

Unifi ESP8266/NodeMCU Doorbell Ringer

Github: <https://github.com/rutschsr/unifiespdoorbell>

Interfaces Two Unifi G4 Doorbells with mechanical chimes using an ESP8266 / NodeMCU and Home Assistant.

Ubiquiti does not provide support or instruction to support connecting two doorbells to chimes on the same circuit, so I created a wifi interface to ring the mechanical chimes.

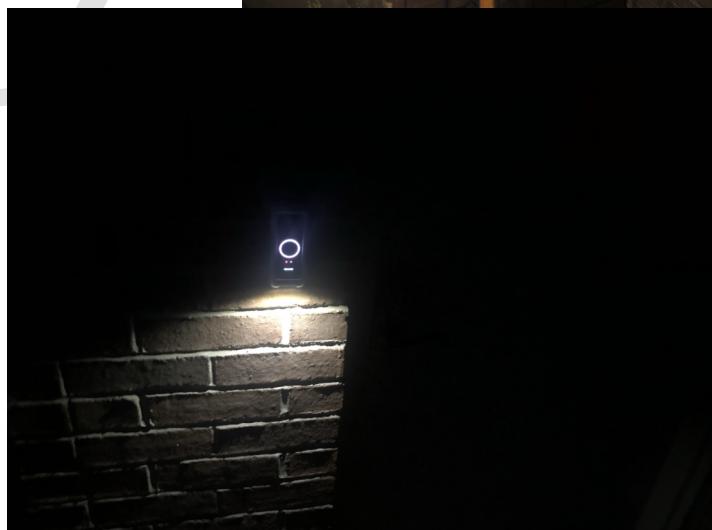
All Software used is open source and subject to their licenses.

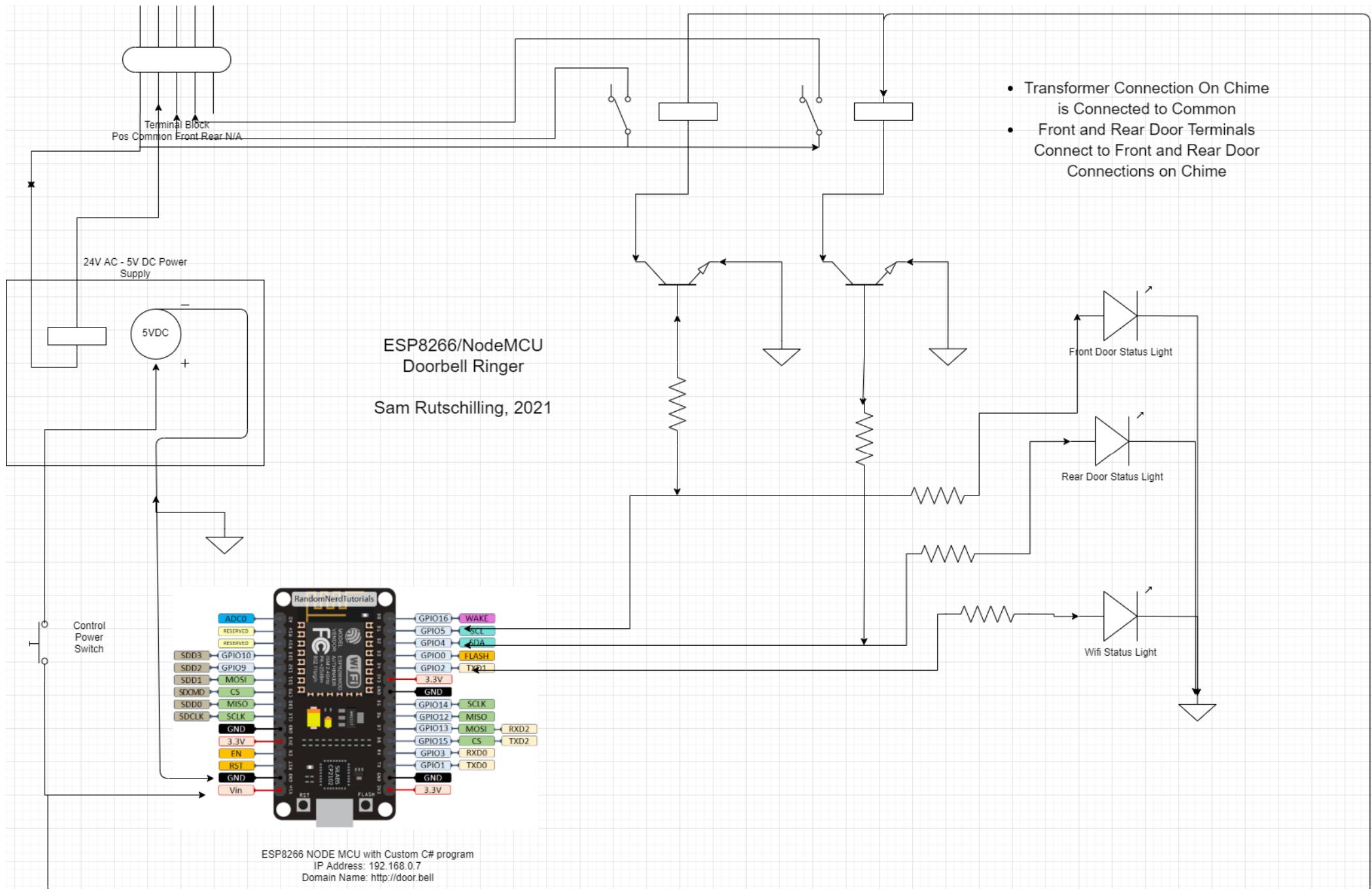
Some parts of the Arduino program were taken from a guide by circuits4you.com
<https://circuits4you.com/2018/02/05/esp8266-arduino-wifi-web-server-led-on-off-control/>

