Team 36:
Fuel Cell Monitor

Update Presentation 02/21

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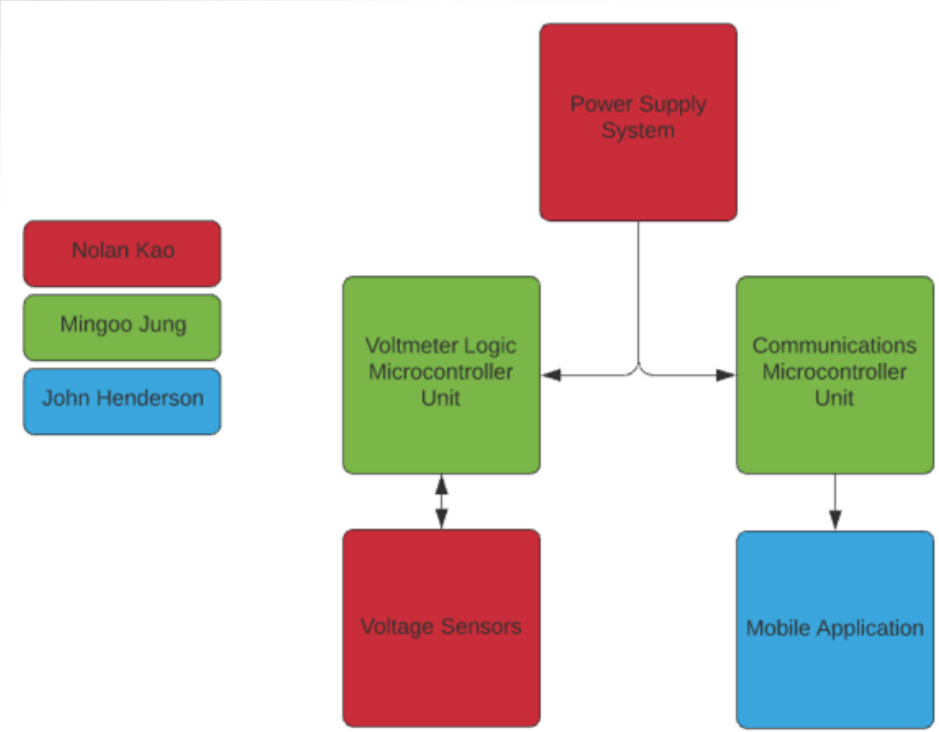
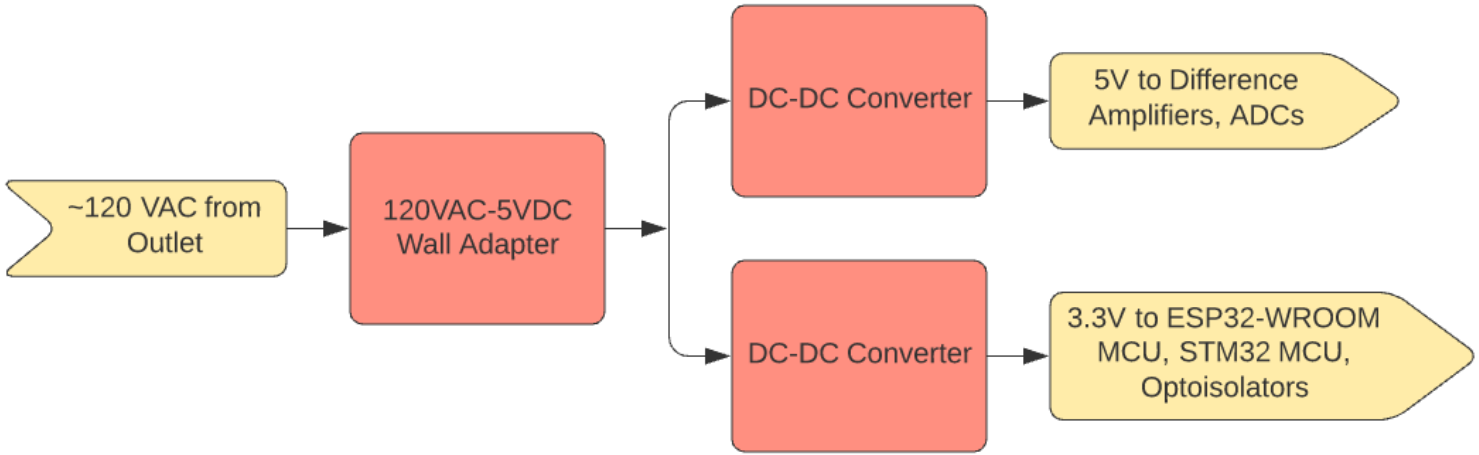
Project Overview

