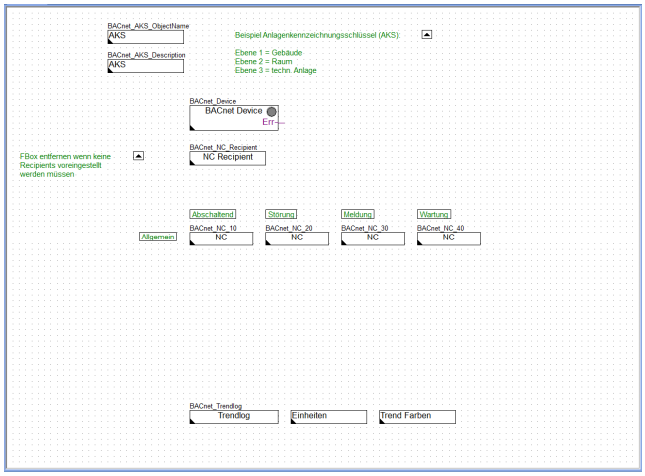
Trending via HDLog 3.0 is preferred for a long-term history.

When using BACnet, the BACnet trend logs can also be accessed if necessary in a web visualisation.



BACnet

Preparation of the PCD to use as a BACnet device.



- 2x FBox **PCS** > For the automatic generation of the object names and their designation (object name/description), a system identification key was provided that uses the first 3 levels (building/room/system)

- FBox **BACnet Device** > Basic settings of the device such as name, description, location.

  BACnet is deactivated and must be activated if required, all FBoxes that should automatically generate BACnet objects must then be correctly parameterised.

  Warning: When using BACnet, BACnet objects created for the stack monitoring must never be manually removed from the bacnet.bnt file.

- FBox **NC Recipient** > is only required if the **Recipients list** for notification classes must be predefined. This may be required for some BOWS as they do not independently log on as recipients in the PCD.

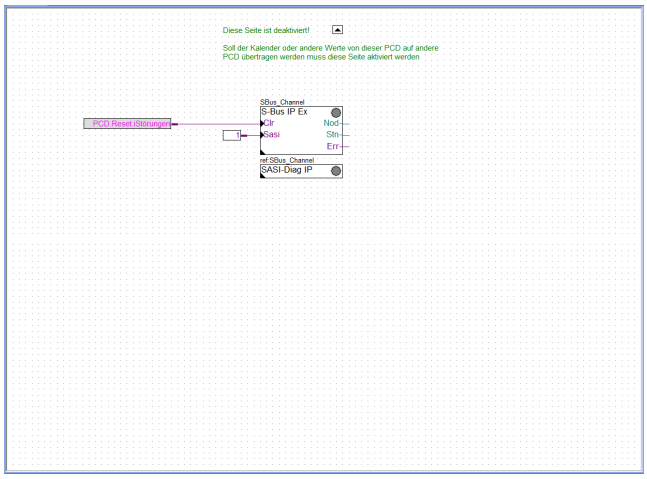
- 4x FBoxes **NC** > Setup of 4 notification classes, these have the function
  - NC 10 = error messages switching off
  - NC 20 = error messages that do not directly lead to switch off
  - NC 30 = Messages such as limit value violation
  - NC 40 = maintenance messages

- FBox **Trend log** > Activation of BACnet trend log, the trend data is saved on M1 = BACnet stack, this requires the use of a PCD7.R562.

- FBoxes **Units** and **Trend Colours** > Definition of units and colour values that are used to represent BACnet trend logs in a web visualisation using a HDLog Macro.

S-Bus communication

This page is optional and deactivated and can be deleted if the PCD does not communicate with Send/Read FBoxes to other stations.

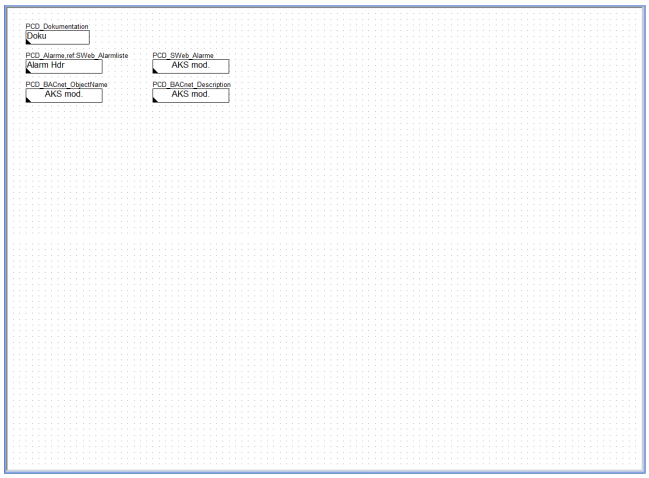


It must be activated if this PCD wants to read independent values of other stations or send to them. e.g. this may be required if the calendar program of this PCD has to be transferred to other stations.

If required, the FBox **S-Bus IP Ex** may be replaced by another FBox if communication via, e.g. Profi S-Bus or serial, is to take place.

PCD

This page represents the start of a new system and includes all the required FBoxes:



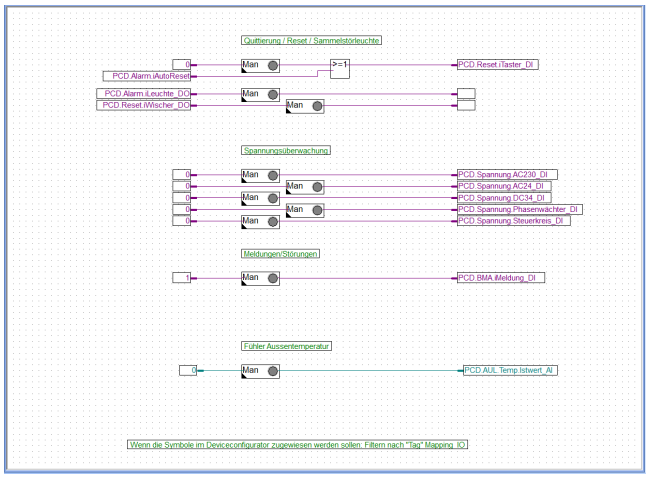
- Add a description of the automatically created documents via FBox **Docu**
- With the FBox **Alarm Hdr**, specify a defined start address of the first alarm for this system (-1 = consecutive automatically) and adapt the effect of an acknowledgement in the web visualisation for this system
- FBox **PCS mod.** for SWeb Alarming > Adjustment of the system identification key of the 3rd level = system
- 2x FBox **PCS mod.** for BACnet > Adjustment of the system identification key of the 3rd level = system – for object name and description

The definitions for the PCD regarding the switch cabinet are on this page and do not yet refer to heating or ventilation.

Hardware IO

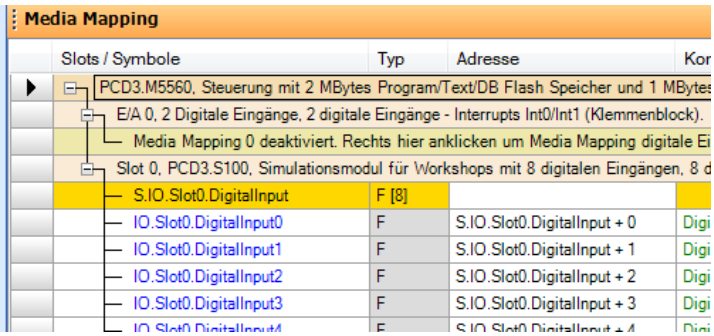
This page is used for the connection of the application-related IO data points of the program with the effective IO data points of the PCD. These are mostly provided by defining them in the device configurator using media mapping.

This page is optional and deactivated, this “transfer page” should be activated if it is to be used.



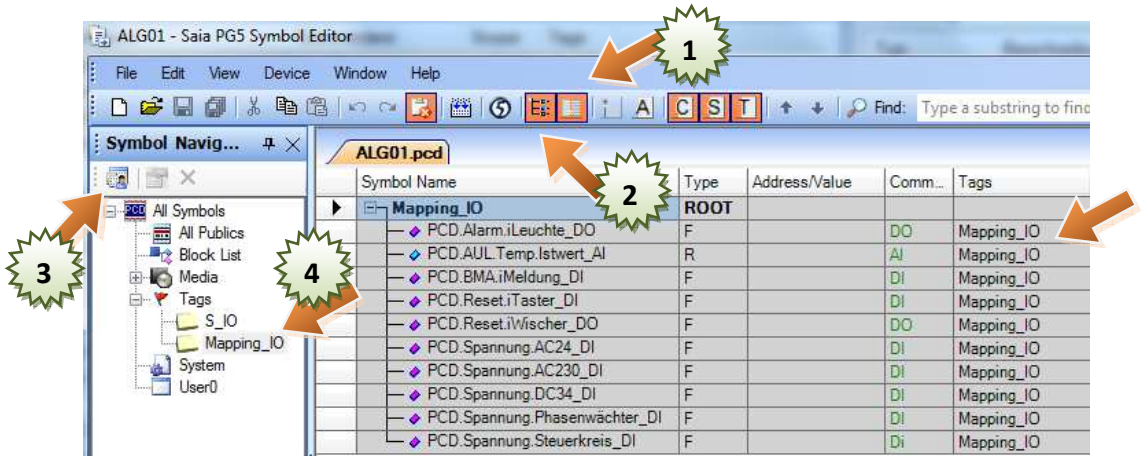
Assignment of the IO in the device configurator

If the user-related IO data points are connected directly in the device configurator with the physical IO data points, this page is not required and can be deleted.

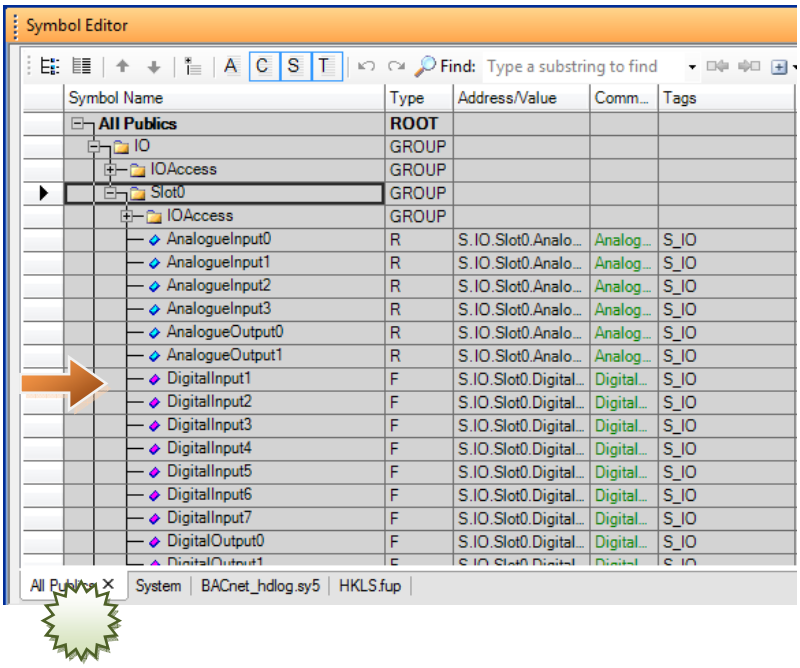


In the device configurator, open the **media mapping** window and the **Symbol Editor**.

In the **Symbol Editor**, set to **List view** (1) and create a new filter (2+3), set filter rule **Tags** to **Mapping_IO** (4). All application-related IOs are then displayed and can moved from the **Symbol Editor** window by **drag&drop** to the **media mapping** window on the corresponding IO.



Assignment of the IO to the hardware IO page (transfer page)



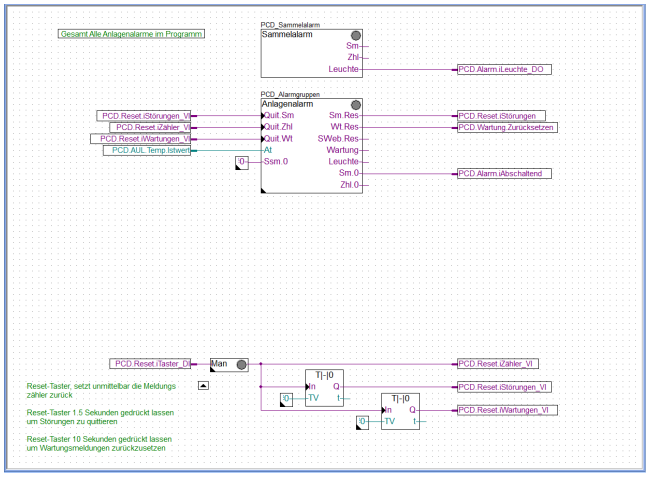
In most cases the IO is assigned to a transfer page. The advantage here is that there is no need to continually change between Fupla and device configurator and it can immediately be seen in Fupla where the data points are assigned. It is also possible here to override an IO using the **Man** FBoxes if required.

If an assignment is made using this page, this must be activated. This time the assignment is made in reversed form.

To do this, the **Symbol Editor** must be opened in Fupla. The register **All Publics** must then be activated, a separate group with the name of the slot and the IO of this card below it can then be found for each IO card defined in the device configurator and for which the media mapping is activated in the group **IO**. This is then taken from the **Symbol Editor** by **drag&drop** in the Fupla into the empty (provided with 0 or 1 respectively) **connectors**.

Collective alarm

Summary of alarm messages of the entire program and the alarms that are only assigned to the PCD alarm group.



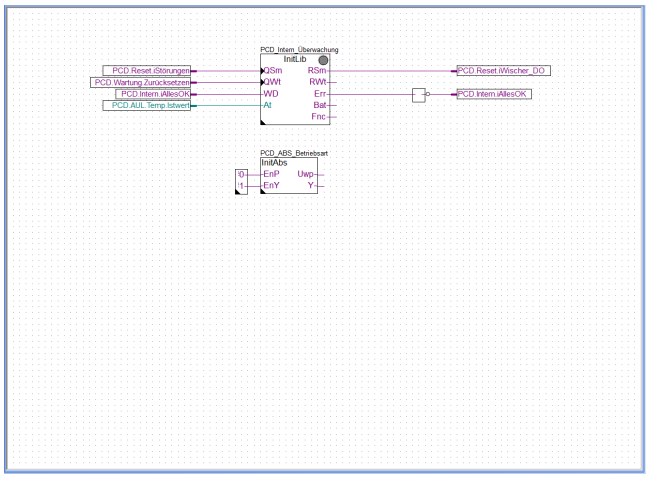
- FBox **Collective Alarm** > Sum of all error messages switching off over the entire program
- FBox **System Alarm** > Definition of a PCD alarm group in which all alarms should accumulate that should not be assigned to the systems (see also DDC Suite 2.7 Alarming Manual)

The acknowledge button has been provided for 3 functions:

- Short activation (< 1.5 seconds) only deletes the counter of the newly occurring alarms, this causes the **lamp** output to go out if there are no longer any faults switching off. The output is controlled as a permanent light if a fault is still pending.
- Long activation (> 1.5 seconds) also deletes an acknowledgement. All pending saved faults are reset.
- Long activation (> 10 seconds) resets all maintenance messages and starts **all** maintenance counters again.

DDC Suite

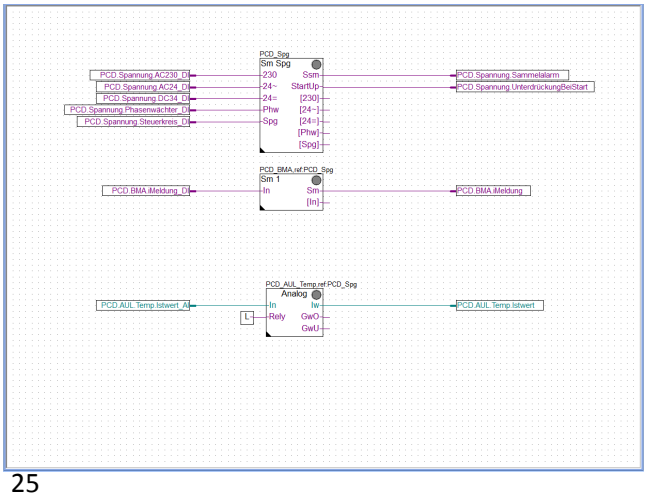
Initialisation FBoxes that are mandatory for the DDC Suite 2.7



- FBox **Init Lib** > Basic functions such as
  - Central acknowledgement of all error messages
  - Central reset of all maintenance
  - Masking of hour meters
  - Installation of the internal fault routines (XOB)
  - Monitoring of the battery
- FBox **Init ABS** > Central pre-setting of the anti-block safety function for pumps, constant and open/closed drives

General

On this page there are elements that can be retrieved for the system templates, e.g.

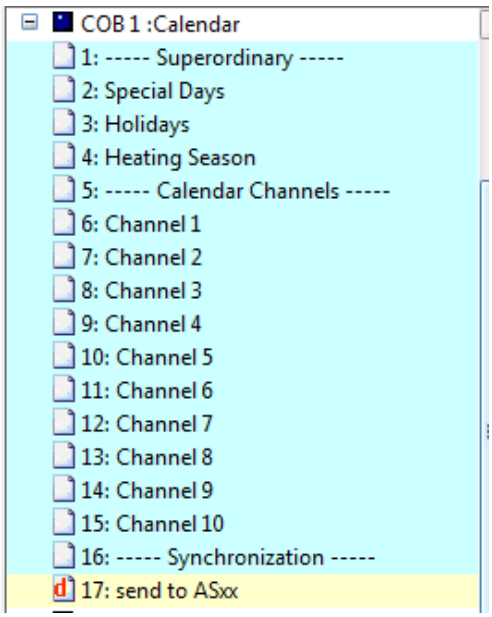


- FBox **Ala Fuse** > Monitoring of control voltages. This FBox is preset so that in the event of failure of a fuse, the following **Ala Fuse** FBoxes of the systems report a fault internally and switch off the systems, i.e. this FBox is higher level voltage monitoring

- FBox **1 Alarm** > as a contact of the fire alarm system is often available, an error message FBox is provided in this template
- FBox **Sensor** > recording of the outside air temperature, this FBox is also retrieved in the system templates. As there is often only one outside air temperature sensor, there are system templates already preset to also use the IO of this FBox.

CAL01 – Calendar

The CAL01 – Calendar template is already included in the template device of a DDC Suite 2.7 template project in the **COB 1:Calendar**.



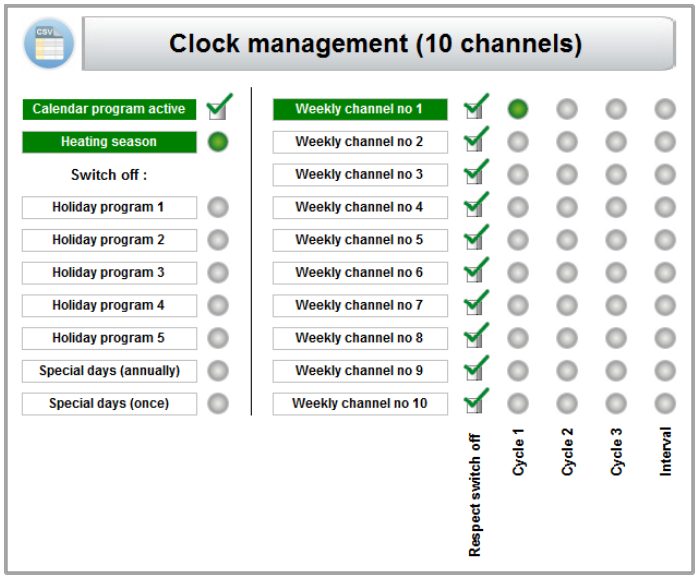
The calendar is used for the central administration of switching programs in a controller but can also be used with several PCDs.

The use of clock FBoxes per system is common whereby the number of switching points per day must be considered. If for example included in a PCD 10 heating circuit, each heating circuit must have its own time switch, 10 time switches must be operated if the switch-on time changes to 8 a.m. for all circuits.

This may be accepted for a controller, but may quickly prove impractical for larger installations with many systems. The calendar offers the option to manage 10 switching channels, the systems are then assigned to a switching channel. If the 10 heating circuits named above are all assigned the same switching channel, only one switching channel need be adjusted.

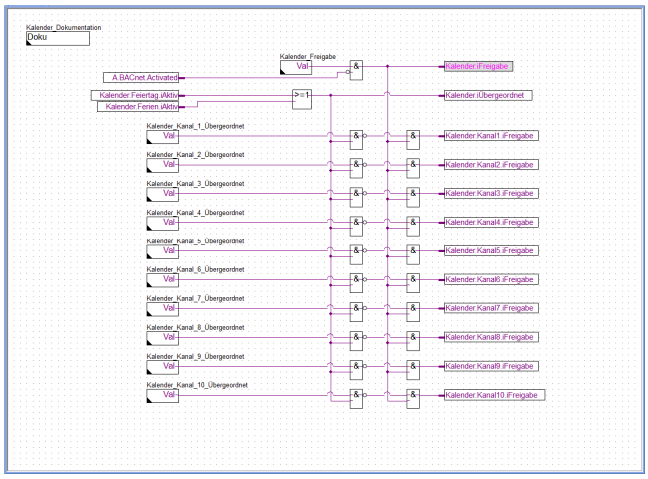
The calendar has the following features:

- Central activation/deactivation of the calendar
- 24 one-day public holiday programs, switching off
- 5 holiday programs, switching off
- 10 switching channels, 3 switching cycles per day, interval function and option to take public holiday/holidays into consideration
- Heating period for heating systems
- Synchronisation with/from other PCDs for central calendar management



In a SCADA, the overview of the calendar can be mapped as shown opposite:

Higher level



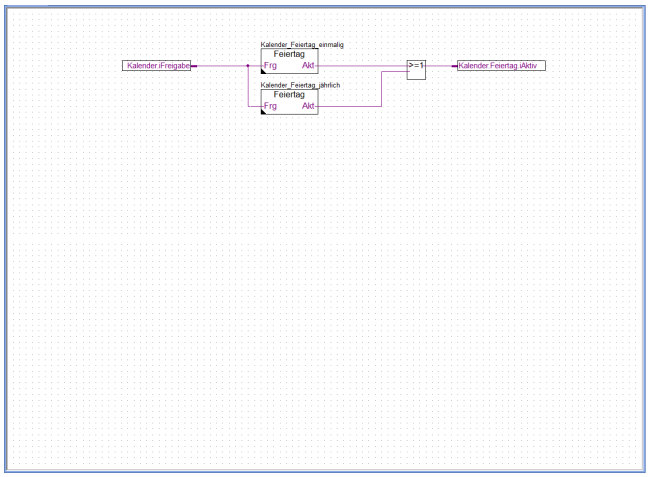
The calendar can be centrally activated/deactivated on the higher level page. e.g. this can be useful if all systems have to be switched off at short notice.

In addition the calendar function is automatically switched off when BACnet is activated as, in this case, the switching function is carried out via the BACnet scheduler/calendar.

If the BACnet stack fails, the calendar is automatically reactivated by the monitoring in the BACnet Device FBox so that a type of “Emergency” calendar function is available. The information whether BACnet is activated and is running correctly is provided via the variable **A.BACnet.Activated**.

In addition, users can specify for each switching channel whether a switch-off should be considered in holiday or public holiday programs. For WC ventilation systems, odours may arise if the systems are shut down during the Christmas holidays, a switching channel should be used for this purpose that ignores shutdowns.

Public holidays



There are 2x 12 one-day public holidays available.

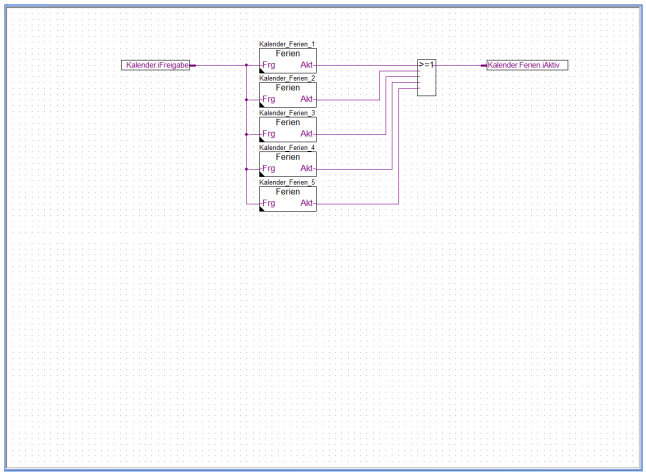
The time for the start/end of shutdown can be specified once for each of the 12 public holidays.

An FBox is defined for non-recurring public holidays, i.e. variable public holidays are specified here that are automatically deleted from the FBox after processing.

The second FBox is provided for annually recurring public holidays. The days entered here are retained in the FBox after processing and will be active again next year.