The circuit is rather simple, just interfacing the ESP8266 with a relay breakout board to ring the doorbells and light an LEDs. The particular board I used includes an optoisolator and requires sunk current to turn on. Thus I used NPN transistors to sink the optoisolator current to fire the doorbells.

The Project runs from the same 24VAC transformer the doorbells operate from. It is a 100VA transformer to be able to power two doorbells, two chimes, and the ESP chime driver unit.

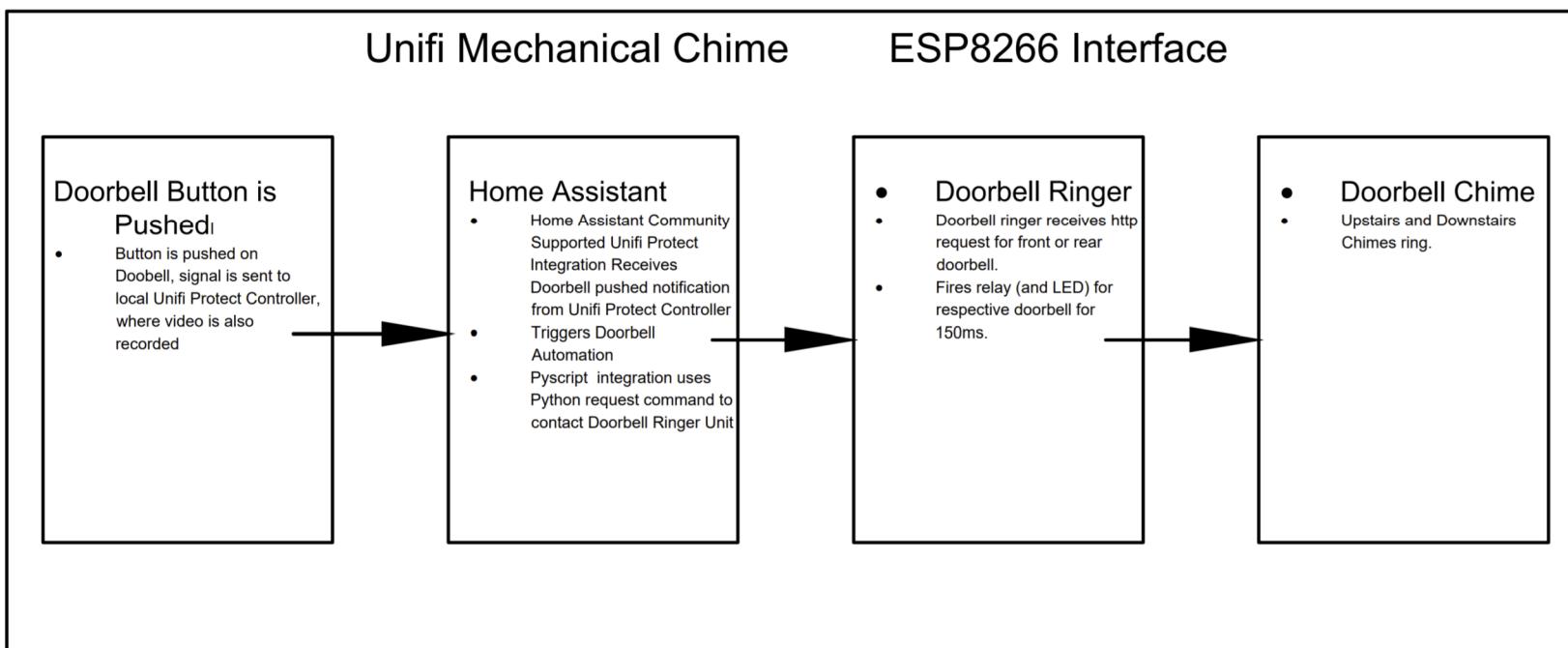
Youtube Demo: https://youtu.be/H_CKSIQREEA

