FLSTDmAHUE customization training

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High
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Topics

1. How to add a probe management
2. Ebm papst fan management
3. Supply setpoint compensation based on Return Temperature
4. Connect an pCOe expansion board to a J23 connector of a large controller (pCO3 or pCO5)
5. Sharing a probe value through the AHUE's units via pLAN network
6. Air flow fans control management

Topics

7. Fancoil management
8. Fans management with the supply temperature
9. Night freecooling

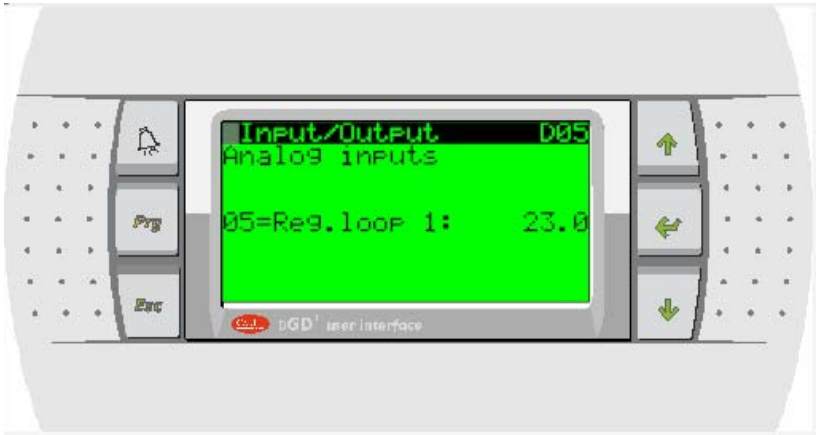
10. New features available starting from the release 2.0

1 How to add a probe management

The simplest way, and already available in the application, is the using of an auxiliary loop for reading an analogue input (refer to masks Ha19, Ha20..23, Hb19..22, Gfc36..39).

The probe value is available in the I/O loop masks.

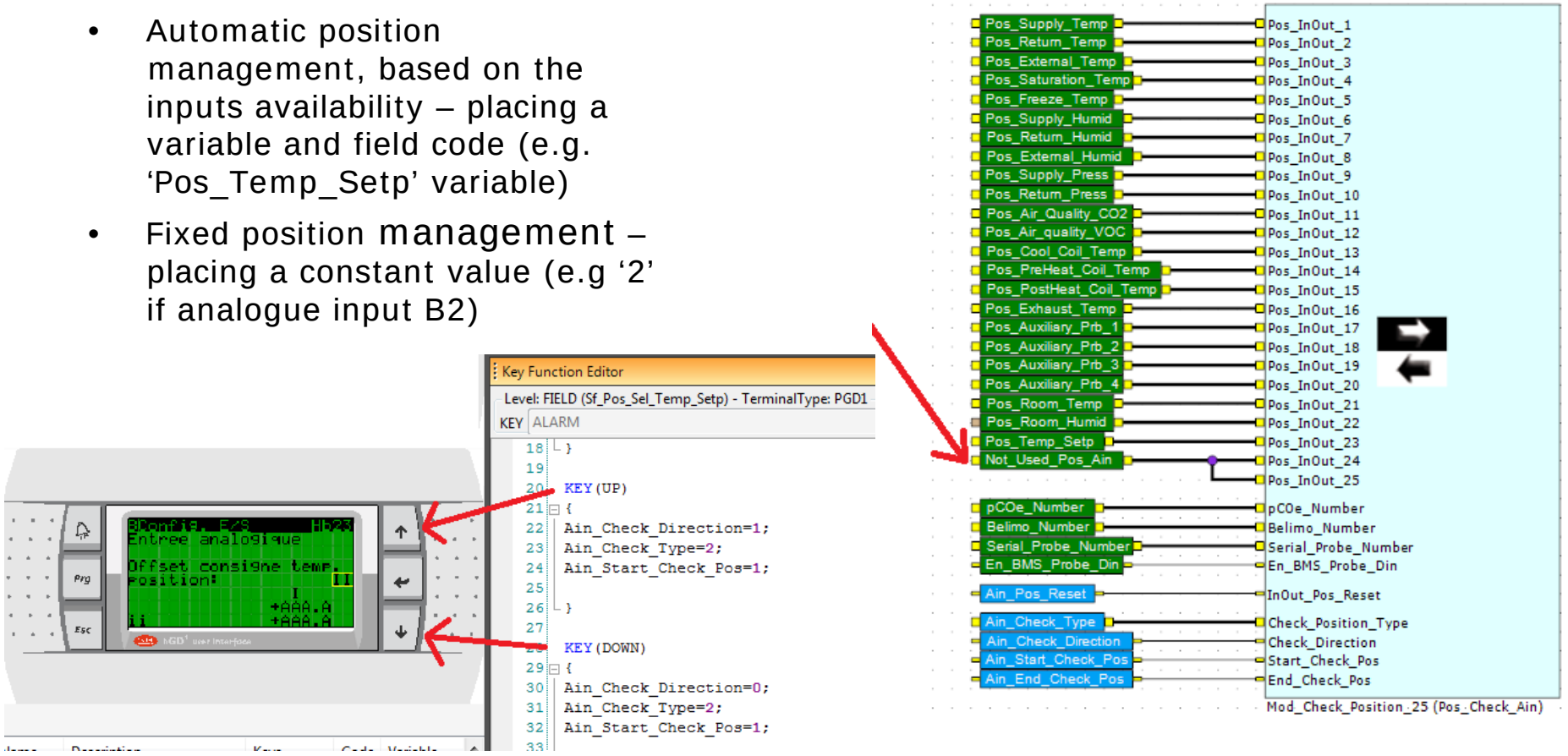
This management doesn't need an application modifying, just a proper parameters setting.



1 How to add a probe management

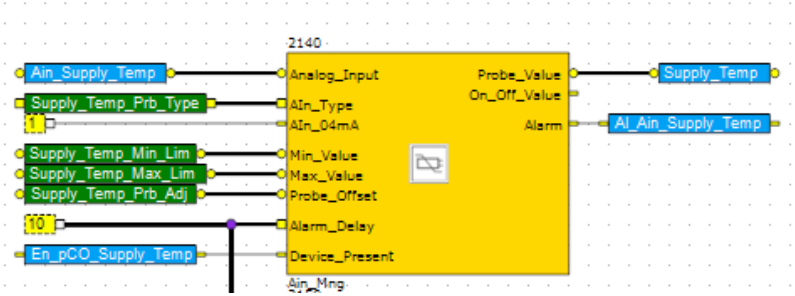
You can add an analogue inputs management modifying the ‘Mod_Check_Position_25’ 1tool module

- Automatic position management, based on the inputs availability – placing a variable and field code (e.g. ‘Pos_Temp_Setp’ variable)
- Fixed position management – placing a constant value (e.g ‘2’ if analogue input B2)

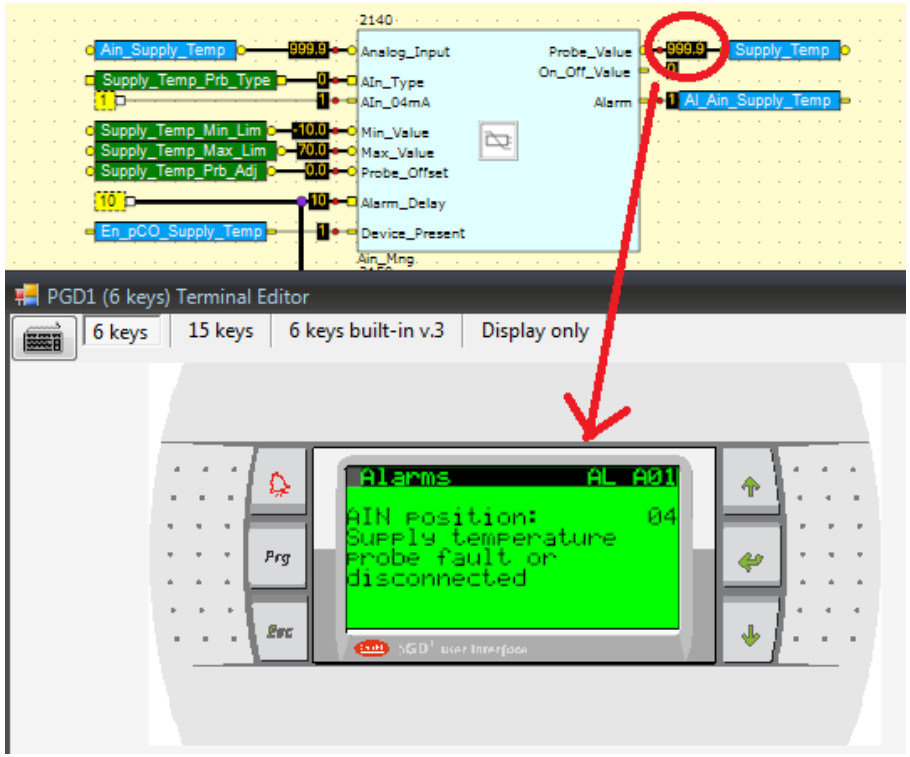


1 How to add a probe management

All the other inputs management (conversion, probe type, probe alarm, supervision availability) can be copied from an already present analogue input management.