The Fuel Cell Monitor (FCM) will be able to monitor up to sixteen cell voltages simultaneously and display them on a web interface and a mobile application.

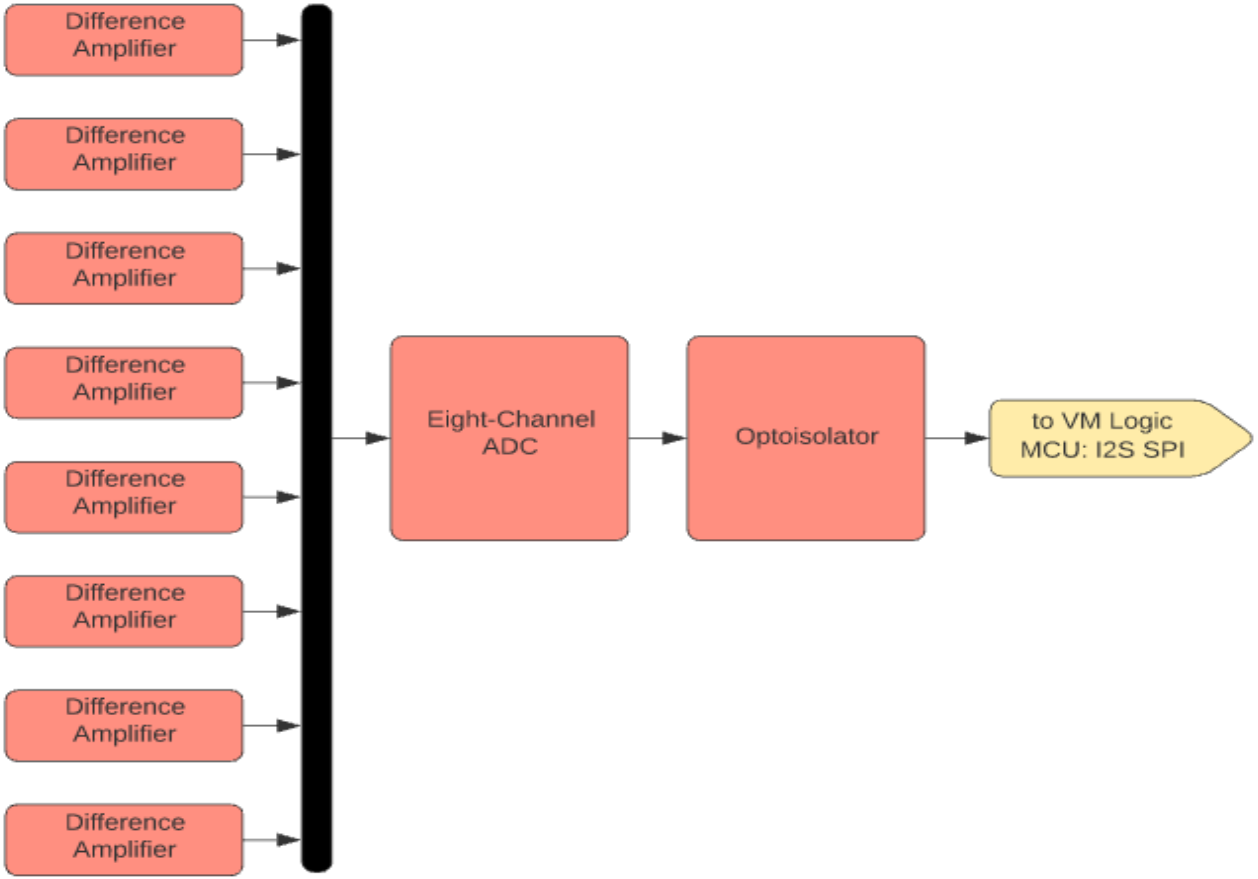
FCM System Diagram



Power Supply Subsystem Diagram



Voltage Sensor Subsystem Diagram



Power Supply Characteristics

- 120VAC to 5VDC wall plug supplies power to PCB power supply
- PCB power supply has two different output source voltages: 3.3V and 5V
- 3.3V goes to optocouplers, MCUs
- 5V goes to difference amplifiers, ADCs

