

Holly Payne Project – Detailed view (v5)

By Bill Weis

Requirements:

1. Be able to voice control her bed (Drive Delta 1000 – hard wired remote)
2. Control the ceiling lights in her room – turn on/off and dim
3. Be able to intercom with caregiver whose bedroom is at opposite end of the house.

Solution – High Level:

1. Installed an Amazon Echo and a custom developed bed controller to allow Holly to control her bed using voice commands
2. Installed (2) Lix Mini (A19) Wi-Fi Smart LED bulbs in ceiling fixture enabling Holly to turn on/off/dim/change color through voice commands using Amazon Echo
3. Installed an Echo Dot in caregiver's room and together with the Amazon Echo in Holly's room, they enabled the "Drop In" feature to set up intercom between their two rooms

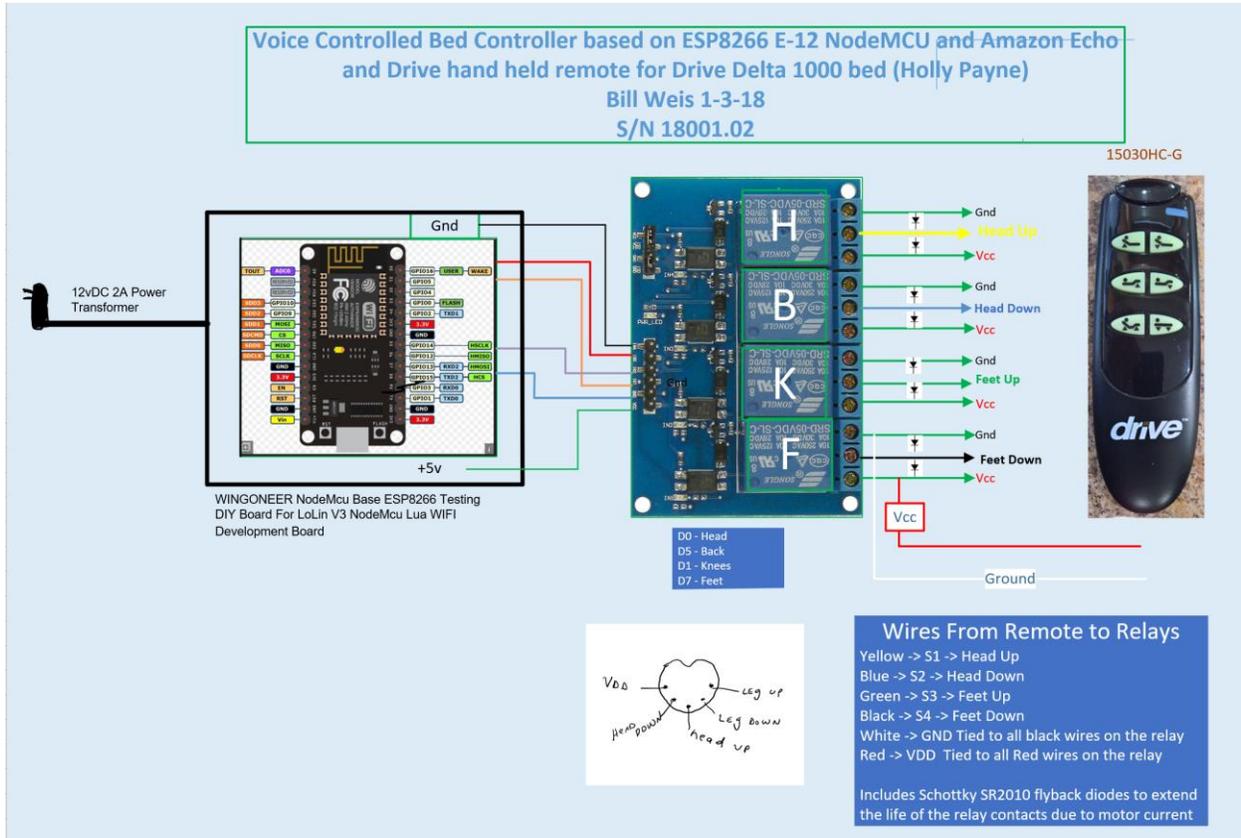
Details of the Solution

1 – Voice Control her bed – Holly has a Drive Delta 1000 bed with a hard wired remote. She wanted the top 4 buttons on the remote to be voice activated. (The lower two buttons were not a priority for her as she rarely used them). One of the considerations pertained to whether or not a splitter could be installed so both the standard hand-held control as well as the voice activated solution could be cabled to the bed at the same time. This approach might be beneficial to her caregiver should there be a failure to the voice activation device or should the internet go down. After looking at the circuit for the hand-held device, the answer was no. Only one device at a time could be cabled to the bed as trying to connect the two devices in parallel would result in neither of them working. The normally closed side of each switch/button on the hand-held is tied to ground, and the normally open contact is tied to Vcc. So it is more than simply one set of contacts closing to complete a circuit, but rather switching between passing ground or vcc.

We were able to leverage the same core design we did for Robbie with the exception that we did not have to struggle with soldering wires to the PCB of the wireless remote as we did with Robbie's solution. The fact that the Drive bed came with a hard-wired remote made the design easier. One addition we needed to make however was soldering Schottky SR2010 flyback diodes on the relay board to extend the life of the relay contacts. We did notice some strange behavior during test in our lab. When we would open the Amazon Alexa app and then go to the Devices webpage, it triggered a GetBinaryState message to our voice activated controller, and this resulted in undesirable relay activity. Each time you

would go to that Devices page, or click refresh on that page, each of the 4 relays would cycle on/off. [Here](#) is the writeup I did on Github. The link to the fix is [here](#).

Here is a visio diagram of the solution.



2. Turn on/off the lights in her room by voice – We installed (2) Lixf Mini (A19) Wi-Fi Smart LED bulbs in ceiling fixture enabling Holly to turn on/off/dim/change color through voice commands using Amazon Echo. The Lixf bulbs do not require a hub as each bulb can be directly accessed by the Amazon Echo. (Recently announced is the Amazon Echo Plus which includes a built-in ZigBee smart home hub which supports Philips Hue and other bulbs, but we went with the Lixf bulbs).

Lixf offers [step by step guidance](#) for installing and configuring the bulbs. One tip worth passing on is to install and configure one bulb at a time. I made the mistake on the Robbie lvey project of mounting all 6 bulbs at once, and since you need to connect to each bulb to configure them from the smart phone or table Lixf app, mounting multiple lights added some complexity to the installation process.

3. Be able to intercom with caregiver whose bedroom is at opposite end of the house – It is important for the individual and the caregiver to be able to communicate with each other, particularly in the middle of the night when your rooms are at opposite ends of the house. Holly purchased a Echo Dot over the holidays and together with the Amazon Echo

that was installed in her room, the Echo Dot installed in the caregiver's room allowed them to take advantage of the 'Drop In' feature. [Here](#) is the guidance to install that feature. (You can enable device to device Drop In feature within a house by going into the app on a PC or Tablet and simply turning off Do Not Disturb.

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)