



Spring 2019

CS-4501/SYS 4582: F1/10 Autonomous Racing

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Operation Manual

(Getting Started)

[Always inform the instructor(s) if the car gets damaged.]

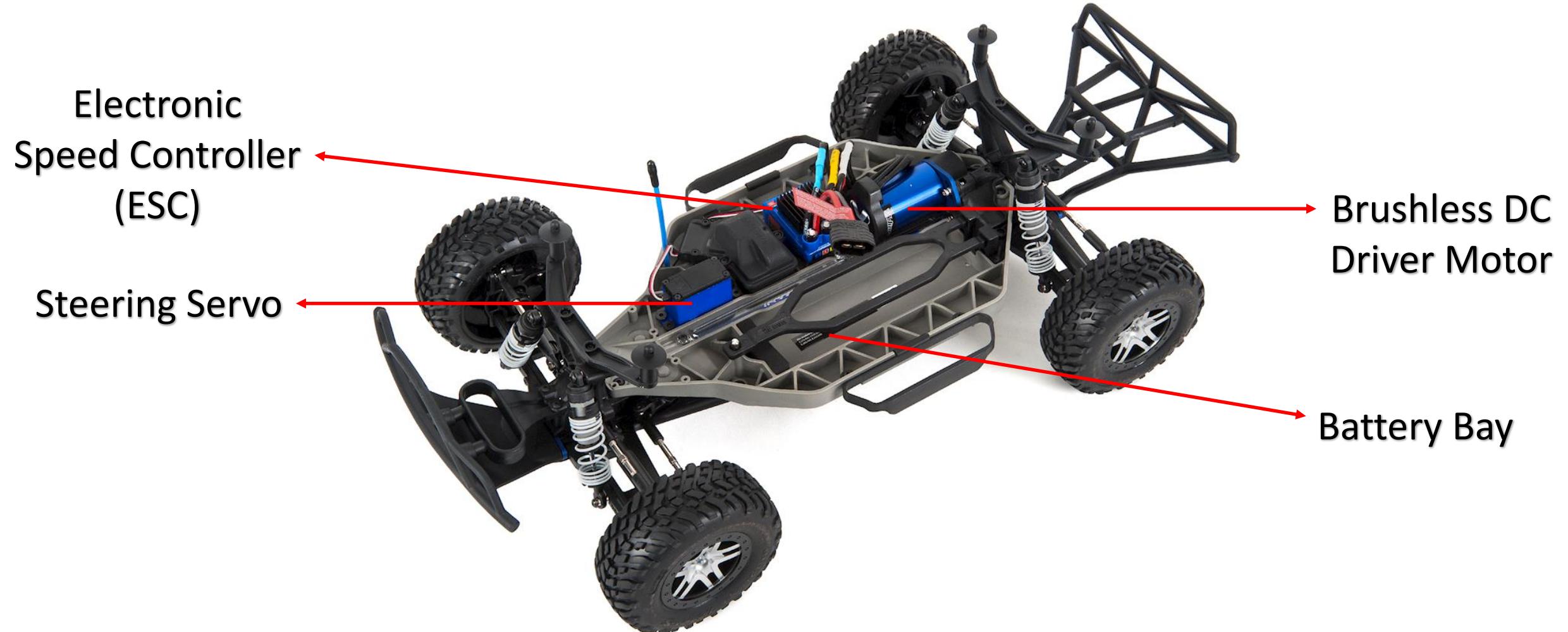
Use caution at all times

The F1/10 car is capable of very high speeds.

