Distributed Sniffer Nodes for Batteryless Sensor Nodes

Design Document

Team 25

Client/Advisor: Henry Duwe

Thomas Gaul- Team Leader
Spencer Sutton-
Matthew Crabb-
Ian Hollingworth-
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Executive Summary

Development Standards & Practices Used

List all standard circuit, hardware, and software practices used in this project. List all the Engineering standards that apply to this project that were considered.

Will use Kicad for all hardware design and GitHub for version control.

Summary of Requirements

List all requirements as bullet points in brief.

- Modular with a goal of 10 Sniffers and nodes but potential to go to 100, 1000
- Sniffers must be able to simulate sensor input
- Low cost at roughly 10 dollars a board
- Avoid causing measurable change to the nodes from connecting the sniffer
- Be open source for future researchers

Applicable Courses from Iowa State University Curriculum

- EE 201 Circuits I
- EE 230 Circuits II
- EE 285 Intro to C
- EE 330 Intro to VLSI
- EE 333 PCB design
- EE 224 Signals and Systems I
- EE 324 Signals and Systems II
- EE 321 Communication Systems I
- EE 465 Digital VLSI

CPRE/EE 185 Intro to EE/CPRE

CPRE 281 Digital Logic

CPRE 288 Embedded Systems

CPRE 381 Computer Structure and Assembly

New Skills/Knowledge acquired that was not taught in courses

List all new skills/knowledge that your team acquired which was not part of your Iowa State curriculum in order to complete this project.

- Team management
- PCB design
- System-level Debug
- Soldering

Table of Contents

List of figures/tables/symbols/definitions (This should be the similar to the project plan)

1 Team

1.1 Team Members

Matthew Crabb, Thomas Gaul, Ian Hollingworth, Tori Kittleson, Spencer Sutton

1.2 Required Skill Sets for Your Project

Embedded Systems

PCB Design

Electrical Systems

Radio Communication Protocol

Soldering

Debugging

1.3 Skill Sets covered by the Team

Embedded Systems- All members

PCB Design- Matt, Tori, Ian, Thomas

Electrical Systems- Thomas, Matt, Tori

Soldering- All members

1.4 Project Management Style Adopted by the team

We want to do an agile management style with goals for each week which will be assigned to each team member. Daily scrum meetings will be in the form of bi-weekly messages sent to teams. We plan on using GitLab to put down goals and outlines.

1.5 Initial Project Management Roles

(Enumerate which team member plays what role)

1. Leadership roles for each team member (e.g., team organization, client interaction, individual component design, testing, etc.):
   Thomas- Lead, Technical Software
   Matt- Technical hardware
   Tori- Technical hardware
   Ian- Technical electrical systems
   Spencer- Technical software