

**A. Questions about the ideal heating load:**

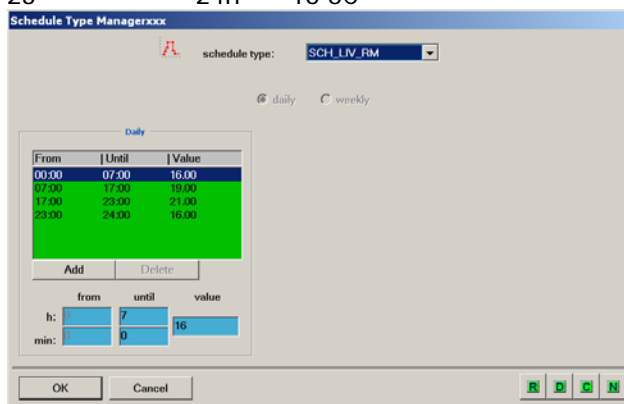
**1. When using a schedule in TRNbuild (see figure 1) I notice that:**

- a. Somehow the heating only switches on at exactly the time of the switch (in my case 7 h and 17 h), while I assumed the schedule to mean that at the new time the new temperature must be obtained. The heating switches OFF at exactly the changing time, so it then takes the new setpoint temperature. (see figure 2)
- b. More strange I find that it takes two hours for the temperature to reach the setpoint temperature..  
In case I take 0,5 hr timestep, it takes an hour to reach the setpoint temperature. So in general it takes two timesteps for the ideal heating to reach the required setpoint.  
Is this normal or what am I doing wrong?

**Fig 1. my schedule within TRNbuild**

In TRNbuild I included a heating schedule as follows:

0	-	7h	16 oC
7	-	17h	19 oC
17	-	23h	21 oC
23	-	24h	16 oC



**Figure 2: comparing the resulting indoor air temperature (pink) with the setpoint as produced with an equation solver.**

(calculation timestep 1 h)



In order to compare the resulting indoor air temperature with the setpoint schedule I also plotted a schedule produced in an equation solver, as follows:

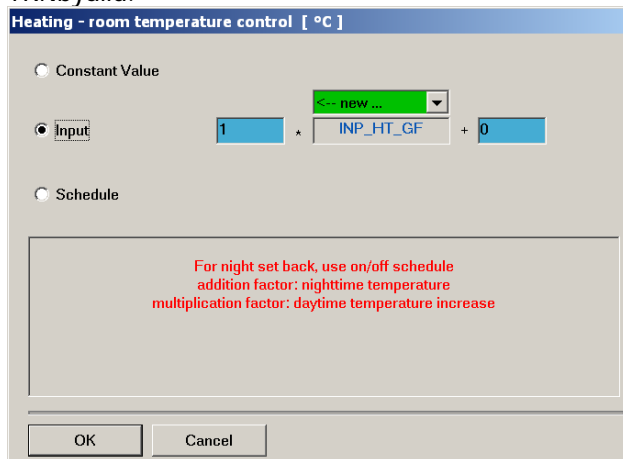
$$LT(hr\_day,7) * 16 + (GT(hr\_day,7) + eqI(hr\_day,7)) * LT(hr\_day,17) * 19 + (GT(hr\_day,17) + eqI(hr\_day,17)) * (LT(hr\_day,23) + eqI(hr\_day,23)) * 21 + GT(hr\_day,23) * 16$$

Where:

$$Hr\_day = \text{hour of the day} = \text{mod}(\text{time}, 24)$$

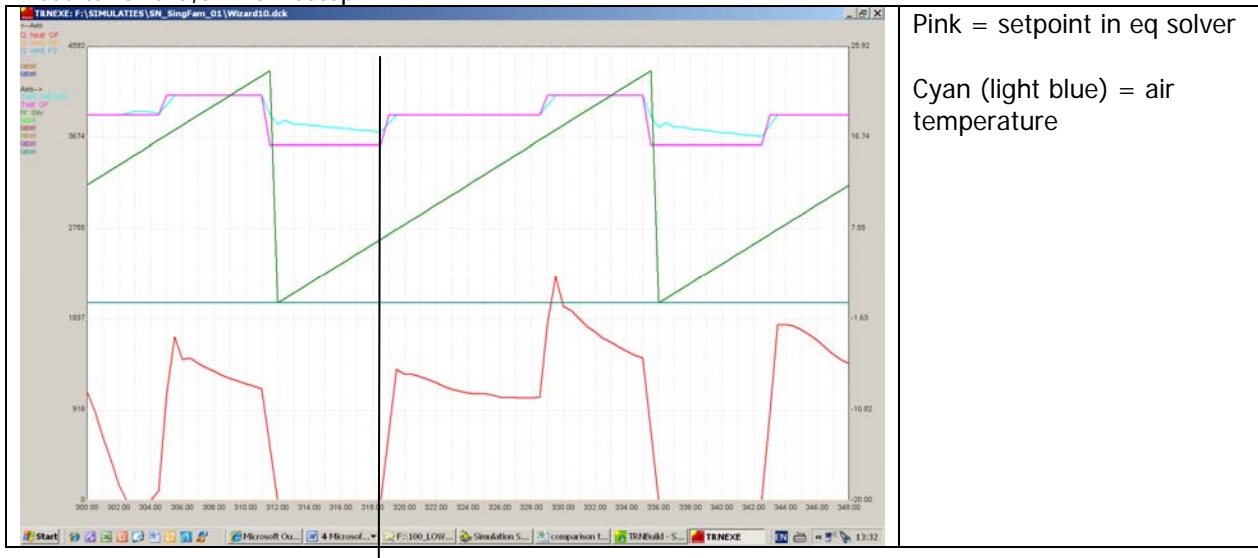
## 2. Implementing a setpoint as an input from the equation solver.

In this case I used the above described schedule from the equation solver as an input for the heating in TRNbuild.



(I cannot use an on /off schedule as suggested in red, since the required schedule is more complicated.)

Results for a 0,5 hr timestep:



Question:

In this case the heating switches on at the time the setpoint goes up. But still it takes two timesteps before the setpoint temperature is reached. Does anyone know why?

**B. Question about the simulation:**

Does anyone know why the temperature seems to be fluctuating a little (in other words: it is not a smooth line) as soon as the heating turns off?

Also when using a smaller timestep the line is not smooth, but the temperatures stay constant during a hour, so the line looks like a staircase..

(note: the non-smooth line occurs when the heating is OFF)

1 hr calculation timestep.



0.5 hr timestep



0.125 hr timestep



Is this normal and if so, why is this kind of fluctuation / pattern the result?  
Or am I doing something wrong?

Thank you very much again.

Sabine