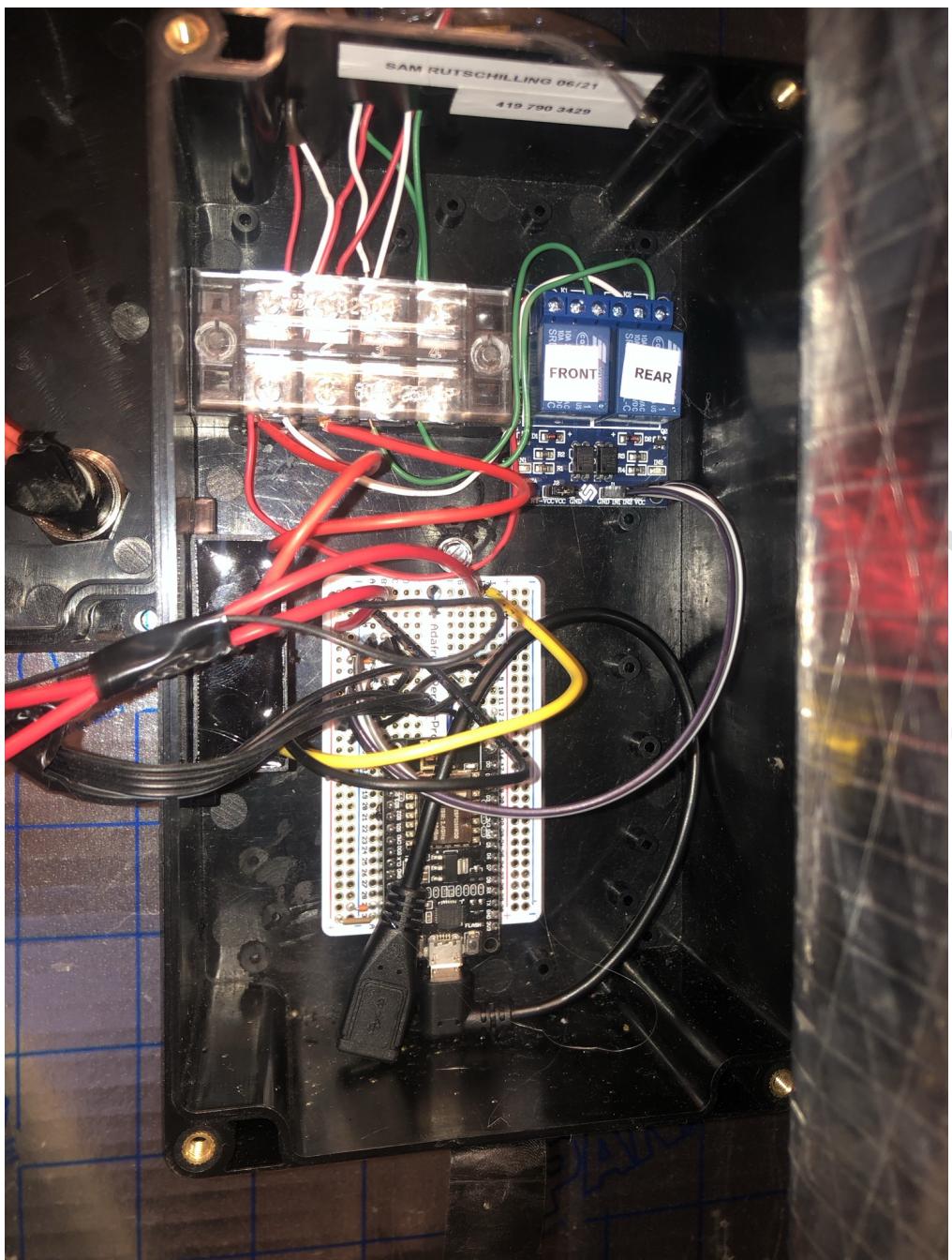




High Level Block Diagram

Unifi Protect G4 Doorbell Interface With Mechanical Chimes





Completed Device:

Terminal Block:

Power In (24VAC), Common, Front Door, Rear Door

Relay Module

ESP8266 / NodeMCU Interface, with NPN Transistors

The Relay Module (in my case) had an on board 5V optocoupler with sinking logic. This means when the input was sunk to ground the relay turns on. This was accomplished with a NPN transistor between the output from the NodeMCU and relay board.