Holidays

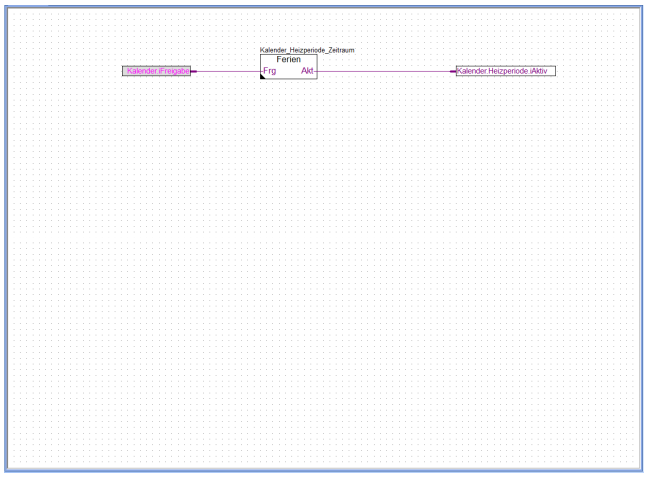
The 5 holiday programs are for periods from date/time until date/time and are generally used for plant holidays/school holidays.



Heating season

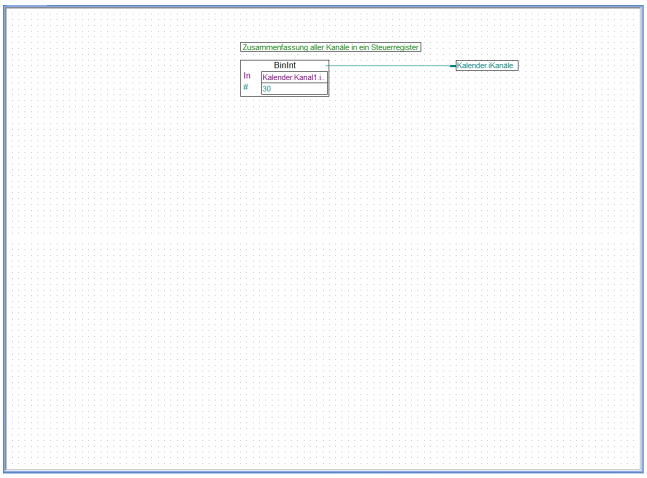
For heating systems or heating circuits, a release according to date is often provided, in this case an FBox **Holidays** is implemented that releases the heating period from 1/10 until 30/4 (to be adapted if necessary).

Alternatively a separate mechanism can also be implemented on this page (e.g. after AT average, etc.). Make sure that the release is linked to the symbol **Calendar.HeatSeason.iActive** again as this symbol is used in the heating templates.



Switching channels

The calendar has 10 switching channels whereby each switching channel can be used for up to 3 stages. This results in 30 releases.



For simple handling, the resulting 30 flags are copied to a register so that the symbol **Calendar.iChannels** contains the full calendar with the release of all switching channels and all stages. This symbol is then used in the system templates.

The definition of the bits in the register **Calendar.iChannels** is as follows:

- Bit 0 = switching channel 1, stage 1
  Bit 1 = switching channel 2, stage 1
  …
  Bit 8 = switching channel 9, stage 1
  Bit 9 = switching channel 10, stage 1

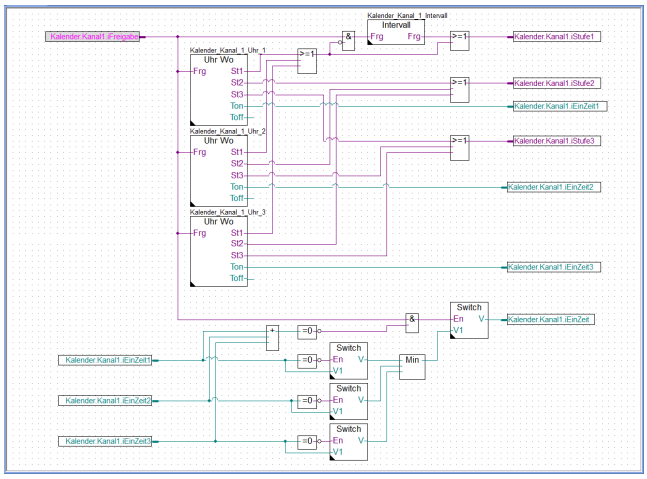
- Bit 10 = switching channel 1, stage 2
  Bit 11 = switching channel 2, stage 2
  …
  Bit 18 = switching channel 9, stage 2
  Bit 19 = switching channel 10, stage 2

- Bit 20 = switching channel 1, stage 3
  Bit 21 = switching channel 2, stage 3
  …
  Bit 28 = switching channel 9, stage 3
  Bit 29 = switching channel 10, stage 3

This enables users to create a separate calendar program. It is important that the releases in the register **Calendar.iChannels** are summarised as listed above, so that the system templates and the FBoxes of the release family operate correctly.

Channel 1(-10)

The 10 switching channels are identical in their function and therefore only the page of **channel 1** is described.

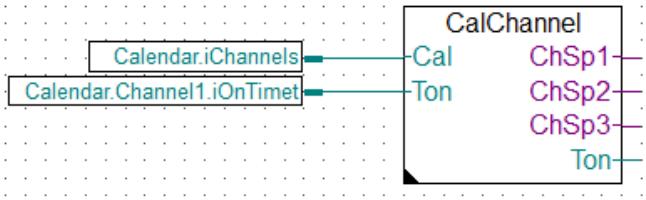


3 weekly time switches are used to enable users to define 3 switching cycles per day. The weekly time switch used can also be used for a 3-stage switching unit.

It is therefore at least possible for a 3-stage system to specify for each stage a switching cycle for each day, for 2-stage systems e.g. 2x stage 1 and 1x stage 2 or 1x stage 1 and 2x stage 2.

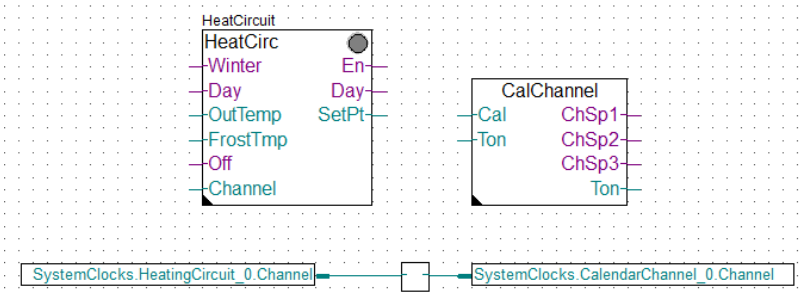
If none of the 3 weekly time switches are active, an interval program can be used. This is often used for example for WC ventilation systems or battery rooms. The system is therefore controlled during the day according to the weekly time switch, after the ending of the weekly time switch, then switched on every 45 minutes for 15 minutes, for example.

In addition, the earliest switch-on time is determined from all 3 weekly timer switches. This is necessary when a system must be optimally switched on. However the FBox **Calendar** in the system must still be used and switched as follows:

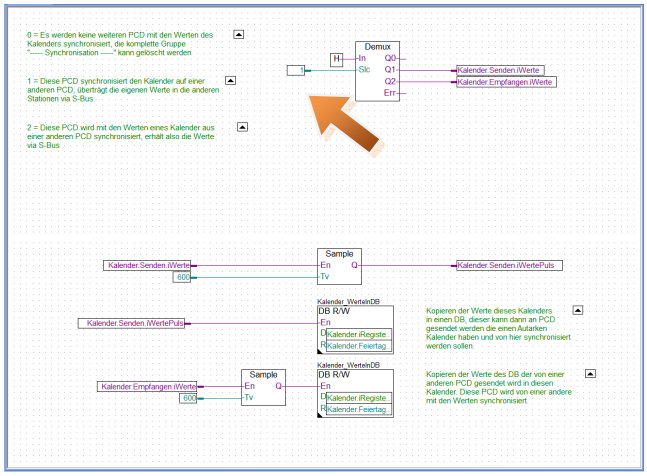


The drawback with this method is that the switching channel must have the same setting in the systems switch and in the Calendar FBox, otherwise the heating circuit will run via switching channel 1 and the selection of the switch-on point will run via switching channel 2.

Therefore it is necessary to synchronise the selected switching channels in both FBoxes. The safest way is to copy the switching channel from the system switch FBox to the Calendar FBox using a MOV as shown opposite. An assignment of the icons within the FBoxes should not be carried out, as one icon would then be used in 2 FBoxes.



Synchronisation



The calendar can also be used in conjunction with other controllers to avoid every PCD containing a separate calendar with different switching times. This may be required, but the calendar function is usually centrally operated.

It is therefore necessary to synchronise the calendar of the controllers, i.e. to transfer the set date and time values of a master PCD to the other PCD.

As a relatively large volume of data is to be transported here, the addresses of the FBoxes that were used in the calendar have a fixed address and are assigned in a consecutive range from F 100 and R 100. For this reason, the dynamic range for F and R should start from 1000, upper limit 9999 as the alarm list uses flags again from 10,000. In the template project, the dynamic range for flags and registers is therefore already preset from 1000 to 8191. The upper limit 8191 should be retained if possible, but can be expanded to 9999 if required. Please also activate the PG5 option “Use 16-bit register and flag addressing” for this.

On this page it should be specified whether this PCD

- should operate fully independently with the separate calendar, in this case the following **send to ASxx** page can be deleted
- if the calendar is a master, a **1** must be entered in the connector marked for this. The target station must be parameterised on the following page. This PCD then sends the calendar data to other stations
- if a calendar is a slave, i.e. it receives the calendar data of another controller, the page **send to ASxx** can be deleted.

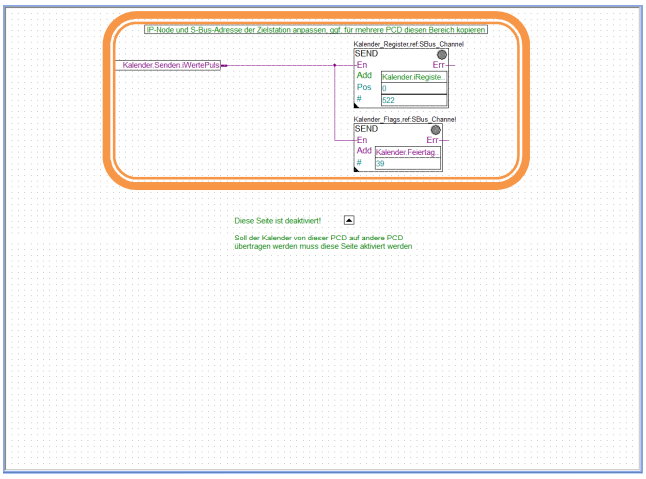
On this page, the calendar data, depending on whether master or slave, is copied from the calendar to a DB or from the DB to the calendar. The DB is transferred instead of the registers, as this more efficient.

send to AS xx

This page is only required if this PCD is the calendar master and the calendar values should be transferred to other controllers.

The DB and several flags respectively are transferred, communication occurs every 60 seconds.

In the slave, the values are also transferred every 60 seconds from the received DB to the separate calendar, therefore in the worst case it can take up to 2 minutes for a slave to be updated with the newly set values in the calendar. The times can be reduced if necessary.

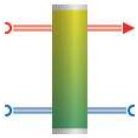
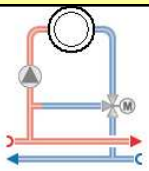


Only the **IP node** and the **destination station** must be entered in the FBoxes, the marked area is duplicated for each additional slave PCD.

Heating technology templates

For PHW (pumped hot water) there are currently 2 main categories available

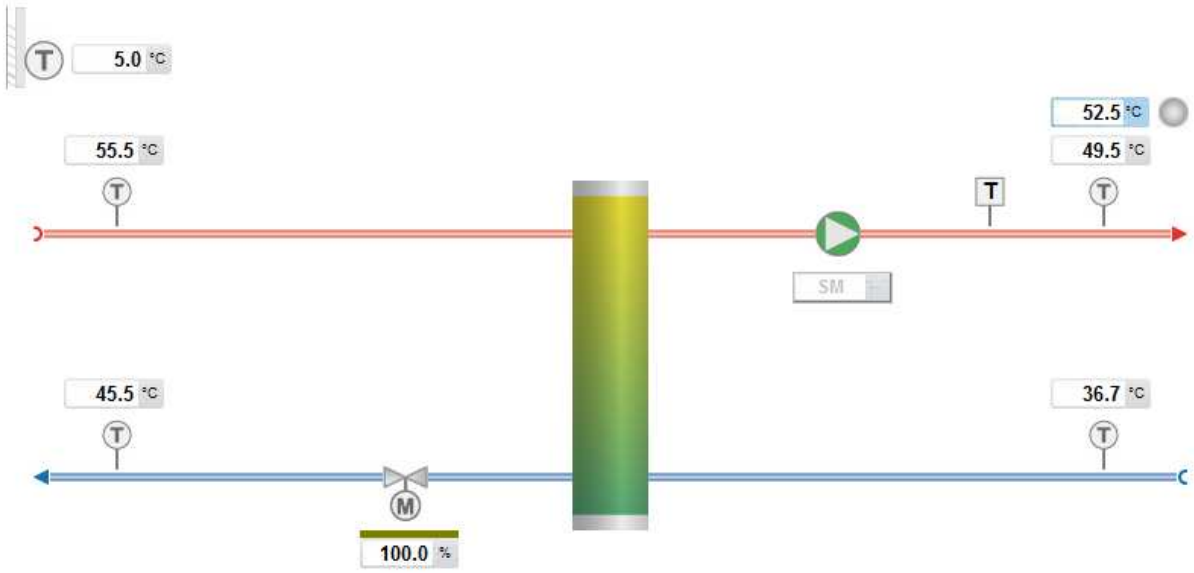
- PHW generation– preliminary number HZG0
- Simple heating circuit – preliminary number HZG1

		PHW generation	Heating circuit
	Extension		
Single pump		HC01	HC11
Double pump			HC12

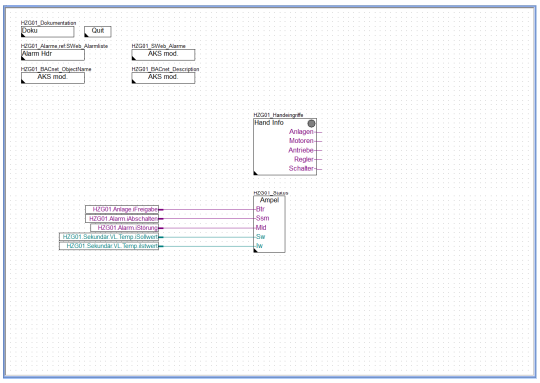
HC01 – Heat exchanger (district heating)

The template HC01 – heat exchanger is a typical application for a utility-supplied transfer station. The technical features are:

- Primary side (district heating): Inflow and return flow temperature sensor, through valve constantly controlled on the return flow side
- Secondary side (consumer): Inflow and return flow temperature sensor, pump on the inflow side, safety temperature limiter
- The inflow temperature is controlled on the secondary side with a max. return flow temperature limit on the primary side



Start page

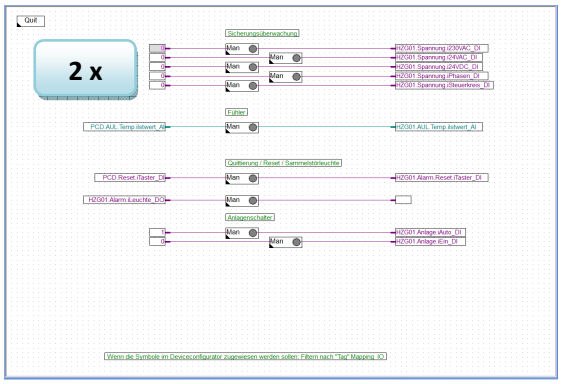


This page represents the start of the system. See also **ALG01/PCD**.

In addition the FBoxes

- **Manual Op** > monitors whether all switches of this system are in the automatic position and shows the number and types of the switches with a manual override
- **Status** > serves as a quick overview for web visualisations or a SCADA
  - System operation (green LED)
  - Error message not switching off pending (yellow LED)
  - Error message switching off pending (red LED)
  - And the most important target/actual value (e.g. Inflow temperature for heating circuits or room temperature for ventilation units)

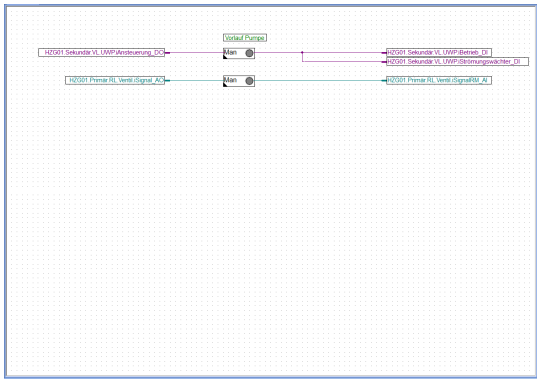
HW IO



These pages are used to assign the systems IO to the physical IO.

See also **GEN01/Hardware IO**.

Simulation



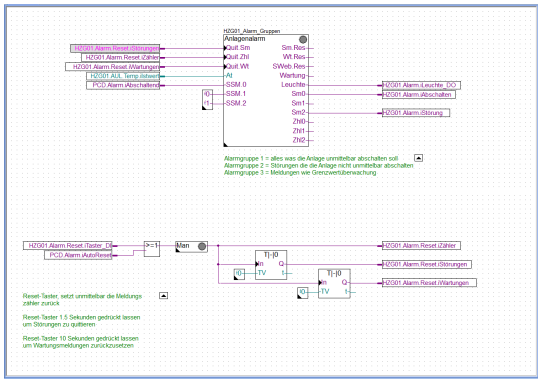
This page is used for the simple test of the application in the office without specific hardware. Feedback is automatically emulated here by the control, the DI/AI can be manipulated directly in the **Fupla Editor** or in the **Watch Window**.

Also see **Pages with colour background - Functions.**

Collective alarm

Definition and recording of alarm groups of the system, higher level alarm message of the PCD (BMA, control voltages) also switch the system off.

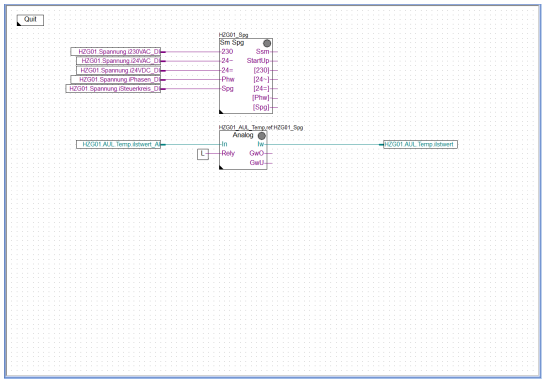
See also **GEN01/Collective Alarm**.



General

See also **GEN01/General**.

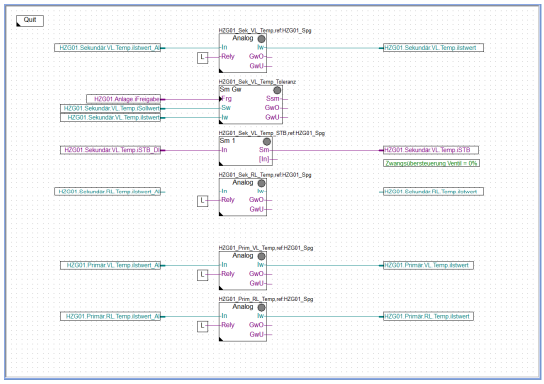
The FBox **Ala Fuse** is informed by the same FBox of page **GEN01/General** of a higher level tripped fuse so that a tripped fuse is also reported internally (not as a real alarm) in this system. After download and a restart of the PCD, faults are suppressed for 30 seconds if necessary, the system is blocked during this time.



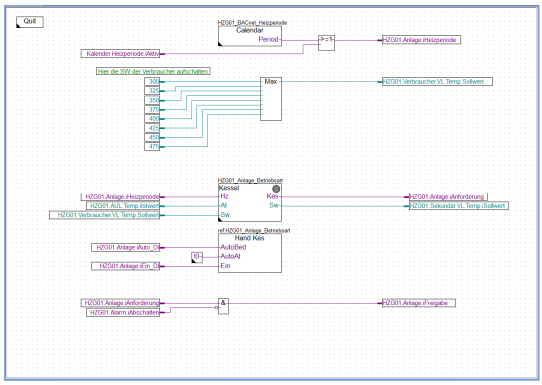
Sensor

Recording of all measured values of the system, analog and switching sensors.

Controlled variables (e.g. inflow temperature) are also monitored for tolerance on this side, i.e. the measured value must be within a hysteresis around the target value in control mode. A message is output if the tolerance band is left for a time that can be modified. This is usually an indication that the medium (heating/cold) is not sufficient or valves/flaps have been manually adjusted on the system.



System



Release condition of the system, consisting of the

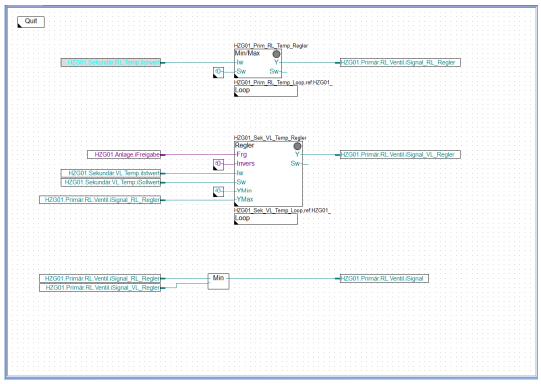
- heating period according to date, either via calendar or BACnet. See also **CAL01/Heating Season**
- Selection of the largest target value of the consumer
- Systems FBox with effective release of the system
- Manual switch FBox, this is optional and can be deleted if no switch is available on the switch cabinet

The heat supply is fed into this system when required, i.e. the target values of the consumer are created at the FBox **Max**. The system is required if at least one consumer reports a target value > 21°C. The target value for the heat supply is also increased by 5 Kelvin (adjustable) to compensate for losses up to the consumers.

If the heat supply should be activated for use over the whole year, the input **Winter** of the FBox **Boiler** should be permanently switched to **High**, alternatively the heating period can be parameterised all year round.

The input **Winter** switches the system off for the **Low** state in automatic mode, even when the switch is on **Auto Requirement**!

Regulation

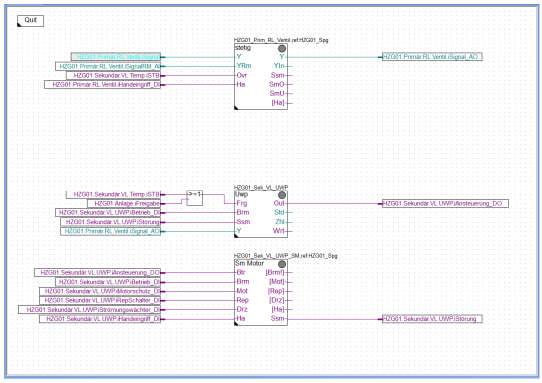


Control of the inflow temperature on the secondary side and the max. limit of the return flow temperature on the primary side.

The max. limit controller is permanently released, the control signal is transferred to the secondary inflow controller as the max. control signal via the input **YMax**. This leads to a soft transition in the event of a limit.

If the **signal** is set to **Manual** in the secondary inflow controller, the max. limit would be ineffective, therefore the smaller signal is then also selected from both control signals.

Valve; Pump



Control of the control valve in the return flow of the primary circuit and the pump in the inflow of the secondary circuit.

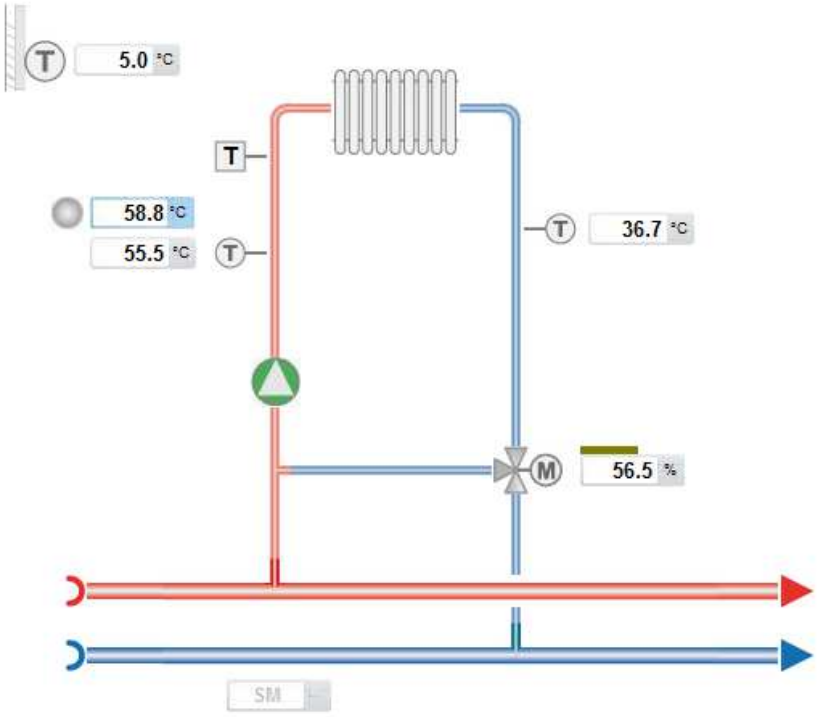
The control valve is forcibly closed via the input **Ovr** if the **STL** has triggered. This forces the closing of the valve drive and is subordinated to all manual switches of the FBoxes and thus the last safety switch in the application.