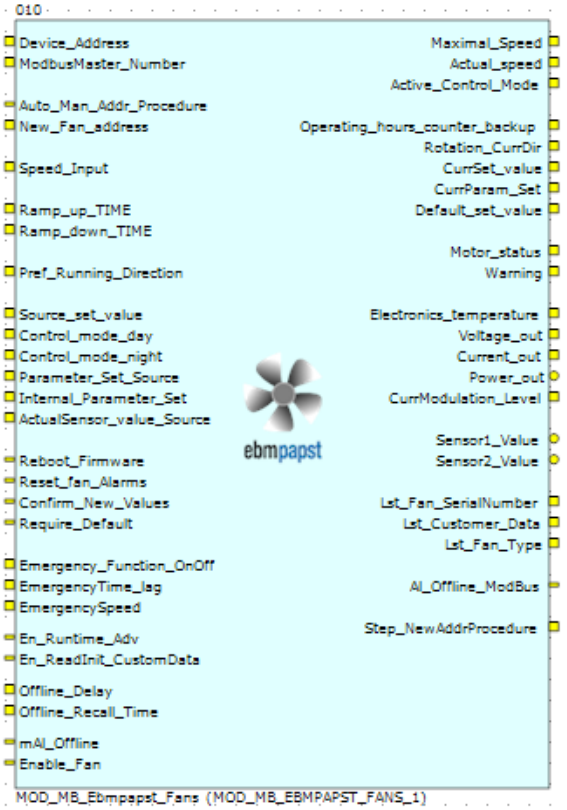
‘Ain_Mng’ 1tool macroblock provides a complete analog input management, value conversion based on the probe type, limits management and probe alarm.

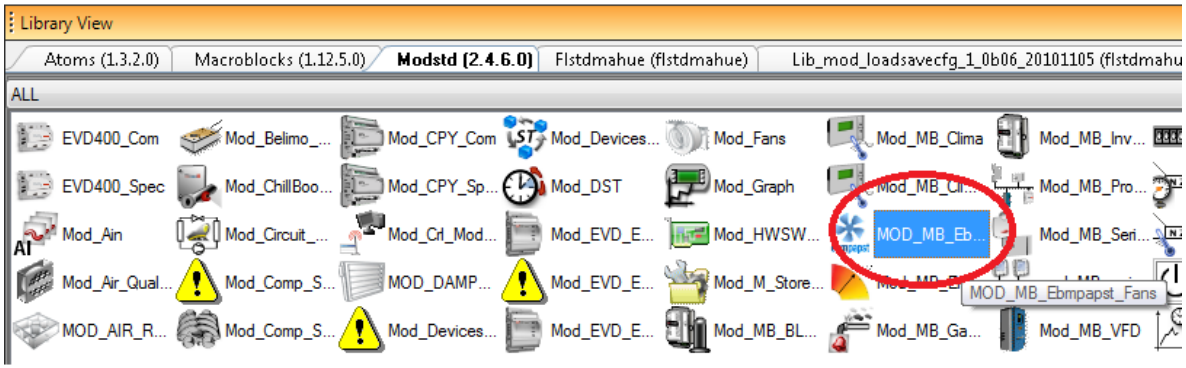


2 Ebmpapst fan management

It is possible to manage the ebmpapst fans, using the 'Mod_MB_Ebmpapst_Fans' 1tool module available in the 1tool modules standard library ModStd (ver2.4.6.0).

A demo application is available at the KSA site (http://ksa.carel.com)





2 Ebmpapst fan management

For introducing the Ebmpapst fans management the following steps are needed:

1. Place in a strategy page the ‘Mod_MB_Ebmpapst_Fans’ 1tool module (1 module = 1 ebmpapst fan)
2. Update the ‘MB_List_Size’ pin of the ‘MB_protocol_Mng’ module adding the required sublists number (24 sublists for each module ‘Mod_MB_Ebmpapst_Fans’ added in the strategy page). The calculation rule is:

10 + device sublist*2

↓

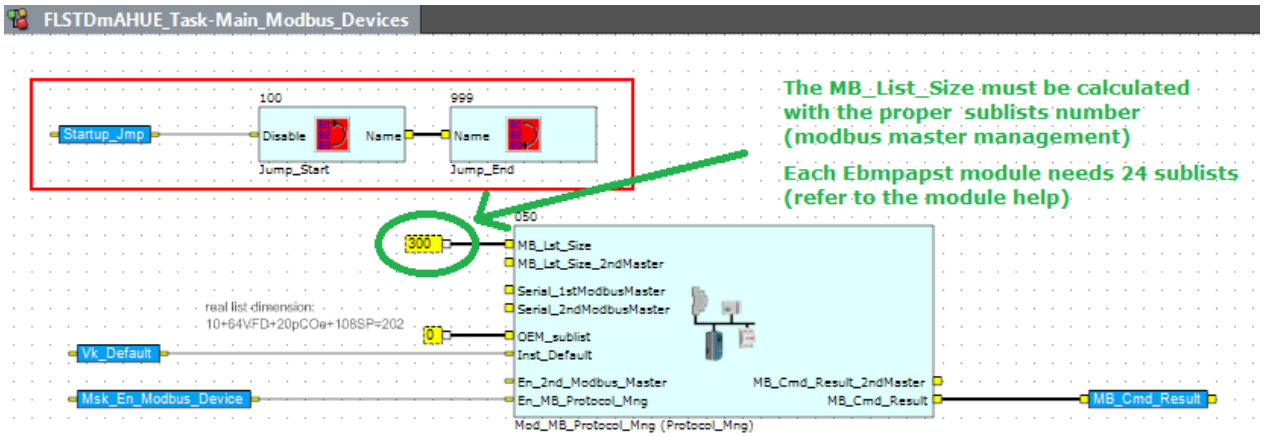
24

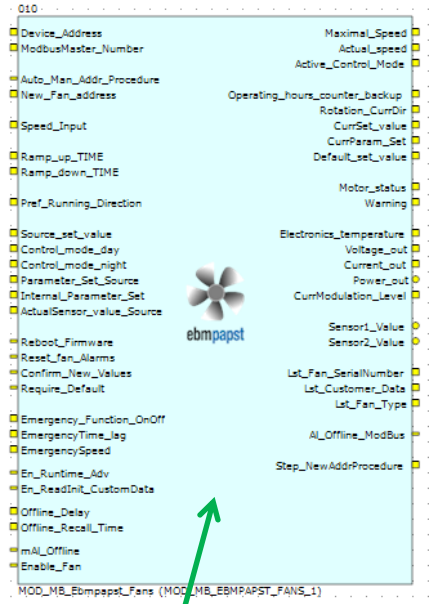
2 Ebmpapst fan management

A modbus master management adaption is required, adding the ebmpapst sublists number in order to control the fans.

Each module (1 module = 1 Ebmpapst fan managed) needs 24 sublists.

e.g. adding 1 Ebmpapst fan, the ‘MB_List_Size’ pin number will become: 300 (actual modbus master management)+24*2 (Ebmpapst fan) = 348





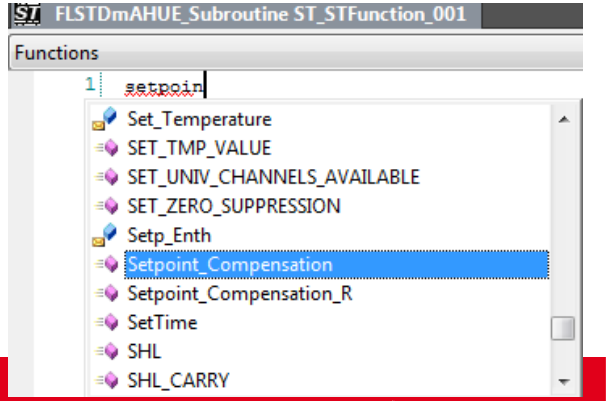
24 sublists for the modbus control of the fan

3 Supply setpoint compensation based on return or room Temperature

If supply regulation is selected (Mask **Hc01**), a possible useful function could be the supply setpoint compensation based on the return or room temperature. The management can be done directy in the **Scheduler_OnOff_Mng** page.