220Ohm resistors were used all around.

USB cable Included to be able to program in place.
(It is my understanding these NodeMCU devices have diodes between the VIN and USB power and will not be damaged if both are connected at the same time)

Power supply is an inexpensive potted 12-36VAC to 5VDC power supply. It is not isolated and the negative (on output) should not be connected to ground, this would short the power supply and destroy it.



120VAC to 24VAC transformer, 96VA

Plenty of size to push two doorbells, two chimes, and the driver unit. Ideally would have been more like 16VAC

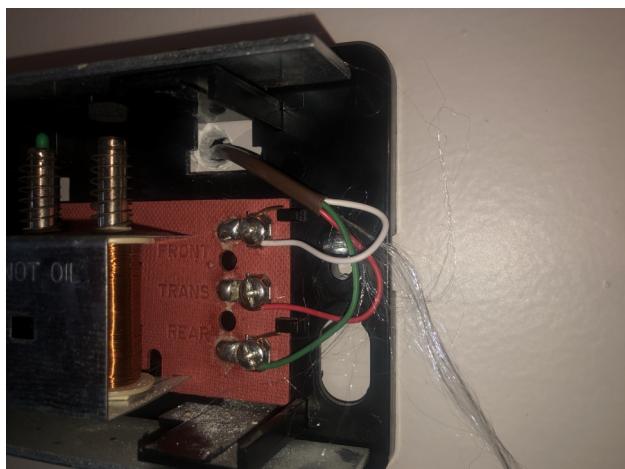


Completed Device mounted in final location
Closed Cover shows control power switch (ring lit while powered on), Wi-fi status light, and the Front and Rear Door Status lights.



Shows cover off

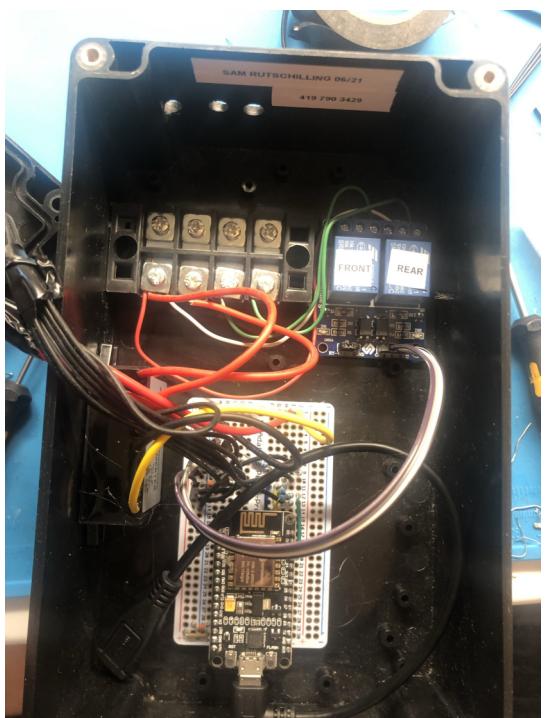
Plenty of extra wire was left for service



Doorbell Chime Connection



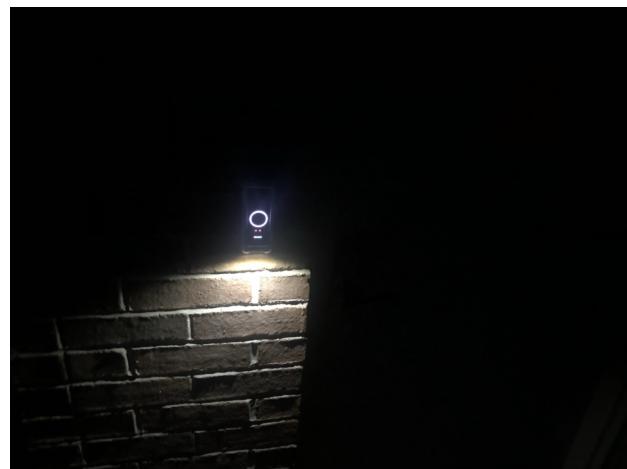
Front Doorbell



Complete Device, before installation

Rear Doorbell at night

With walkway light on



Pictures of Board being soldered together and prototyped on breadboard