The pump in the inflow is controlled to release the heat supply and to trigger the **STL** to carry any surplus heat away.

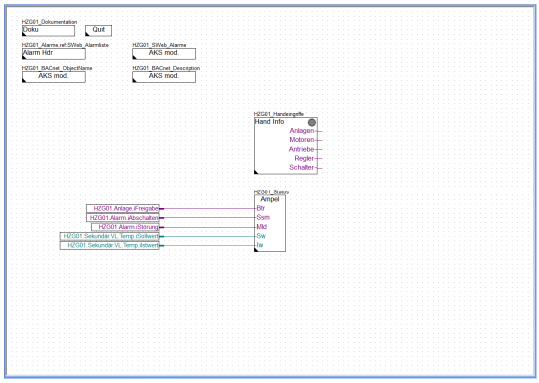
HC11 – Heating circuit with single pump

The template HC11 – Heating circuit with a single pump is a typical consumer.

- Inflow and return flow temperature sensor, constantly controlled three-way valve on the return flow side (installation position is irrelevant)
- Circulation pump, STL in inflow, e.g. for floor heating circuits
- The inflow temperature is controlled with a max. return flow temperature limit



Start page

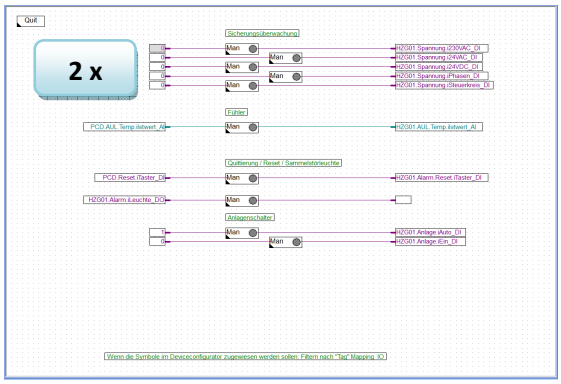


This page represents the start of the system. See also **GEN01/PCD**.

In addition the FBoxes

- **Manual Op** > monitors whether all switches of this system are in the automatic position and shows the number and types of the switches with a manual override
- **Status** > serves as a quick overview for web visualisations or a SCADA
  - System operation (green LED)
  - Error message not switching off pending (yellow LED)
  - Error message switching off pending (red LED)
  - And the most important target/actual value (e.g. Inflow temperature for heating circuits or room temperature for ventilation units)

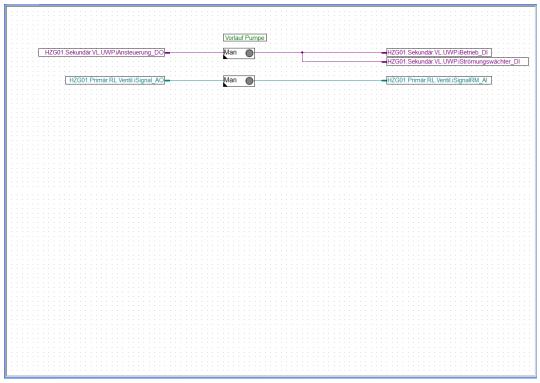
HW IO



These pages are used to assign the systems IO to the physical IO.

See also **GEN01/Hardware IO**.

Simulation



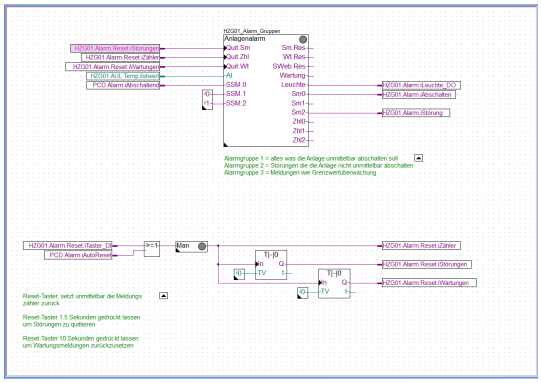
This page is used for the simple test of the application in the office without specific hardware. Feedback is automatically emulated here by the controls, the DI/AI can be manipulated directly in the **Fupla Editor** or in the **Watch Window**

Also see **Pages with colour background - Functions.**

Collective Alarm

Definition and recording of alarm groups of the system, higher level alarm message of the PCD (BMA, control voltages) also switch the system off.

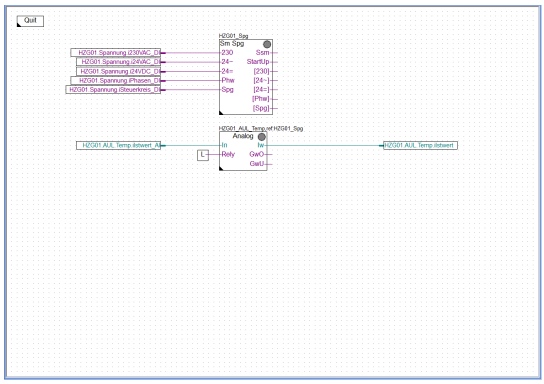
See also **GEN01/Collective alarm**.



General

See also **GEN01/General**.

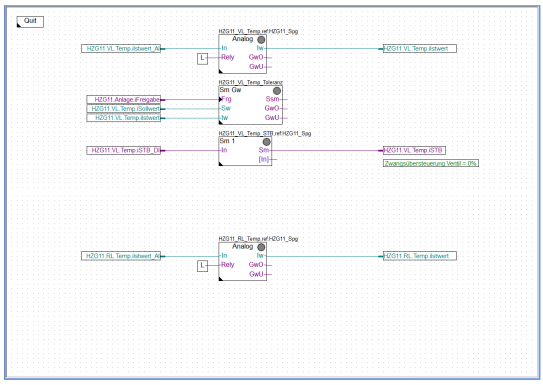
The FBox **Ala Fuse** is informed by the same FBox of page **GEN01/General** of a higher level tripped fuse so that a tripped fuse is also reported internally (not as a real alarm) in this system. After download and a restart of the PCD, faults are suppressed for 30 seconds if necessary, the system is blocked during this time.



Sensor

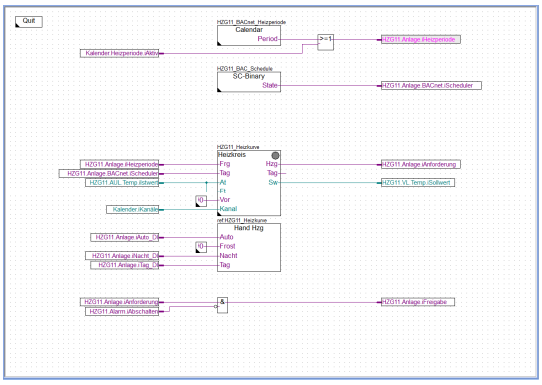
Recording of all measured values of the system, analog and switching sensors.

Controlled variables (e.g. inflow temperature) are also monitored for tolerance on this page, i.e. the measured value must be within a hysteresis around the target value in control mode. If the tolerance band is left for an adjustable time, a message is output. This is usually an indication that the medium (heating/cold) is not sufficient or valves/flaps were manually adjusted on the system.

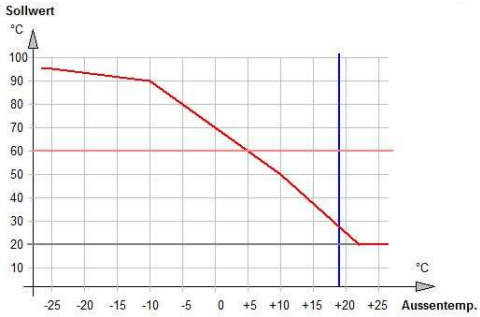


System

Release condition of the system, consisting of



- heating period according to date and night/day switching, either via calendar or BACnet. See also **CAL01/Heating Season/switching channels**
- Systems FBox with effective release of the system
- Manual switch FBox, this is optional and can be deleted if no switch is available on the switch cabinet



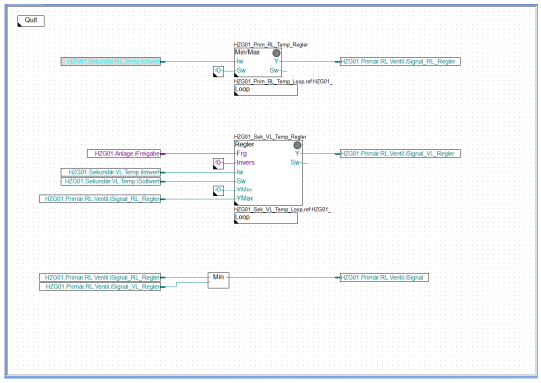
The heating circuit calculates the target value of the inflow temperature depending on the outside air temperature. The calculation occurs with a heating curve above 4 points.

At night the target value is reduced, the presetting is 10 ° Kelvin. If the outside air temperature is higher than the AT limit value (night or day) and the effective target value > 21°C, the heating circuit is released. The input **Winter** must also be **High** so that the heating circuit in automatic mode is only switched on when required and during the heating period.

The input **Winter** switches the system off for the **Low** state in automatic mode, even when the switch is on **Auto requirement**!

Control

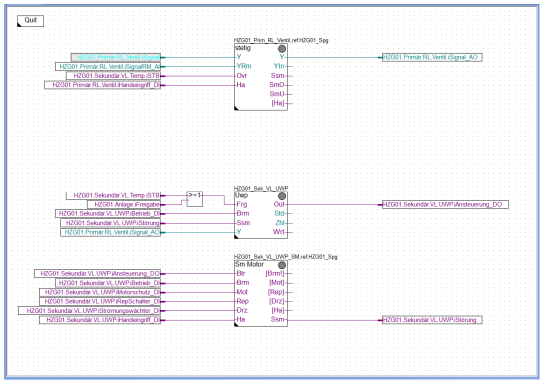
Control of the inflow temperature and the max. limit of the return flow temperature.



The max. limit controller is permanently released, the control signal is transferred to the inflow controller as the max. control signal via the input **YMax**. This leads to a soft transition in the event of a limit.

If the **signal** is set to **Manual** in the inflow controller, the max. limit would be ineffective, therefore the smaller signal is then also selected from both control signals.

Valve; Pump



Control of the control valve in the return flow and the pump in the inflow.

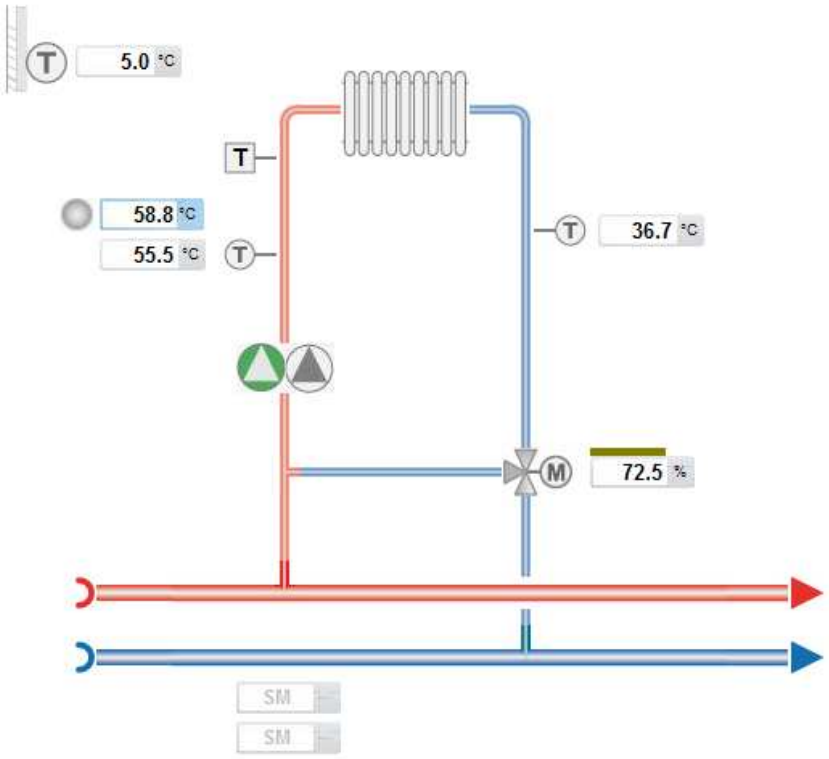
The control valve is forcibly closed via the input **Ovr** if the **STL** has triggered. This forces the closing of the valve drive and is subordinated to all manual switches of the FBoxes and thus the last safety switch in the application.

The pump in the inflow is controlled for the release of the heating circuit.

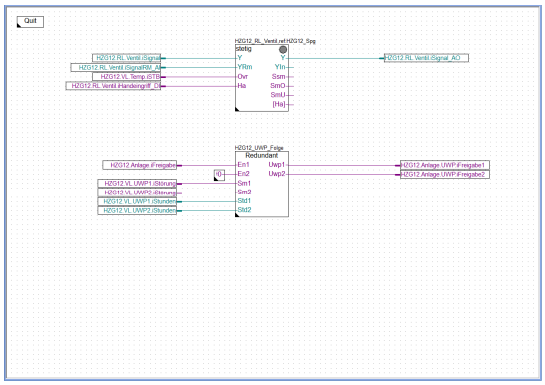
HC12 – Heating circuit with dual pump

The template HC12 – Heating circuit with dual pump is a typical consumer and has almost the same function as HC11. Only the differences are listed here

- Dual pump with automatic switching according to the difference in hours of operation or for pump fault



Valve; Sequence

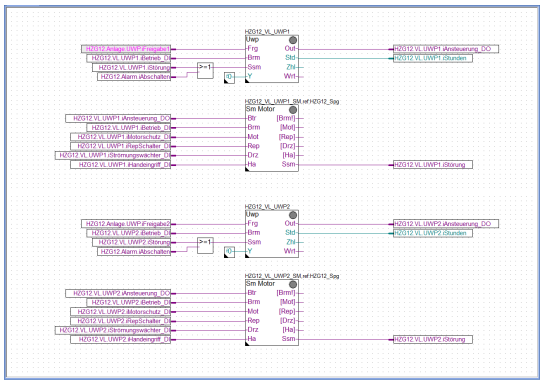


Control of the control valve in the return flow and subsequent switching of the pumps.

The control valve is forcibly closed via the input **Ovr** if the **STL** has triggered. This forces the closing of the valve drive and is subordinated to all manual switches of the FBoxes and thus the last safety switch in the application.

The pumps are released with the release of the heating circuit, whereby always only one pump is running. The pump is switched according to the operating hour difference or for a pump fault. Alternatively switching can occur on a weekday or at a specified time every day.

Pumps



Control of pumps in the inflow.

Both pumps have the same design, i.e. each pump is controlled individually and has its own operating/fault messages.

Some dual pumps have a controller that only requires a release and performs switching independently. In this case template HC11 may be more suitable, but it must be ensured that the pump is not switched off when there is a fault message for the pump controller as the 2nd pump is still ready for operation.

Sanitary technology templates

There are currently 2 templates for HW (hot water)

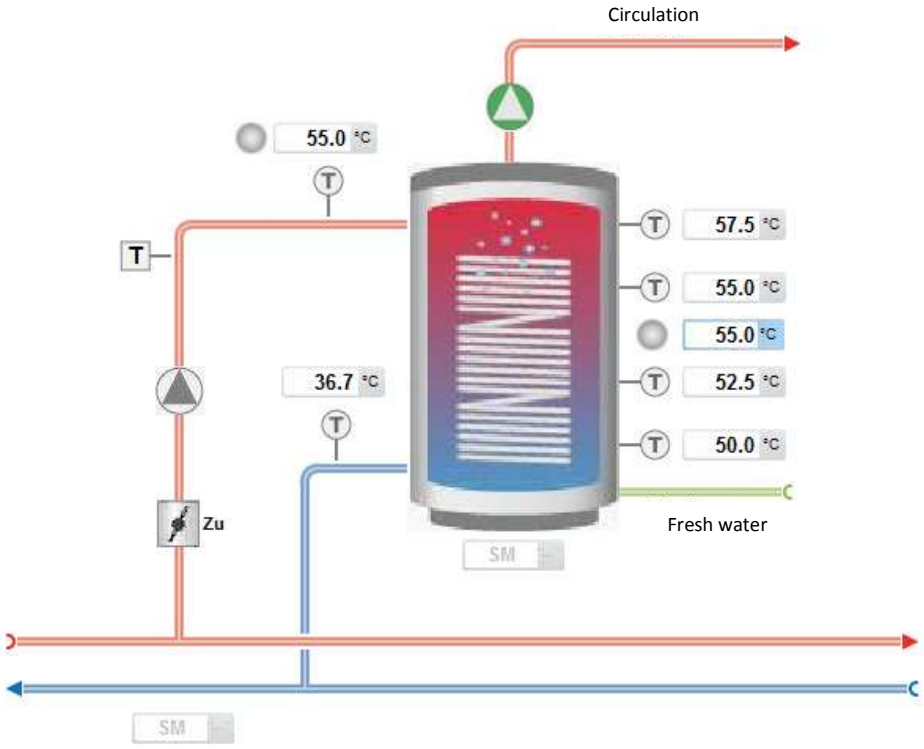
- HW switched –SAN11
- HW controlled – SAN12

	Extension	PHW generation
Single pump		SAN11
Double pump		SAN12

SAN11 – water heater switched

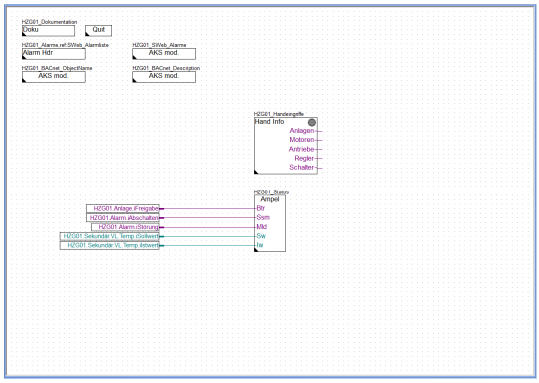
The template SAN11 – HW switched is a typical water heater.

- Inflow and return flow temperature sensor in the loading circuit
- Circulation pump, STL and shut-off flap of the loading circuit
- Four temperature sensors in the reservoir
- Circulation pump



Start page

This page represents the start of the system. See also **GEN01/PCD**.



In addition the FBoxes

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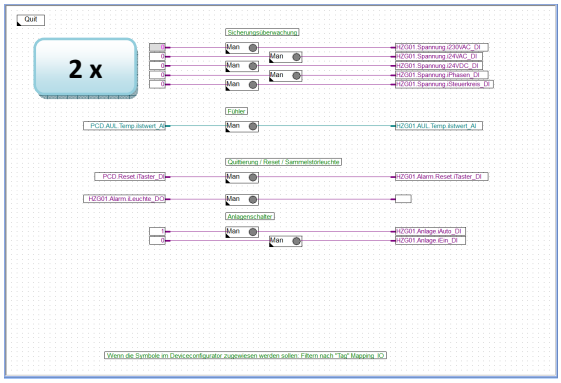
HW IO

These pages are used to assign the systems IO to the physical IO.

See also **GEN01/Hardware IO**.



Simulation

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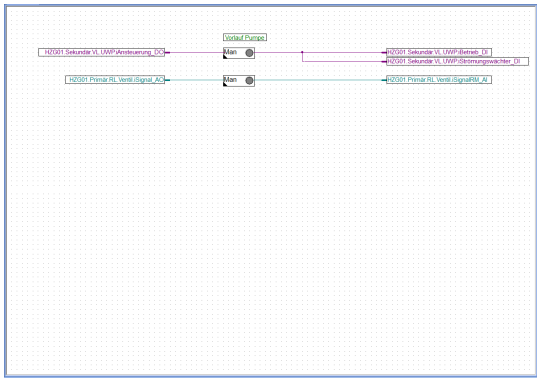
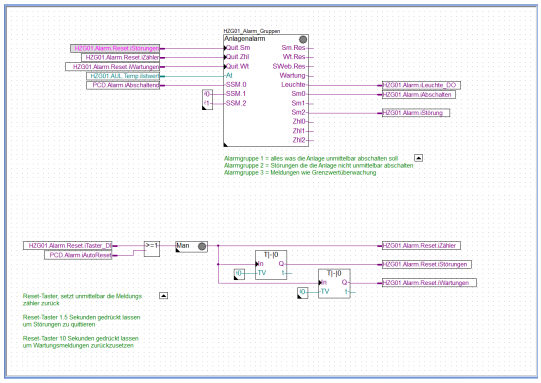
Also see **pages with colour background - functions.**



Collective Alarm

Definition and recording of alarm groups of the system, higher level alarm message of the PCD (FAS, control voltages) also switch the system off.

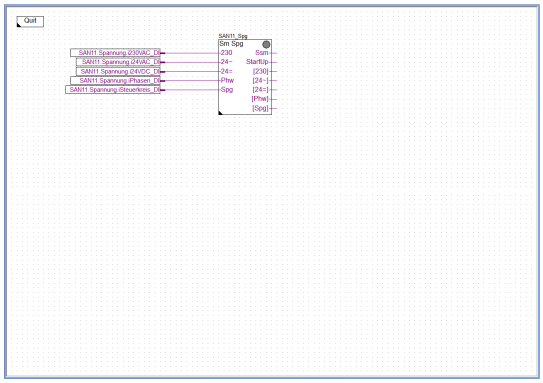
See also **GEN01/Collective alarm**.



General

See also **GEN01/General**.

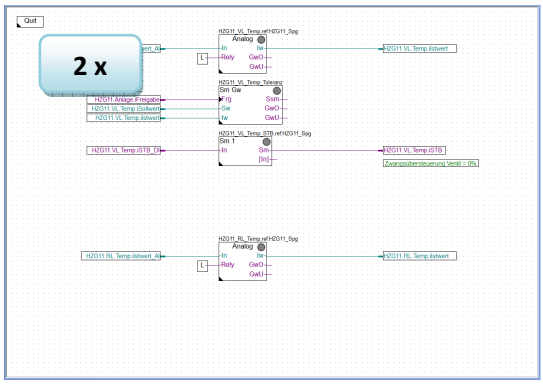
The FBox **Ala Fuse** is informed by the same FBox of page **GEN01/General** of a higher level tripped fuse so that a tripped fuse is also reported internally (not as a real alarm) in this system. After download and a restart of the PCD, faults are suppressed for 30 seconds if necessary, the system is blocked during this time.



Sensor

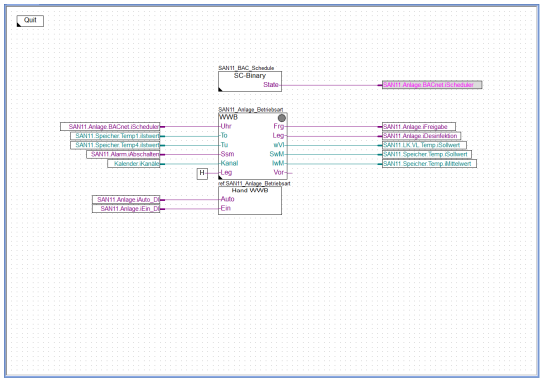
Recording of all measured values of the system, analog and switching sensors. A page for the sensors of the loading circuit, another one for the sensors of the reservoir.

Controlled variables (e.g. inflow temperature) are also monitored for tolerance on this side, i.e. the measured value must be within a hysteresis around the target value in control mode. A message is issued if the tolerance band is left for an adjustable time. This is usually an indication that the medium (heating/cold) is not sufficient or valves/flaps were manually adjusted on the system.