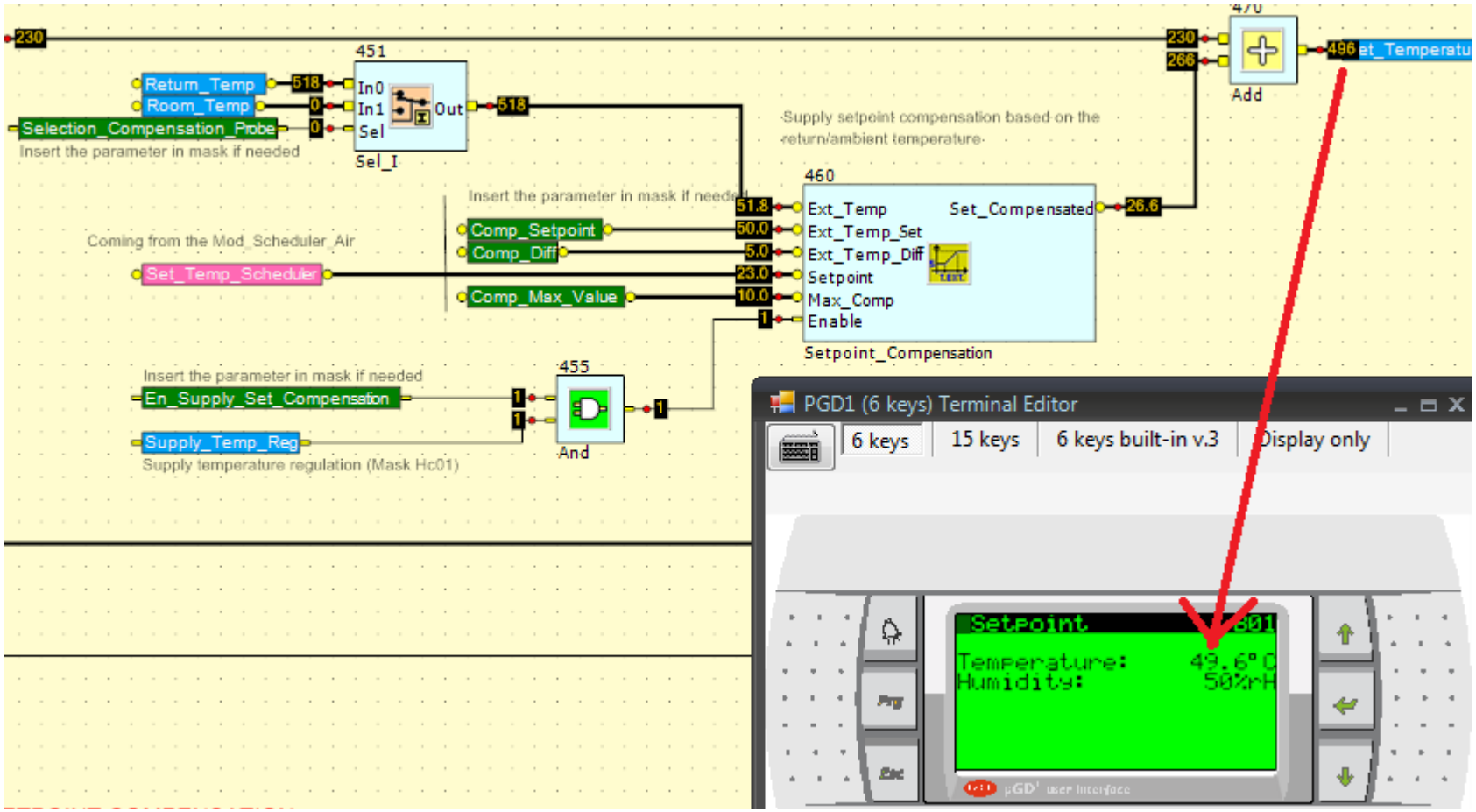
Here the steps:

1. Insert a Setpoint_Compensation macroblock (Macroblock library) in the strategy page **Scheduler_OnOff_Mng**
2. Insert the parameters in mask or fixed values.
3. Add the macroblock output value with the variable coming from the already present setpoint management



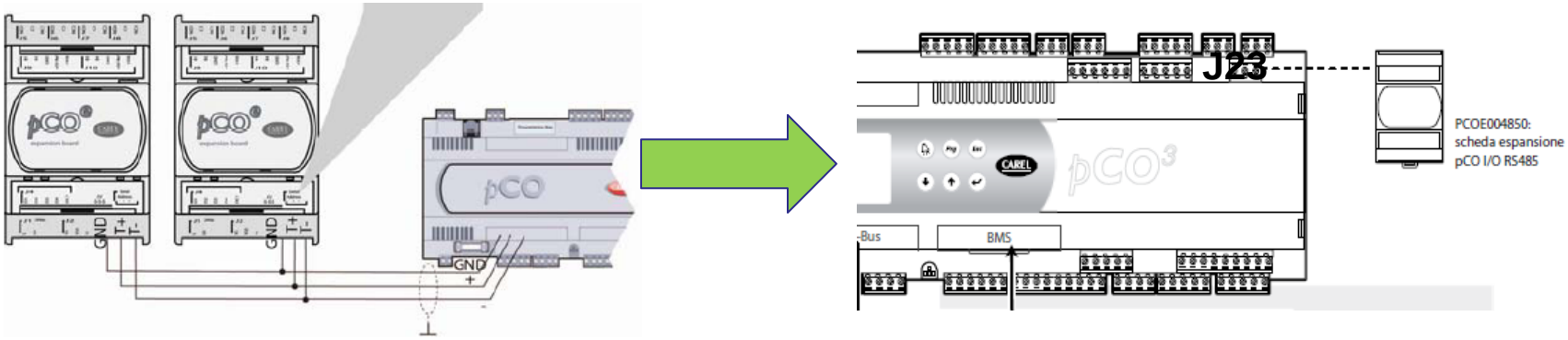
Remember that you can use also the ST function block

3 Supply setpoint compensation based on return or room Temperature



4 Connect an pCOe expansion board to a J23 connector of a large controller (pCO3 or pCO5)

The FLSTDmAHUE manages the pCOe expansion board connected in the fieldbus port (pCO100FD10 in the field card slot) as explained in the application manual.

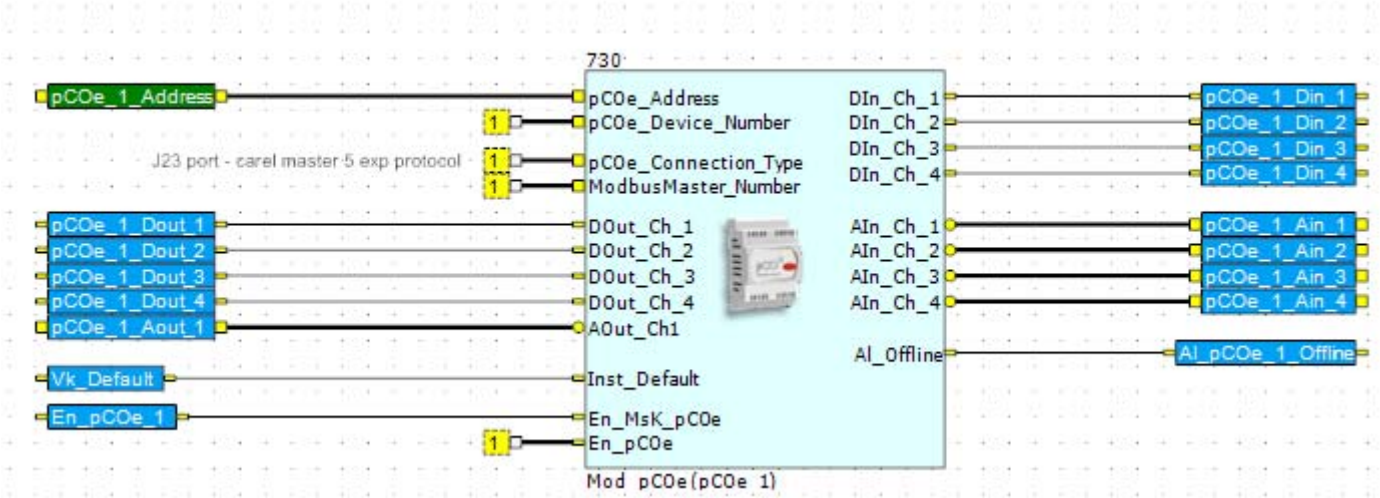


It is possible to keep the pCOe sofware management (masks and strategy) and connect it to the J23 simply changing an input pin value of the **Mod_pCOe** 1tool module.

