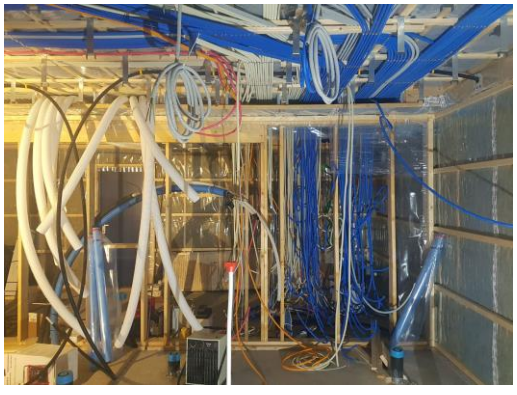
Lighting

- All of the lighting is controlled by KNX and DALI.
- There are movement sensors and local switches in every room for switching on/off/dimm.
- The lights are a mix of LED downlights, LED panels, LED strips and LED drivers (standard and RGB)
- The light color is 2700K, 3000K and Tuneable White, all controlled via KNX/DALI Gateways
- For some lights I use the ISE KNX Hue Gateway to control Philips Hue light bulbs.
- When the house is set to “night mode” the movement sensors switch on only 20% light

The main lighting in the house is done by LED downlights
There are LED strips under the cupboards

The original drivers for the lighting is replaced with DALI drivers to make is possible to control with KNX

Also here the original drivers for the lighting are replaced with DALI drivers.



The electrical installation in the house is in progress.
The ceiling is lowered approx. 20cm to make space for the installation.

Heating

- The heating of the house is done with under-floor water heating.
- There are 2 thermostats in each room, one in the room and one in the floor.
- This makes it possible to set a minimum temperature for the floor even if the room is hot enough
- The heating of the garages (car park) and the shed is done by electrical radiator heating

The heating of the living area is done by under-floor water heating.

The boiler is combined for both heating and tap water. There is a 3kW heating element for the tap water, and 2x4,5kW heating elements for the under-floor heating.

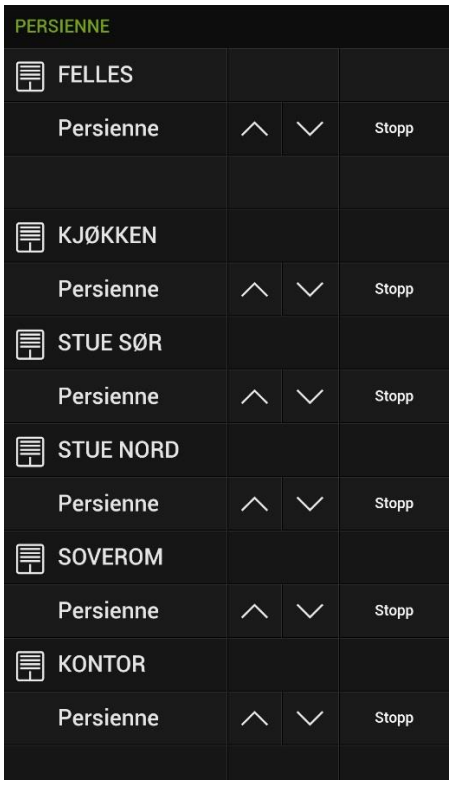
There is also a circulation pump, controlled by KNX.
It stops when there is no heating demand, and starts when one of the circuits demand heating.

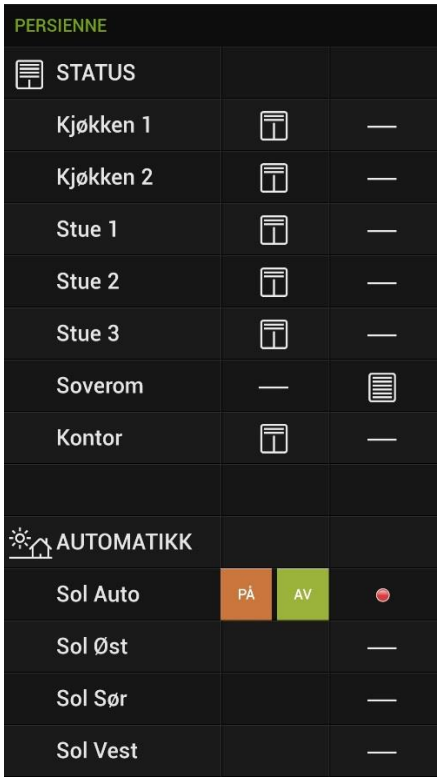
For control of the 12 under-floor heating circuits there is KNX motor actuators.
There is also installed PT1000 elements to measure temperature on the pipes, and pressure sensors to measure the pressure in the pipes.
Alarms are gives via KNX if the temperature or pressure is out of valid ranges.

The water inlet to the house is also monitored.
There are pressure sensors on the main inlet and after the pressure reduction valve. There is also a pressure sensor on the outlet to the outdoor water taps. If this pressure is >0 and the outdoor temperature is <2°C an alarm is given via push-notification to prevent frost damage to the pipes and outlet.
An electrical valve is also installed to close the water in case of a water-leak.

Sun shading (screens)

- The sun-shading is electrical outdoor screens on every window.
- The screens are manufactured together with the windows, and came preinstalled.
- The screens are controlled by outdoor weather station (sun, wind, rain)
- There are local switches to control each room individually
- The magnet contacts on the windows prevent the screen from going up when a window is in ventilation position.





Door and window monitoring

- All the doors and windows have magnet contacts for monitoring of status open/closed.
- The doors also have micro switches for indication of status locked/unlocked.
- The terrace doors have wireless sensors for transmitting indication of locked/unlocked status.
- Push notification is sent if one of the doors is left open for a certain time.
- Push notification is sent if the burglar alarm is set and a door in the house is unlocked.

