INSULIN TEMPERATURE WARNING SYSTEM BY THE BYTE BUNCH

Team Leader:

- Fabio J. Matos Nieves

Team Members:

- Enrique J. Chompré González
- Guillermo A. Colón Bernardi

Monitoring the temperature of insulin, ensuring safe storage guidelines in a mass storage context.

PROBLEM AND CUSTOMER

- Hurricane Maria caused the longest US blackout and over 2,900 deaths, including people with diabetes who rely on insulin. The lack of electricity for months after the storm left them without proper insulin storage highlighting the need for a tool to monitor insulin storage in normal/post-disaster conditions.

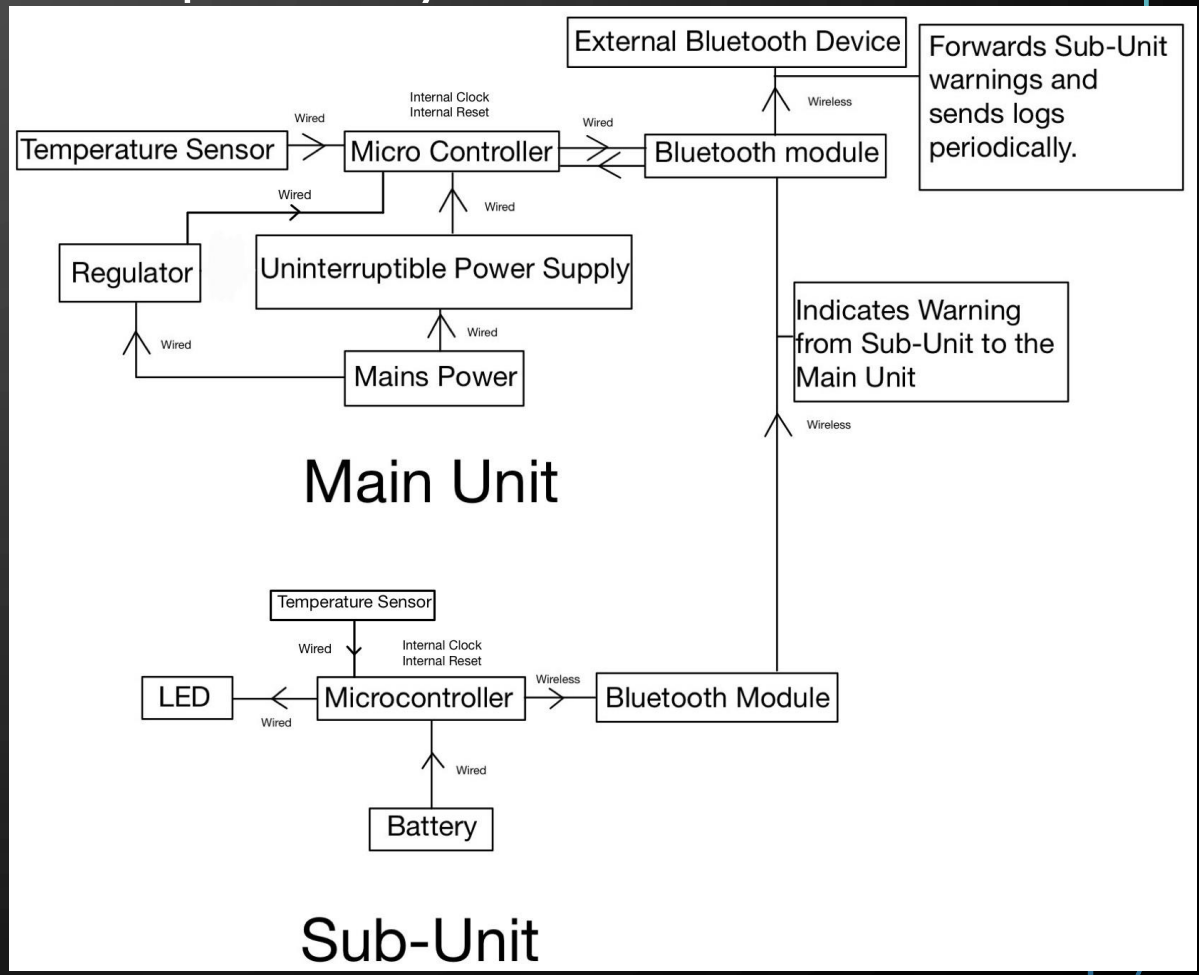
- The costumers of this project are aimed at large pharmaceutical companies that have large industrial refrigerators where they can keep track of temperatures in various areas of them and make sure that all vials stored in those refrigerators meet compliance.

