

Next-gen thermostat development with Edge AI for a global partner

A market-leading electric floor heater manufacturer turned to Proekspert to develop a next-generation version of their successful floor heating thermostat.

Competencies and methods

C/C++, embedded Edge AI, on-device machine learning

CASE STUDY

A generational leap in accuracy – without extra hardware cost

A next-gen solution to stay ahead the competition

A market-leading electric floor heating manufacturer needed a breakthrough thermostat with unprecedented room temperature accuracy and control. Their current thermostat already included a touchscreen and smartphone app, but end-user demands for precision were rising – turning accuracy into a key differentiator.

So they set an ambitious goal: dramatically improve measurement precision and user experience, leveraging advanced approaches, while keeping production costs locked.

Edge AI enables precise, real-time temperature control

Proekspert was trusted with hardware and electronics development, physical product design, and deeply integrated device software – including on-device Edge AI.

The project's objective:

- Upgrade the thermostat with cloud connectivity, remote updates, and device networking
- Enable the device to control multiple thermostats across locations
- Train and deploy an Edge AI model running locally on the thermostat for real-time, precise room temperature measurement and control
- Deliver all enhancements while keeping the Bill of Materials cost strictly fixed

Proekspert joined the client's development team, supporting everything from physical product, UI, electronics, to embedded and Edge AI software. As an end-to-end partner, Proekspert unified electronics, embedded, and AI specialists.

In addition to hardware and device software, Proekspert researched product, electronic and design trends to deliver a more comfortable and affordable thermostat. Example: Replaced the expensive LCD with an efficient LED, migrated complex control logic – including temperature prediction and optimization – to the device's Edge AI, and offloaded other functions to the mobile app.

To create the industry's most **precise thermostat**, Proekspert turned to Edge AI: Instead of relying on basic sensor readings, the thermostat uses neural network-based machine learning algorithms running locally (on the edge), allowing rapid and highly accurate temperature estimation despite competing environmental factors – floor type, drafts, sunlight, room layout, and heat from electronics.

This leap in intelligence means the thermostat maintains a set temperature precisely, regardless of room size or location, without cloud or server delay.

A next-gen product powered by Edge AI keeps the client in front

The client continues to lead in electric floor heating solutions. By using machine learning to train the temperature estimation model, their consumer thermostats now deliver industry-leading accuracy, intuitive design, and smart connectivity. The client has a long track record of innovation for both installers and end-users, and this move toward advanced machine learning is the logical next step in modernizing the product line.

Continuous innovation – now powered by Edge AI – helps deliver trustworthy products that both consumers and installers rely on and love. The technology works in the background, making the thermostat feel natural and intuitive, without drawing attention to itself.

Impact for the client's organization

The client successfully launched a modern thermostat that sets a new standard for accuracy and ease of use – maintaining its market leadership while supporting future growth.

- Industry-leading temperature precision through embedded machine learning – making the thermostat the most accurate in its category.
- Intuitive, minimalist design that appeals to installers and end-users – fitting discreetly into any environment.
- Robust cloud and offline connectivity via a user-friendly mobile app – making monitoring and control simple from anywhere.