# Electrical Specification Document

# Block Diagram

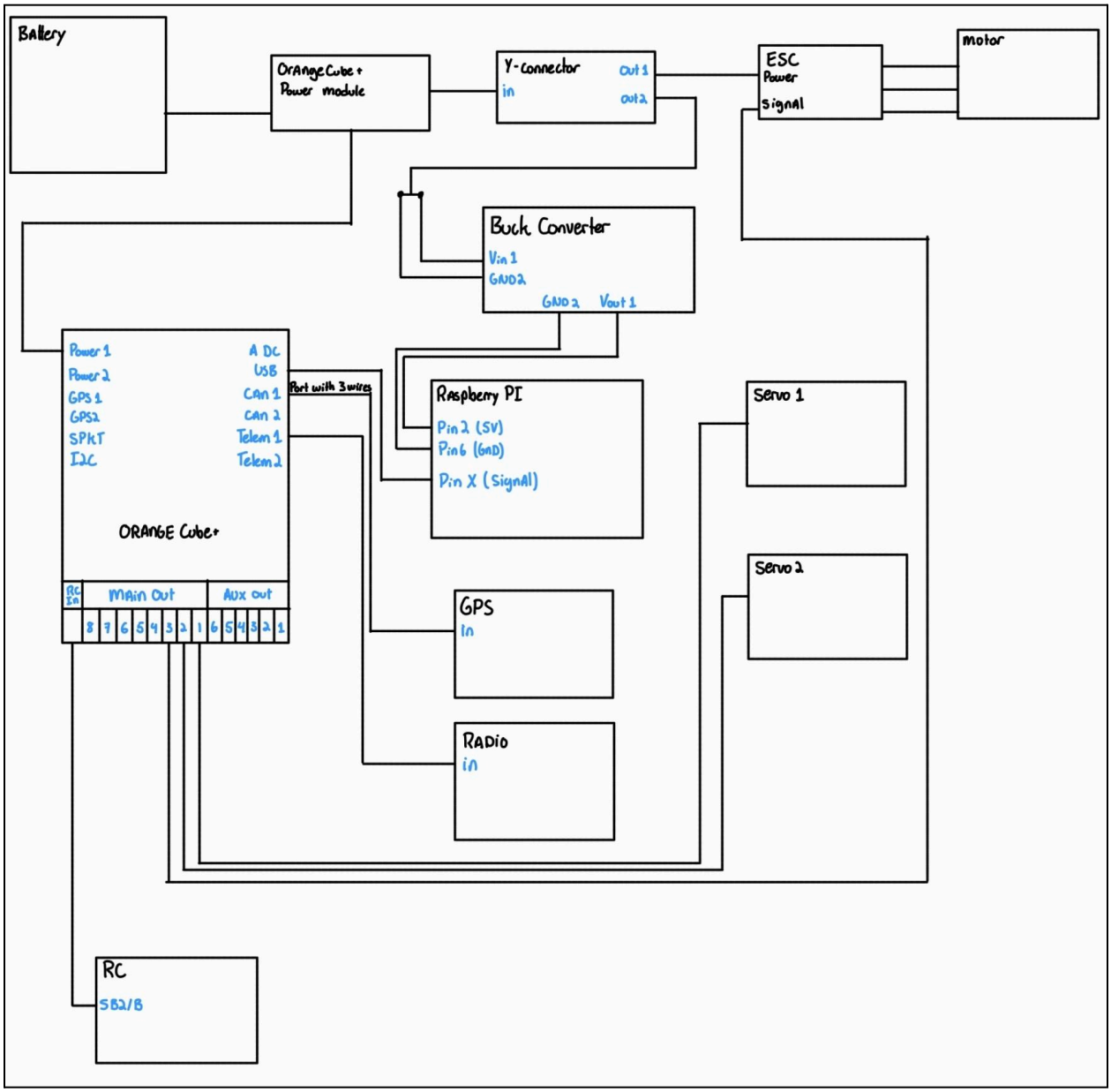


*Figure 1: Block Diagram of the electrical components (some small changes are needed when more testing)*

# Buck Converter

Here is the buck used : link.

