## Pins:

|  |  |
| --- | --- |
| EN | D23 |
| VP | D22 |
| VN | TX0 |
| D34 | RX0 |
| D35 | D21 |
| D32 | D19 |
| D33 | D18 |
| D25 | D5 |
| D26 | D17 |
| D27 | D16 |
| D14 | D4 |
| D12 | D2 |
| D13 | D15 |
| GND | GND |
| VIN | 3V3 |

Key:

|  |  |
| --- | --- |
|  | Input only (no pull-up/pull-down) |
|  | Avoid |
|  | Output only (onboard LED) |
|  | ADC unavailable when Wi-fi is enabled |
|  | State affects boot-up process |

## Avoid:

* GPIO6
* GPIO7
* GPIO8
* GPIO9
* GPIO10
* GPIO11
  + [Click for explanation](https://randomnerdtutorials.com/esp32-pinout-reference-gpios/#:~:text=Additionally%2C%20there%20are%20pins%20with%20specific%20features%20that%20make%20them%20suitable%20or%20not%20for%20a%20particular%20project.%20The%20following%20table%20shows%20what%20pins%20are%20best%20to%20use%20as%20inputs%2C%20outputs%20and%20which%20ones%20you%20need%20to%20be%20cautious.)
* RX0
* TX0
  + Serial debugger pins
* GPIO2
  + LED on board acts as a very strong pull-down, since we’re using a pull-up approach for all buttons, this pin should only be used for outputs
  + Additionally, Chris uses the LED for debugging so try to avoid unless absolutely necessary
* GPIO5
* GPIO12
* GPIO15
  + [Click for explanation](https://lastminuteengineers.com/esp32-pinout-reference/)

## Peripheral needs (MVP):

* Motor driver
  + 2x PWM channels (any GPIO pin)
* LEDS
  + 5x GPIO
* Switches
  + 3x GPIO (with pull-ups)

## Peripheral needs (full design):

* Motor driver
  + 2x PWM channels (any GPIO pin)
* LEDS
  + 6x GPIO
* Switches
  + 4x GPIO (with pull-ups)
* Buzzer
  + 1x GPIO
* Ultrasonics
  + 2x Inputs receive pins
  + 2x GPIO trigger pins

# Pins in use:

|  |  |  |  |
| --- | --- | --- | --- |
| **Connected to** | **Pins** | | **Connected to** |
|  | EN | D23 | E-Stop |
| Ultrasonic echo 2 | VP | D22 | Start button |
| Ultrasonic echo 1 | VN | TX0 |  |
|  | D34 | RX0 |  |
|  | D35 | D21 | Status light |
| Ultrasonic trigger 2 | D32 | D19 | Piezo buzzer |
| Ultrasonic trigger 1 | D33 | D18 | Streetlight MOSFET |
| Car red | D25 | D5 |  |
| Car yellow | D26 | D17 | Top limit switch |
| Car green | D27 | D16 | Bottom limit switch |
| Boat red | D14 | D4 | Light Sensor |
| Driver board In2 | D12 | D2 |  |
| Driver board In1 | D13 | D15 |  |
| Driver board /  5V regulator Gnd | GND | GND |  |
| 5V regulator | VIN | 3V3 |  |