System

Release condition of the system, consisting of



- Requirement according to the clock, either via calendar or BACnet. See also **CAL01/Switching channels**
- Systems FBox with effective release of the system
- Manual switch FBox, this is optional and can be deleted if no switch is available on the switch cabinet

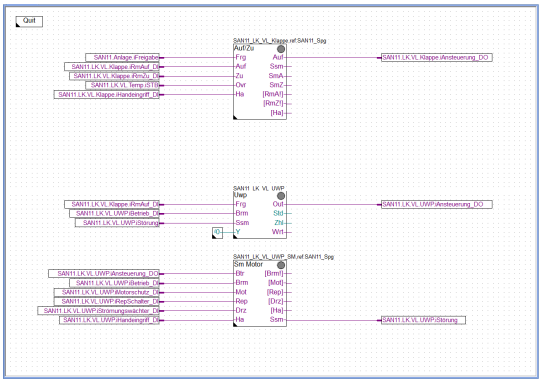
The water heater is switched on in normal mode when at input **Clock** a **High** is present and the sensor connected to the input **Ttop** (top temperature) is lower than the switch-on limit value (50°C). Only when the reservoir is fully loaded, i.e. the temperature at the input **Tbot** (bottom temperature) is higher than the switch-off limit value (55°C), is the HW switched off.

Legionella mode is used to kill bacteria (legionella) and can be generally released/blocked via the input **Disinfec**. In the template, legionella mode is generally permitted and is activated on Sunday at midday for max. 1 hour. The HW is heated to 70°C during this time

WARNING: The time of legionella switching is to be coordinated with the operating times of the user!

Loading circuit

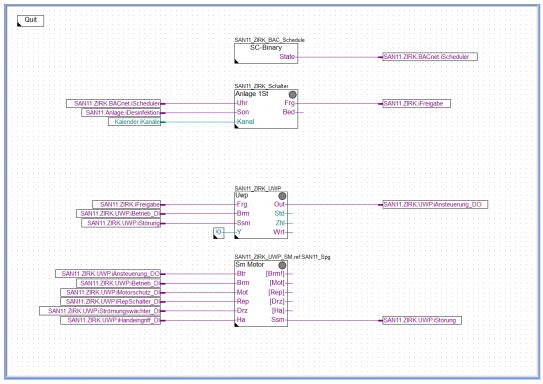
Control of the shut-off flap and the loading pump



The shut-off flap is opened for the requirement HW (normal mode or legionella switching).

The pump is only switched on with Feedback On of the shut-off flap. As soon as Feedback On is not activated, the pump is switched off to prevent it pumping against a closed line.

Circulation



Release of the circulation and control of the circulation pump.

- Requirement according to clock, either via calendar or BACnet. See also **CAL01/Switching channels**
- Systems FBox with effective release of the system

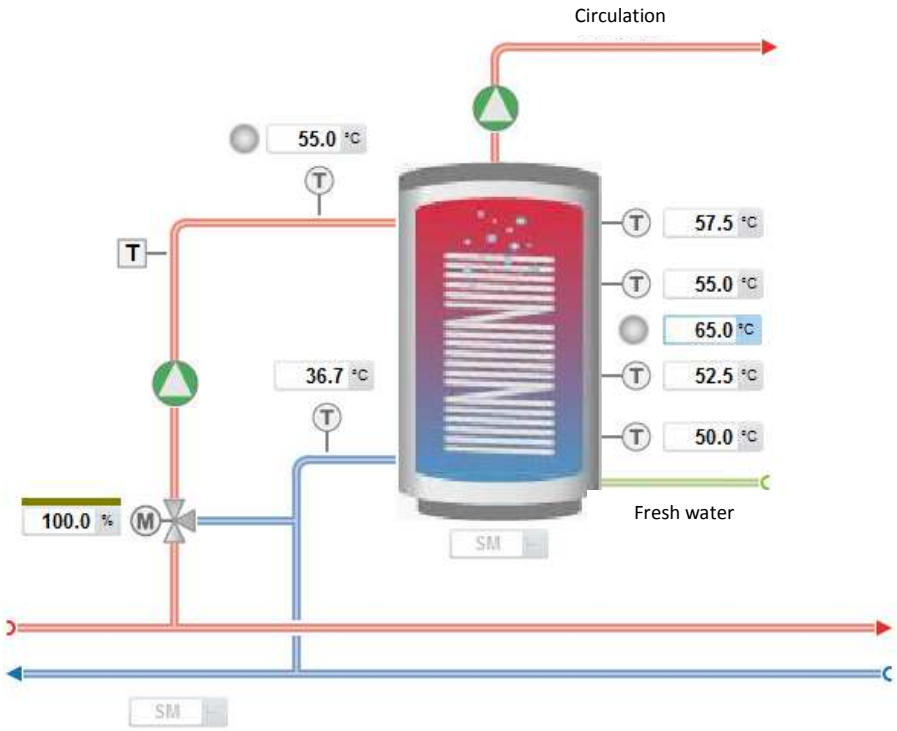
The circulation is activated via a time program. In addition the circulation is automatically switched on if the water heater activates legionella protection switching to also heat up the circulation lines.

WARNING: The time of legionella switching is to be coordinated with the operating times of the user!

SAN12 – Water heater controlled

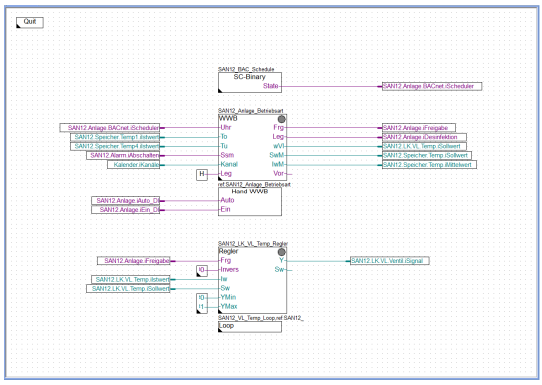
The template SAN12 – HW controlled is a typical water heater and has almost the same function as SAN11. Only the differences are listed here

- Control valve in inflow of the loading circuit



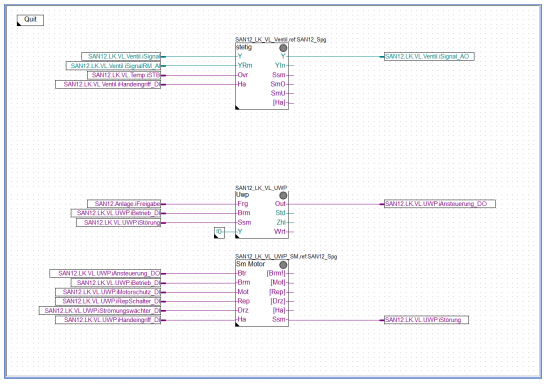
System

A FBox **Controller** is available for the controlled loading circuit. The control variable is the inflow temperature of the loading circuit. The target value is calculated by the FBox HW by adding an overshoot (5°C) to the switch-off limit value (55°C). This ensures that the loading temperature is sufficiently hot to heat up the HW.



Loading circuit

The FBox **Continous** is included on the loading circuit side instead of the FBox Open/Closed. This controls the control valve but is forcibly closed when the STL responds.



Ventilation technology templates

For the ventilation technology, there are various templates available, all are based on the template AHU00, a speed-controlled system (supply and exhaust air) with open/closed flaps and filters, with no further treatment. There are 5 basic types derived from this

- without heat recovery – identification AHUx1
- with mixed air – identification AHUx2
- with cross-flow heat exchanger – identification AHUx3
- with rotation heat exchanger – identification AHUx4
- circuit compound system – identification AHUx5

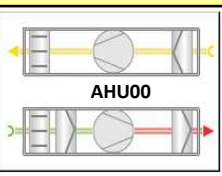
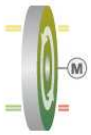
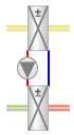
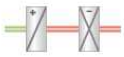
Moreover, there are already 6 additional functions that can be combined with all above named ventilation types

- only with preheater – identification AHU0x
- only with cooler – identification AHU1x
- with preheater and cooler – identification AHU2x
- with preheater, cooler, air quality controller – identification AHU3x
- with preheater, cooler, air quality controller, humidifier – identification AHU4x
- with preheater, cooler, reheater, air quality controller, humidifier, dehumidifier – identification AHU5x

This results in 30 variations of ventilation systems plus the AHU00 basic ventilation unit with no further treatment.

Example: Ventilation with a cross-flow heat exchanger (AHUx3) with the additional function preheater and cooler (AHU2x) then gives rise to ventilation AHU23.

The selection matrix to find the required system combination quickly and easily is shown opposite. Templates are available for all these systems.

	Extension	Base AHU	Mixed Air	Cross flow	Rotation	Circuit
		 AHU00				
Preheater		AHU01	AHU02	AHU03	AHU04	AHU05
Cooler		AHU11	AHU12	AHU13	AHU14	AHU15
Preheater + Cooler		AHU21	AHU22	AHU23	AHU24	AHU25
Preh. + Cool + air quality		AHU31	AHU32	AHU33	AHU34	AHU35
Preh. + Cool + AirQ + Hum.		AHU41	AHU42	AHU43	AHU44	AHU45
Preh. + Cool + AirQ + Hum/Dehum		AHU51	AHU52	AHU53	AHU54	AHU55

As the systems have a modular design to a certain extent, not every system is described in detail. The individual components, e.g. preheater, humidifier, pressure controller, are described in detail here.

AHU00 – Basic ventilation unit

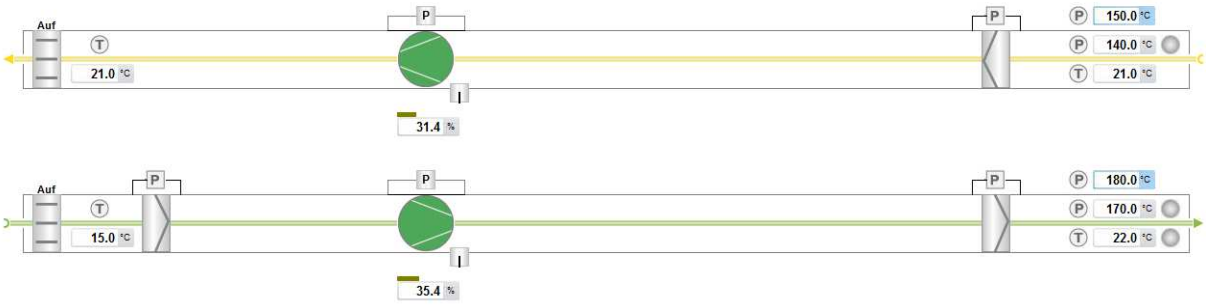
All variations of the ventilation systems are based on this ventilation unit. The basic components are:

- In the outside air
  - multi-leaf damper open/closed with feedback
  - Temperature sensor
  - Filter with switching pressure box

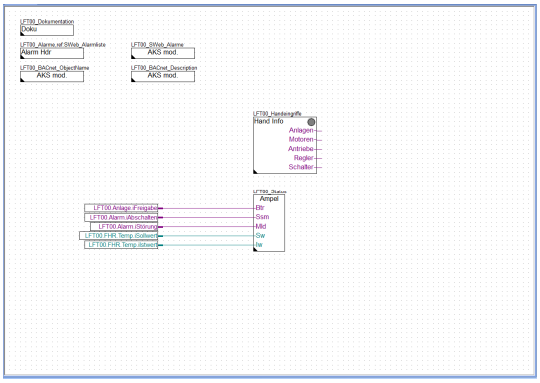
- In the supply air
  - Fan with frequency inverter, motor protection, rep. switch, speed monitoring (switching pressure box, alternatively via pressure sensor), operating feedback and manual intervention
  - Filter with switching pressure box
  - Temperature sensor
  - Pressure sensor

- In the exhaust air
  - Temperature sensor
  -Pressure sensor
  -Filter with switching pressure box
  -Fan with frequency inverter, motor protection, rep. switch, speed monitoring (switching pressure box, alternatively via pressure sensor), operating feedback and manual intervention

- In the outgoing exhaust air
  - Temperature sensor
  - Multi-leaf damper open/closed with feedback



Start page



This page represents the start of the system. See also **GEN01/PCD**.

In addition the FBoxes

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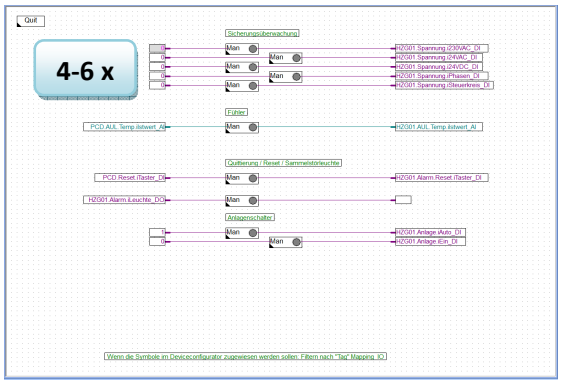
  - And the most important target/actual value (e.g. Inflow temperature for heating circuits or room temperature for ventilation units)

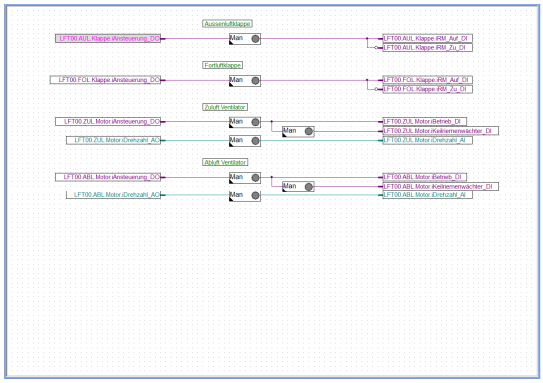
HW IO



These pages are used to assign the systems IO to the physical IO.

See also **GEN01/Hardware IO**.

Simulation



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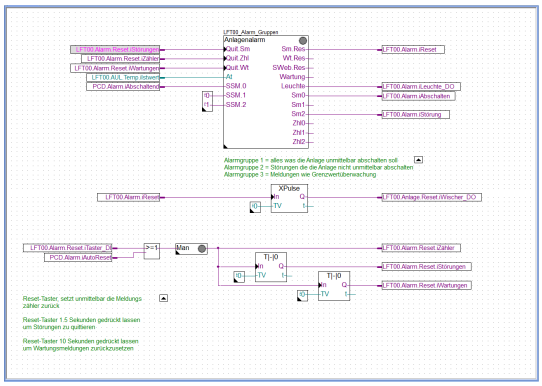
Also see **pages with colour background - Functions.**

Collective alarm

Definition and recording of alarm groups of the system, higher level alarm message of the PCD (FAS, control voltages) also switch the system off.

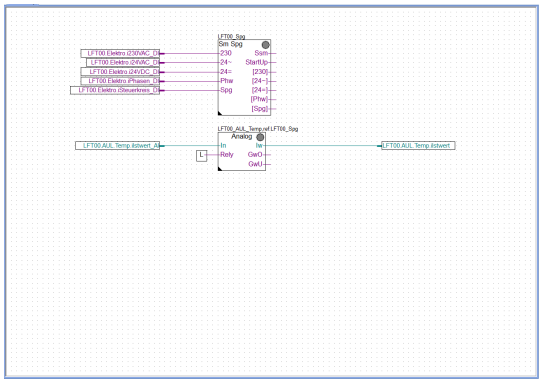
See also **GEN01/Collective alarm**.



General

See also **GEN01/General**.

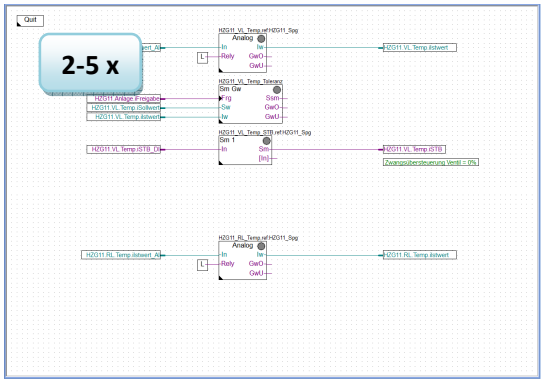
The FBox **Ala Fuse** is informed by the same FBox of page **GEN01/General** of a higher level tripped fuse so that a tripped fuse is also reported internally (not as a real alarm) in this system. This is used by the message suppression to trigger a fuse/electrical circuit. After download and a restart of the PCD, faults are suppressed for 30 seconds if necessary, the system is blocked during this time.



Sensor

Recording of all measured values of the system, analog and switching sensors. The pages are sorted according to temperature, pressure, humidity, etc.

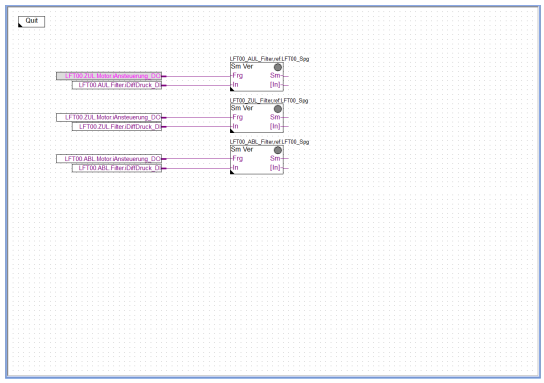
Controlled variables (e.g. Inflow temperature) are also monitored for tolerance on this side, i.e. the measured value must be within a hysteresis around the target value in control mode. If the tolerance band is left for an adjustable time, a message is output. This is usually an indication that the medium (heating/cold) is not sufficient or valves/flaps were manually adjusted on the system.



The sensors are summarised according to function (pressure, humidity, etc.) on several pages.

Filter

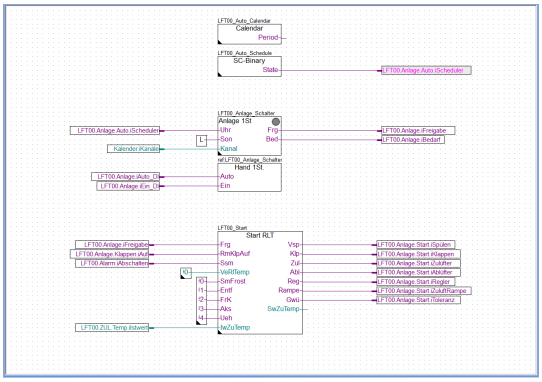
Monitoring of outside air, supply air and exhaust air filter. Monitoring is only active when the associated fan is running. The message “Filter dirty” is only activated 1x and is displayed until the fan is switched off. A filter message is therefore only generated 1x a day.



If it should be possible to reset the filter message also during operation, the “Acknowledgement required” parameter should be set to “yes”, an acknowledgement using a button is then always required.

System

The system runs in automatic mode according to the switching program. See also **CAL01/Calendar**.



A virtual system switch that can be operated via Web or SCADA is provided, the switching positions are Off – Automatic – On.

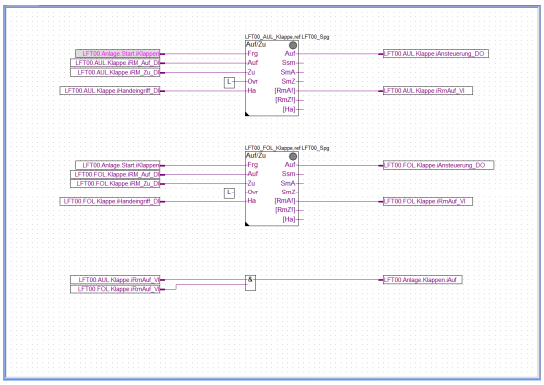
A higher level system switch is provided on the switch panel, FBox **Sytsem 1sp**, and has the same switching settings as the virtual system switch, but overrides this for the Off or On position. If no switch is available on the switch panel, the FBox can be deleted.

In addition the sequential release of the system by the FBox **Fan Start** takes place here. This ensures that the flaps are opened first. When all the flaps are open, the supply air motor is released with a brief delay of the exhaust motor.

All additional functions of this module that refer to a temperature controller are invalid in these cases and ineffective, as there is no further treatment of the air in this system. These functions are only used in combination with other templates.

The template is designed so that the Fupla calendar is deactivated when using BACnet and the system is operated via Calendar/Scheduler. If BACnet is not used, the Fupla calendar is automatically activated.

Damper OUT/EXH

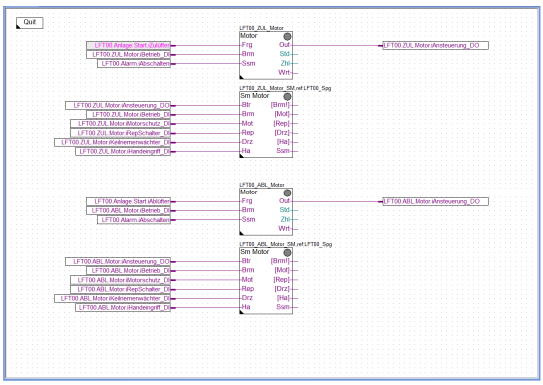


Control of the outside air and outgoing exhaust air. It is assumed that the flaps have feedback contacts for open and closed. If only one contact is available, the other is to be designed inversely to the existing contact.

If no feedback contact is available, the parameter **Open/Closed Messages** must be set to **Emulate**. The FBox inputs for the feedback can then be switched with an L.

The effective determined feedback Open (hardware or emulated) of both flaps is summarised and used again at Fan Start.

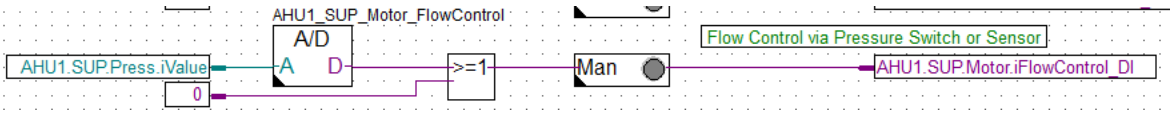
Fans



Control of supply air and exhaust air motor with operating hour counter, maintenance message and virtual switch.

In addition the motors are monitored for the following faults:

- Operating feedback
- Motor protection
- Service switch
- Speed monitor (process feedback) – this can be carried out with a switching pressure box or by the constant pressure sensor. Both are already provided in the **HW IO** page.



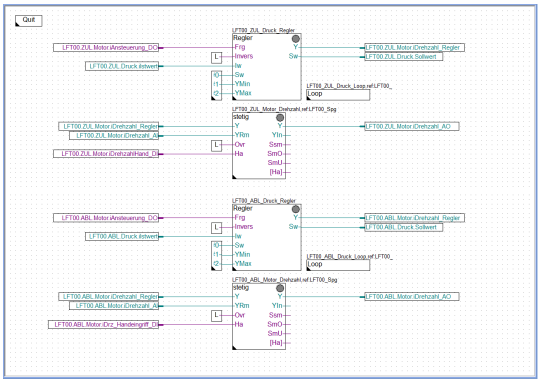
f

the process feedback is via the constant pressure sensor, the Or FBox and the digital input connector can be deleted. The threshold value for the pressure is to be set in the A/D FBox. If the process feedback is via the switching pressure box, the Or FBox, A/D FBox and the integer input connector are to be deleted.

- Manual intervention (switch position, manual operating module or coupling relay feedback)

Pressure Regulation

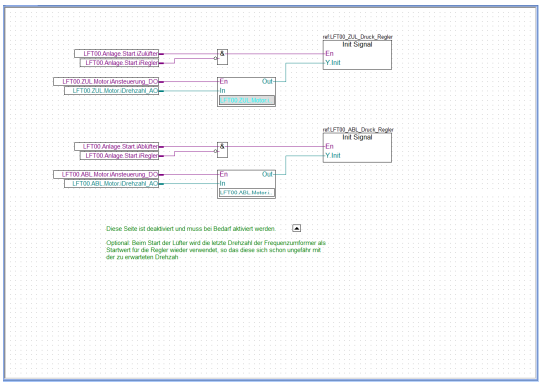
The pressure control for supply air and exhaust air pressure occurs constantly, the target value is set directly in the FBoxes **Controller**.



The control signal is supplied via the FBoxes **Continous**, if necessary this monitors the position feedback (parameter **feedback available**) and manual intervention at the signal output (feedback switch position manual operating module)

Pressure Regulation (optional)

This page is optional and deactivated and can be activated if required. Function:



When starting the system, the pressure controller tries to regulate the set system pressure. Depending on the control parameter, this can take a long time (e.g. large P-band, long reset time) or fast but audible on/off of the ventilation unit (e.g. small P-band, short reset time).

