Lexi Project – Detailed View (v1)

By Bill Weis

Requirements:

1. Be able to voice control her bed (Invacare bed with 1115288 pendant).
2. Be able to voice control their door

Solution – High Level:

1. Designed a microcontroller-based Voice Activated solution that provided the desired functions of Head Up, Head Down, Feet Up, Feet Down.
2. Designed a microcontroller-based Voice Activated solution that enables Lexi to open their door hands free.


Details of the Solution

1 – Voice Control his bed – The Invacare bed has a 1115288 pendant that is direct wired to the bed. The approach was to have an ESP8266 microcontroller drive 4 relays which replaces the original 1115288 pendant. The 4 functions of Head Up, Head Down, Feet Up, and Feet Down, are each controlled by one of the 4 relays. We also provide an RJ50 connector to allow for a hand held 1115288 to be added, therefore both voice commands as well a manual use of the pendant will control the bed. This way the caregiver can still manually control the bed when there is a disruption of the voice service whether it be internet is down, Wifi router is down, or bed controller is down.

Once the voice activated controller was connected to the bed and working, we configured some Alexa Routines that supplemented the voice commands that ship with the bed controller. For redundancy, we also provided a Google home mini which also controls the bed.

The functional engineering drawing on the next page shows the connections between the microcontroller and the relays, as well as the relays to the bed.

Lexi - Invacare semi-electric
## Bill Weis 3-1-19 S/N 18029.08

1115288

Gnd

Head Up

Head Down

Feet Up

Feet Down

Vcc
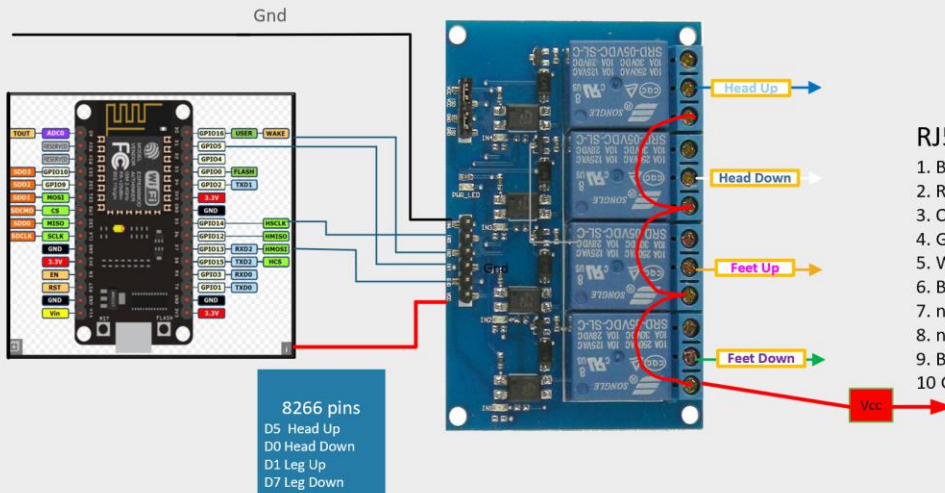
RJ50 Connector
1. Black (n/c)
2. Red (38v to all relay)
3. Orange
4. Green
5. White
6. Blue
7. n/c
8. n/c
9. Brown (n/c)
10 Grey (n/c)

8266 pins
D5 Head Up
D0 Head Down
D1 Leg Up
D7 Leg Down

Wires From Relays to Bed (RJ50)
Blue -> S1 -> Head Up
White -> S2 -> Head Down
Orange -> S3 -> Feet Up
Green -> S4 -> Feet Down
Red -> VDD Tied to all Red wires on the relay

An RJ50 Female connector is provided in the cover of the bed controller for the 1115288 (4) function pendant can be plugged in for manual use when the voice control is not possible

2 - Be able to voice control their door – Lexi has an Open Sesame Door system that she needed to be able to control using voice commands. We designed a microcontroller solution that works with both Alexa and Google. For added security a WeMo Smart Mini switch was added to control power to the door opener.

Lexi - Voice Activated *Open Sesame* door opener
5/18/2019
S/N 18026.07
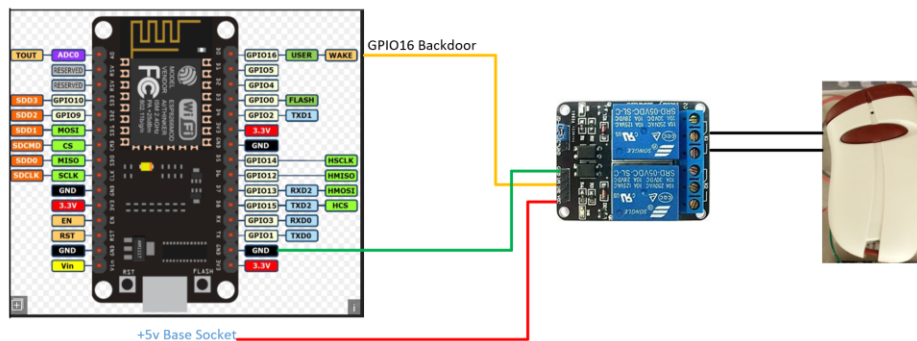
The Open Sesame door activation solution uses GPIO16 Pin D0 to energize the relay which then opens the Door by closing the same contacts within the hand held remote as you would by depressing the button on the remote.

Resources
Amazon Echo
Alexa Support (Contact Support via the Amazon Alexa app - can have them call your number)
Google Home getting started
Google Home Help Forum
Google Home Support   Phone number for Google Home hardware support = 855-971-9121 (24/7 days a week)
Logitech Harmony Knowledge Base
Logitech Harmony Support Phone # for Support = 866-601-5644 (M-F 8am to 6pm PST)
Lifx
Wemo Support Phone number for Support = 1-844-745-wemo (9366)