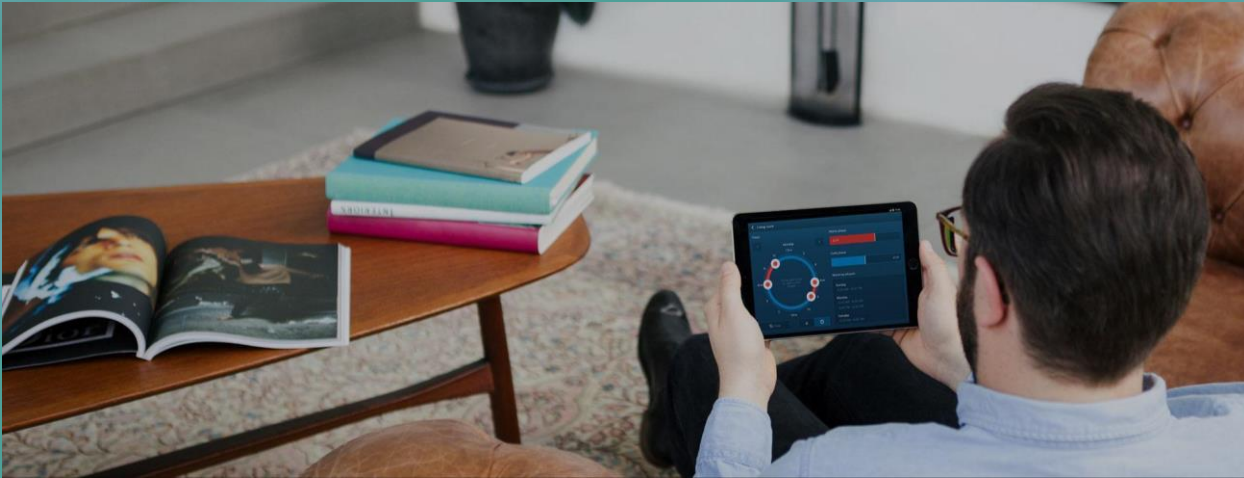


Code #LikeABosch Hardware development challenge



Who we are?

A home that thinks for itself. Intelligently networked devices that make your own four walls safer and everyday life easier: That is Bosch Smart Home. With products from Bosch Smart Home, your home controls regular processes completely automatically. Installation and operation with the Smart Home app are as easy as one-two-three – even when on the go. For you, this means fewer routine tasks, more time for living. We support your start into smart living with individual advice and a comprehensive range of services. Use the basic functions of our products without additional costs. Experience more living comfort – and the good feeling that everything is under control at home.

Introduction to the challenge

The energy crisis in 2022 has faced us with many challenges. One of these challenges for everyone is to reduce or make our energy consumption more efficient.

Your task will be to design and create an IoT device network that helps the homeowner make the property save energy and become more efficient. Think about water, gas, electricity or heat - and even more expenses that the homeowner could save on. Your network can be composed of “off the shelf” modules and modules created by your team, but your solution must include at least one module designed by you! This device must use at least two or more sensor technologies. The proposed solution can be a standalone device or one retrofitted to an existing appliance. For example, an ordinary gas-boiler that is retrofitted with temperature sensors, flow sensors, relays to control the operating time of the boiler even more precisely. Or another example can be a motion detection controlled light switch, that automatically turns on and off the lights if the internal brightness is lower than a given threshold.

During the course of 48 hours your team needs to:

- Create the value-add from the point of the customer (value add can be for example the energy – money – saved by the homeowner, or the time that can be saved by your sensor network to operate the home more efficiently).
- Create a visual representation of the whole sensor network
- Design at least one (or multiple), sensor(s) in a circuit designer software of your choice (Altium, OrCAD, PADS, KiCad, Eagle, etc.), Schematic + Layout!
- Create a detailed documentation of your solution
 - One-pager summary
 - Presentation of your solution
 - What you offer to the homeowner
 - Operation principle
 - The map of your sensor network
 - Realized sensor (schematic and layout design)
 - Calculated savings

What we will provide

Since the event will be held simultaneously online and offline, we cannot provide you hardware elements without giving advantage to the team present at the Hackathon, so we can only provide you with experienced mentors, Q&A availability.

Evaluation criteria

- Value saved for the homeowner
 - Cost of the saved energy (electricity, gas, water, etc.)
 - Time saved while making the home more energy efficient
 - Any other saving your system can offer
- Ease of use
 - Does your customer need to be a software guru or a simple application is all needed?
 - Maintenance and repairability
- Can it be retrofitted to an existing home?
 - Does your solution need the owner to purchase new appliances, or the existing ones can be used?
 - How difficult it is to install your solution
- Complexity of the proposed sensor network
 - Used technologies (temperature sensing, flow sensing, air quality sensing, actuators, displays, etc.)
 - How general is your solution to a specific home, or it can be implemented in virtually any home?

- Cost of the sensor network
 - Calculate the component prices for ~1000 pcs
 - Energy consumption of the device
 - Installation cost
- Complexity of your own sensor design
 - How many components are used?
 - How well do you keep general layouting rules?
 - Expandability of your sensor

Useful links

<https://www.bosch-smarthome.com/uk/en/smart-home-explained/>

<https://www.zigbee2mqtt.io/>

<https://www.mysensors.org/>

<https://tasmota.github.io/docs/>

<https://esphome.io/>