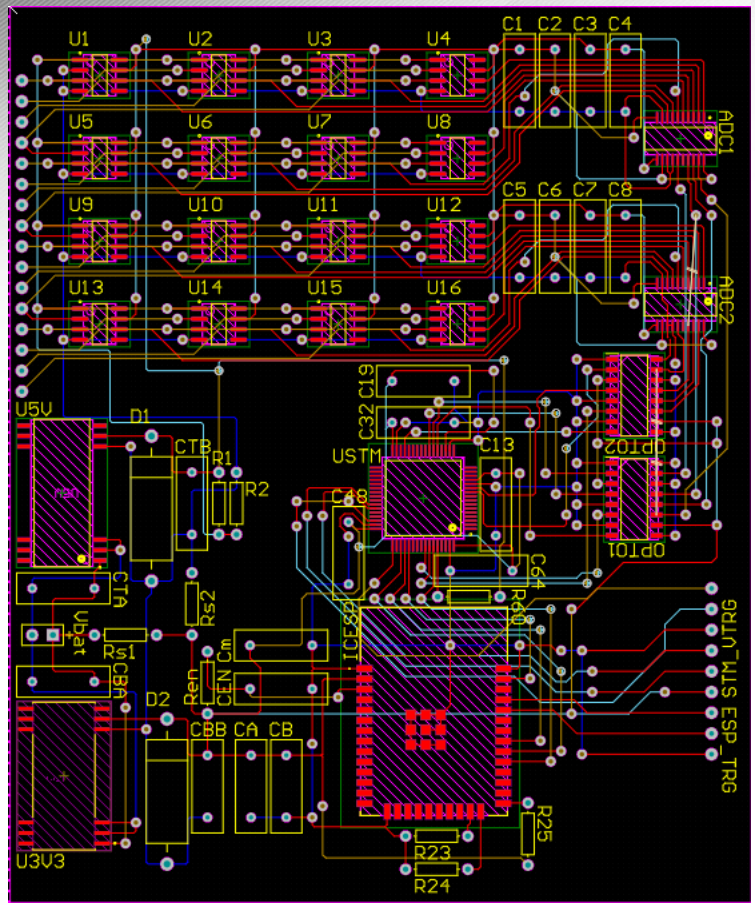
Voltage Sensor Characteristics

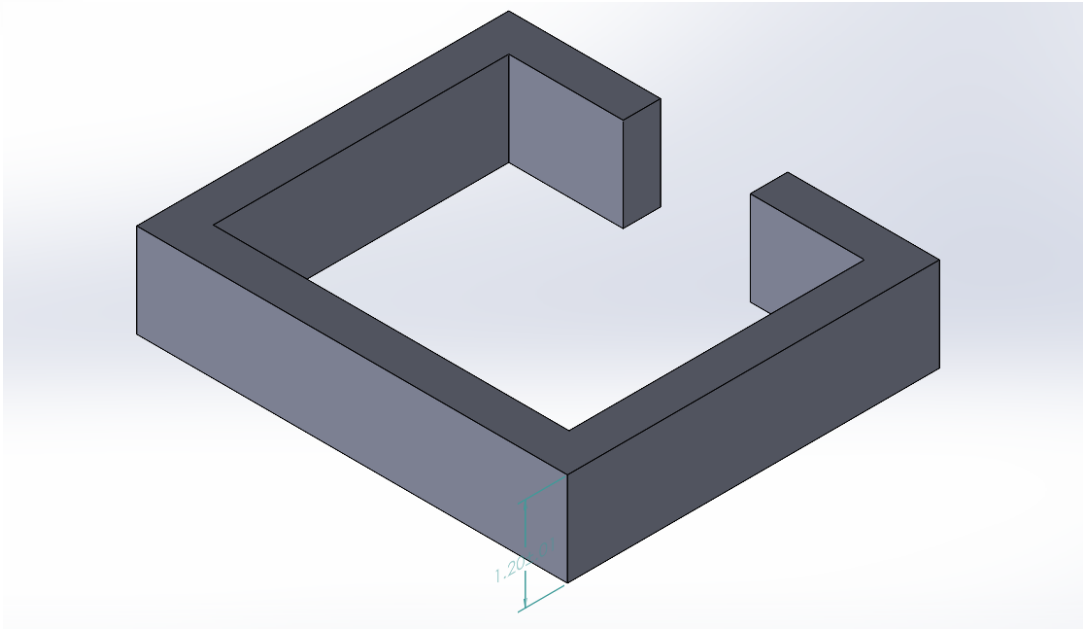
- Consists of sixteen difference amplifiers, two ADCs, and two optocouplers
- Printed on PCB

Update on Power Supply and Voltage Sensors

Nolan Kao

Accomplishments since last week 5 hours of effort	Ongoing progress/problems and plans until next presentation
• Sent redesign for vendor fabrication. • Created wall (with crevice) for main PCB and pin sockets.	• Create rough model of device casing in Solidworks 3D


U1
U2
U3
U4
C1 C2 C3 C4
U5
U6
U7
U8
ADC1
U9
U10
U11
U12
C5 C6 C7 C8
U13
U14
U15
U16
ADC2
U5V
D1
CTB
R1
R2
C19
C32
USTM
C13
OPTO2
C48
OPTO1
C64
R60
CTA
Rs2
Vbat
Rs1
CBA
D2
Ren
CEN
Cm
ICESP
CBB CA CB
VTRG
STM_
ESP_
TRG
R25
R23
R24
U3V3