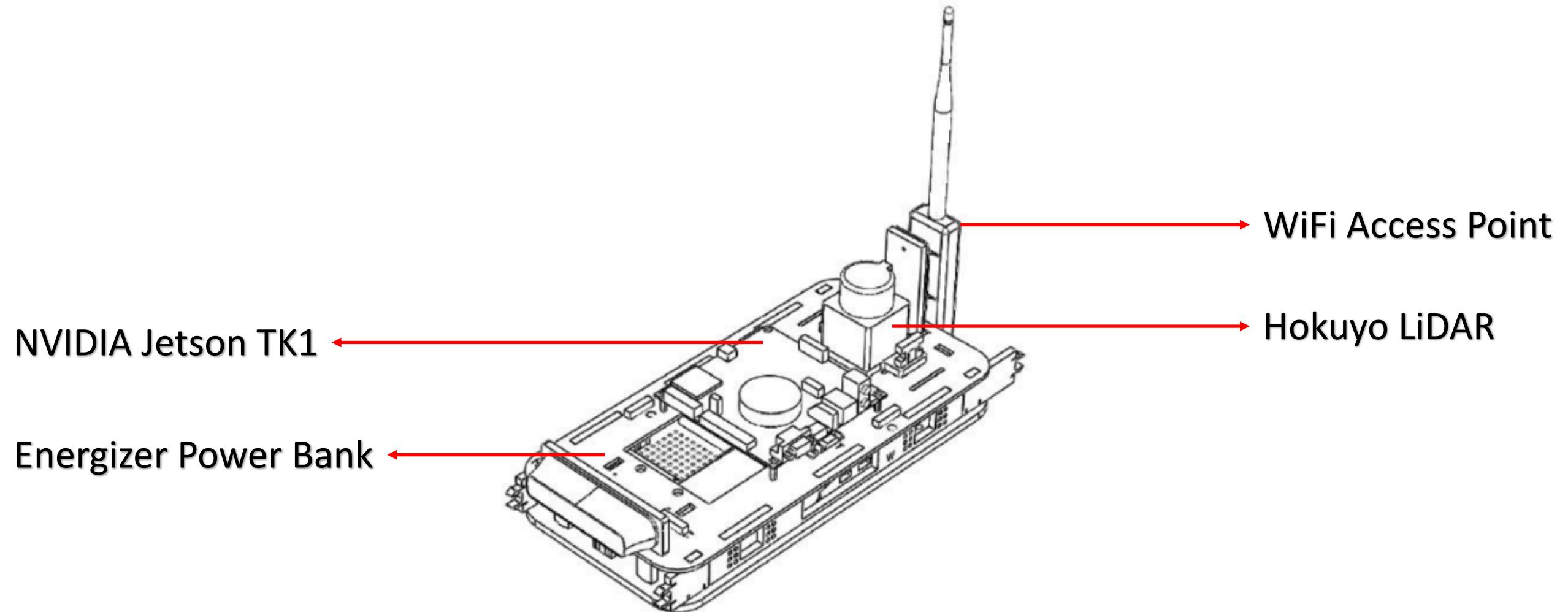
Pay special attention to the handling of Li ion high current batteries

When in doubt; ask the instructor

The F1/10 Platform (Chassis)



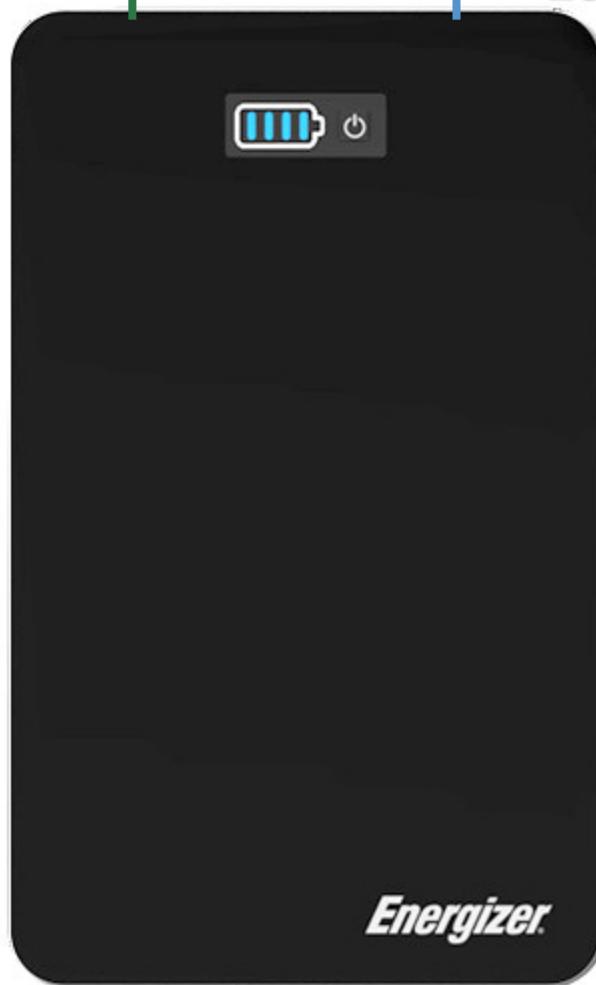
The F1/10 Platform (Upper Deck)