SYSTEM OVERVIEW

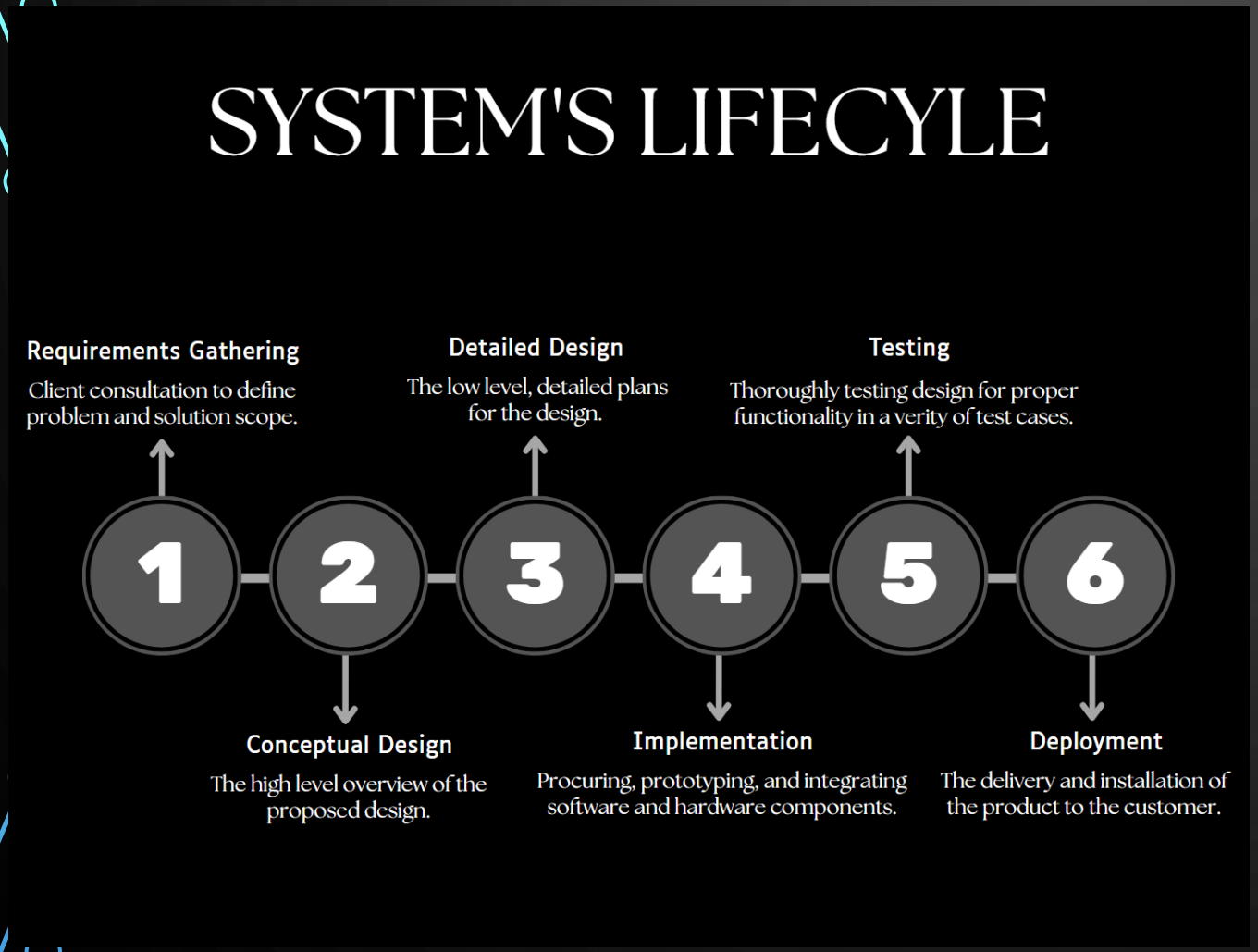
The solution to this problem is to create a micro-controller based design that can:

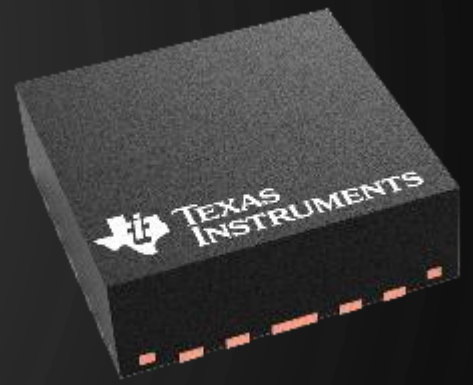
- Monitor the temperature of the insulin.
- Check if a power outage has occurred.
- Warn the main unit if the temperature has exceeded 15◦C and turn on a warning light on the sub unit.
- Record the temperature, timestamp and power availability on a log file on the main unit.
- Let the main unit warn an operator if a sub-unit has exceeded temperature guidelines.
- The main unit send its logging information to a device.

Top-Level System View & Architecture



DESIGN LIFECYCLE AND MCU





MSP430FR2000 MSP430FR2110

MCU	Dev Kit	IDE	Cost
MSP430FR2000	YES	YES	$0.276
MSP430FR2110	YES	YES	$0.305

TOP-LEVEL SYSTEM FUNCTIONALITY