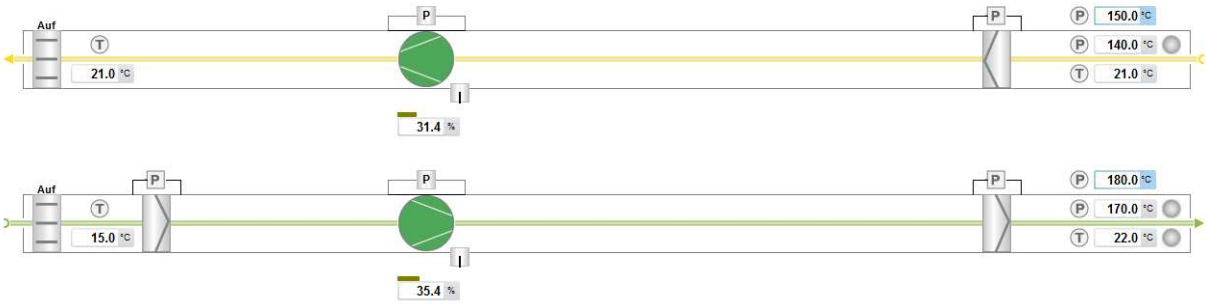
To optimise this, the control signal is permanently saved in a register when the system is in operation. If the system is switched off, it can be assumed that the pressure was controlled, so the last signal output remains saved.

When starting the system, this is then saved (= last control signal) to be used as the coldstart value for the pressure controller and fixed until the Fan Start module releases the controller. Until then, the frequency inverter should have reached the specified speed and have stabilised the air flow. Ideally the system pressure is also reached and the pressure controller must only be slightly readjusted.

Tip: The signal to be saved may be slightly lower than the actual control signal if before the FBox **Load if enabled**, the signal is reduced with a **Subtraction**. This can be helpful for systems with volumetric flow controllers.

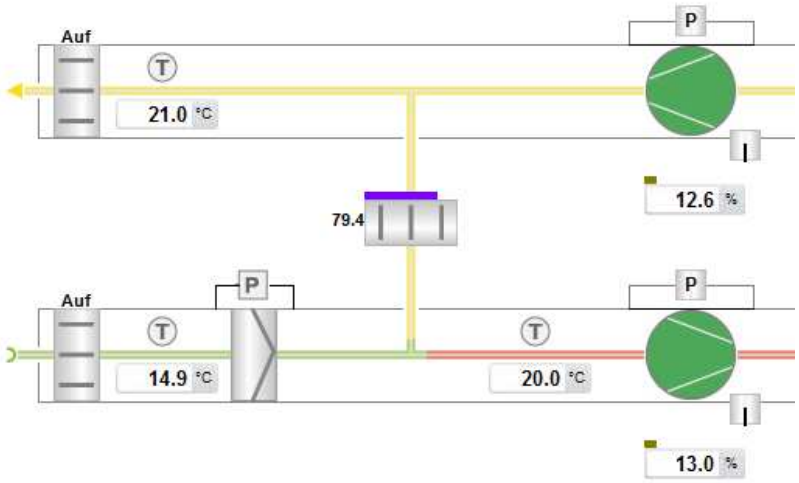
AHUx1 – Ventilation unit without heat recovery

This basic type of system corresponds to the AHU00 system, and is a ventilation unit without heat recovery. The X in the ventilation number is the type of further treatment and is explained at the back of the manual.

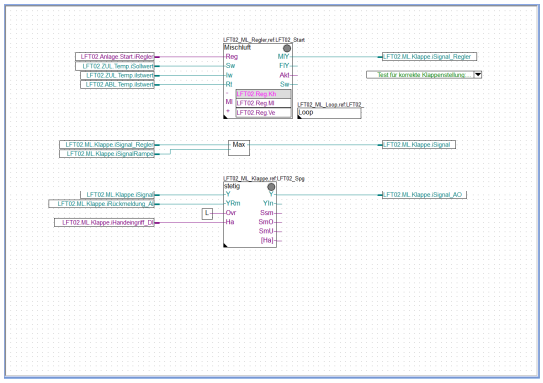


AHUx2 –Ventilation unit with mixed air

This basic system type is based on the AHU00 system, an admixture of extracted air is used for heat recovery = mixed air. The X in the ventilation number is the type of further treatment and is explained at the back of the manual.



Mixed air (controller)



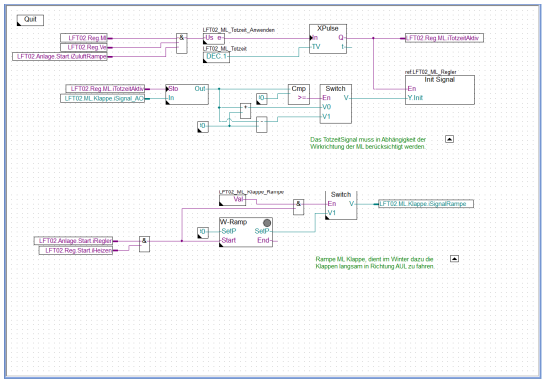
The mixed air is used for heat recovery by reusing the air extracted from the room.

The mixed air controller operates according to supply/demand, i.e. depending on whether there is heating or cooling - the most favourable air, outside or exhaust air, is used.

To do this, the controller compares the outside air temperature with the exhaust air temperature. If the mixed air controller is active, it constantly controls the mixed air flap. If the controller is inactive but detects that the cooler or heater controller is active, for example, it immediately sets the mixed air flap so that the air with the most favourable energy is used with the maximum permitted proportion.

Usually a minimal proportion of outside air is required, this must be set in the FBox **Mixed air** in the parameter maximum value. Here it must be noted that the maximum mixed air proportion is limited (therefore to be viewed inversely). For a minimum outside air proportion of 30%, 70% must be set in the above parameter.

Mixed air (extras)



On this page, additional functions are implemented that affect the mixed air controller or the signal.

The mixed air controller performs an initial PID calculation when activated, i.e. the P-share has a direct effect.

In some cases this can be undesirable, so the controller should only control over the reset time after activation so that the first P-jump is suppressed.

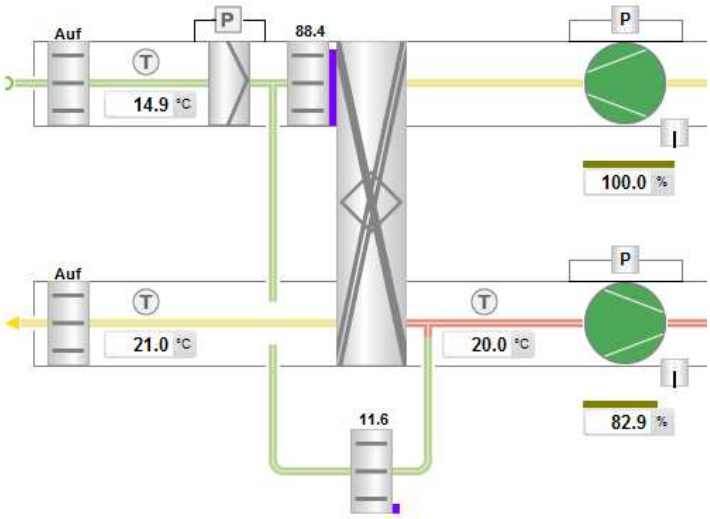
This is provided in the top section of this page, it can be determined whether the deactivation of the P-share should occur for initial release with the FBox **Use** (setting **Yes**) or with P-share (**No**).

If deactivation is chosen, a dead time can also be specified in which the controller is maintained at its start value for activation (coldstart value).

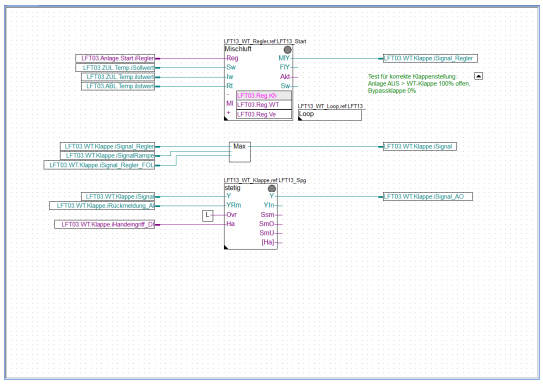
In the lower section of the page, a ramp function is defined that gradually reduces the signal of the mixed air flap over a set time period from 100% to 0% when starting the system in winter, heating mode. The higher signal from the ramp function and mixed air controller is output to the flap. This should prevent a frost function being triggered in winter as too much cold outside air is extracted too quickly.

AHUx3 –Ventilation unit with cross-flow heat exchanger

This basic type of system is based on the AHU00 system, a cross-flow heat exchanger is used for heat recovery, i.e. exhaust air and outside air pass by each other without mixing. The X in the ventilation number is the type of further treatment and is explained at the back of the manual.



Heat exchanger (controller)

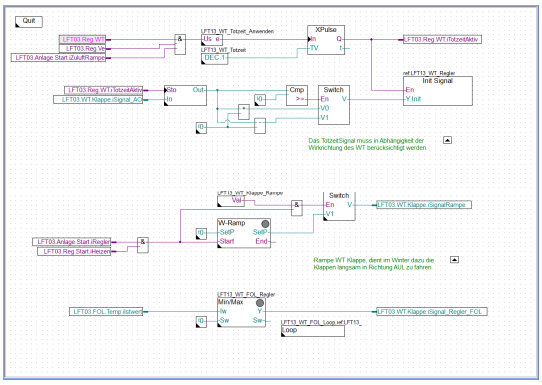


The cross-flow heat exchanger (WT) is used for heat recovery of the air extracted from the room without being mixed with the extracted fresh air.

The heat recovery controller operates like the mixed air controller according to supply/demand, i.e. depending on whether there is heating or cooling - the energy from the most favourable air, outside or exhaust air, is used.

To do this, the controller compares the outside air temperature with the exhaust air temperature. If the HR controller is active, it constantly controls the HR flap. If the controller is inactive but detects that the cooler or heater controller is active, for example, it immediately sets the HR flap so that the air with the most favourable energy is used. The bypass flap always runs opposite to the HR flap.

Heat exchanger (HR) extras



On this page, additional functions are implemented that effect the HR controller or the signal.

The HR controller performs an initial PID calculation when activated, i.e. the P-share has a direct effect.

In some cases this can be undesirable, so the controller should only control over the reset time after activation so that the first P-Jump is suppressed.

This is provided in the top section of this page, it can be determined whether the deactivation of the P-share should occur for initial release with the FBox **Use** (setting **Yes**) or with P-share (**No**).

If deactivation is chosen, a dead time can also be specified in which the controller is maintained at its start value when activated (coldstart value).

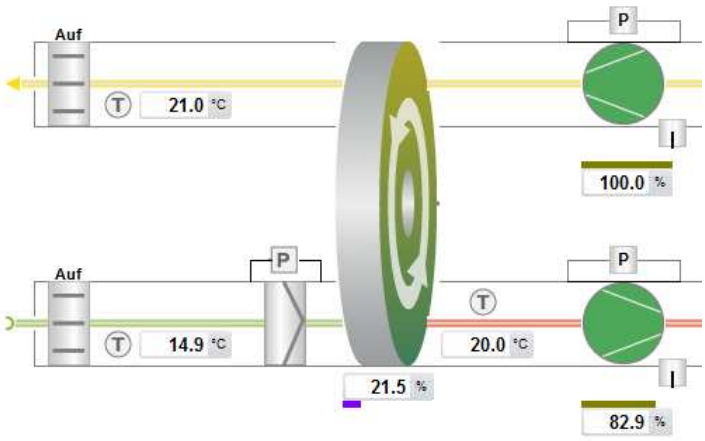
In the lower section of the page, a ramp function is defined that slowly reduces the signal of the HR flap over a set time period from 100% to 0% when starting the system in winter, heating mode. The higher signal from the ramp function and HR controller is output to the HR flap. This should prevent a frost function being triggered in winter as too much cold outside air is extracted too quickly when the HR is bypassed.

A minimum limit of the outgoing exhaust temperature is also included. In winter humid room exhaust air in the HR may cool down so much that moisture is released and it starts to freeze. This is called **icing**, and during operation can lead to the HR on the exhaust air side partially or completely freezing and reducing or even blocking the air flow.

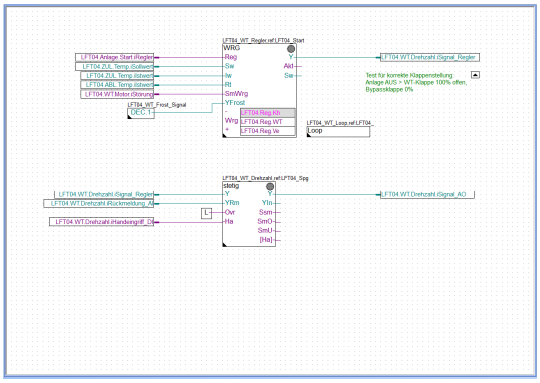
The outgoing exhaust temperature after the heat exchanger is therefore controlled to a minimum value (> 5°C) so that the situation described above can never occur.

AHUx4 –Ventilation unit with rotation heat exchanger

This basic type of system is based on the AHU00 system, a rotation heat exchanger is used for heat recovery, i.e. Exhaust air and outside air are fed through a rotating wheel, a minimum addition of room exhaust air to the fresh air is possible. The X in the ventilation number is the type of further treatment and is explained at the back of the manual.



Heat exchanger (HR) controller

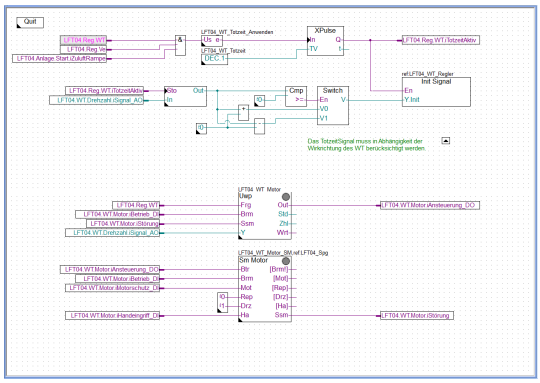


The rotation heat exchanger (HR) is used for heat recovery of the air extracted from the room, a minimum addition of room exhaust air to the extracted fresh air is possible.

The HR controller operates according to supply/demand, i.e. depending on whether there is heating or cooling - the energy from the most favourable air, outside or exhaust air, is used.

To do this, the controller compares the outside air temperature with the exhaust air temperature. If the HR controller is active, it constantly controls the speed. If the controller is inactive but detects that the cooler or heater controller is active, for example, it immediately sets the speed to 0% or 100% so that the air with the most favourable energy is used.

Heat exchanger (HR) extras



On this page, additional functions are implemented that effect the HR controller or the signal.

The HR controller performs an initial PID calculation when activated, i.e. the P-share has a direct effect.

In some cases this can be undesirable, so the controller should only control using the reset time after activation so that the first P-jump is suppressed.

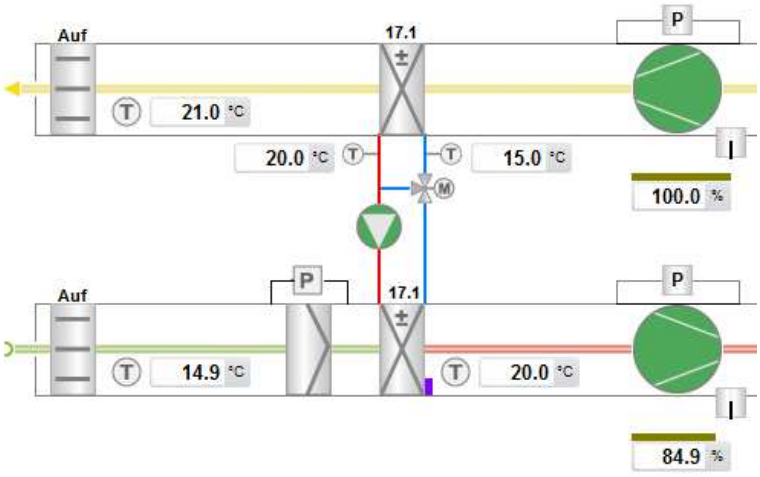
This is provided in the top section of this page, users can determine whether the deactivation of the P-share should occur for initial release with the FBox **Use** (setting **Yes**) or with P-share (**No**).

If deactivation is chosen, a dead time can also be specified in which the controller is maintained at its start value for activation (coldstart value).

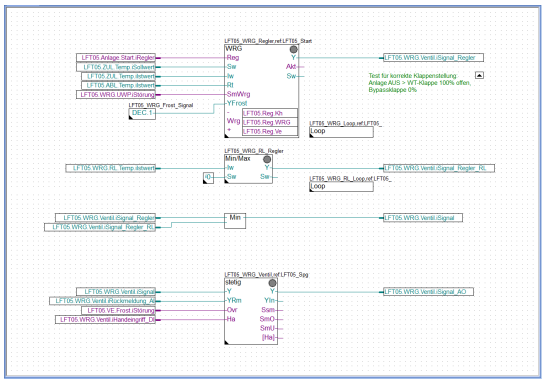
In the lower section of the page, there is a digital control of the rotation heat exchanger included and also the monitoring of error messages of the drive (On/Off). In many cases this control is not necessary as the HR controller activates the drive independently when the signal is > x%.

AHUx5 –Ventilation unit with circuit compound system heat exchanger

This basic type of system is based on the AHU00 system, a circuit compound system is used for heat recovery, exhaust air and outside air are fed through a register, the heat is transported via a pipe system. The X in the ventilation number is the type of further treatment and is explained at the back of the manual.



Heat exchanger (HR) controller



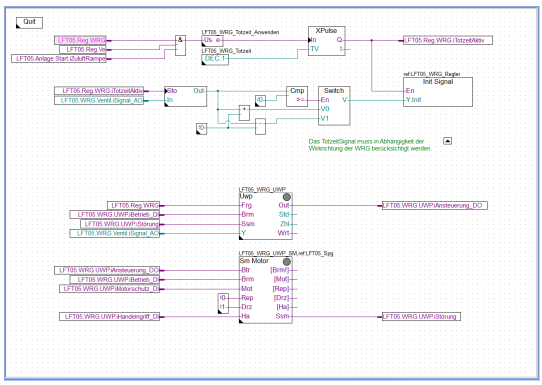
The heat exchanger is used for heat recovery of the air extracted from the room, it is not possible to mix room exhaust air with the extracted fresh with this HR.

The HR controller operates according to supply/demand, i.e. depending on whether there is heating or cooling - the energy from the most favourable air, outside or exhaust air, is used.

To do this, the controller compares the outside air temperature with the exhaust air temperature. If the HR controller is active, it constantly controls the valve. If the controller is inactive but detects that the cooler or heater controller is active, for example, it immediately sets the valve to 0% or 100% so that the air with the most favourable energy is used.

A minimum limit of the return flow temperature of the register in the exhaust air side also occurs, this should prevent icing of the register in winter (see also **AHUx2**)

Heat exchanger (HR) extras



On this page, additional functions are implemented that effect the HR controller or the signal.

The HR controller performs an initial PID calculation when activated, i.e. the P-share has a direct effect.

In some cases this can be undesirable, so the controller should only control over the reset time after activation so that the first P-Jump is suppressed.

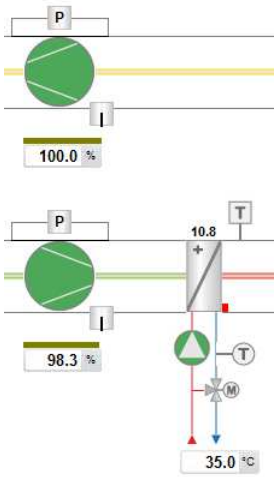
This is provided in the top section of this page, users can determine whether the deactivation of the P-share should occur for initial release with the FBox **Use** (setting **Yes**) or with P-share (**No**).

If deactivation is chosen, a dead time can also be specified in which the controller is maintained at its start value for activation (coldstart value).

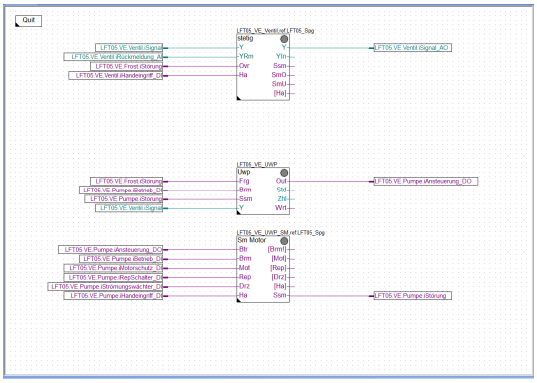
In the lower section of the page, the control of the pump of the circuit compound system is included and also the monitoring of error messages of the pump.

AHU0x –Preheater

Expansion of the basic types of system AHUx1 to AHUx5 with a preheater.



Preheater (valve/pump)



The control of the valve and circulation pump is described on this page.

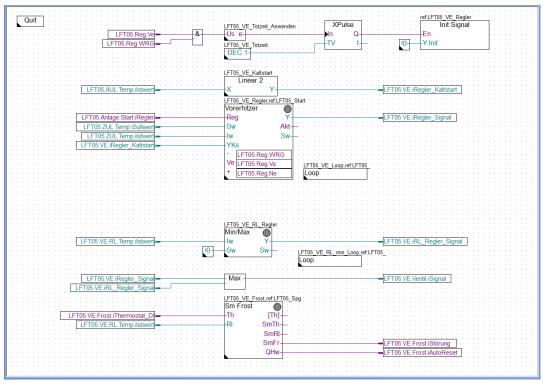
The valve is controlled with the maximum value from the control signal of the supply air temperature and the control signal of the minimum limit of the return flow temperature. In addition, the valve is forcibly opened at 100% for a frost message.

The circulation pump is controlled in automatic mode when

- the outside temperature is lower than 5°C
- or the valve signal is higher than 5%
- or for a frost message (no forced override!)

Safety switching: The valve must open and the pump must be activated on the hardware side when the frost protection thermostat responds, also for a disabled controller!

Preheater (controller)



The preheater is used to heat up the extracted air.

The VE controller performs an initial PID calculation when activated, i.e. the P-share has a direct effect.

In some cases this can be undesirable, so the controller should only control over the reset time after activation so that the first P-Jump is suppressed.

This is provided in the top section of this page, users can determine whether the deactivation of the P-share should occur for initial release with the FBox **Use** (setting **Yes**) or with P-share (**No**).

If deactivation is chosen, a dead time can also be specified in which the controller is maintained at its start value for activation (coldstart value).

When starting the ventilation in winter (usually for an outside air temperature less than 10°C), a pre-flushing is required by the FanStart module. With this requirement, the VE opens the valve 100%, the pump is switched on, hot water is therefore transported to the register. If the release of the flap comes from the Fan Start module, the VE controller is initialised with a coldstart value that is inversely proportional to the outside air temperature (see FBox **Linear 2**). This should already bring the valve into a position that roughly corresponds to the anticipated valve position with the release of the controller. The VE controller then starts to control independently with the release of the controller.

The preheater is monitored for frost, this should prevent the register freezing, bursting and causing water damage when thawing. The return flow temperature of the register and a frost protection thermostat on the air side is also used.

The return flow temperature is controlled with a controller to at least 12°C.

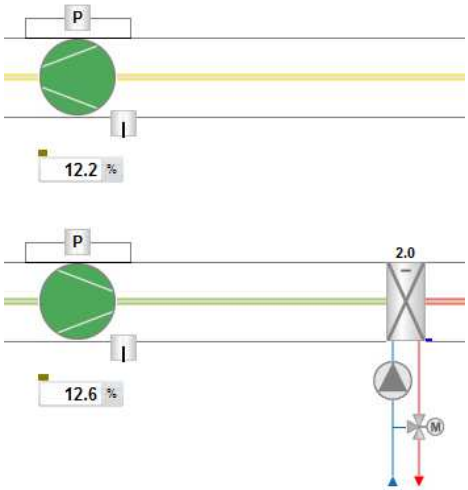
However if the return flow temperature drops below 8°C or if the frost protection thermostat triggers, the FBox **Ala Frost** outputs a frost warning that switches the system off, see also **Preheater (valve/pump)**.

If the normal state is reached again after 3 minutes (a HW reset must also be possible from the controller), the system can automatically start. However if a frost warning is determined again in the next 10 minutes, the system switches off with a frost fault, is then locked and must be acknowledged.

If the normal state is not restored in the first 3 minutes, the system remains locked with a frost fault and must be acknowledged.

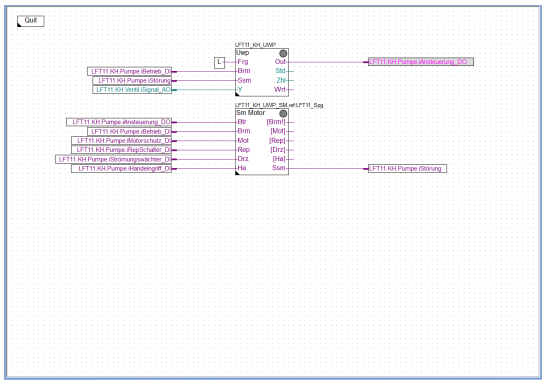
AHU1x cooler

Expansion of the basic types of system AHUx1 to AHUx5 with a cooler.