Magnet contact installed on every doors and windows. This is connected to KNX input modules to indicate status open/closed.

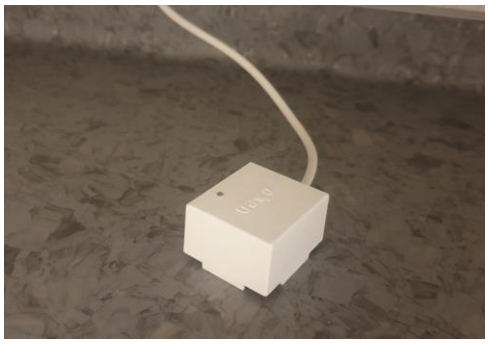
On the terrace doors the status of locked/unlocked is transmitted with ABB Wireless KNX.
I have installed a micro switch in the lock to monitor the position of the lock.

Micro switches is installed in the locks to monitor status locked/unlocked. This is connected to KNX input modules to indicate status.

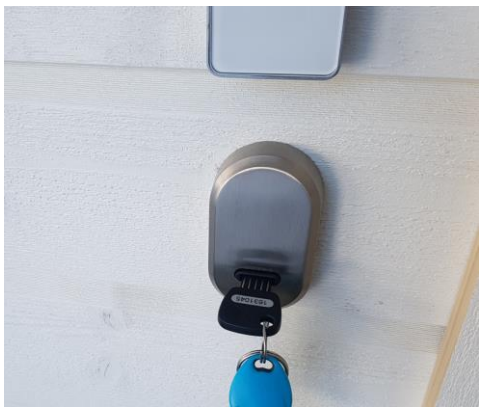
Alarm panels for fire, intrusion and water

- The alarm panel ABB GM/A 8.1 with integrated KNX is used for intrusion and water alarms
- This alarm panel controls KNX devices directly if the system is set, unset or in any alarm state
- The fire alarm is a separate addressable system from Honeywell Eltek with integration to the KNX system with input/output modules.

Movement sensors are installed in every room.
This is in addition to the KNX movement sensors used to control lighting.



Water leakage sensors are installed in rooms where flooding can occur.
In case of flooding the alarm panel sends signal to the water valve, so the water inlet to the house is shut off.

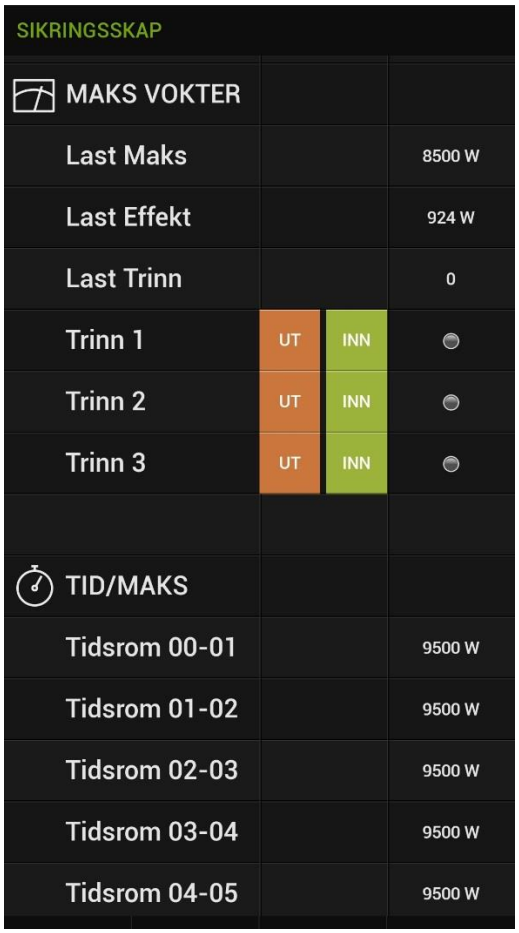


A key-fob is used to set/unset the burglar alarm.
This is connected directly to the ABB GM/A alarm panel.

Load shedding

- I have installed 4 energy meters to monitor the energy consumption in the house and garages.
- The “main energy meter” is also used for load shedding in 3 steps
- First step is reducing the setpoint of the boiler with a fixed temperature
- Second step Is reducing the temperature of garage, laundry room and switching irrigation off
- Third step is reducing the setpoint of other rooms with 1-2°C.
- Power limits is adjustable by time-intervals in the Gira Homeserver

ABB Energy meters with KNX module is installed to monitor energy consumptions.
I have one main meter, one for the heating of the house and two for consumption in the garages.



The load shedding is controlled in Gira Homeserver.
Setpoint for max energy consumption allowed for certain times of the day is manually set.
I am also planning to implement import of daily power rates, so this will be automated according to when the power is at lowest cost.

Garden watering (irrigation)

- The pump for garden watering (irrigation) is also controlled by KNX
- Start and stop of the pump is possible from remote, and there are several security functions
- Flow sensor and current sensor for monitoring of correct operation
- Automatic stop of the pump in case of errors in flow or current draw
- The pump is also stopped in case of load shedding step 2 is reached

The pump for garden watering (rrigation)

Sensors for monitoring of correct operation.
Flow sensor, pressure sensor and temperature sensor.
If the values from these sensor is out of range the pump is stopped and a push warning is sent.

Water for garden watering is pumped from the small river beside the house.

Gira Homeserver if used for control and monitoring of the garden watering (irrigation).
And also for the outlet to Husqvarne lawn mower.

Gira Homeserver

- Logic functions and visualization is done in Gira Homeserver