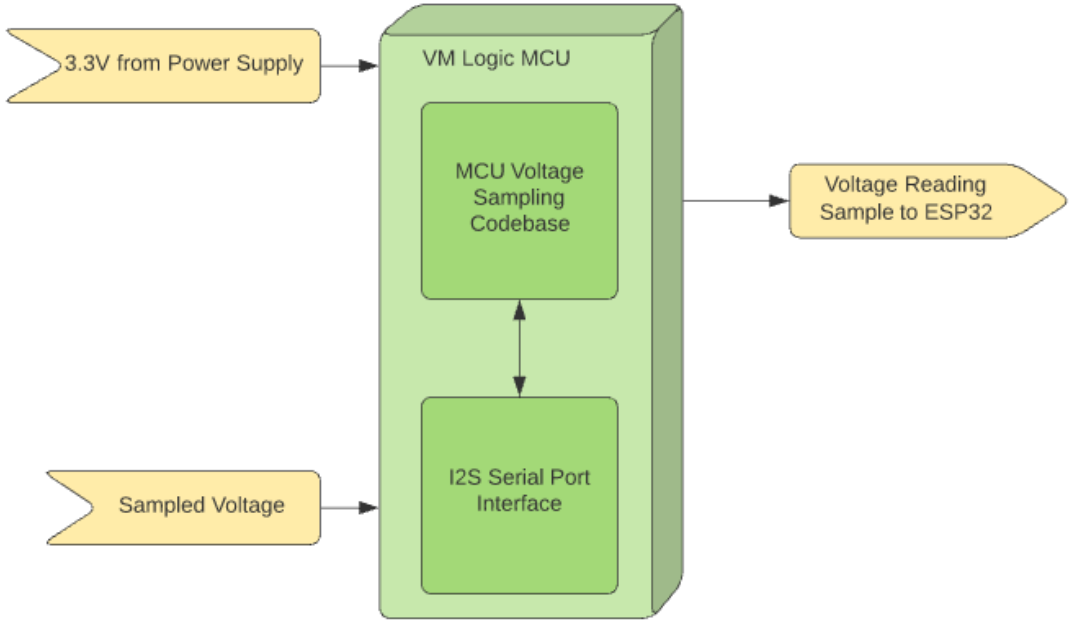


MCU/VSA Schedule

TASK	7-Feb	14-Feb	21-Feb	28-Feb	7-Mar	14-Mar	21-Mar	28-Mar
Design integrated MCU/VSA system in Altium								
Fabricate integrated MCU/VSA system								
Validate integrated MCU/VSA system								
Complete outer casing of FCM								

Key
Completed
On Schedule
Behind

Voltage Logic MCU Subsystem Diagram



Update on MCU Subsystem

Accomplishments since last week 10 hrs of effort	Ongoing progress/problems and plans until next presentation
• Validation for external power supplying of MCU subsystem (temporarily stop) • Finalize to redesign PCB for integration of the MCU, power supply and voltage sensor subsystems	• Start to integration with Smart phone application and the communication MCU data