Cooler (valve/pump)

The control of the circulation pump of the cooler is on this page.

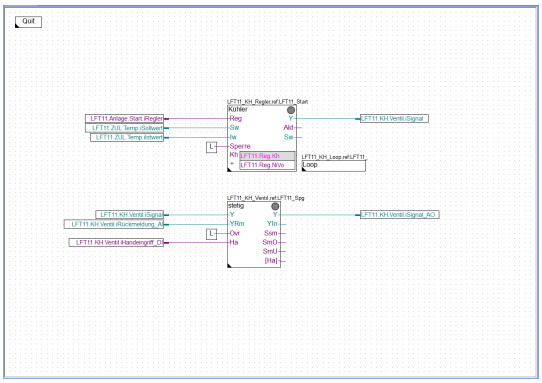


The circulation pump is controlled in automatic mode when

- the outside temperature is higher than 18°C
- and the valve signal is higher than 5%

If no circulation pump is available, this page can be deleted.

Cooler (controller)



The cooler is used to cool the extracted air.

The KH (cooler) controller performs an initial PID calculation when activated, i.e. the P-share has a direct effect.

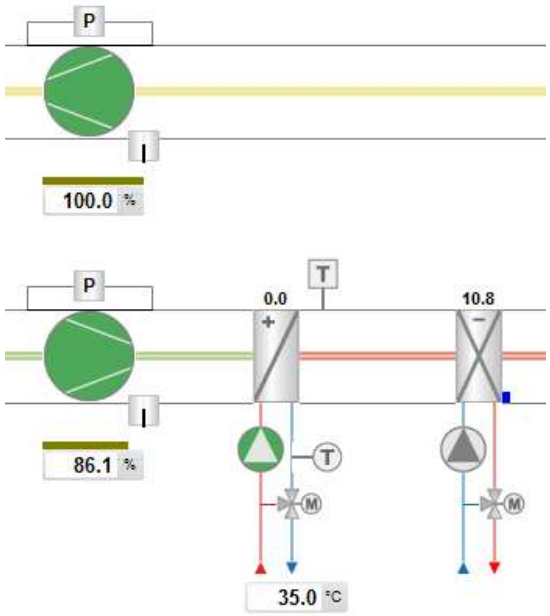
In some cases this can be undesirable, so the controller should only control over the reset time after activation so that the first P-Jump is suppressed.

This is provided in the top section of this page, users can determine whether the deactivation of the P-share should occur for initial release with the FBox **Use** (setting **Yes**) or with P-share (**No**).

If deactivation is chosen, a dead time can also be specified in which the controller is maintained at its start value for activation (coldstart value).

AHU2x –preheater and cooler

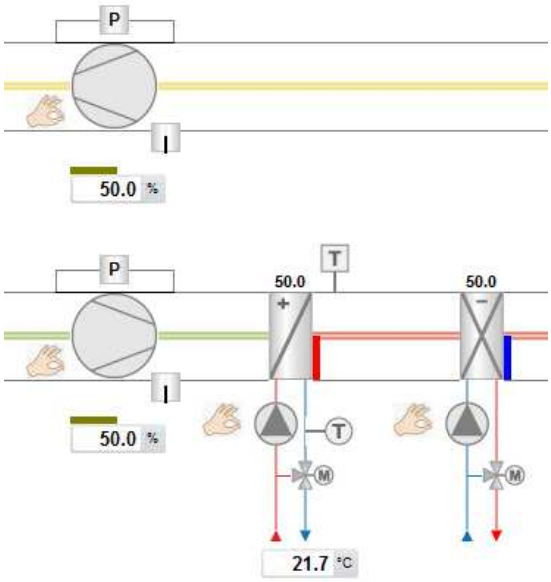
Expansion of the basic types of system AHUx1 to AHUx5 with a preheater and cooler.

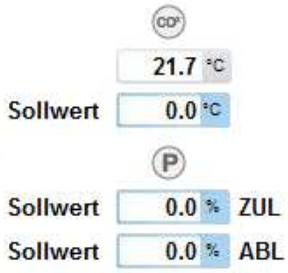


The functions of the preheater can be found in the description for **AHU0x** and for the cooler in the description for **AHU1x**.

AHU3x –Preheater, cooler and air quality

Expansion of the basic types of system AHUx1 to AHUx5 with a preheater, cooler and an air quality controller.





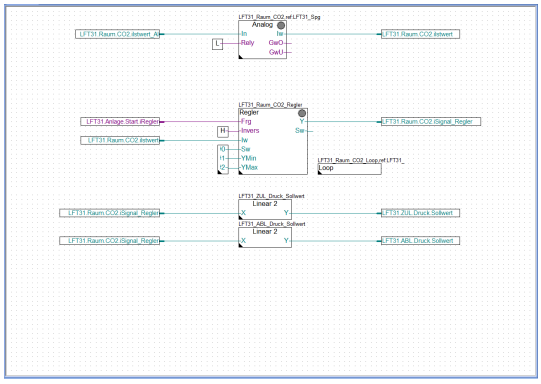
The functions of the preheater can be found in the description for **AHU0x** and for the cooler in the description for **AHU1x**.

Air quality - speed

The air quality in the room is measured with a CO2 sensor. For an increasing CO2 concentration, the air flow should be increased to improve the air quality again.

In normal operation, the system runs with a low speed = low target value of supply and exhaust air.

The increase of the air flow occurs by raising the pressure target values, the system must be measured for 2 operating points for this, normal mode (= min.- pressure) and max. air flow (= max.-pressure)

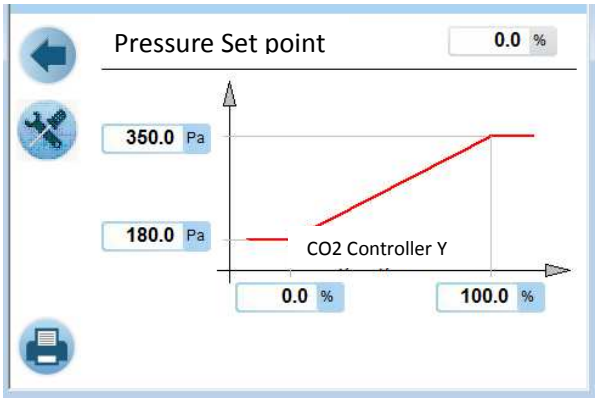


The FBox **controller** has the room CO2 value and a target value fixed in the controller as control variables. When the CO2 value increases, the controller specifies a signal between 0% and 100%. This is the air flow percentage that is required to improve air quality.

This signal is converted via two linear conversions to a supply and exhaust air pressure target value.

The pressure target values determined by the CO2 control function are then connected to the pressure controller of the supply air and exhaust air motor.

The pressure target value is therefore no longer fixed in the controllers.

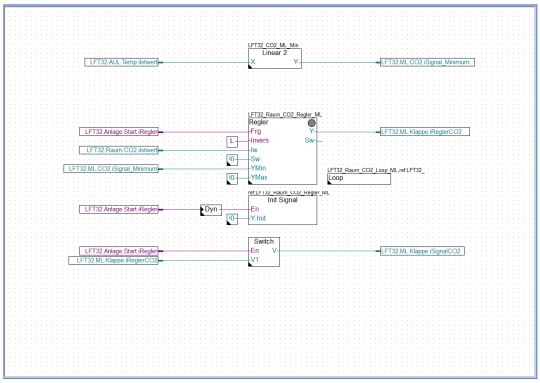


Air quality - mixed air

For all systems with/without heat recovery, the supply air is always operated with 100% outside air.

However for the mixed air systems **AHUx2**, room exhaust air is added to the outside air. The mixed air flap is therefore first reduced to a minimum before increasing the air flow.

2 CO2 target values are used for this function. A lower target value e.g. 300 ppm that should be maintained with the aid of the mixed air flap.

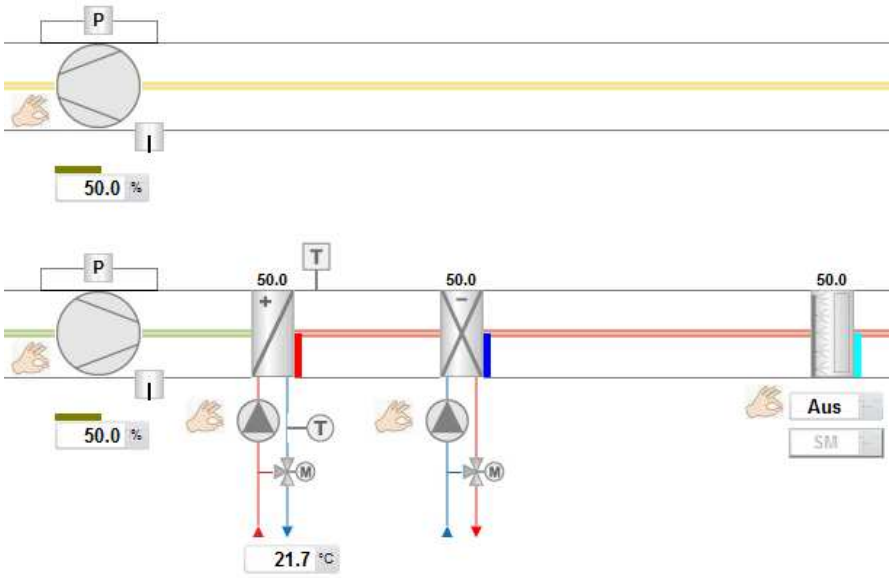


And a higher target value, e.g. 450 ppm, that then increases the air flow as under **Air quality – speed** when despite the max. outside air flow, the air quality in the room is not reached.

In this case the effective signal of the mixed air flap is a selection from ramp function, mixed air controller and CO2 controller.

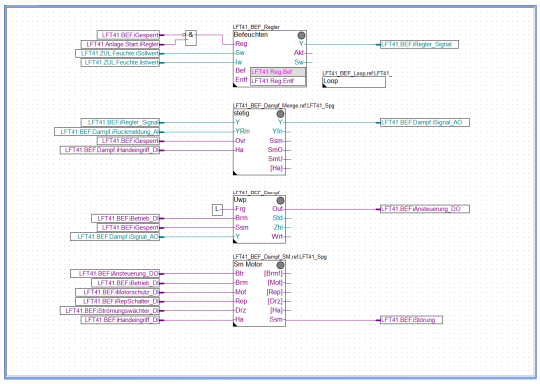
AHU4x –preheater, cooler and air quality and humidifier

Expansion of the basic types of system AHUx1 to AHUx5 with a preheater, cooler, air quality controller and humidifier.



The functions of the preheater can be found in the description for **AHU0x**, for the cooler in the description for **AHU1x** and for the air quality in the description for **AHU3x**.

Humidifier

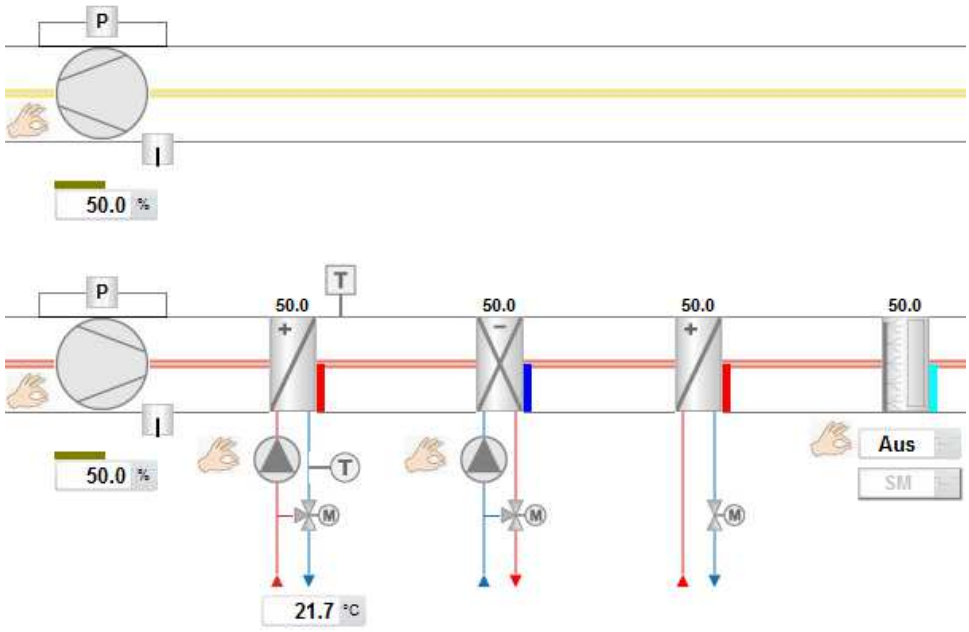


The humidification of the air occurs with a humidifier that can bring constant humidity in the supply air by a release On/Off and a constant signal 0-100%, this is generally a steam humidifier.

The humidifier affects the supply air humidity and not directly on the room humidity, see also **Master – Humidity**. In this way, excessive humidity in the supply air that can condense out in the room can be prevented. In addition a max. hygrostat is available in the supply air that switches off the humidifier when the measured humidity exceeds the limit value set at the device.

AHU5x –Preheater, cooler, reheater, air quality, humidifier dehumidifier

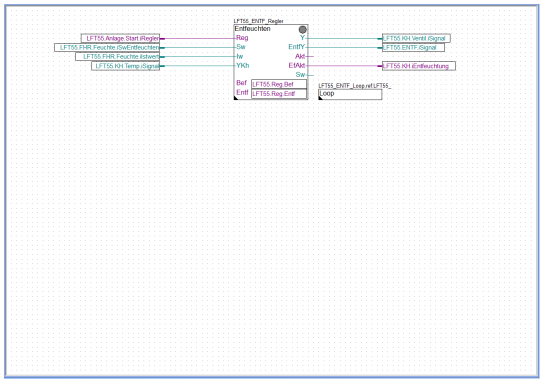
Expansion of the basic types of system AHUx1 to AHUx5 with a preheater, cooler, reheater, air quality controller and humidifier.



The functions of the preheater can be found in the description for **AHU0x**, for the cooler in the description for **AHU1x**, for the air quality in the description for **AHU3x** and for the humidifier in the description for **AHU4x**.

Dehumidification

The dehumidification of the air is via the cooler, i.e. the cooling register is used by 2 controllers, the controller for the supply air temperature and that for the room humidity in the event of dehumidification, see also **Guide – Humidity**.



The signal of the **cooler controller** from the temperature controller is looped by the **Dehumidification controller**. The higher signal at the valve of the cooler is output.

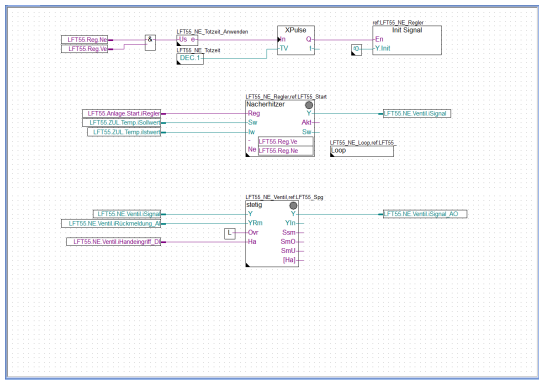
If the signal of the dehumidification controller is higher

than the signal of the cooler controller for the temperature, dehumidification is activated. The controller reports **dehumidification** at the output of the FBox, this is sent back to the Fan Start module. All controllers (preheater, cooler, reheater, heat recovery and mixed air) get this information via the Fan Start module and respond to the situation accordingly

- cooler controller remains or becomes active
- mixed air or heat recovery controller switches to the air that has more favourable energy (according to temperature, not enthalpy)
- preheater controller is deactivated
- reheater controller is deactivated

When the signal of the dehumidifier controller is 5% lower than that of the cooler controller, the dehumidification is cancelled and the system switches back to normal operation.

Reheater



During dehumidification, the air is cooled down with the cooler to the dew point temperature and humidity is released from the supply air.

The resulting supply air temperature would lead to discomfort (draughts) and the room would cool down below this target value.

Subsequent heating of the air cooled for the purpose of dehumidification is therefore required, as a rule this occurs with a reheater that must be arranged in the air flow direction after the cooler. However the reheater may be required in winter when the preheater has not reached the target value of the supply air temperature.

The NE controller performs an initial PID calculation when activated, i.e. the P-share has a direct effect.

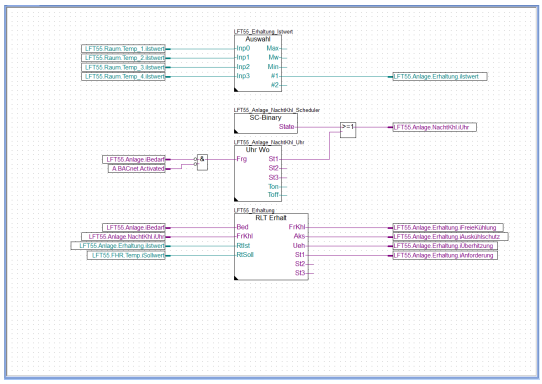
In some cases this can be undesirable, so the controller should only control over the reset time after activation so that the first P-Jump is suppressed.

This is provided in the top section of this page, it can be determined whether the deactivation of the P-share should occur for initial release with the FBox **Use** (setting **Yes**) or with P-share (**No**).

If deactivation is chosen, a dead time can also be specified in which the controller is maintained at its start value for activation (coldstart value).

The circulation pump is controlled in automatic mode when the valve signal is higher than 5%.

Preservation



All systems except the basic AHU00 ventilation can switch on the ventilation outside of the operating times independently.

This involves the function for **Preservation** of the room temperature in certain situations. There are 3 types:

- Summer night cooling, also described as free night cooling.

  Here the system is predominantly switched on in summer when the room is overheated (x°K > target value) and the outside air at night has cooled down to such an extent that the room can be cooled by blowing in the cooler outside air without further treatment.

- Overheating protection

  Also in summer, only effective when no summer night cooling is possible (minimal cooling at night). Switches the ventilation on when the room is overheated (x °K > target value), but forces further treatment with the cooler at the minimum supply air temperature. Switches the ventilation off again when the room has been sufficiently cooled.

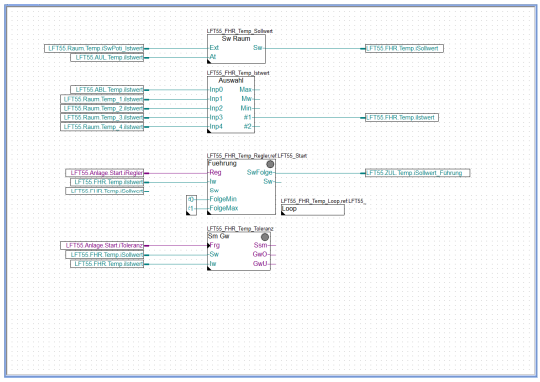
- Cool down protection

  Used to keep free of frost or for excessive decrease in the room temperature, e.g. in winter holidays when the system has been shut down for a long period. Switches the ventilation on when the room cools down (room < x°C), forces further treatment with the preheater to the maximum supply air temperature. Switches the ventilation off again when the room has been sufficiently heated.

These preservation functions are only active when no requirement is determined by the system switch, the system is therefore not activated by manual or operating times.

Summer night cooling also requires a release, this occurs usually between 3 a.m. and 5 a.m. The external air is generally coldest at this time, and night cooling is therefore very efficient.

Master - Temperature



The guide temperature is determined from the mean of the room and exhaust air temperature.

The target value of the guide temperature is usually provided with summer compensation so that the difference between AT and RT is not more than 6°K for high summer outside temperatures.

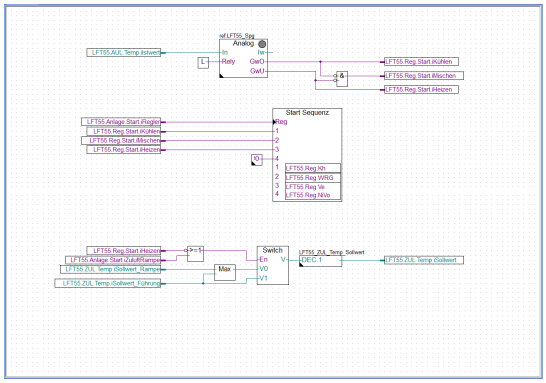
A **master controller** calculates the target value of the supply air temperature when the room temperature is reached, also called the target value slave controller.

This involves a cascade sequence controller, whereby the sequence controllers are the controllers for the further treatment of the air (KH, ML, HE, VE, NE). The sequence controllers thus do not directly control the room temperature, but the target value of the supply air temperature as calculated by the guide controller.

The guide controller is limited with a minimum and maximum target value of the supply air temperature. These are usually at 16°C and 34°C. A supply air temperature that is too low would accelerate the cooling of the room but is often experienced as a draught. A supply air temperature that is too high causes the air that is introduced not to flow through the room > hot air stays high up and is immediately extracted.

The minimum target value of the supply air temperature is also used for the forced cooling preservation function, the maximum target value of the supply air temperature for the cool down protection preservation function.

Sequence - Temperature



The sequence controller refers to the target value of the supply air temperature of the guide controller.

When starting ventilation in winter (< 10°C), the ventilation unit can overheat due to the pre-flushing of the preheater so that the sequence controller switches to the cooling direction after the start of the fans and the release of the controller.

This can lead to unwanted temperature fluctuations, triggering of the frost function in unfavourable situations.

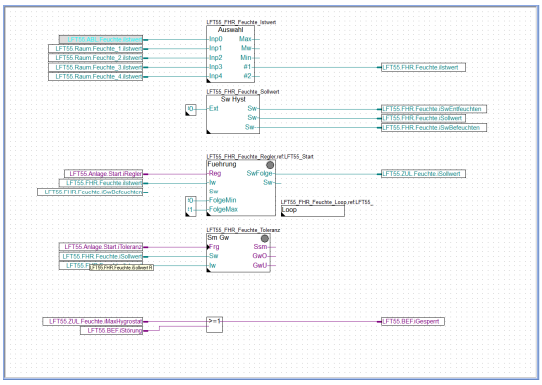
To prevent this, the current measured supply air temperature is output simultaneously as the supply air temperature target value for the release of the controller by the Fan Start module and slowly reduced over a ramp time.

The effective target value of the supply air temperature is the largest target value from this ramp function and the target value of the supply air temperature of the guide controller.

When starting the controller in winter, the valve of the heater is fixed by a coldstart value. The resulting supply air temperature to be set is used as a target value. The preheater controller is thus forced to the operating point and now slowly follows the supply air target value changed by the ramp or guide controller.

The system thus slowly shifts to normal operation.

Guide - Humidity



The guide humidity is determined using the mean of the room and exhaust air humidity.

The target value of the guide humidity is constantly specified only for systems that humidify (AHU4x), the target value is directly saved in the guide controller.

The target value of the guide humidity for systems with dehumidification (AHU5x) is specified as a desired target value in the module **Hysteresis**, the effective target value for the humidification is the desired target value less a hysteresis (5% rH), the effective target value for dehumidification is the desired target value minus a hysteresis (5% rH).

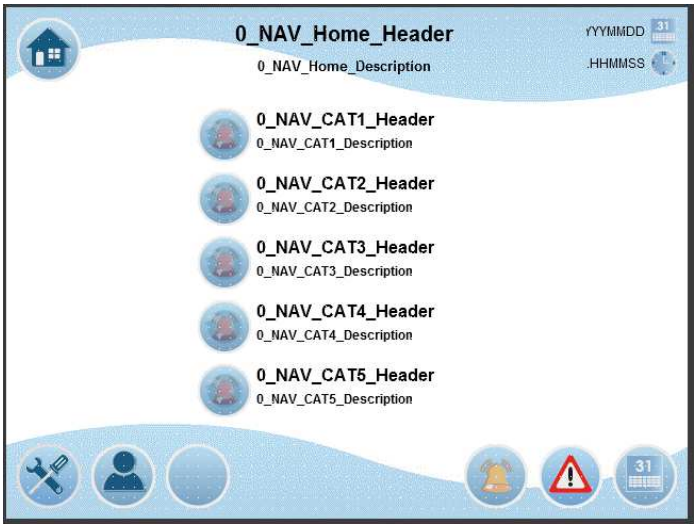
As humidification particularly, but also dehumidification, represents a high expenditure of energy, the hysteresis prevents immediate switching from humidification to dehumidification and vice versa.

The target value of the dehumidification has a direct effect on the dehumidification controller, and the target value of the humidification on the **master controller**. This calculates the target value of the supply air humidity when the room humidity is reached by humidification, also called target value slave controller.

This involves a cascade sequence controller, whereby the sequence controller is only the humidification controller. The sequence controller does not therefore directly control the room humidity, but the target value of the supply air humidity calculated by the guide controller.