# Connections helper

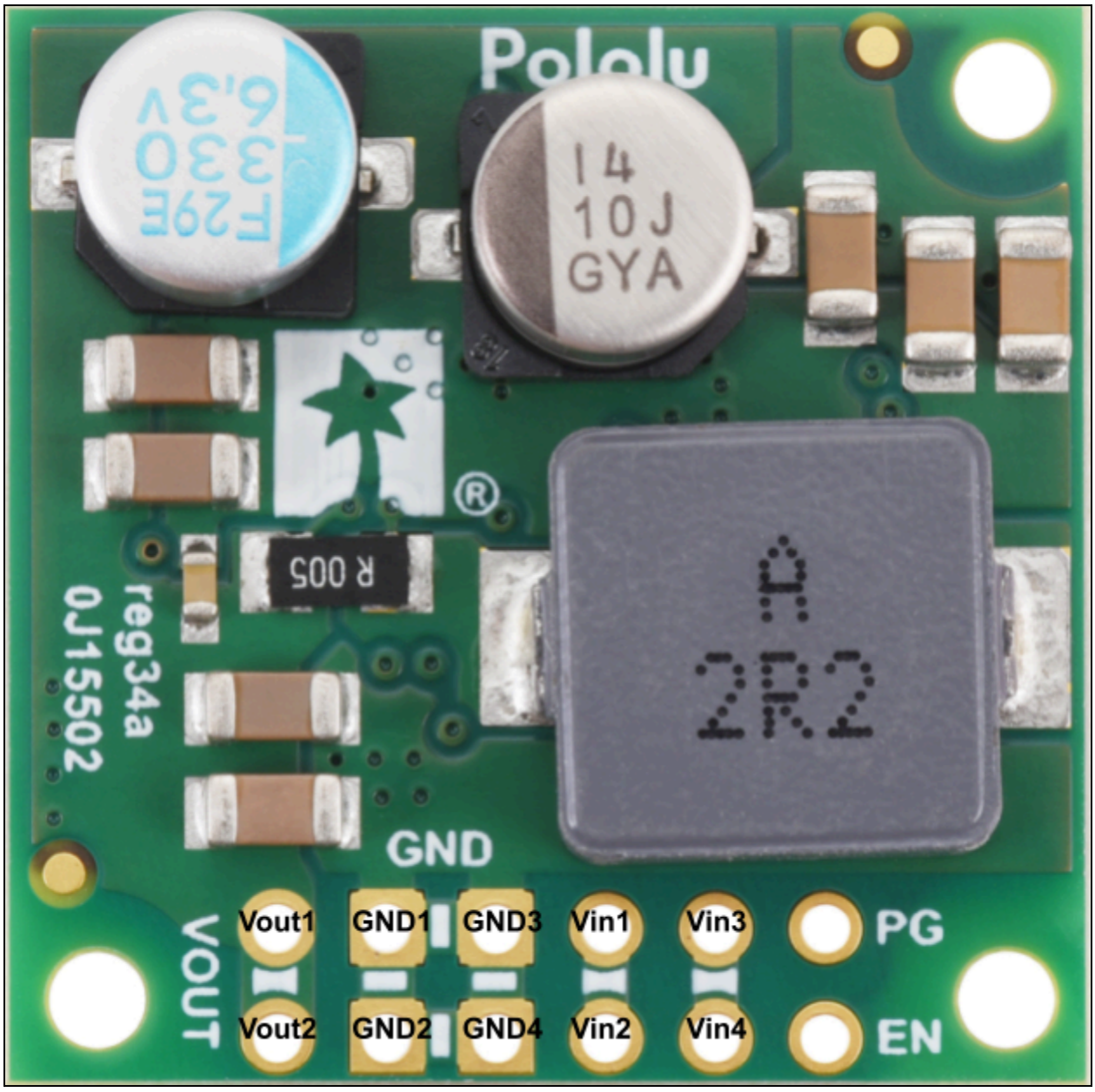


*Figure 2: Buck Converter Ports Name*

Note: Those port attributions are made by me, they are not part of the datasheet of the buck. It was to make sure we all can identify which ports from which.

| Name of Port | On the buck specification | Where it connects |
|---|---|---|
| Vout1 | Vout1 is short circuit with Vout2 | Raspberry PI |
| Vout2 | Vout2 is short circuit with Vout1 | N/A |
| GND1 | All grounds are shorted together | Ground of Raspberry PI |
| GND2 | All grounds are shorted together | N/A |
| GND3 | All grounds are shorted together | N/A |
| GND4 | All grounds are shorted together | Negative of the battery (black wire) |
| Vin1 | Vin1 is shorted with Vin2 | Positive of the battery (red wire) |
| Vin2 | Vin 2 is shorted with Vin1 | N/A |
| Vin3 | Vin3 is shorted with Vin4 | N/A |
| Vin4 | Vin4 is shorted with Vin3 | N/A |

Note: any ports that are short circuit with each other can be used for the same connection, but only use one of them. For example, just use one of the Vout to connect to the Raspberry PI.