4 Connect an pCOe expansion board to a J23 connector of a large controller (pCO3 or pCO5)

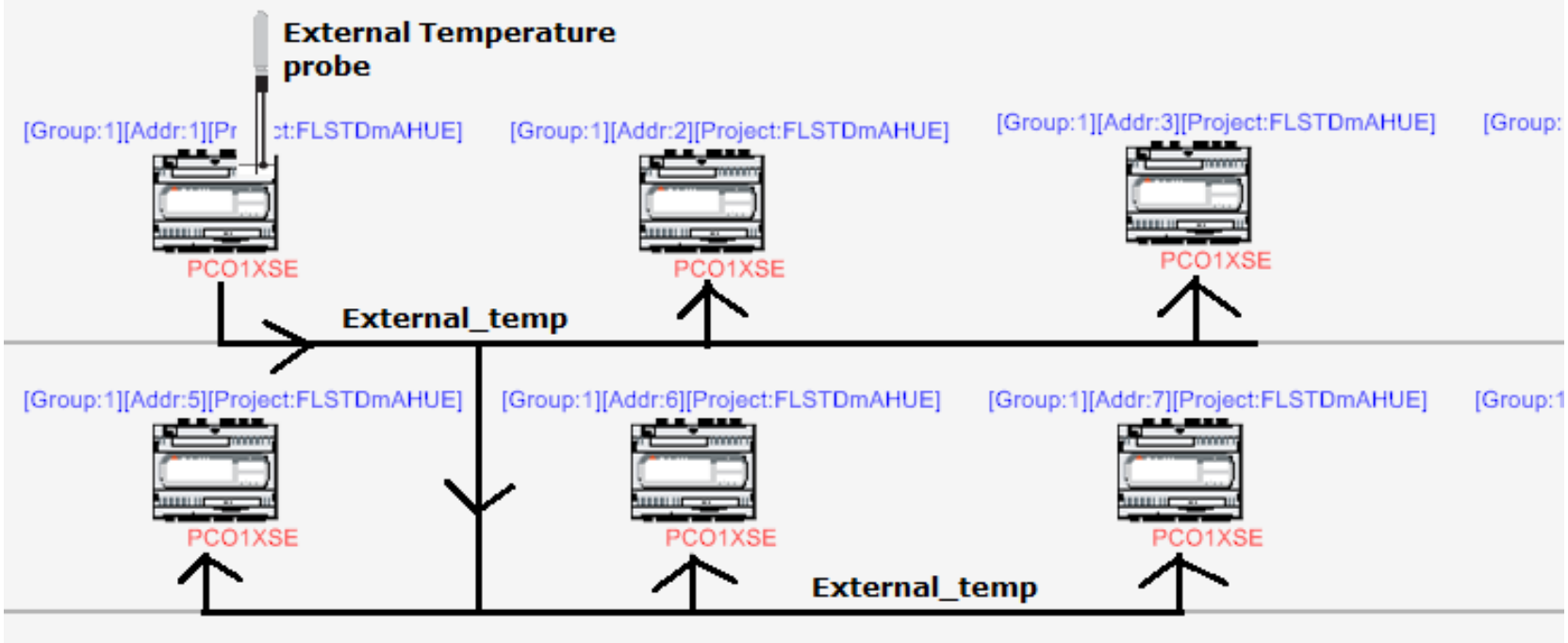
Here the steps:

1.Select the strategy page **Modbus_devices**
2.Modify the **pCOe_Connection_Type** pin value from **3** to **1**



5 Sharing a probe value through the AHUE units via pLAN network

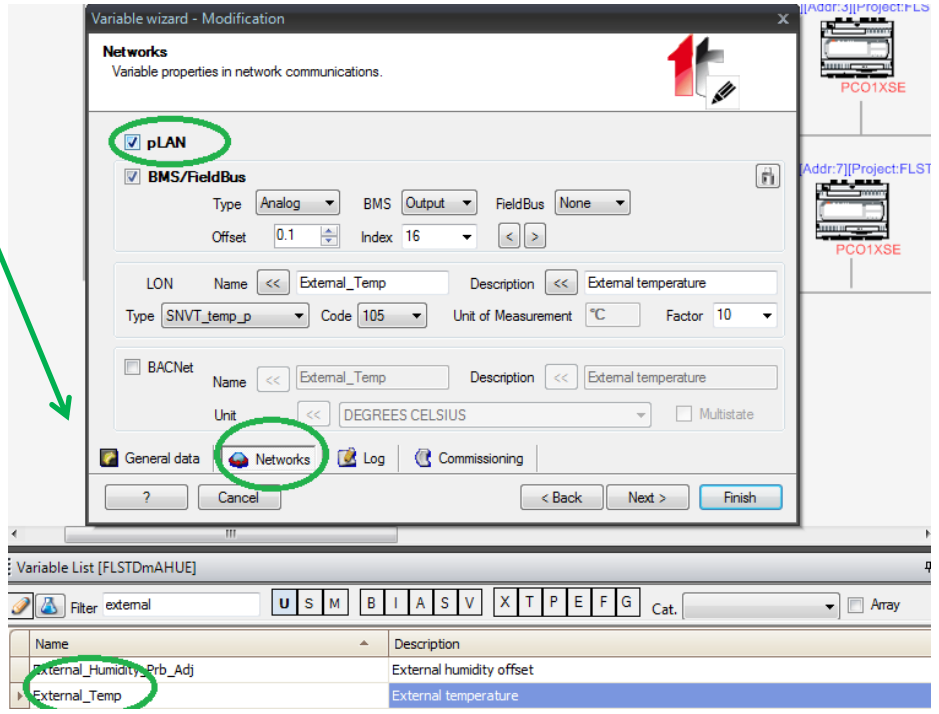
Using the pLAN network is possible to share a probe value through the AHUE's units; it is necessary to select the probe reading variable, for example **External_temp,** and share in the Network editor of the project.

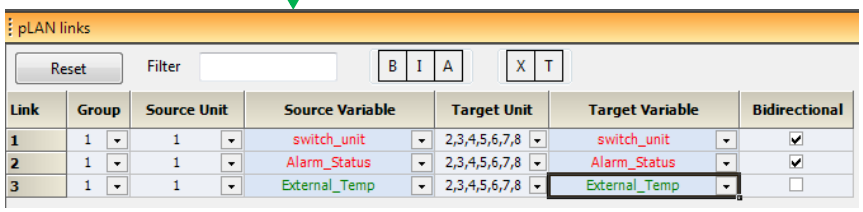


5 Sharing a probe value through the AHUE units via pLAN network

Steps:

1. Enable the pLAN property of the variable External_Temp
2. Use the variable External_Temp in the pLAN link table





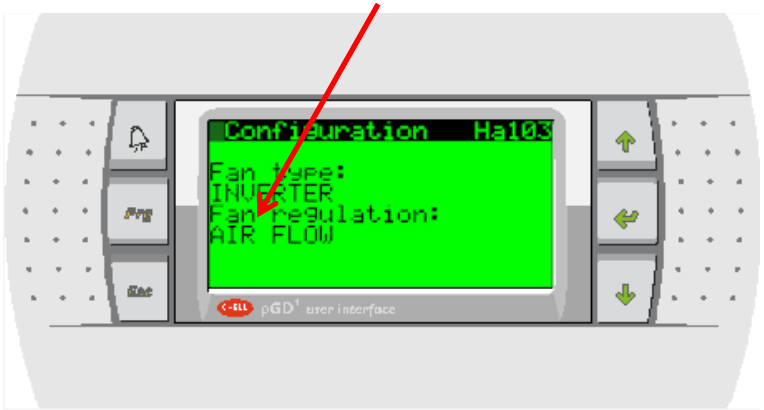
6 Air flow control managemen

Available in the release 2.0

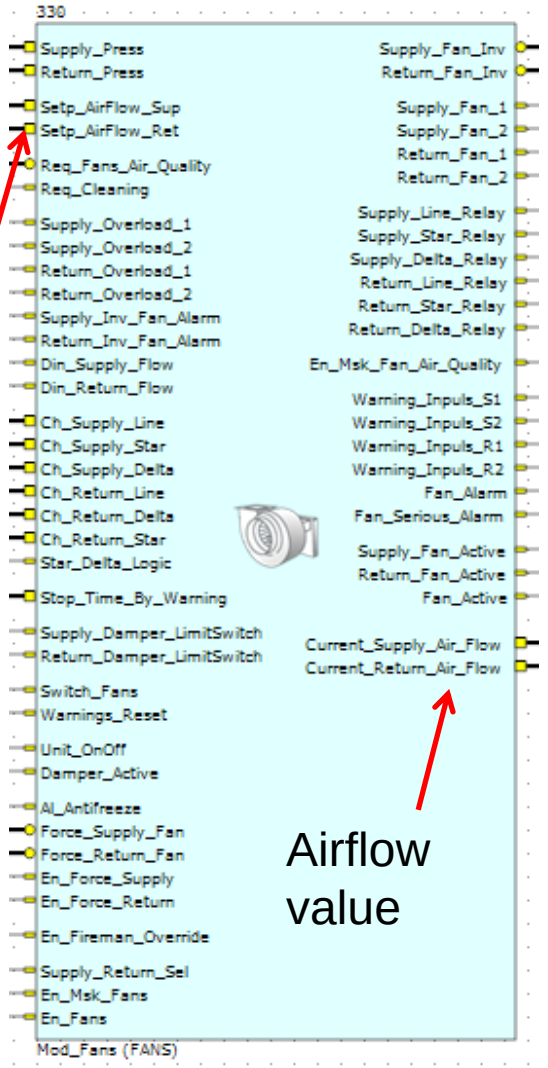
This feature is available starting from the release 2.0.

The module **Mod_Fans** manages the fans control; the airflow control needs some application masks and a simple strategy logic outside the module **Mod_fans**.

Airflow control enabled based on the m3h



Airflow setpoint

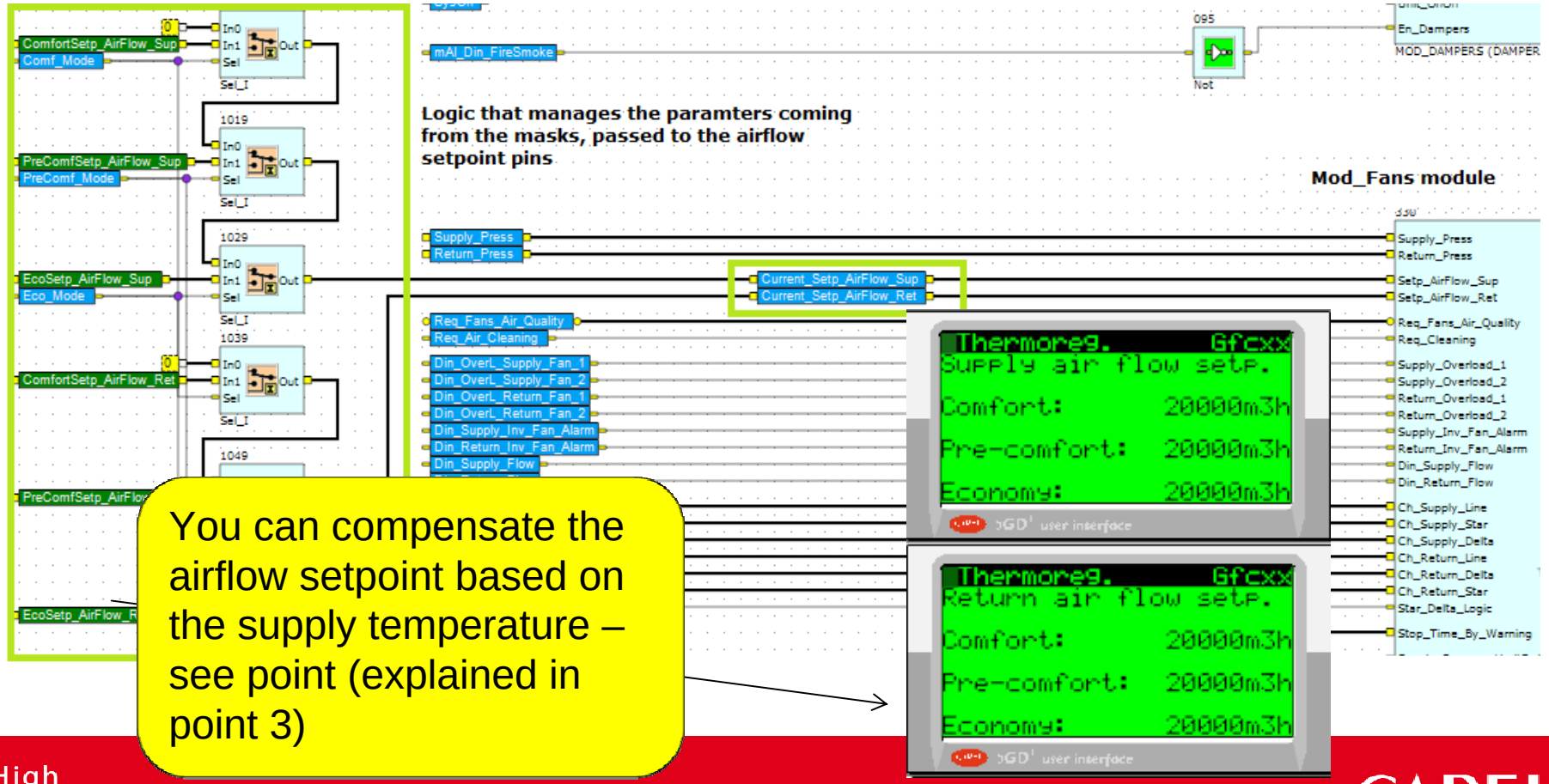


Airflow value

6 Air flow fans management

Available in the release 2.0

The airflow setpoints are managed using the module pins and placing in mask the parameters. We suggest to place the mask in the thermoregulation loop.

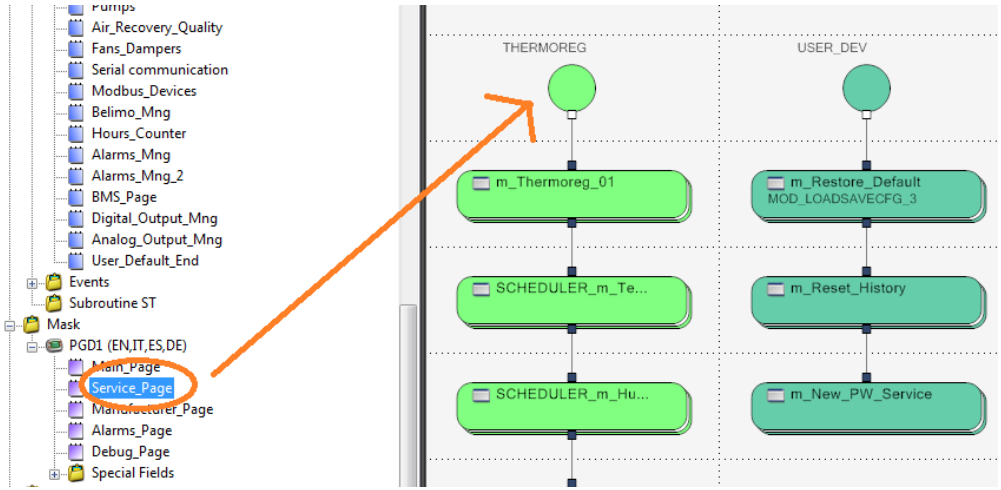


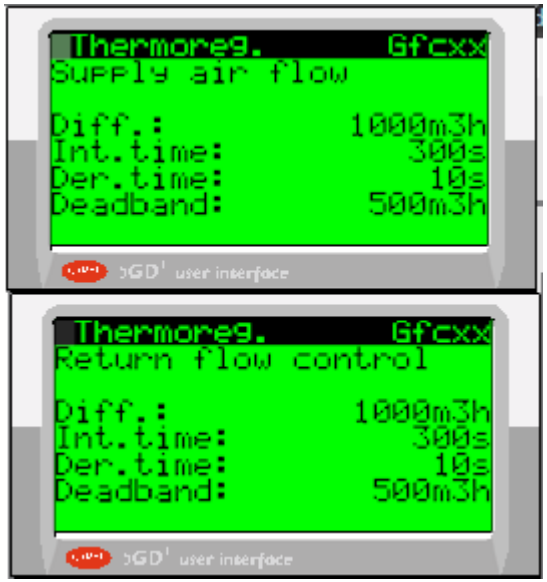
6 Air flow fans management

Available in the release 2.0

The airflow regulation parameters (Diff, int.time, etc) are already available in the **Mod_Fans** module masks, these mask are imported (linked or imported) placing the module in the strategy page.

