# ROVER ROBOTICS

# R&D Payload V2 Manual

# Revision History

| Version | Date | Notes |
|---------|------|-------|
| 1.0.0 | 8/4/2020 | Initial Release |
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# What's included

| | Description | Qty |
|---|---|---|
| | Interface Board | 1 |
| | 16V Power Cable | 1 |
| | USB Cable | 1 |
| | M5 Screws | 8 |
| | Xbox Controller | 1 |

# 1) Opening the R&D V2 Payload

The R&D payload V2 includes 2 quarter turn fasteners. Twist both 90 degrees counterclockwise to allow the lid to be opened.
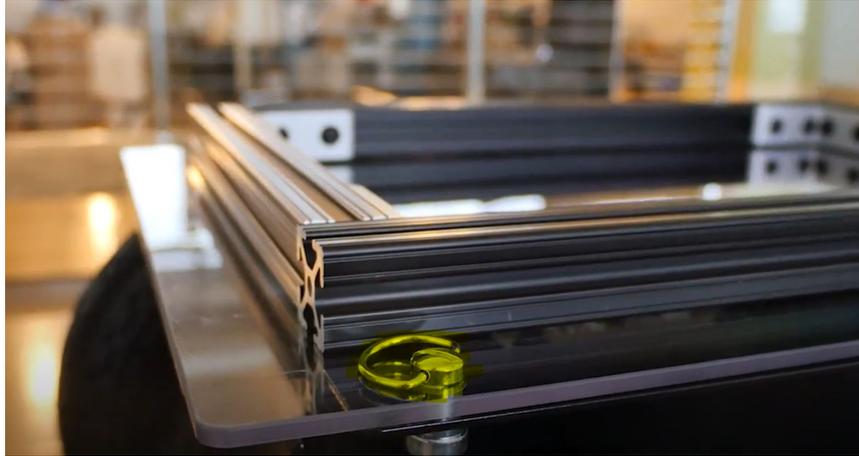


# 2) Securing the payload to the robot

Use the x8 included M5 screws to secure the payload to the robot in the following highlighted locations



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## 3) Wiring the payload

a) Plug the interface board into payload port 1 of the robot

b) Connect the power and USB cables to the interface board and the computer.

# 4) Power on the Rover by plugging in battery

Once the R&D payload is securely mounted, power the robot on by inserting the battery. The R&D payload computer will automatically boot up and start ROS.

You should see the amber RX and TX lights on the interface board start blinking after roughly 30 seconds. This indicates that ROS has started correctly and that you are ready to drive the robot.
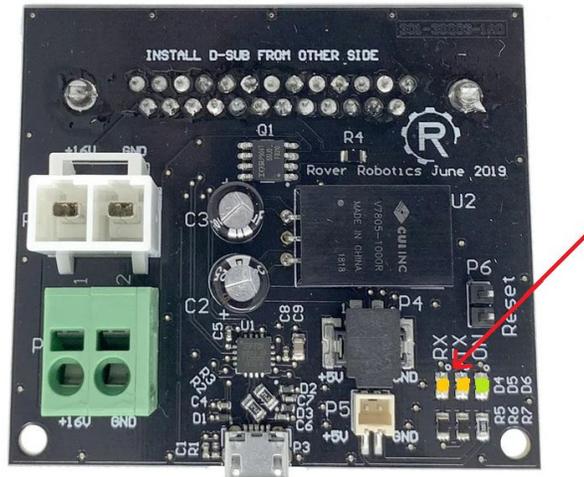
# 5) How to drive the robot

Turn on the Xbox controller by pressing the center button. The Xbox controller is pre-synced with the payload so the center LED should turn solid in the player 1 spot after several seconds. Once you see this you will be able to drive forward/backwards using the left analog stick, and you can turn using the right analog stick. If the robot isn't moving, ensure that the soft Estop is not activated by pressing the b button.

Note: The effort for the rover to turn when in the 4WD configuration can be highly dependent on the surface material the rover is driving on.  If the robot is struggling to turn either increase the throttle with the left D-pad while driving or edit the *~max_vel_turn* parameter of the rr_xbox_mapper_node mapper node in your launch file.

# 5) Modifying the system

Computer Credential

Username: rover
Password: rover

The system uses two systemd services to start processes on bootup.

**/etc/systemd/system/roscore.service**
*starts roscore

**/etc/systemd/system/roverrobotics.service**
*runs roslaunch

If you want to restart ROS use the following two commands:

**sudo systemctl restart roverrobotics.service**

You can check error messages by running the command:

**systemctl status roverrobotics.service**

To add additional nodes to be launched add them to the launch file specified in

**/usr/sbin/roverrobotics**

We recommend considering the following ROS packages

http://wiki.ros.org/robot_localization
http://wiki.ros.org/gmapping
http://wiki.ros.org/move_base

Good luck and happy Roving :)