



### RPi Header

Protection diodes on UART lines to protect segments from damage spreading. These are used on all other lines as well.

Connects the RPi to the system over UART and supplies the 3.3V needed to the system. There is a button used for proper shutdown of the RPi.

### Telemetry

nRF24L01 used for telemetry to chase vehicle. Only data is transferred, no voice.

### Microcontroller (MCU)

Collects and distributes bike data between RPi systems using UART to communicate with RPi's. Can be programmed and debugged either by UART through the RPi or USB.

RPi it is mounted to connects by UART1, the other on UART2. There is a button to reset specifically the MCU.

### Secondary Out

Header used to connect the secondary system to the main system. Connects UART, GND, and BATT for monitoring on the main board. NOTE: UART is crossed over on main board.

### GPS

GPS is used primarily as a backup source for speed information but coordinates are recorded during the run. Connected on UART3.

Decoupling capacitors for the MCU

### DHT11

Digital temperature and humidity sensor

### Main Input

Connections for the main board to the secondary board and encoder.

### Power Input

Power is fed through a reverse polarity protection circuit, then to the monitor power jack and the 5V regulator.

Hysteresis Comparator Used to convert a potentially analog signal into a clean digital one and avoid noise bouncing the comparison for the encoder

- Mounting Holes
- MK1 M2.5
  - MK2 M2.5
  - MK3 M2.5
  - MK4 M2.5

5V 3A Regulator provides 5V to the RPi. Has a switch to ground its EN pin to restart system.

Board for data collection and communication in TITAN, as a Pi HAT

For both main and secondary displays, albeit differently configured. Only power input and RPi header parts must be populated on sec.

### Title: TITAN Board

UoT HPVDT	Date: 2020-09-26	Rev: 2.1
KiCad E.D.A. kicad 6.0.1-79c1e3a40b-116-ubuntu21.04.1	Size: USLetter	Sheet: 1/1