The module mask are available in the THERMOREG loop, reachable from the Service_page sheet of the solution explorer as shown below.

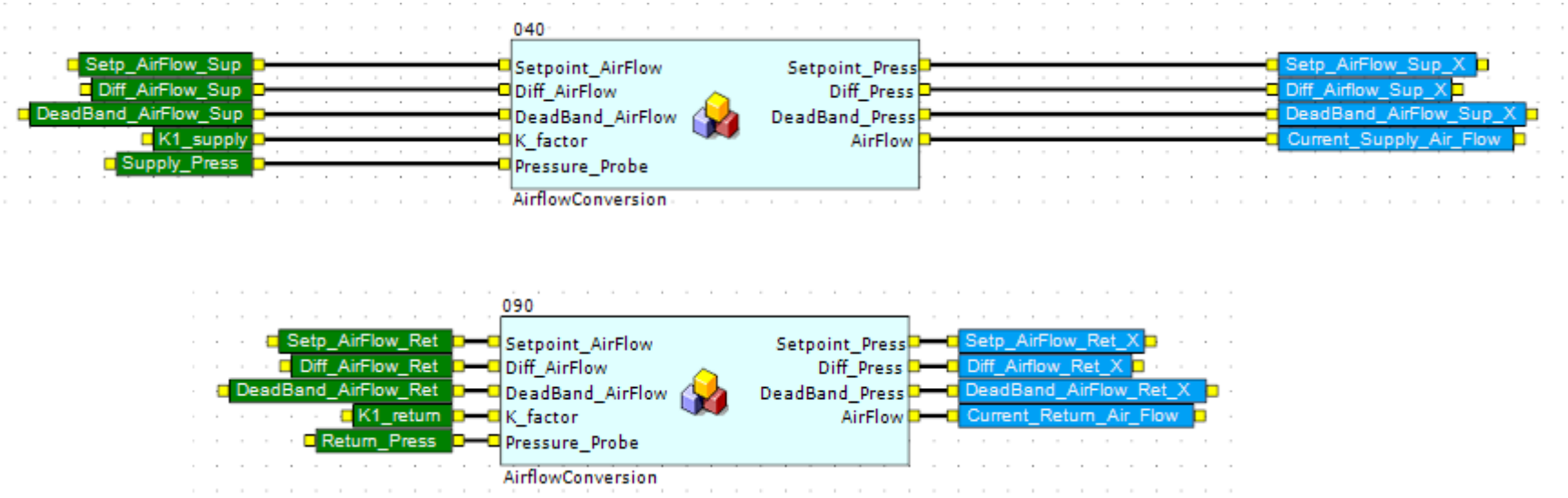




6 Air flow fans management

Available in the release 2.0

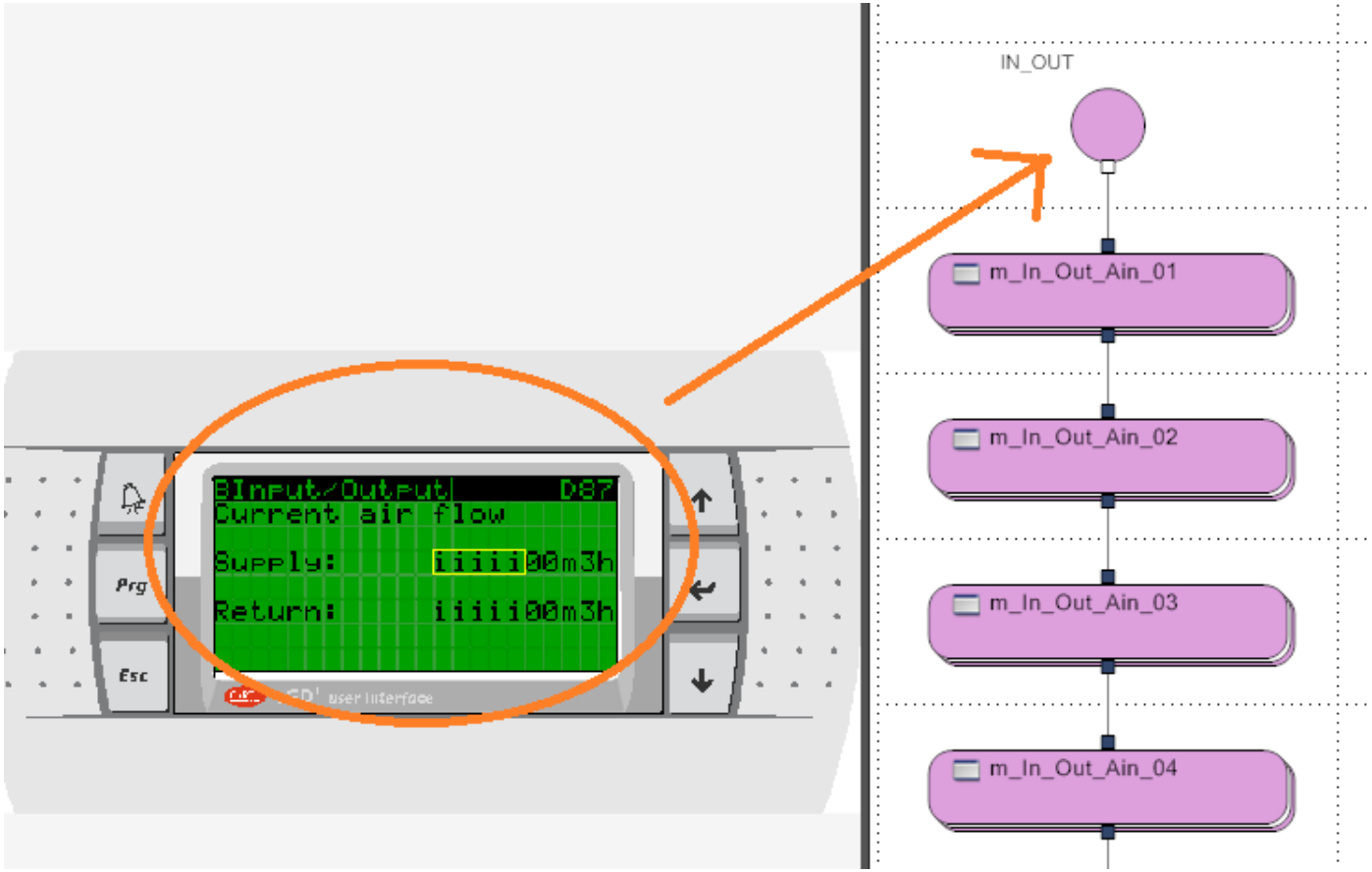
The airflow management is done inside the **Mod_Fans** module, where a macroblock acts the conversion between pressure management to airflow



6 Air flow fans management

Available in the release 2.0

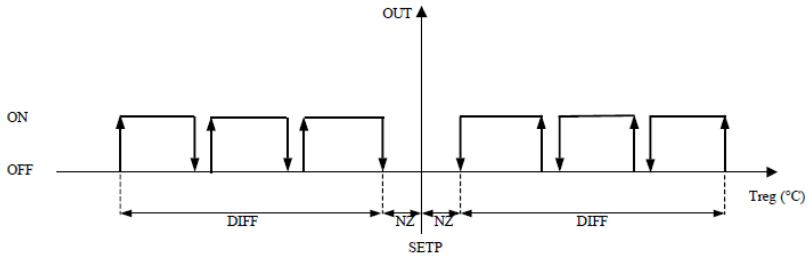
The current airflow feedback is available in the I/O loop mask