The guide controller is limited with a maximum target value of the supply air humidity. This is usually at 80% rH and should prevent condensation of the supply air in the channel system, but especially in the room.

WebEditor 8 - Project template



A Web8 application is also included in the template project.

The start page is preset with “Start.htm”, the first screen is “Home.wev”.

The home page displays

- the heading and designation of the web application
- date and time of the PCD
- 5 categories, e.g. for 5 systems or work groups. These objects can be connected with the FBox ***Traffic light (system state)*** from the family ***Release*** and indicate the operating state of the system via the button.

   = System off, ready to switch on

   = System in operation

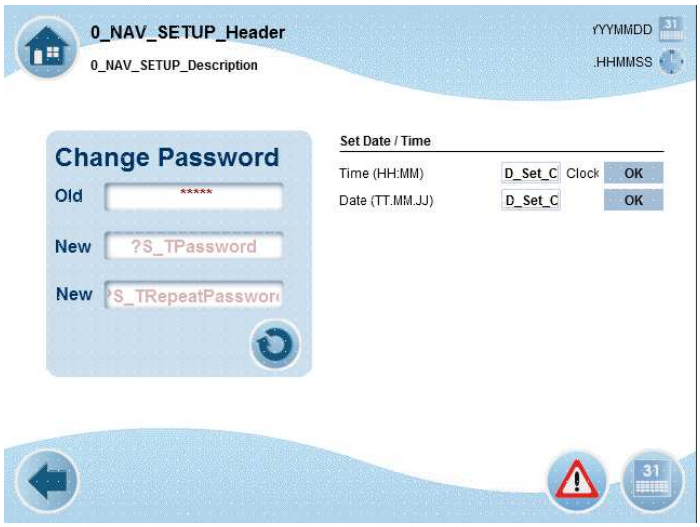
   = System has fault

- Bottom left (tool symbol), a button to access the “Setup” page. Here the operator can change the password and also the date and time of the PCD.
- Bottom left, centre (user), a button with a user icon without lock if the user is logged on, otherwise a user icon with lock. Use this button to access the “Login” page.
- Bottom left on the right next to the user button. This button is only visible when a user is logged in and in this case only shows a lock. Press the button to log off the logged in user.
- Bottom right, “Alarm bell” – use this button to acknowledge all alarms in the PCD. A hidden alarm bell indicates that no active alarm is pending. A yellow alarm bell indicates that a new alarm has occurred and a red alarm bell that at least one alarm is pending. This function is connected with the FBox ***System alarm*** in the COB initialisation and represents all the alarms of the PCD.
- Press the “Alarm triangle” button to the right to access the page “ALM” (alarm list)

- The button on the bottom right with the calendar symbol branches into the “CAL01” overview page of the calendar program.

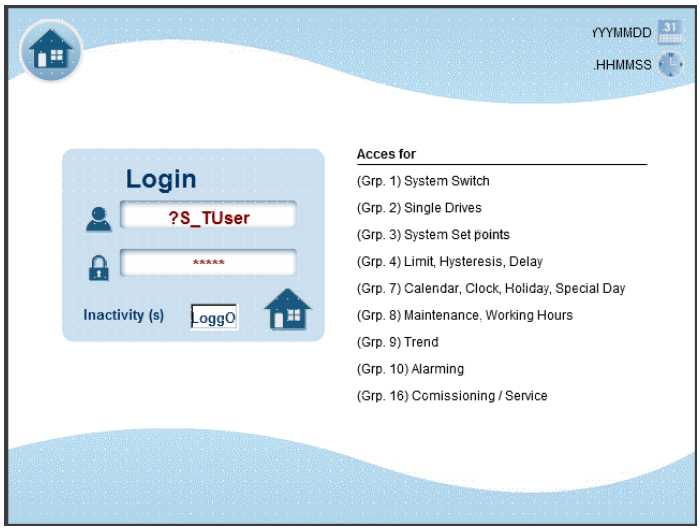
“SETUP” page offers each user the option to change the password.

The date and time can now be set when a user is logged in and has group 7 authorisation.



The user can log in on the “LOGIN” page. When he is successfully logged in, the groups for which he has authorisation are displayed.

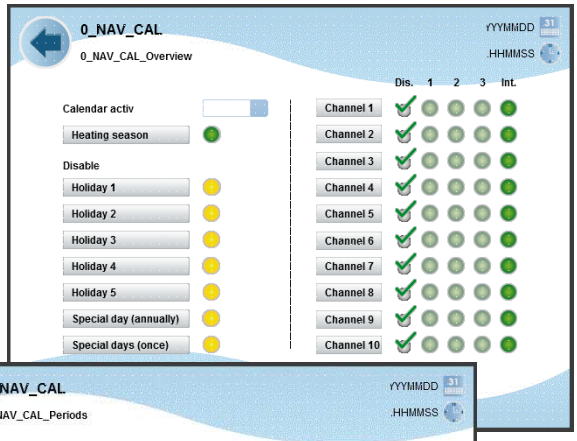
The internal user groups of the Web8 Editor are used, the values are assigned to groups as shown opposite.



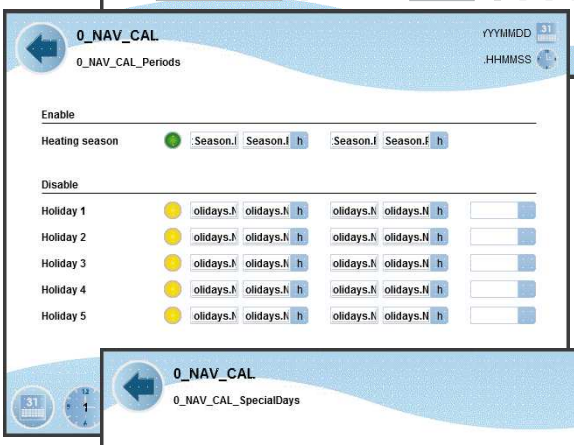
The texts of the page headings, the detailed descriptions and the categories are to be adapted in the translation file. This currently has the disadvantage that the description of the systems cannot be directly seen in the Web8 Editor, but only during the runtime. However the advantage is that these descriptions only have to be entered once.

The calendar program CAL01 in the PCD is also included in the Web8 application. Use the button with the calendar icon that is included on the bottom right on each page to access the overview page of the calendar.

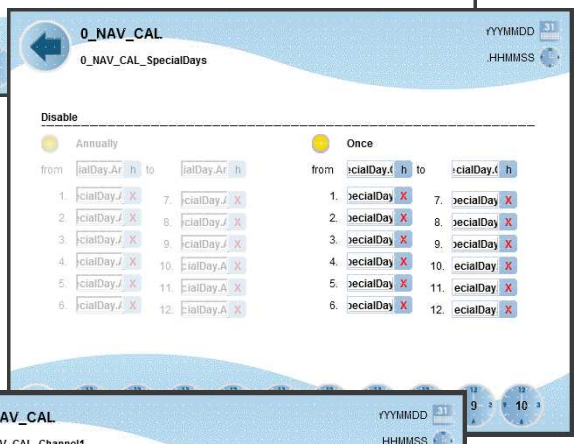
The states of all public holidays, holidays or switching channels can be viewed here at a glance.



On the page “CAL01_H” (Holidays), the heating period and the 5 holiday programs can be operated.

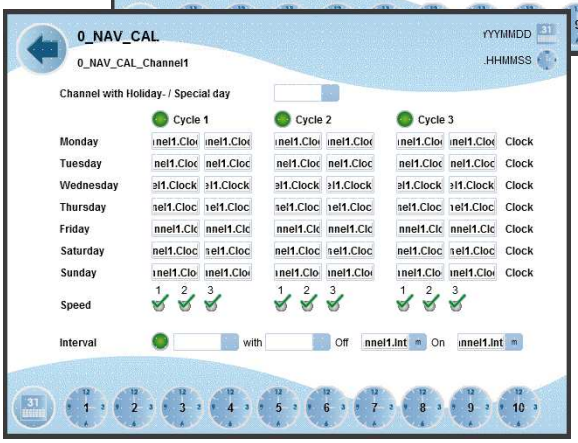


The page „CAL01_SD” (=special days) maps the 2x12 one-day public holidays, whereby each of the 12 public holidays can be used for annually recurring and one-off switching.



Each switching channel is represented on its own page, here the 3 switching cycles per day, the interval and the consideration of holidays/public holidays can be set.

Press a button with the clock icon and the switching channel number to jump directly to the required switching channel.

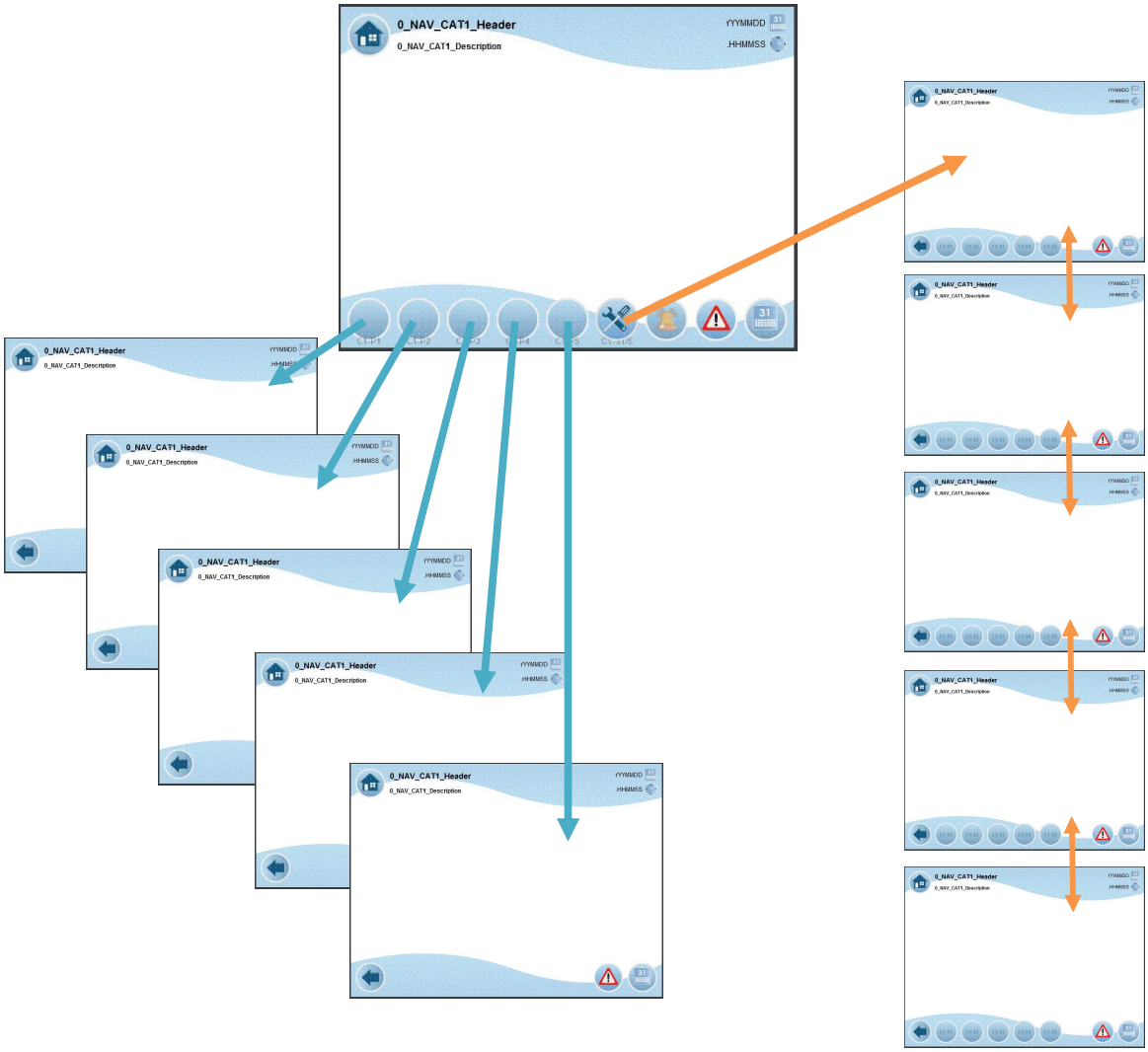


There are 5 categories resp. 5 systems available. Each category has a “CATx” page on which the system scheme is generally displayed.

From here the user can navigate up to 5 operating pages (CATx_P1..5). These pages mostly contain target values, system switches, manual intervention, etc. The 5 empty buttons on the bottom left are already connected with pages to be called up and must only be overlaid with a text or another icon if necessary. Unused buttons can simply be deactivated with the “hidden” option without deleting them.

If a user is logged in with group 16 authorisation, the button with the tool icon is visible. Use this button to reach up to 5 additional operating pages (CATx_S1..5), most of them should only be used for maintenance work, e.g. sensor calibration, setting control parameters.

The button with the alarm bell has the same function as the button on the “Home” page but refers to this system here (by means of cross-reference on the FBox System alarm).



Installation of the templates in WebEditor8

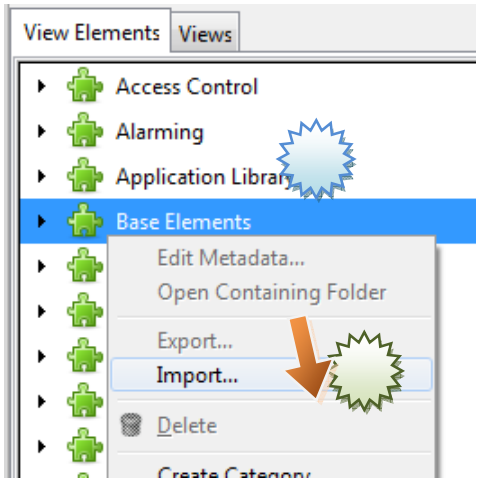
The templates of the DDC Suite 2.7 are not yet included in the current installation of WebEditor8 (PG5 2.1.410). However the basic objects of the DDC Suite 2.5 that can only refer to individual FBoxes can be used without problem as nothing has changed at the data points.

However the templates of the systems and the calendar cannot be used, here structural changes were made to the group names.

New templates are only necessary for a few FBoxes and for the templates of the systems.

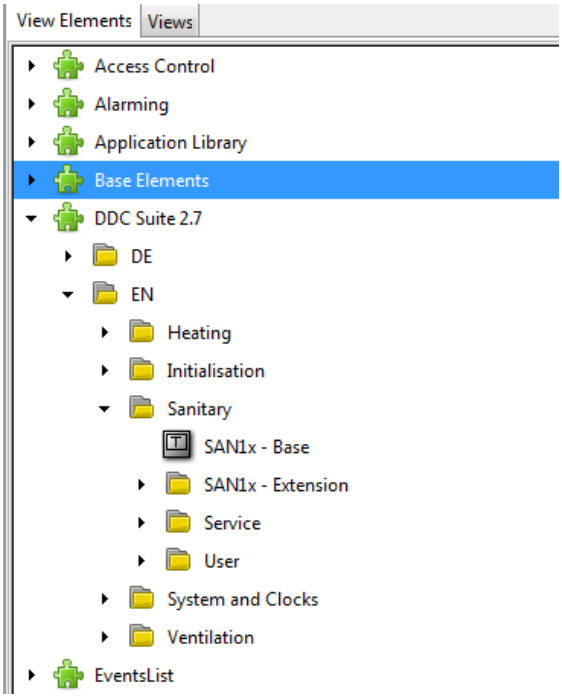
With a DDC Suite 2.7 template project, the file **DDC Suite 2.7 Web8 Templates.zip** is included. This contains all new templates for individual FBoxes and the systems.

Open **WebEditor8**. In the **Library** window, right-click on any location. In the following context menu, select the **Import…** item.



In the **Open Templates** dialog, then select the file named above and complete the process with OK.

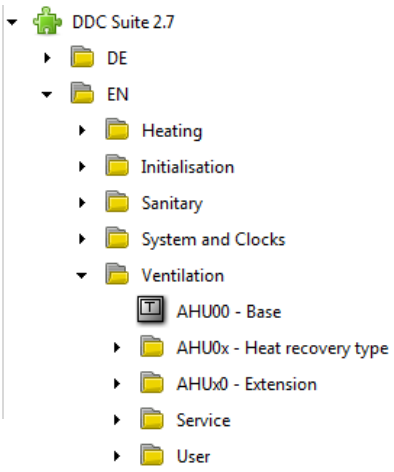
Now you see a separate group **DDC Suite 2.7** in the library. This now contains all the necessary templates for new/extended FBoxes and the system templates.



The Web templates of the systems have a modular design with the DDC Suite 2.7. 30 ventilation systems with 4 operating pages and 4 service pages each give rise to at least 250 web macros. This is neither clearly arranged nor easy to maintain.

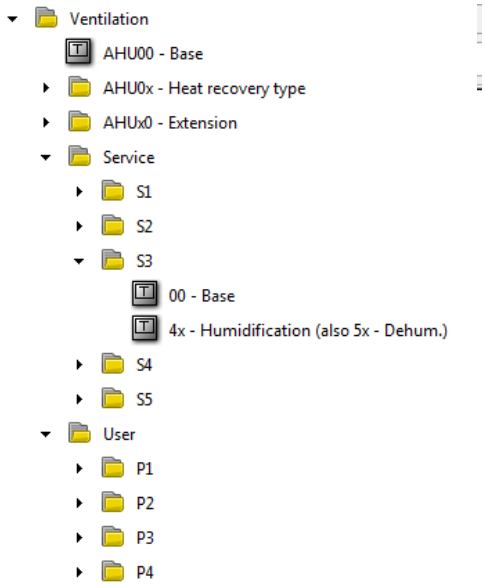
Function groups of a system have therefore been saved in the library to structure the scheme for the ventilation, e.g.

- AHU00 – Base of all ventilation units with air channels, flaps and fans
- Folder AHU0x – Heat recovery type, the appropriate HR is obtained from here
- Folder AHUx0 – Extension, for example the cooler, preheater or humidifier are obtained from here



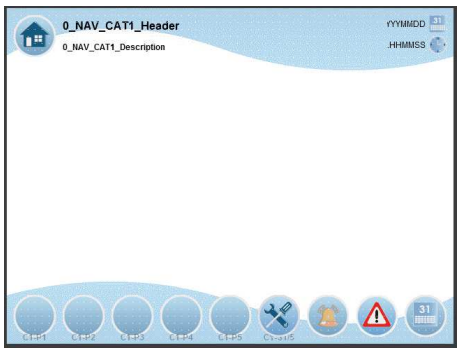
The same applies to the operating pages that should be provided for the user or service technician.

- **User** folder with the subfolders **P1 .. P5** for the user pages, containing 00 – Basic elements and x-elements for the expansion
- Folder **Service** with the subfolders **S1 .. S5** for the service pages, containing 00 – Basic elements and x-elements for the expansion



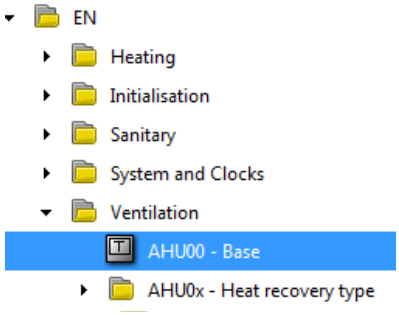
The compilation of a system from these function macros is shown in an example in the following. A ventilation unit of type AHU21 = without HR, with heating and cooling should be represented.

1. Open the category in which the scheme is to be represented.

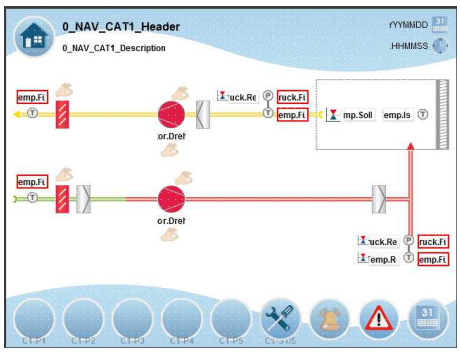


2. Use of AHU00 – Base macros. Always double-click, so that the macro is automatically placed at the intended position. With drag&drop you must position manually.

   Adapt the symbol groups in the cross-reference list when using the macro.

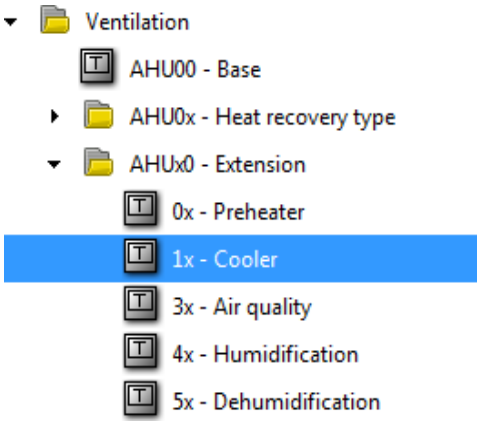


3. The basic ventilation unit is now pasted to the correct position.

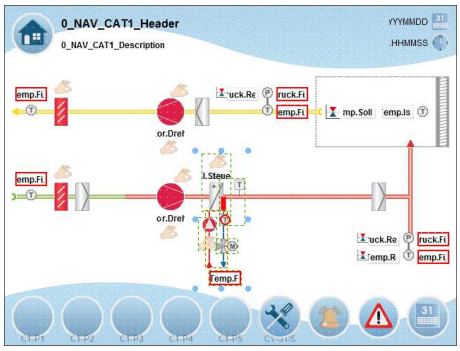


4. Now we must add preheater and cooler. However as we can see, no macro “2x - preheater and cooler” is included in the group ***AHUx0 – Extension***.

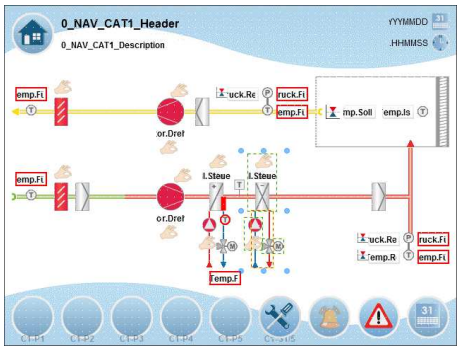
   In this case, the smaller components, ***0x - preheater*** and ***1x – cooler*** must simply be added individually.



5. The scheme after using the macro ***0x – Preheater***

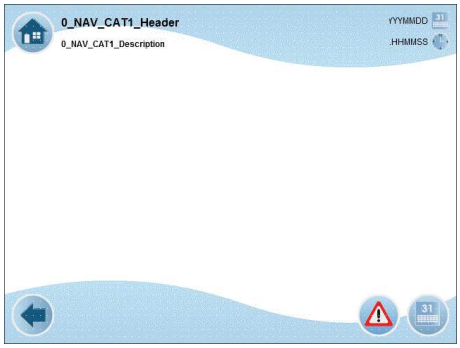


6. The scheme after using the macro ***1x – Cooler***

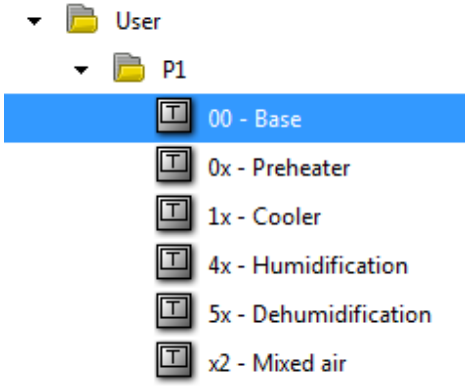


With this, the design of the ventilation unit of type AHU21 would be comprised of 3 function macros. The same is then repeated for the operating pages. This is only shown here for the operating page of the user for manual interventions.

1. Open page "_P1" of the current category



2. Now use the basic macro 00 and the macros for the preheater and the cooler from the ***User*** folder

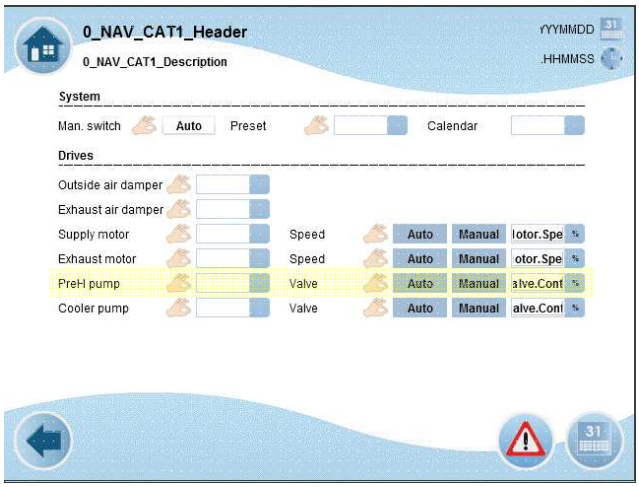


As you can see the macros for the operating pages are also structured so that they extend and never overlap.

e.g. if a ventilation unit does not have a preheater but a cooler, the line marked in yellow would be missing.

