Developer Guide

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TempScanner Group 1

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System Overview

This device is a wall mounted contactless temperature scanner. The device is used by each user having their personal RFID card that has their unique information. Once scanned, the system uses an IR thermometer to take the temperature of the user's forehead. The lcd screen attached will then display the temperature, name of the employee, the real time, and if the employee has a fever. If the user does in fact have a fever, there will also be a buzzer that sounds off. This same information is written to an SD card where all of the past logged scanned can be seen attached to the receptive name. This system was built with the idea that a company could use this with their employees or at OSU since all students have rfid operated student ID’s already.

Electrical Specifications

Supply Voltage (V)	Maximum: 20	Minimum: 6
Supply Current (A)	Maximum:1	Nominal: 1
Operating Temput (C)	Maximum : 70	Minimum : 70

User Guide

- Setting Up
    a. Place SD into SD card module, it can be a micro Sd or regular SD card.
    b. Place electrical components inside enclosure
    c. Mount to a flat surface at appropriate height so that users can easily scan their forehead.
    d. Plug cord in the Arduino through the side opening of the enclosure and plug the other side into the wall.
- Operating
    a. Hold a unique RID scanner to the left side of the enclosure where it states “SCAN HERE.” Hold it approximately one inch away from the surface,
    b. AFter scanner, move forehead to end the long green tube and hold it there for about 3 seconds.
    c. Afterwards, look at the screen to see the name, date, time, and temperature.
    d. To access the data, take the enclosure off of the wall, remove the lid and remove the SD card from its module. Place it into a USB SD card reader and insert into the computer. Open up file titled “TEMPSCAN.”

Artifacts

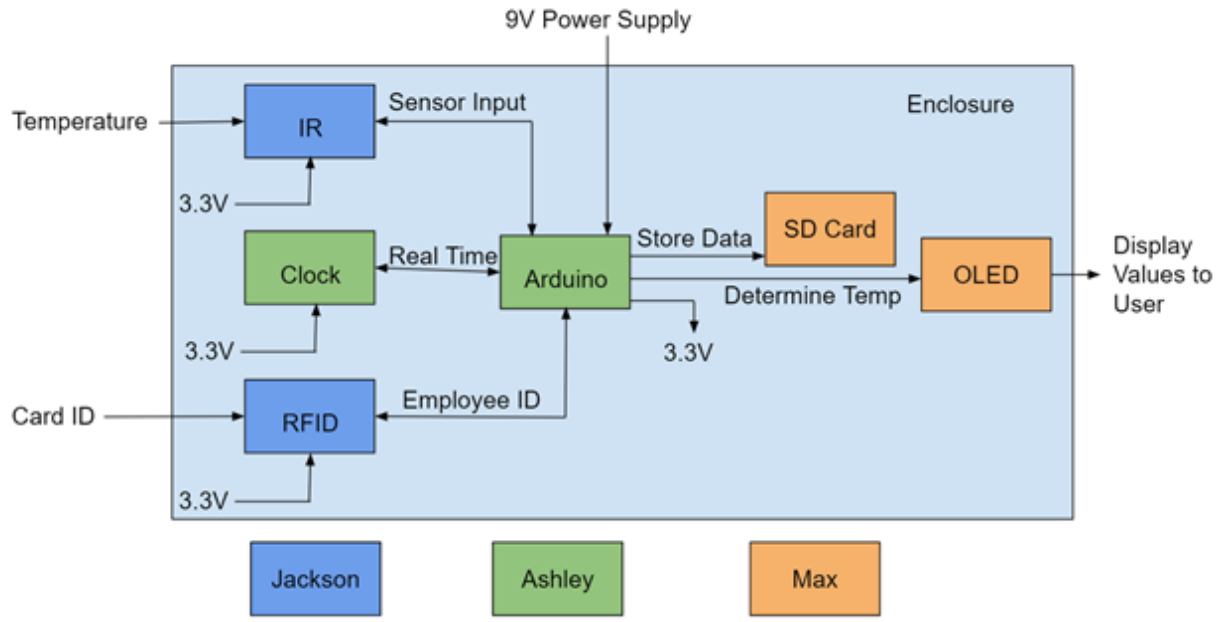

Figure 1 Block Body Diagram

Block Diagram - Figure 1 demonstrates all the key components in our project. Each block has both inputs and outputs that relate to specific interfaces in the design. The IR block takes in a temperature value and then sends it to the Arduino Mega. The clock block sends the real-time value to the Arduino Mega where it will ultimately be outputted onto the OLED display. The RFID block incorporates the non-contact feature for our project as it records the user's information from 1 cm away. The SD card block receives all the data from the Arduino Mega where it will be stored for up to 24 hours or longer. The OLED block receives all the data from the Arduino Mega where it will display the name of the user, the date scanned, and the temperature.