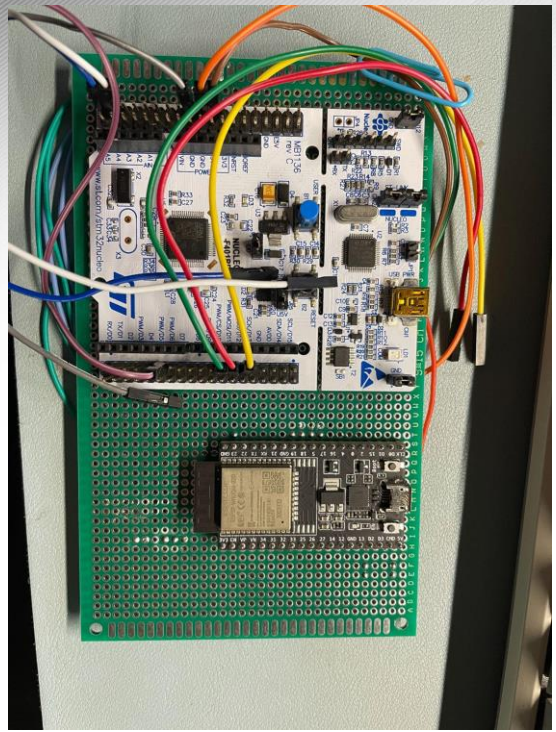


Figure1-1. Actual Wiring between MCUs with soldering

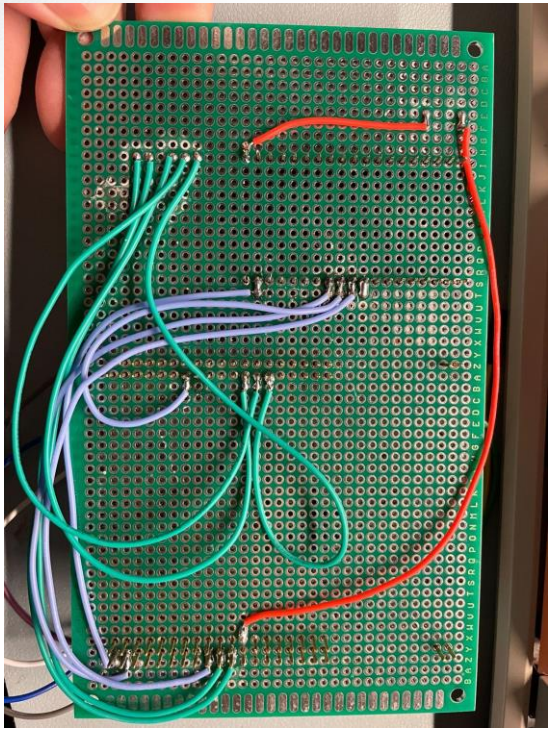