7 Fan-Coil management

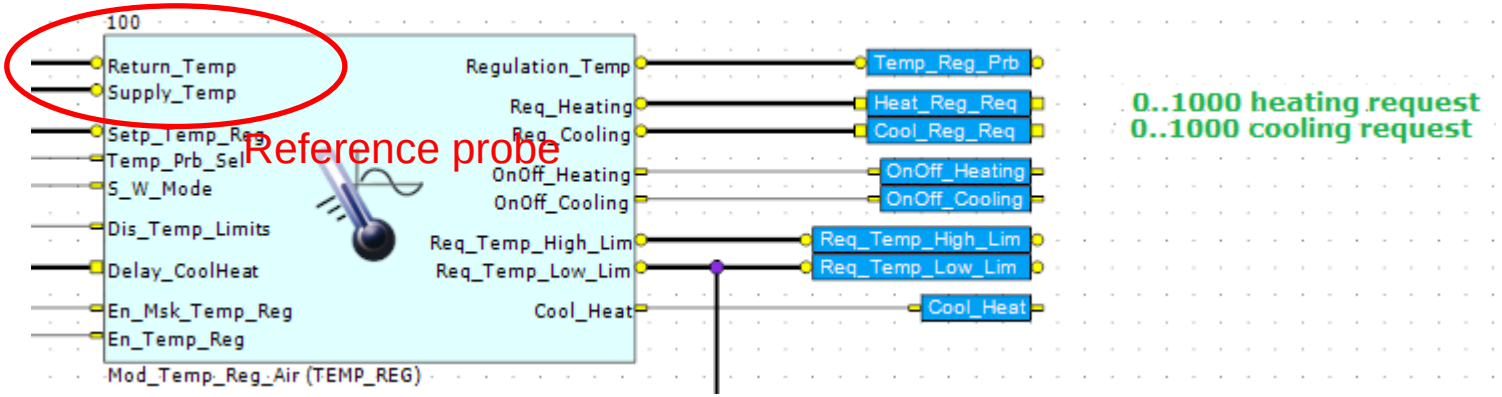
The Fan-Coil management is based on the termoregulation request, the output signal is used to manage the fan-coil steps

Graph of fan coil activation with request from control probe



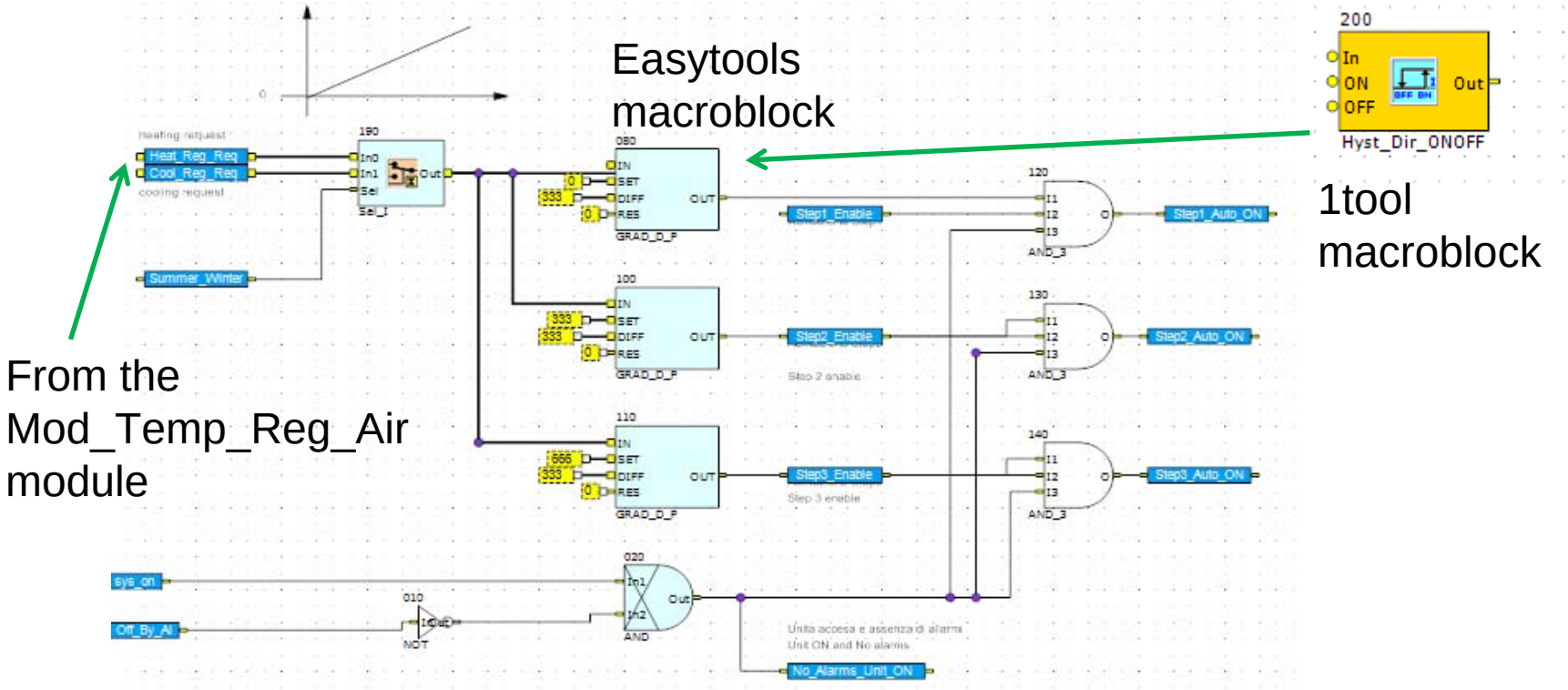
OUT	Speed of the fan coil
SETP	Control set point
DIFF	Control differential
NZ	Control dead zone
Treg	Control temperature

It can be easily implemented, starting from the cooling/heating (0..1000 value) request module available in the Thermoregulation page:



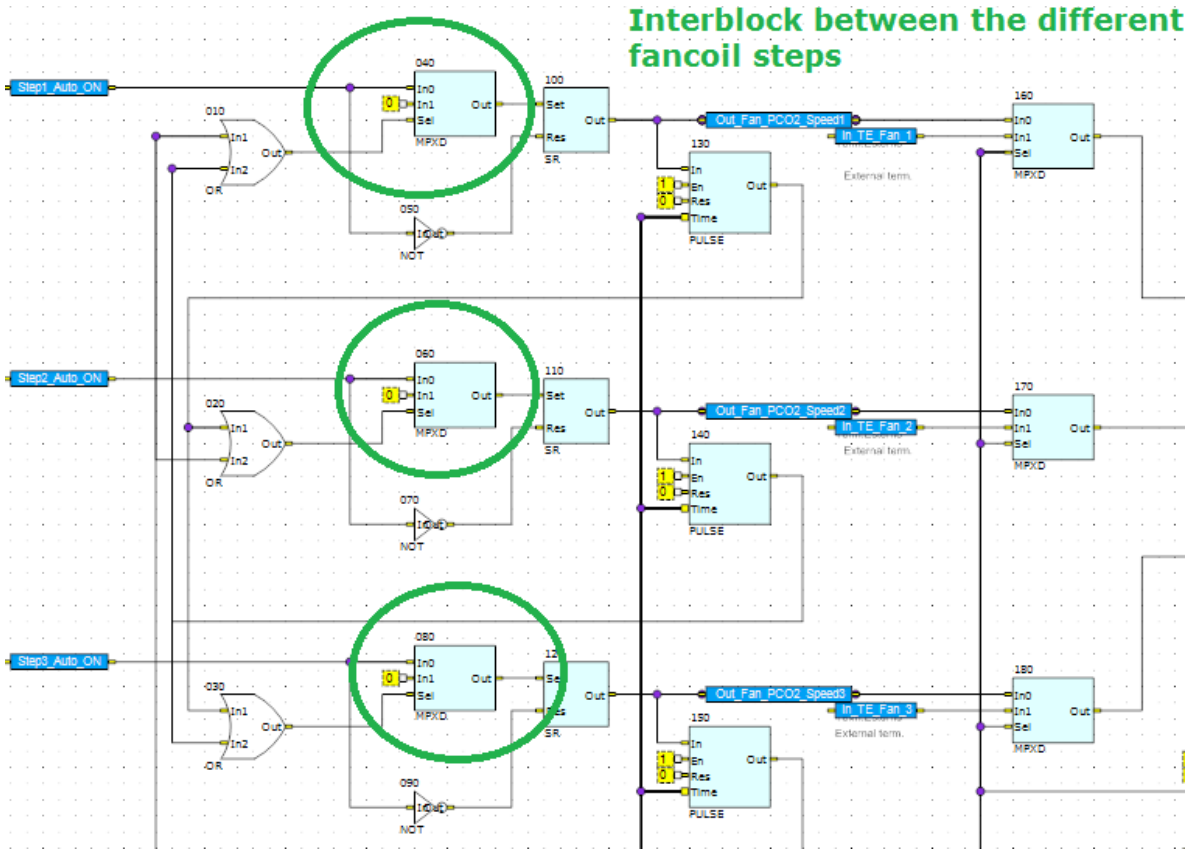
7 Fan-Coil management

The Fan-Coil management implementation is an easy steps management, the fancoil speed activation can be done automatically (termoregulation) or manually by keyboard or with an external thermostat using digital inputs