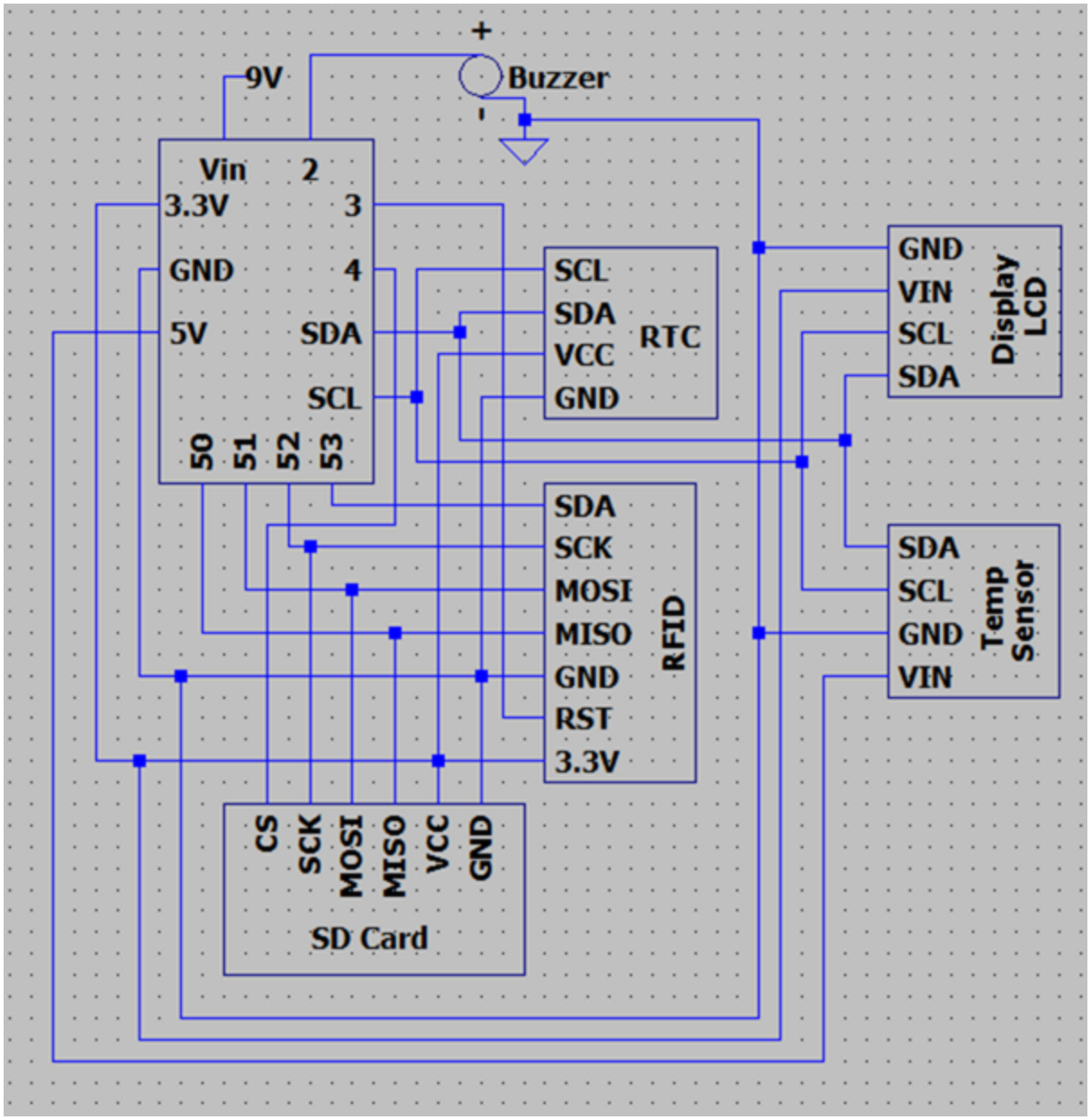

Figure 2 Schematic of our project showing all the connections

Schematic - The schematic below illustrates all of the wiring connections between the modules of our project. All of the components used in this project connect to the Arduino Mega which is the most