Figure1-2. Actual Wiring between MCUs with soldering

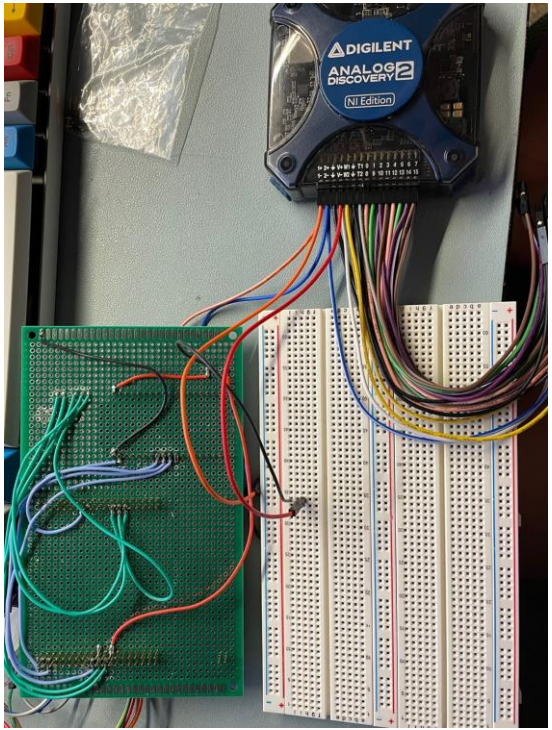
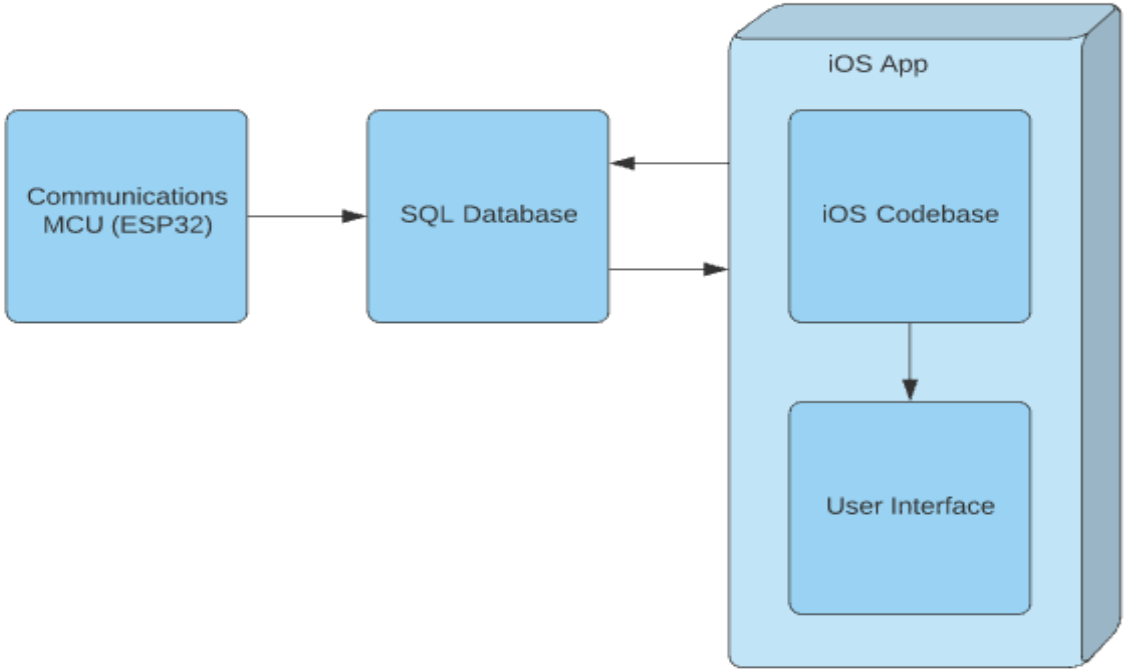


