**A Monorail Emulator User Design**

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**Introduction:**

This manual will describe in detail the operation and general setup of the simulation of a monorail emulator using the AVR microprocessor board. To run the configuration, open the project in AVR Studio, build the project and run the *.hex* file using Arduino.

**Wiring Configuration:**

|  |  |  |
| --- | --- | --- |
| **Component** | **Function** | **Wiring** |
| Motor Configuration | Spin to simulate monorail engine | OpO - +5V (P11)  OpE - RDX3 (Port D)  Mot - POT (Input) |
| Keypad | Read in number and alphabet | (Port L) PL3-0– C0-3  PL7-4 – R0-3 |
| LCD | Display info on LCD | BE – PA4 (Port A)  RW – PA5  E – PA6  RS – PA7  (LCD Data) D0-7 – PF0-7 (Port F) |
| LED |  |  |
| Push Buttons |  |  |

**Operation**

1. Enter number of stations (maximum 10) to visit using the keypad. Alphabet will not be recognized
2. Enter Station names. To input letter, select number key with corresponding letter, then select the position of the letter. For example, if letter ‘C’ is required, select number 2, and then select the letter C on the right side of the keyboard, indicating the 3rd letter of keypad 2. To print whitespace, press ‘1’ + ‘A’. To indicate end of string, press ‘\*’
3. Continue entering station names
4. Enter a number to indicate time from each station (maximum of 10 seconds), if time exceeds 10 seconds, error message will occur
5. Enter a number to indicate stop time of monorail
6. Message will appear, indicating completion of configuration and time of monorail simulation

**Displays**