Dana B. Project – Detailed view

By Bill Weis

Dana Bressler - ALS

Requirements:

1. Be able to use voice commands control the bed
2. Be able to use voice commands to control the TV

Solution – High Level:

1. We designed a solution which allows Dana to control her Medline full electric bed. Model MDR107003L with wired hand remote MDR630154R
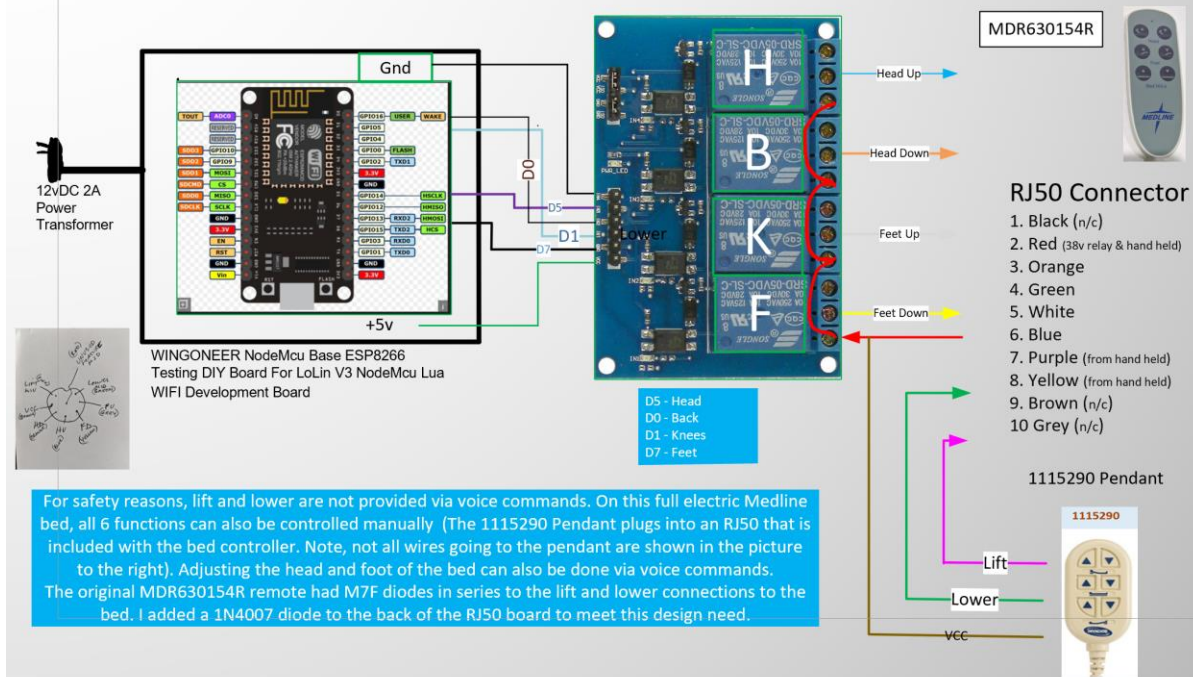2. We provided Dana with an Amazon Fire TV Cube to control the TV

1. Be able to issue voice commands to her full electric Medline bed model MDR107003L with wired hand remote MDR630154R

Dana's bed is a full electric bed with a wired pendant. The pendant plugs into the bed controller using an 8 pin DIN which in most cases implies that motor current passes through the pendant and it takes a combination of two switches working together to drive the linear actuators. The downside of beds that are wired in that fashion is you cannot easily offer dual control of the bed (ie, voice and handheld at the same time). The best we can offer is to add a switchbox to allow for easier switching between the voice controller and the standard pendant.

After assessing the handheld pendant (MDR630154R), I was pleased to find out that the head up/down and feet up/down were using simple contact closure. The lift and lower signal wires are also simple contact closure, but have an M7F diode between the pendant and the bed controller. In our design, we put a 1N4007 in place of the M7F diode. We do not offer voice control of lift and lower for safety reasons. By adding a RJ50 breakout board, we were able to provide a connector on our controller for a handheld pendant while having a direct connection between our bed controller and the activated bed controller. This is really the ideal solution where the caregiver can use the handheld for lifting or lowering the bed as needed, and also have a backup method of manually controlling head up/down and foot up/down should wifi or internet go down.

Here is a schematic of the bed controller design

Voice Controlled Bed Controller for Dana B, mechanical relays to drive the Medline Full Electric bed, manual control for Lift and Lower
Bill Weis 8-11-2021
S/N 20067.02

12vDC 2A Power Transformer

Gnd

+5v

WINGONEER NodeMcu Base ESP8266
Testing DIY Board For LoLin V3 NodeMcu Lua
WIFI Development Board

D5 - Head
D0 - Back
D1 - Knees
D7 - Feet

MDR630154R

Head Up
Head Down
Feet Up
Feet Down

H
B
K
F

RJ50 Connector
1. Black (n/c)
2. Red (38v relay & hand held)
3. Orange
4. Green
5. White
6. Blue
7. Purple (from hand held)
8. Yellow (from hand held)
9. Brown (n/c)
10 Grey (n/c)

1115290 Pendant

1115290

Lift
Lower
VCC

For safety reasons, lift and lower are not provided via voice commands. On this full electric Medline bed, all 6 functions can also be controlled manually (The 1115290 Pendant plugs into an RJ50 that is included with the bed controller. Note, not all wires going to the pendant are shown in the picture to the right). Adjusting the head and foot of the bed can also be done via voice commands. The original MDR630154R remote had M7F diodes in series to the lift and lower connections to the bed. I added a 1N4007 diode to the back of the RJ50 board to meet this design need.

2. Be able to use voice commands to control the TV – We provided Dana with an Amazon Fire TV Cube so she could use voice commands to control her TV.

Resources
Amazon Echo
Alexa Support (Contact Support via the Amazon Alexa app)
Alexa Fire TV Cube support numbers
        888-280-2073