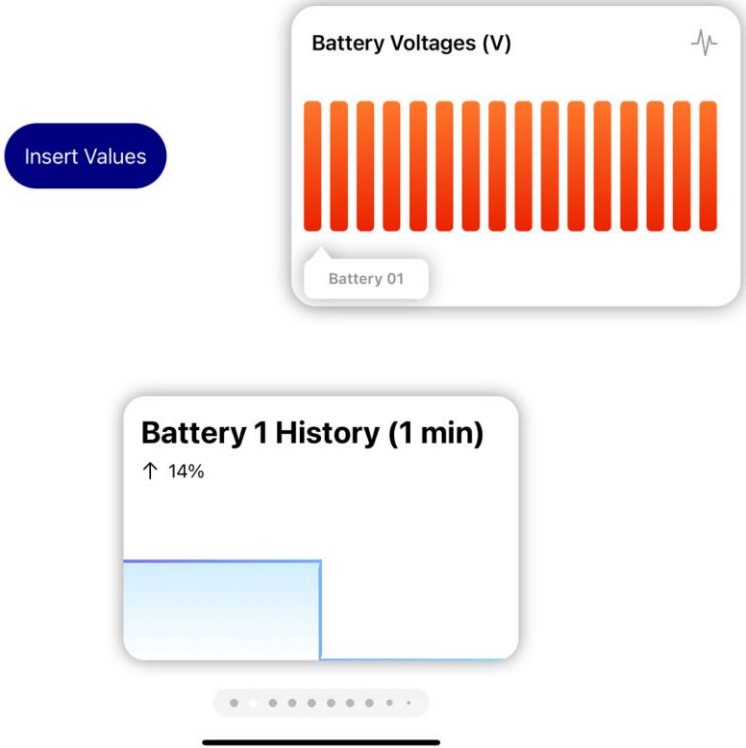
Figure2. Validation for connection between the MCU subsystem and external power supply

SQL Database and Mobile App Subsystem Diagram

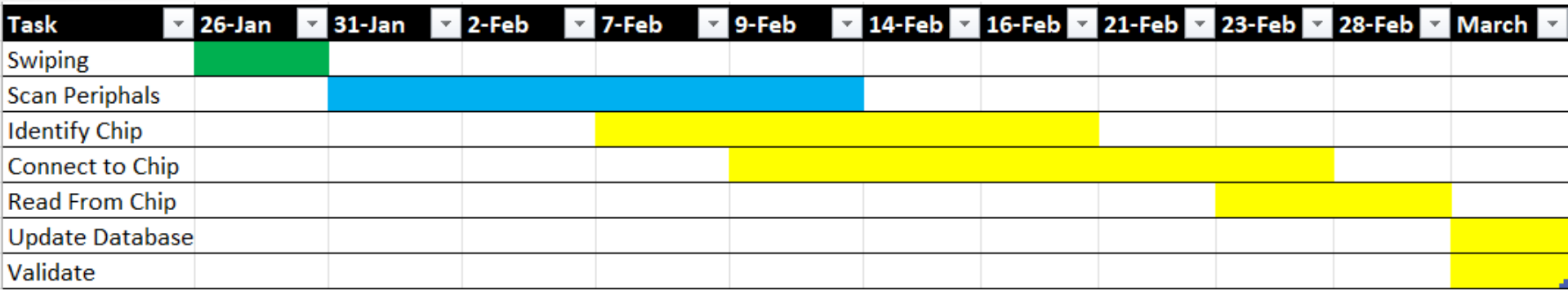


Update on SQL Database and Mobile App

Accomplishments last update 15 hrs of effort	Ongoing progress/problems and plans until next presentation
• App partially downloaded onto phone rather than simulator	• Writing Bluetooth functions to scan and identify • SQL database has been issue running on phone


Insert Values
Battery Voltages (V)
Battery 01
Battery 1 History (1 min)
↑ 14%

Mobile App Schedule



Task	26-Jan	31-Jan	2-Feb	7-Feb	9-Feb	14-Feb	16-Feb	21-Feb	23-Feb	28-Feb	March
Swiping											
Scan Periphals											
Identify Chip											
Connect to Chip											
Read From Chip											
Update Database											
Validate											