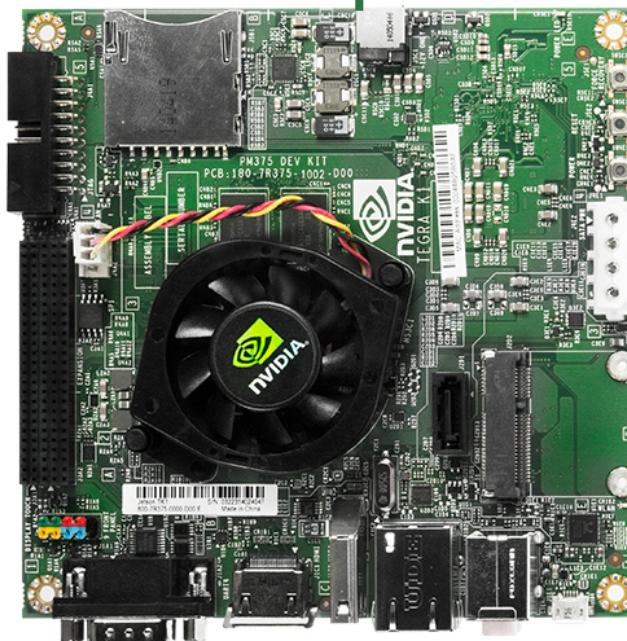
Power Connections

Green connects to green Jetson

(TK1) 12V



Blue connects to WiFi Station



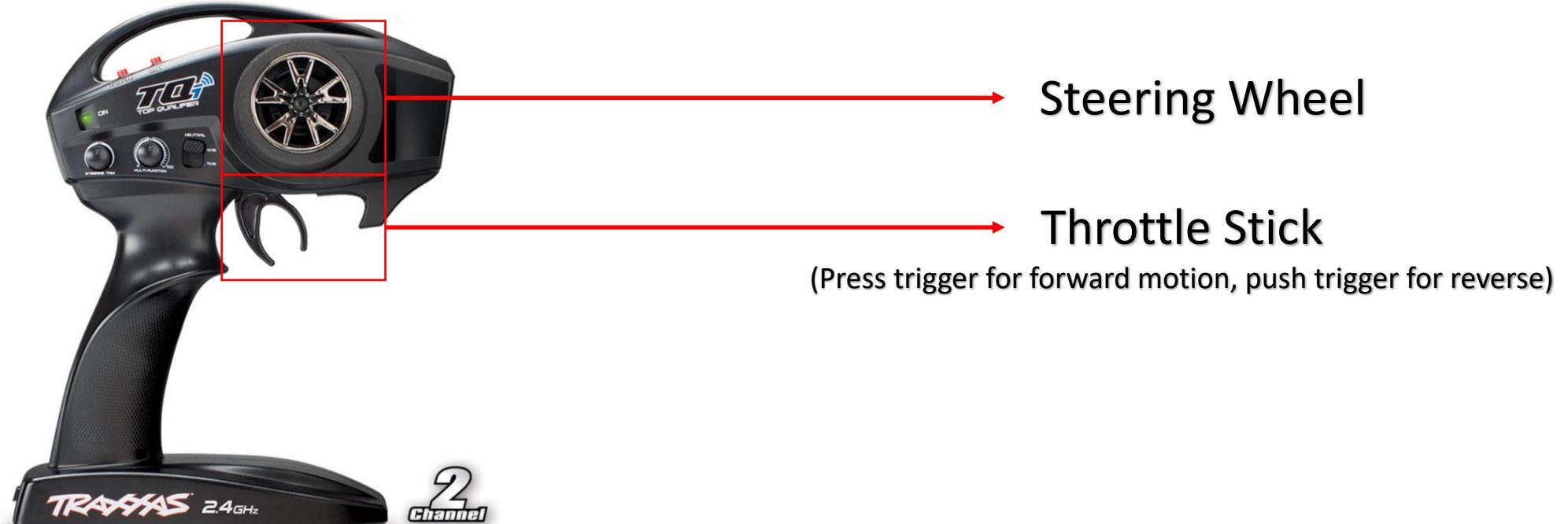
Power Bank

Jetson TK1

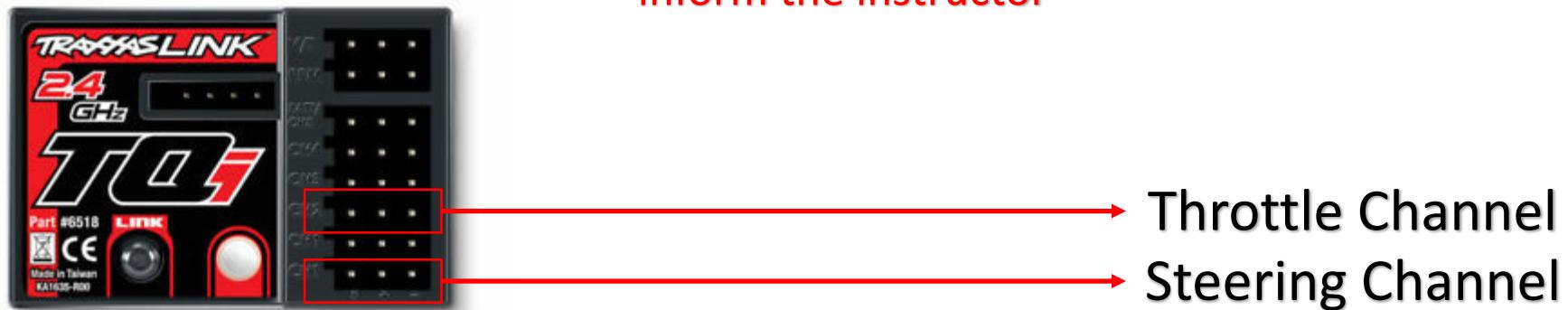
Ubiquiti Pico Station



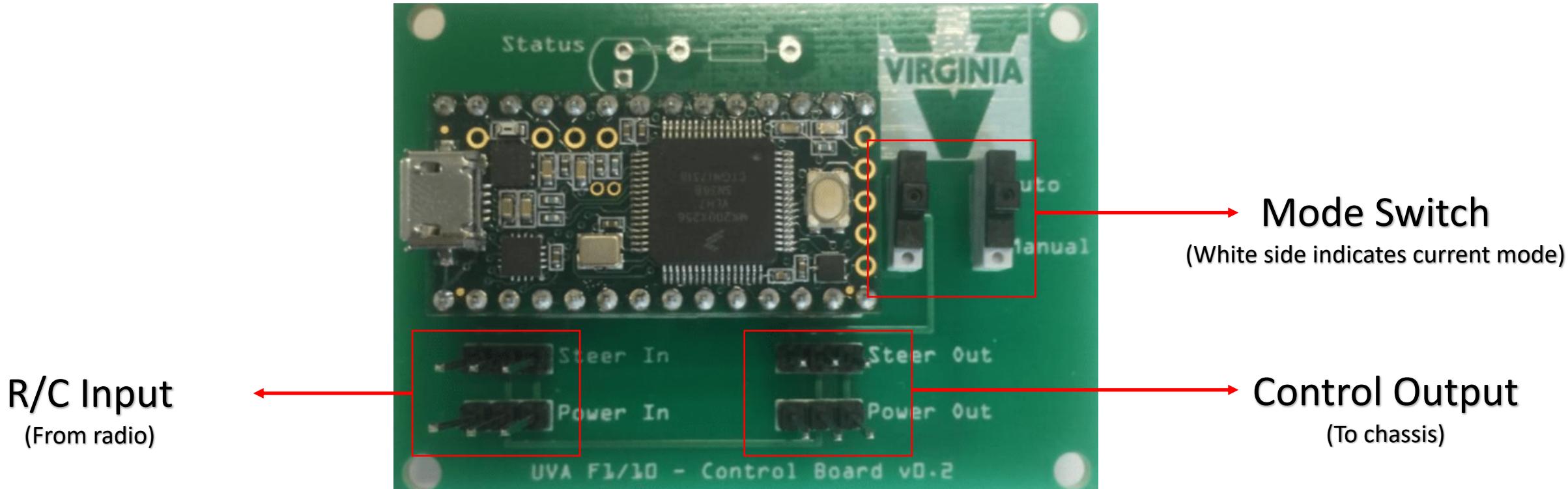
Manual R/C Control System



Each remote/receiver pair is binded. If your car does not respond to the remote, inform the instructor



Teensy Controller



Steps for R/C Teleoperation

Step 1	Step 2	Step 3
<p>Turn on R/C remote</p> <p><u>Do not move controls</u></p> <p>Located at the bottom of the remote controller</p>	<p>Set Teensy to Manual Mode</p> <p>Note: White side indicates current mode</p>	<p>Turn on ESC</p> <p>Long press blue button on motor controller</p>

Team Organization

Vehicle Number	Color Code	Team Name