# Soldering helper

Connection Y-Connector to Buck

The wires on the Y connectors are quite thick (AWG-12) and do not fit into the small through-holes of the buck converter. To address this, we soldered them to smaller AWG-20 wires. Even then, the diameter of the AWG-20 wires was slightly larger than the converter's through-holes, so we trimmed a few strands at the ends to allow proper insertion and soldering.

Connection Buck to Raspberry PI

To make the Raspberry Pi easier to handle, we avoided soldering wires directly onto its pins. Instead, we ordered standard Raspberry Pi jumper wires and soldered the AWG wire from the buck converter to these jumpers. This approach allows the Raspberry Pi to be easily disconnected and moved by simply unplugging the jumper wires.

| From | To |
|---|---|
| **Y-Connector to Buck Soldering** | |
| Black wire Y connector | Black Wire AWG 20 |
| Black Wire AWG 20 | GND 1 |
| Red Wire Y connector | Red Wire AWG 20 |
| Red Wire AWG 20 | Vin1 |
| **Buck To Raspberry PI Connection** | |
| GND2 | Black wire AWG 20 |
| Black wire AWG 20 | Black Jumper wire Raspberry PI |
| Vout 1 | Red wire AWG 20 |
| Red wire AWG 20 | Red Jumper wire Raspberry PI |

# Orange Cube+

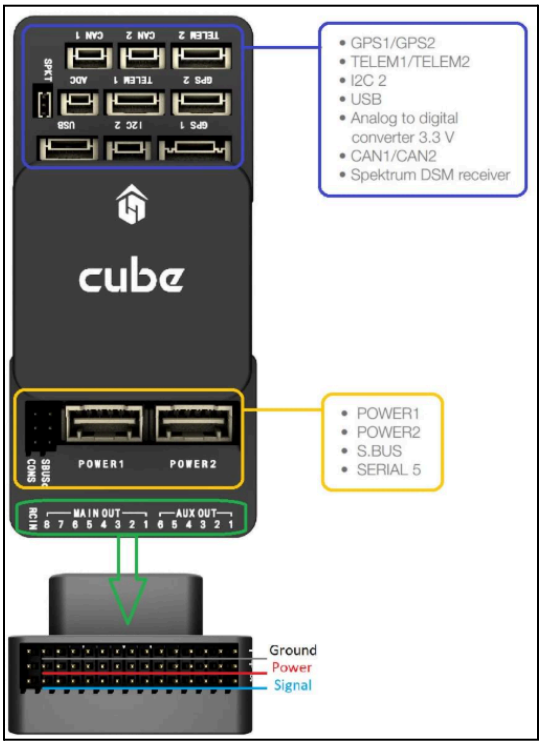


*Figure 3: OrangeCube+ picture of ports (source)*

# Main Out connections

| Main Number | Connection to what | Orientation |
|---|---|---|
| 1 | Servo responsible for (dont know) | Top: Black<br>Middle: Red<br>Bottom: Yellow |
| 2 | Servo responsible for (dont know) | Top: Black<br>Middle: Red<br>Bottom: Yellow |
| 3 | ESC<br>Note that there are two outputs for the ESC, pick the output with 3 wires for this connection. | Top: Black<br>Middle: Red<br>Bottom: Yellow |
| 4 | | |
| 5 | | |

| | | |
|---|---|---|
| 6 | | |
| 7 | | |
| 8 | | |
| Picture include here | | |

# RC IN Connection

| | | |
|---|---|---|
| RC IN connection to OrangeCube+ | SB2/B port in the RC | Top OrangeCube+ → Exterior pin of RC<br>Middle OrangeCube+ → Middle pin of RC<br>Bottom OrangeCube+ → Close to the writing of RC |