important part of the project because it powers everything with 3.3 volts. The Arduino itself is powered by a 9-volt USB adapter. The SDA and SCL pins are used to communicate with almost all other components.

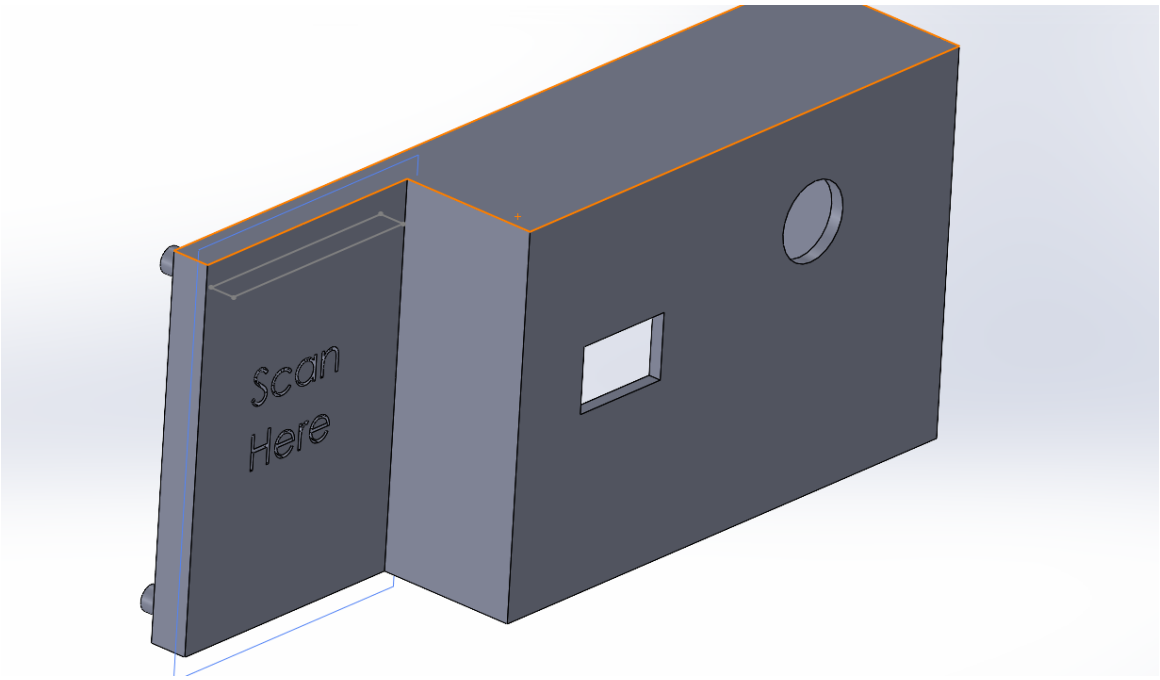

Figure 3 3d model of enclosure displaying the front portion.

