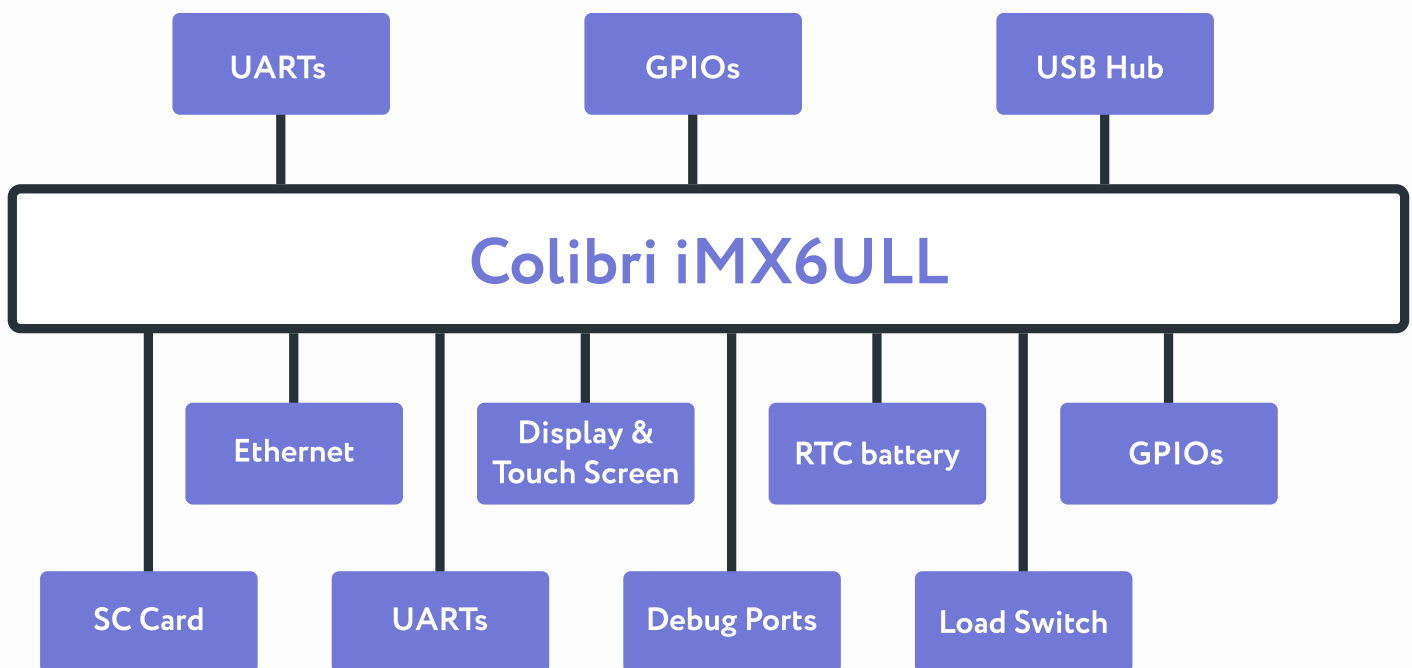# CONTROL UNIT FOR A SMART HEATING SYSTEM

Datasheet

Project objective

Develop a Heating System Computer Motherboard to execute full control for heating systems with a large number of sensors, actuators, and other external devices to be connected. The prospected system has to support the distributed architectures, withstand harsh temperature conditions of boiler rooms, and contribute to convenient and cost-saving heat control.

UARTs		GPIOs		USB Hub

Colibri iMX6ULL

	Ethernet	Display & Touch Screen	RTC battery	GPIOs

SC Card	UARTs	Debug Ports	Load Switch

Result

The client received 4 prototypes of the heating computer motherboard based on SoM Toradex Colibri iMX6ULL, which allows for the creation of full-fledged, multi-functional, and portable heating control centers. The system provides seamless data gathering and reliable control for the connected functional blocks, gathering data from BMSs, burners, boilers, and other devices. The delivered motherboard contains no flammable or poisoning materials and can be implemented for Industrial temperature range from -40 to 85 °C (-40, 185 °F).

Scope of work

- Support for real-time operations with the prevention of system hanging through a watchdog
- The ability to send updates to all the connected control boards
- Ethernet connection at 10/100 Mbit speeds and Power over Ethernet
- Three USB (A) ports for connectivity with external heating devices
- Three full-duplex RS485 ports with power supply
- One display interface (SPI) with additional pins for LCD. Resistive touch screen
- Memory storage through microSD card
- Reset functionality via button available for technicians
- Battery management – battery holder to power RTC and backup battery
- DC/DC converters powered by 18V
- One screwed connector for the power supply
- USB & UART ports for a distant debugging

Activities

- Requirement definition
- Hardware components selection
- Schematics design
- PCB-layout design
- Firmware development
- Testing & Debugging

About the project

Technologies

- C/C++
- ARM
- Ethernet
- USB
- SPI
- UART
- JTAG
- RS485

Platforms

- Linux
- Embedded

Project size

- 2 people

Duration

2.5
months