The line for the cooler can then be moved up to avoid an empty line.

Unfortunately due to the modular design, such adjustments cannot be completely avoided but as the same macros are always used for the operation, handling is simpler in the long run.



The operating pages P1 .. P5 and S1 .. S5 in the library have functions intended as follows:

- P1 = Manual interventions, system switches and all drives, valves, flaps
- P2 = Temperature/humidity target values
- P3 = Pressure/air quality target values
- P4 = Summer night cooling/cool down protection
- P5 = Currently not used
- S1 = Temperature control parameters
- S2 = Humidity/pressure/air quality control parameters
- S3 = Tolerances monitoring
- S4 = Sensors at the system
- S5 = Sensors in the building

For the heating or sanitary systems, the procedure is identical. The structure of the operating pages is similar.

Visi.Plus - Project templates

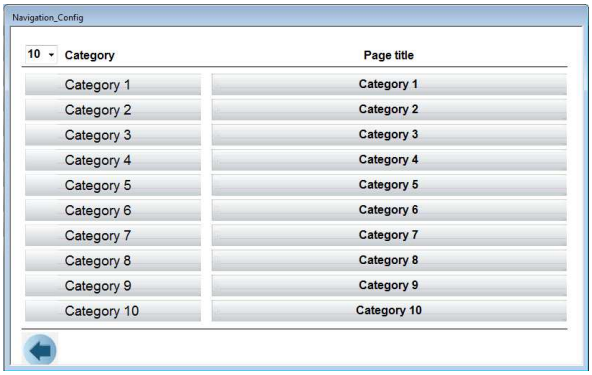
The Visi.Plus project template of the DDC Suite 2.7 includes a complete page structure similar to the WebEditor 8 project so that the systems can be implemented directly.

The structure of the pages is as follows:

- Left = Navigation area
- Bottom = Status bar with display of date/time, logged in user, alarm information and the buttons ***User management*** and ***Settings***, however these are only visible when the user has group 16 authorisation. Also a placeholder, this is used to represent a logo of the SI.
- Top = Header The text is static on this page, dynamic on all other pages and to be parameterised via die ***Settings***.
- Centre = Drawing area for the system schemes

There are 10 categories available, each category has an overview page and 15 pages in which the system schemes are represented. There are therefore 160 pages for the implementation of the systems.

Click on the ***Settings*** button to open the dialog in which the number of categories, the displayed name in the navigation bar and a description of the overview page of the category can be set.

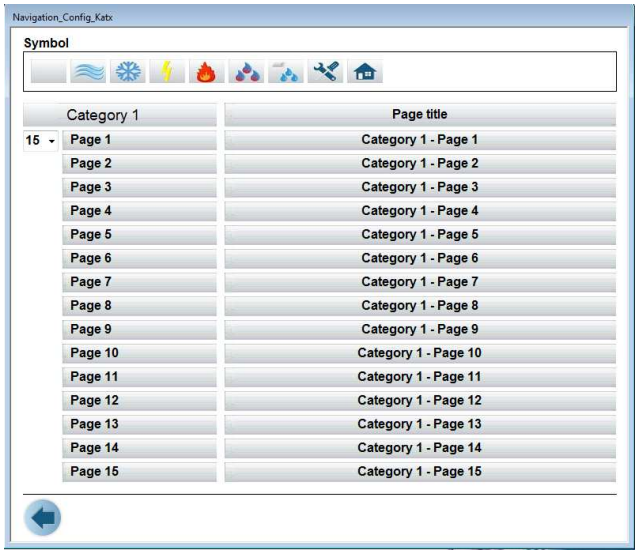


Click on the buttons in the ***Screen title*** column to enter the display text, click on the buttons in the **Categories** column to open the settings dialog of the selected category.

The number of visible pages in this category can be specified in the setting dialog. An icon can also be selected that is displayed on the left in the button of the category. This is helpful if a category is only used for heating, ventilation, etc.

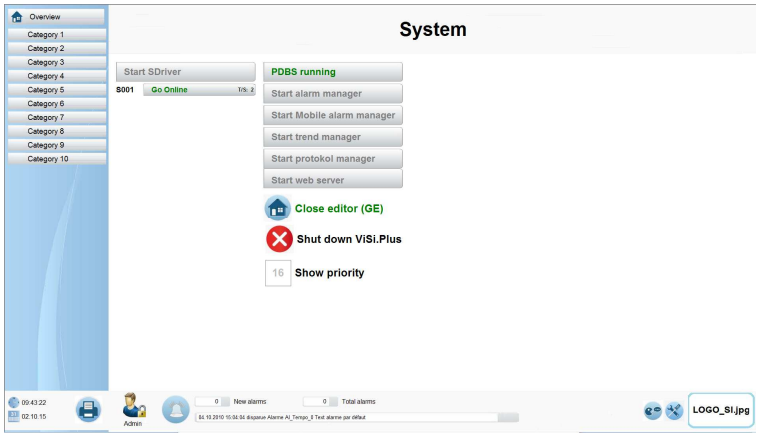
Click on the ***Category x*** button to enter the display text in the navigation bar.

The texts of the pages for the navigation and the screen title can also be edited with a click on the relevant buttons.



Click on the ***System*** button on the bottom left of the start page (only visible if a user is logged on with group 16) to reach a screen with the system functions.

Here you can see if the individual modules of Visi.Plus have already started (green font), this can also be started from here by clicking on the button if required.



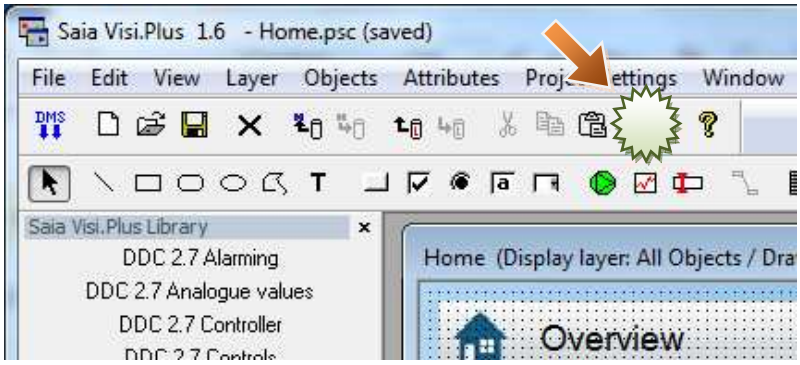
2 buttons (USB and TCP/IP) are implemented for communication and can be used to activate/deactivate the communication of a channel. A separate channel should be used for each PCD, these are then to be copied and adjusted.

If a device has to be imported from a PG5 project into Visi.Plus, it must be available in the Visi.Plus project in the folder **\PCD**. To do this, it is not necessary for the PG5 project to be created or restored in this folder.

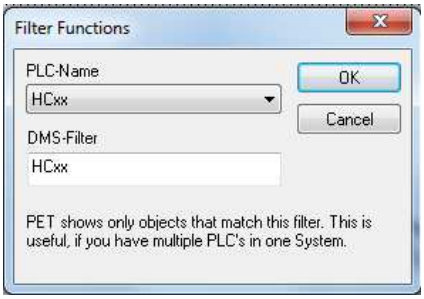
The simplest way is to copy the device folder from the PG5 project into the folder **\PCD**.

It is important that the device was previously successfully compiled; this is mandatory, as only then will all the necessary files for the successful import in Visi.Plus be available in the device folder!

The PET must now be started. To do this, simply switch the GE to edit mode (E key) and click the PET icon in the icon bar.



The PET always asks for the PLC to be filtered when starting. At this point select the device which you have just copied into the **\PCD** folder.



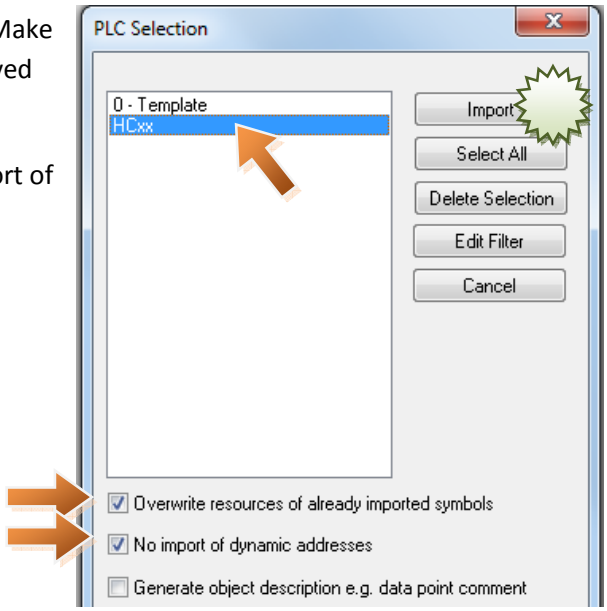
The PET is opened, the ***System objects*** tab is empty as no FBoxes of the device set in the filter were imported.

The import procedure is started by selecting ***PG5*** in the menu and selecting the item ***Import Labels***.

Select the device to be imported in the following dialog. Make sure that the first two checkboxes are activated as displayed in the illustration, and the last two are deactivated.

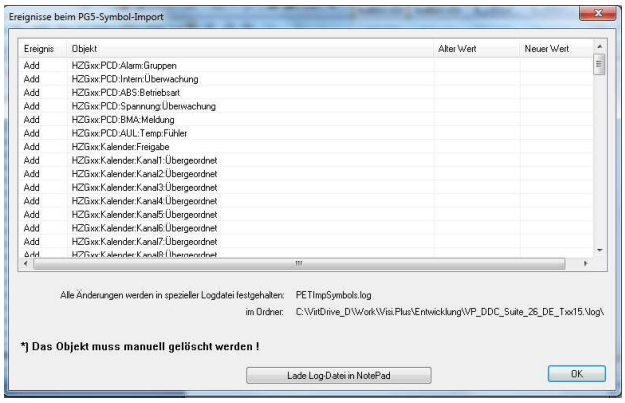
The filter settings are therefore optimally set for the import of the DDC Suite FBoxes.

Start the import by clicking the ***Import*** button.



After successful import, a dialog appears that lists which FBoxes

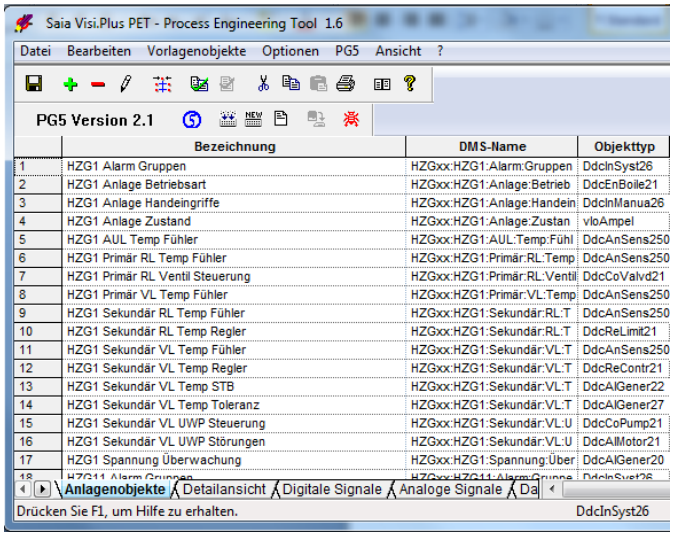
- Add = are newly added
- Deleted = are available in Visi.Plus, but are now no longer found in Fupla
- Renamed = are available in Visi.Plus, but the group name is now used in Fupla with another FBox = Replacement of a FBox



Above all this is helpful if a device was already imported in Visi.Plus so that it is immediately apparent what was newly added or deleted for a renewed import.

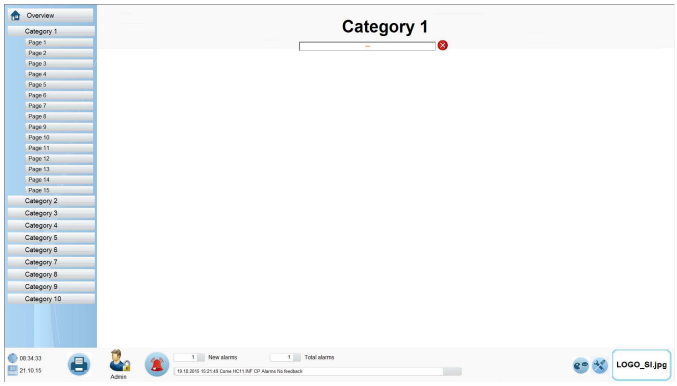
After successful import, all imported FBoxes of this device can be seen in the PET in the ***System objects*** tab.

The import would therefore be completed, the PET is not required any further for the implementation of the scheme in GE, save and close the PET.

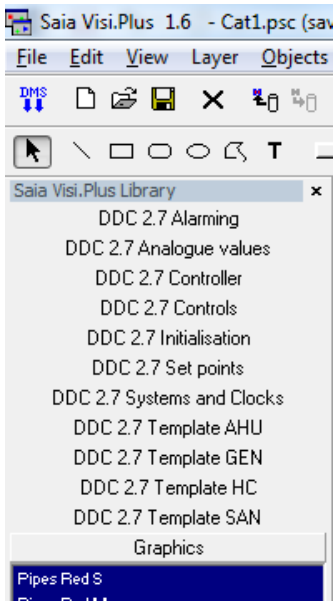


Switch the GE in runtime mode again (E key) and navigate to the page in which a scheme should be inserted.

Now change to Edit mode again (E key).



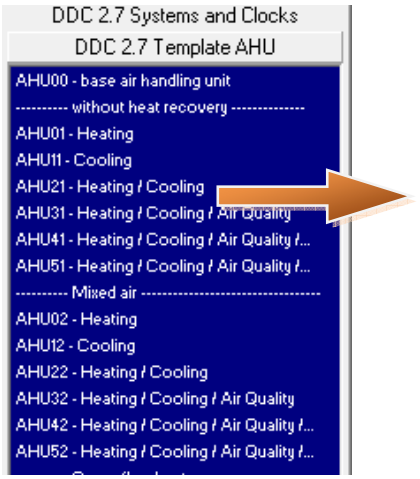
On the left side, there is the templates catalogue, this provides at least one graphic object for all FBoxes divided according to families (as in the FBox Selectors of Fupla).



However in most cases, several objects are available, these often only differ in the alignment or size.

There are 4 catalogues for the system templates divided according to

- GEN = Initialisation and calendar functions
- HC = Heating systems
- AHU = Ventilation systems
- SAN = Sanitary systems

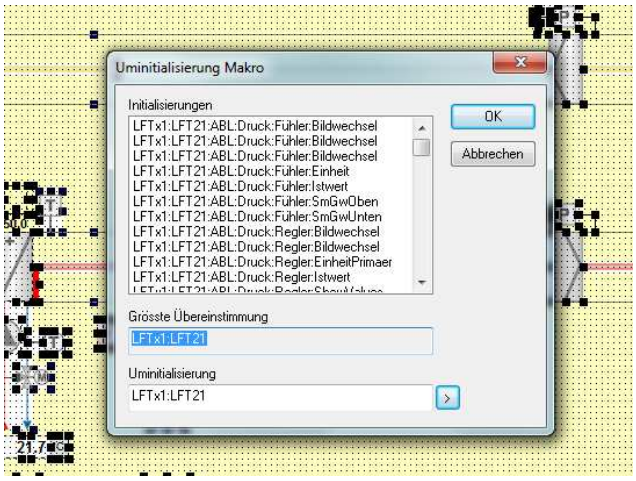


In the example, the ventilation AHU21 – without HR, with heating and cooling – should be used again.

In Visi.Plus a complete Visi.Plus template suitable for each Fupla template is available, a compilation as in WebEditor8 is therefore not required here.

Drag&drop the suitable template from the relevant catalogue onto the page.

By dropping the template, the ***Reinitialisation macro*** dialog appears – select the suitable system of the device here from the DMS and confirm with ***OK***.

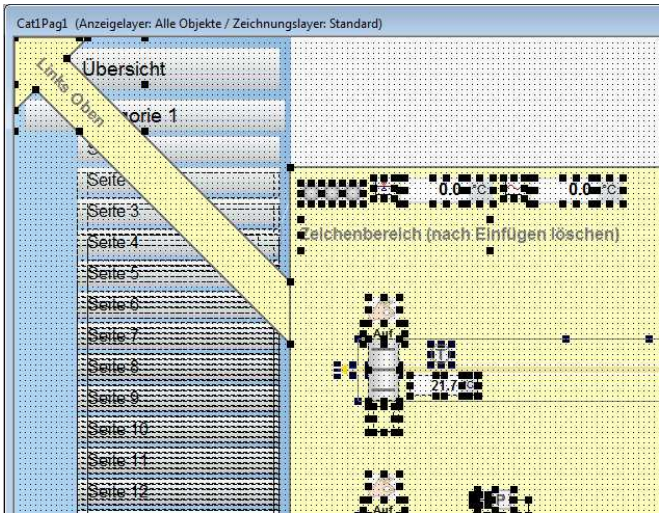


After the template has been pasted on the page, all objects included in it are marked.

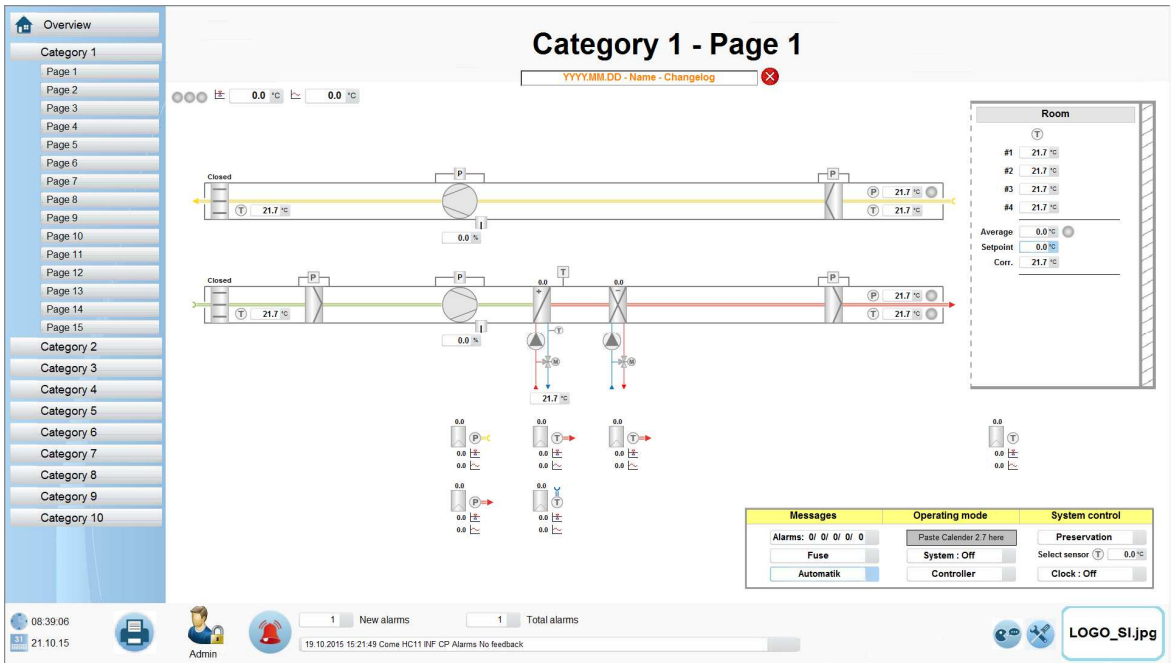
A yellow rectangle can be seen in the background and an arrow on the left side that is used for orientation.

Now move the entire template so that the arrow points exactly in the upper left corner.

Now click on a section outside of the arrow so that all markings are cancelled. Now click in the yellow orientation area and delete it.



In contrast to a WebEditor8 project, only the scheme must be created here. Click on an object, e.g. the exhaust air flap, and the user window will open automatically so that no additional pages for setting parameters are necessary.



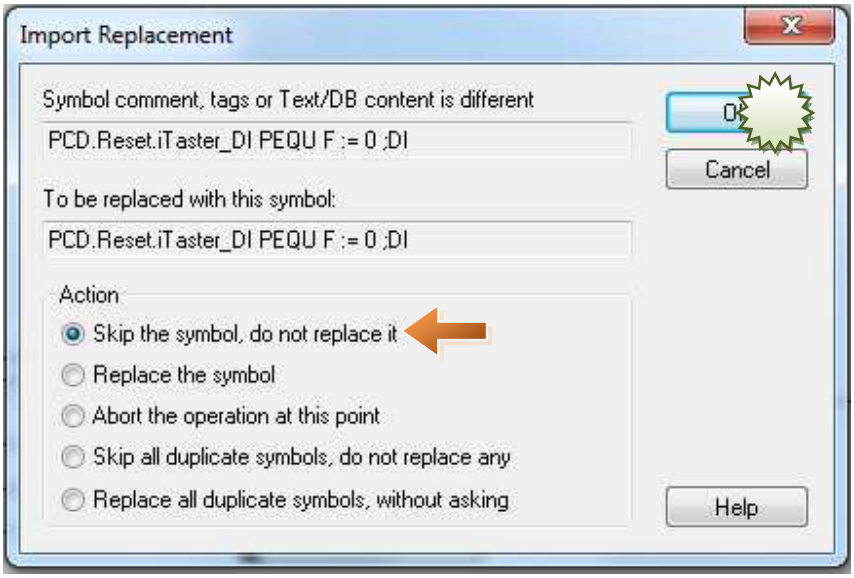
Tips

You can find a few tips in the following section.

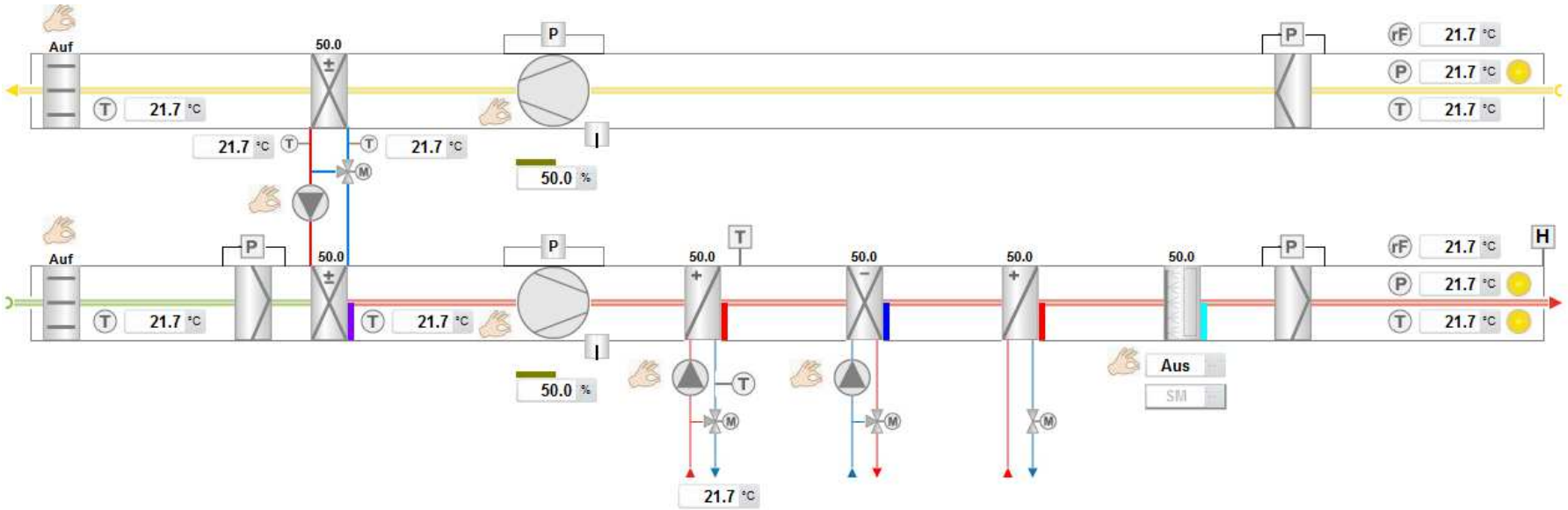
Messages when using the templates in Fupla

Templates that use the functions together, e.g. calendar, central acknowledgement, use the same symbols. These shared symbols are saved in the individual templates so that a message appears for the import that says that a symbol is already available and included in this template and the one to be used.

If this involves symbols that start with the **PCD** or **Calendar** main group, you can simply select the option **Skip the symbol, do not replace it** and complete the procedure with **OK**.



Schematic representation of the AHU55 - Full air conditioning



Annex A

Schemes and VDI Lists (external PDF)