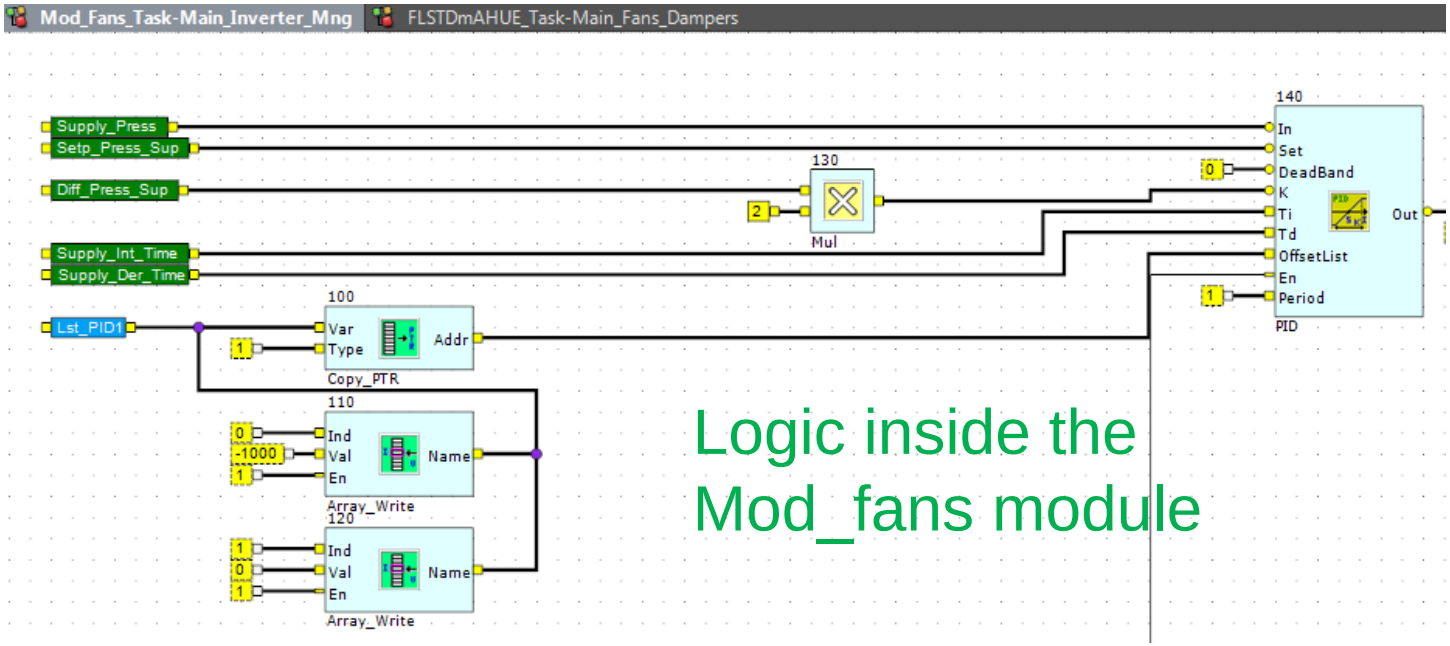
7 Fan-Coil management

The Fan-Coil management requires the fancoil steps interblock for having a single speed working at time



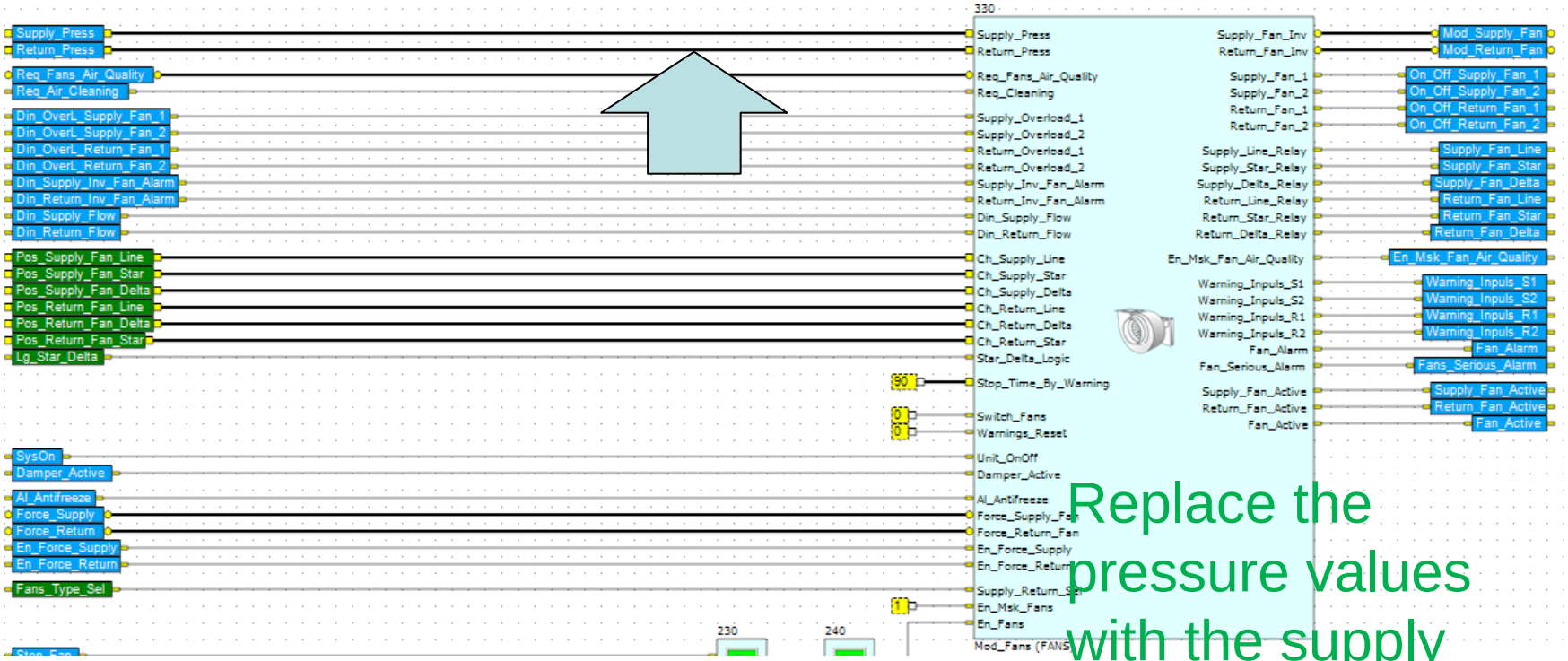
8 Fans management with the supply temperature

The **Mod_Fans** module, usually managed with the pressure can be controlled using the supply temperature as well.
The logic inside allow to replace the pressure variables (probe, setpoint and differential) with the supply temperature ones.



8 Fans management with the supply temperature

The different probe request can be done using a SEL_I atom that discriminate the fans regulation signal (probe,setpoint, differential)



Replace the pressure values with the supply temperature values

New features available starting from the release 2.0

1. Airflow management
2. Direct evaporative cooling (DEC)
3. Indirect evaporative cooling (IEC)
4. Offcoil humidity probe (dehumidification with absolute and not relative humidity)

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