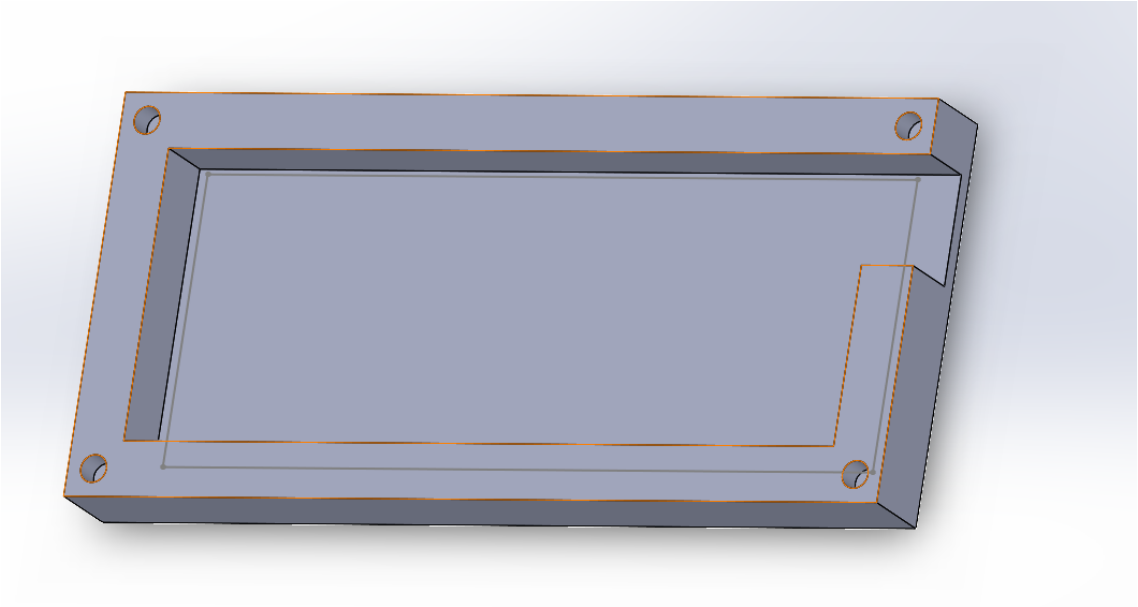

Figure 4 3d model of enclosure showing the internals and the base where the parts will be put.

3D Model - The 3d models shown in both Figures 3 and 4 are of our enclosure for the non-contact thermometer. This enclosure includes a small cut-out for the OLED display where it will be able to display the information for the user when the card is scanned. The circular cut-out of the enclosure is for the temperature sensor where a tube will be implemented for more precise measurements. The enclosure also features engraved lettering “SCAN HERE” on top of where the RFID will be placed to allow for a smooth user interface experience.

