Wireless Handheld Controller Interface

David Andersen

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**Common Handheld Controller Inputs**

1. Horn
2. Bell
3. Head Lights
   1. High
   2. Low
   3. Off
4. Aux Lights
   1. On
   2. Off
5. Controller Power Cutoff
6. Direction Control
   1. FWD
   2. REV
7. Speed Control
   1. 0-100%
8. Sound Control
   1. PWR
      1. ON
      2. OFF
   2. VOL
      1. Increase
      2. Decrease
9. Battery Voltage Monitor
   1. 5 LED’s
      1. RRYGG (RedRedYellowGreenGreen)
10. Parking Brake
    1. On
    2. Off
11. Train Air Brakes
    1. Pressure Increase
    2. Pressure Decrease

**Translation of Input to Required Electronics**

1. Horn
   1. Active Low
      1. I/O to GND
      2. 1 I/O
   2. 2 position switch
2. Bell
   1. Active Low
      1. I/O to GND
      2. 1 I/O
   2. 2 position switch
3. Head Lights
   1. Active Low
      1. I/O to GND
      2. 2 I/O needed
4. Aux Lights
   1. Active Low
      1. I/O to GND
      2. 1 I/O needed
5. Controller Power
   1. ON/OFF Switch
   2. No I/O needed
6. Direction Control
   1. 1 I/O
      1. VCC = FWD
      2. GND = REV
7. Speed Control
   1. 1 channel ADC (10 bit good, 8 bit ok)
8. Sound Control
   1. PWR
      1. Active Low
         1. I/O to GND
   2. VOL
      1. Active Low
         1. I/O to GND
         2. 2 I/O needed
9. Battery Voltage Monitor
   1. SPI Buss to 595 Shift Registor to Darlington Driver Array
   2. 5 LED Display?!?!
10. Parking Brake
    1. Active Low
       1. I/O to GND
       2. 1 I/O needed
11. Train Air Brakes
    1. Pressure Increase
       1. Active Low
          1. i/o to GND
          2. 1 i/o needed
    2. Pressure Decrease
       1. Active Low
          1. i/o to GND
          2. 1 i/o needed