1		Scuderia Ferrari
2		McLaren Racing
3		Red Bull Racing
4		Mercedes Petronas
5		Renault Sport
6		Williams Martini
7		Sauber Racing

Logistics

Each team receives a color coded:

- Assembled F1/10 Car (with lithium batteries)
- Lithium Battery Charger
- Energizer battery charger
- R/C Remote

Ask instructor for replacement AA batteries when
the R/C remote stops working or blinks red

Team Networks

Network Name	Color Code	Network Password
scuderia_ferrari		_go_ferrari_
mc_laren_racing		_go_mclaren_
red_bull_racing		_go_redbull_
mercedes_petronas		_go_mercedes_
renault_sport		_go_renault_
williams_martini		_go_williams_
sauber_racing		_go_sauber_

Network Restrictions

The following IP addresses are reserved

192.168.1.1 (Used by Jetson TK1)

192.168.1.20 (Used by WiFi station)

192.168.1.100 (Instructor diagnostics)

Static IP

Use these links to setup a static IP for your computer

Ubuntu: <http://www.sudo-juice.com/how-to-a-set-static-ip-in-ubuntu-graphically/>

MacOS: <http://www.macinstruct.com/node/550>

Windows: <https://support.microsoft.com/en-us/help/15089/windows-change-tcp-ip-settings>

Example setting:

IP address: 192.168.1.5

Netmask: 255.255.255.0

Gateway: 192.168.1.1

Enable ROS over network

The F1/10 has ROS over network preconfigured

Your remote computer/VM must also be configured in the same manner

To do this, open the .bashrc file using an editor

Eg: nano ~/.bashrc

Scroll down to the bottom and add: export ROS_MASTER_URI=http://192.168.1.1:11311

Remote login (SSH)

Do this only after you have configured the network as instructed

```
ssh ubuntu@192.168.1.1  
password: ubuntu
```

Do not change passwords for TK1 or the network