PCB information

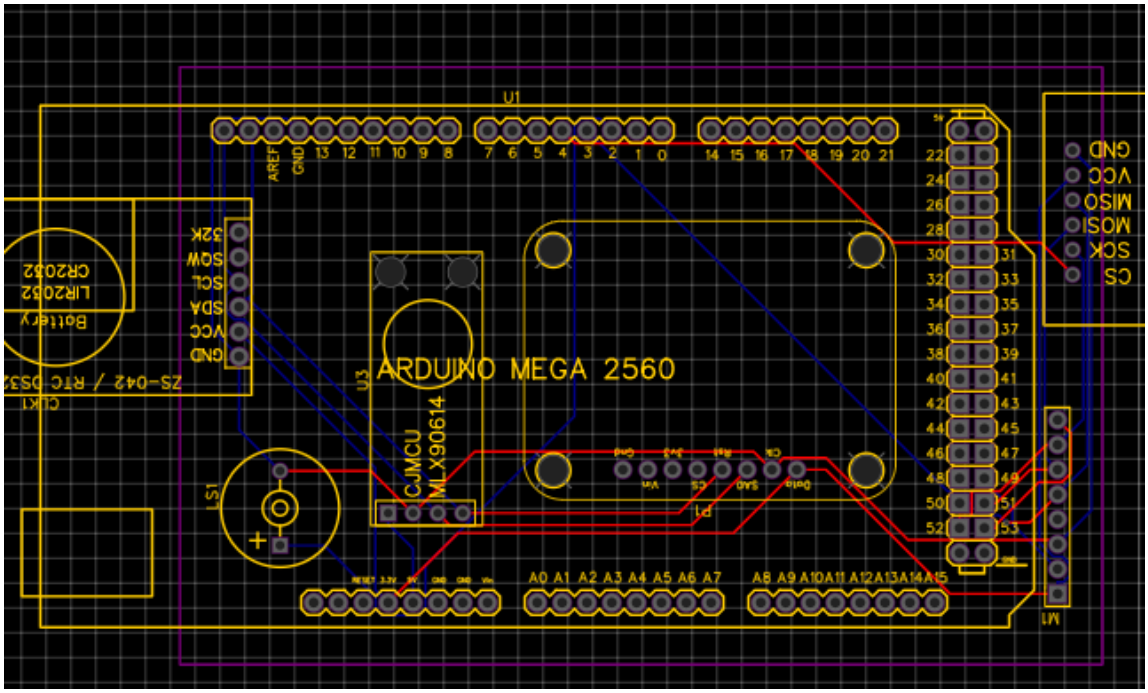

FIgure 5 displays our PCB layout

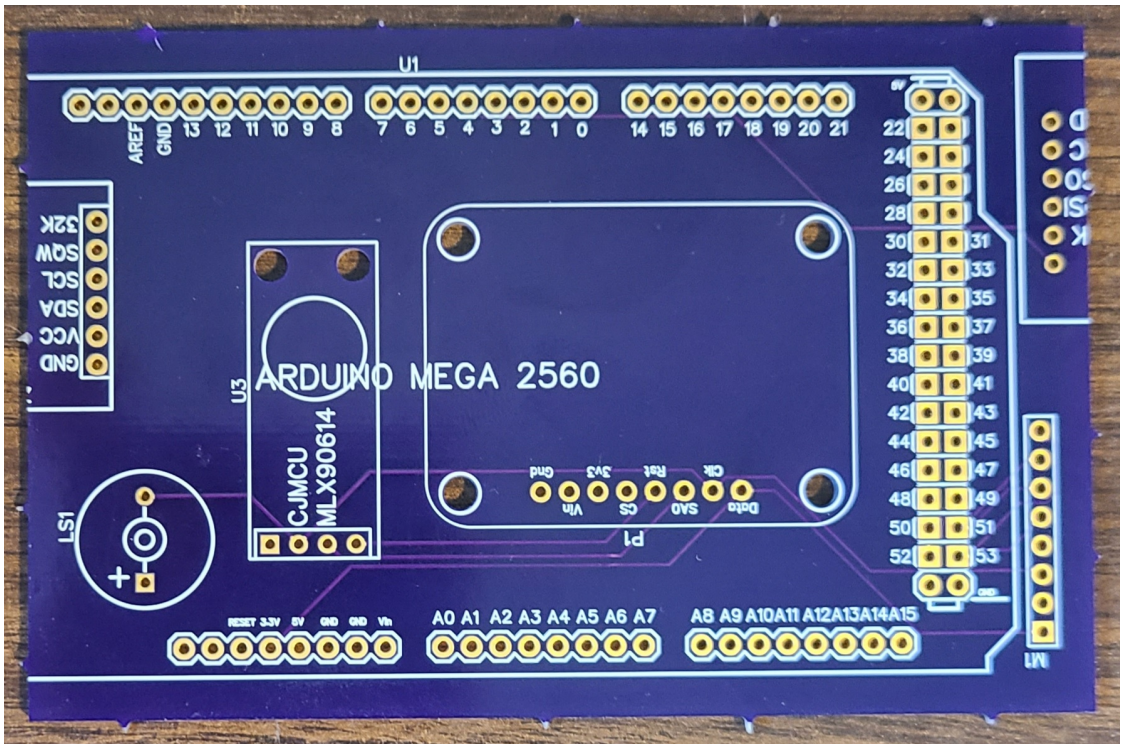

FIgure 6 displays our physical PCB

PCB size: 94.23 mm X 61.09 mm

Part Information

Reference Designator	Value	Digikey Number	Manuf. Part Number	Qty in Design	Price	
U1	MEGA 2560	1050-1018-ND	A000067	1	$40.30	
U2	RTC	DS3231S#T&RTR-ND	DS3231S#T&R	1	$5.99	
U3	RFID	MFRC52201HN1,115	MFRC52201HN1	1	$6.99	
U4	Temp Sensor	SEN0206-ND	mlx90614	1	$29.99	
U5	OLED LCD LED	2544-AOM12864A0-0.96BV	AOM12864A0-0.96BW-ANO	1	$14.99	
Vcc	Power Supply	1939-1484-ND	WR9MD1000LCP-F(R6B)	1	$9.75	
U6	Micro SD Card	AF32GUD3-OEM-ND	AF32GUD3-OEM	1	$7.99	
U7	Micro SD Storage Board	1286-1200-ND	410-380	1	$4.99	
					$120.99	<--Total