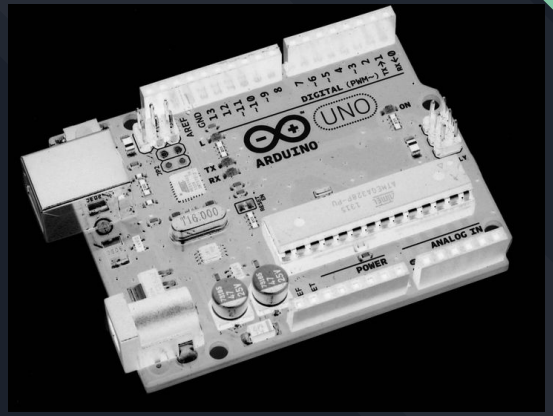
Arduino Door Controller



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Problem

Too much time and energy is expended performing tedious tasks repeatedly which results in a loss of time throughout the day.

From this formal problem definition the following applies:
~ Opening and unlocking a door can be troublesome for certain individuals which is why a new way to accomplish this task is desired.

~ Either it's not being able to physically open the door or the process of simply unlocking the door is too much work, something needs to be created to fix these problems in the home.

Solution

The fix:

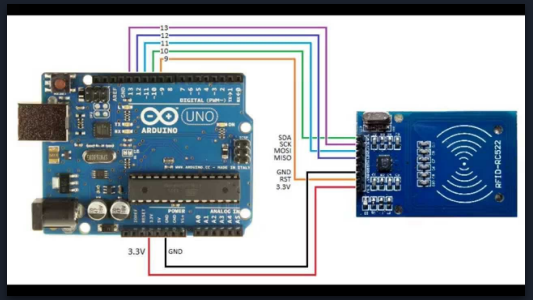
Remote controlled door unlocker and opener.

Key card entry from outside for added security.

What is used in the design?

- Sensors: Infrared Receiver, RFID
- Actuators: Servo, Solenoid, DC Relay
- Extra: 12V battery supply

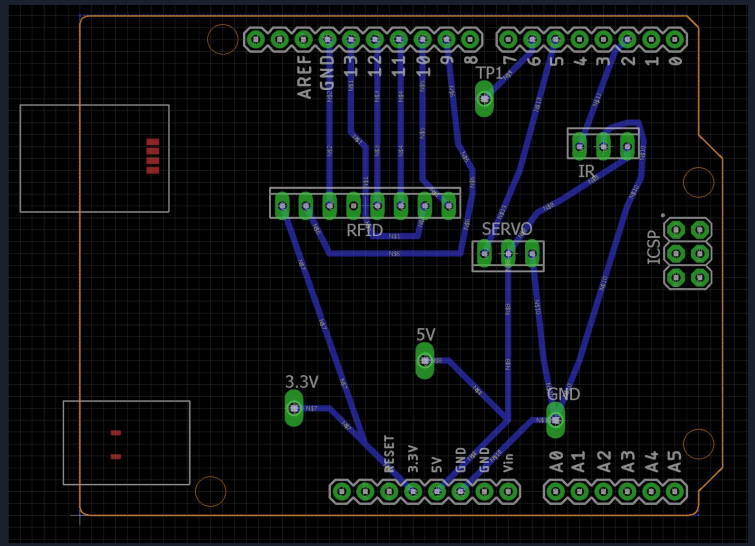
How does it work?

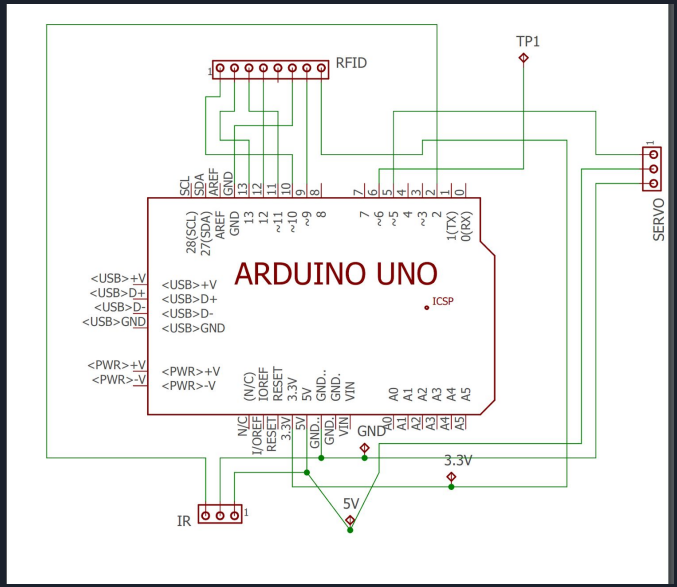


- The door is opened by a small servo motor that is attached to the top of the door.
- The servo is controlled by the arduino and will only open once a verified key card has been scanned or the correct button on the remote has been pushed.
- The door will be locked and unlocked by a magnetic solenoid which is also controlled by the arduino and will only open when a verified key card has been scanned or the correct button has been pushed on the remote.

- The remote works by sending an IR signal to the IR receiver which is on the arduino.

Circuit Board





Cost Breakdown (for a bigger servo)

With an upgraded servo, and IR unit, the total cost breaks down to :

+ High Torque Servo…….$27
+ Arduino……...$23
+ Solenoid……..$12
+ Battery pack (12V).....$7
+ IR receiver……...$3
+ RFID reader…….$15
+ DC Relay……..$10

Total……...$97

Future Improvements

- High-Torque Servo
- Keyless relay (will replace the relay and IR set-up)
- Digital Interface
- Pinpad to interact with the interface and program other cards into the system
- Low voltage Solenoid and thus, low voltage power supply