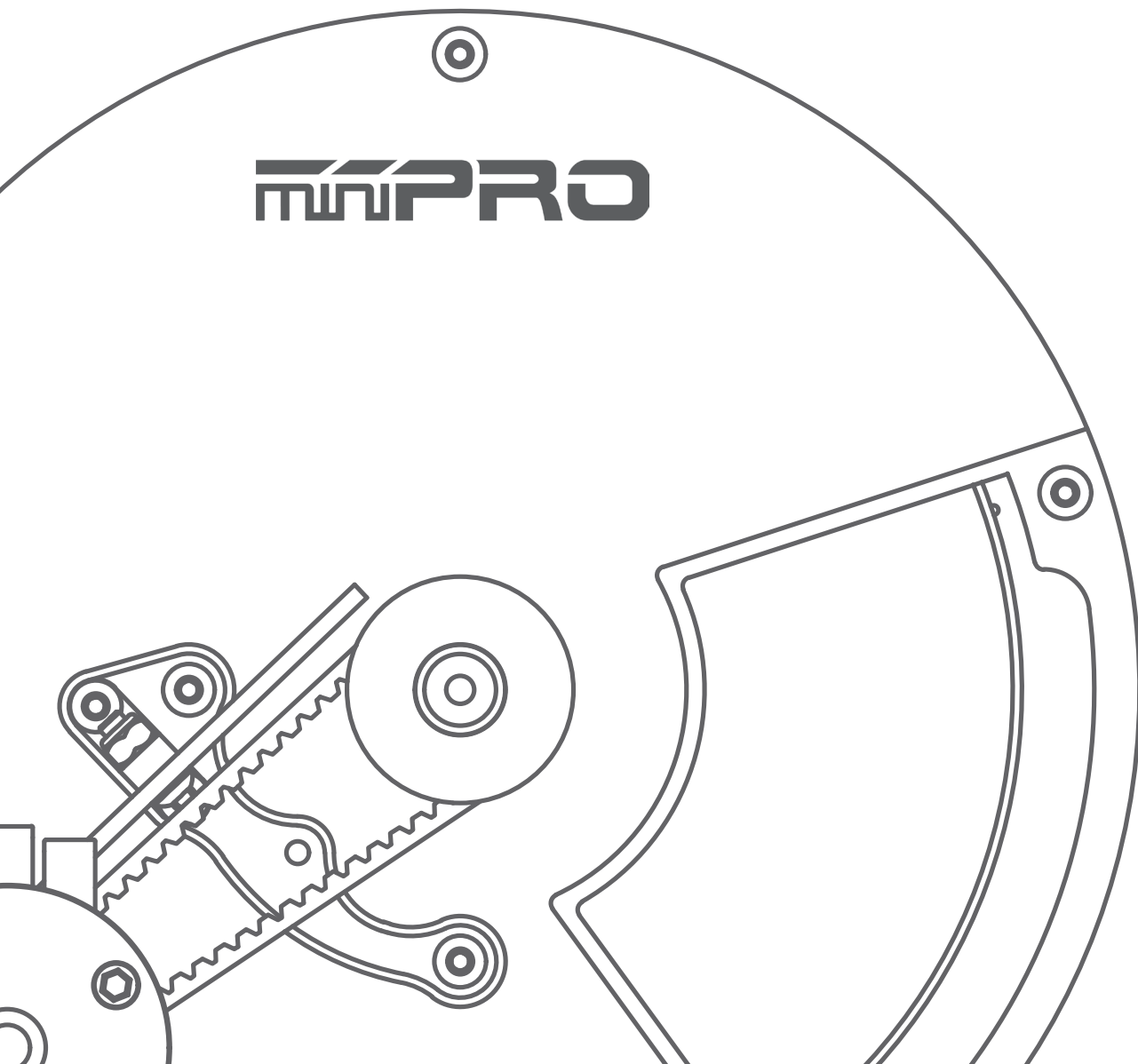


HOBBY MOTOR I. DYNO

Instruction Manual

V4.0.3



MINIPRO

USING THIS GUIDE

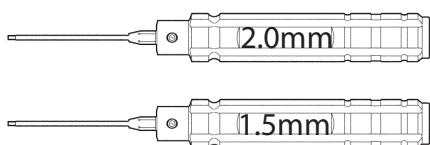
Before Using the Dyno

This dyno is a high-quality motor analyzing tool intended for persons aged 18 years and older with previous experience building and operating RC cars, boats, airplanes, and drones. This is not a toy; it is a precision testing equipment. This dyno is not intended for use by beginners, inexperienced customers, or by children without direct supervision of a responsible, knowledgeable adult. If you do not fulfill these requirements, please return the kit in unused and unassembled form back to the shop where you have purchased it.

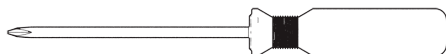
Before building and operating your dyno, YOU MUST read through all of the operating instructions and instruction manual and fully understand them to get the maximum enjoyment and prevent unnecessary damage. Read carefully and fully understand the instructions before beginning assembly. Contents of the box may differ from pictures. In line with our policy of continuous product development, the exact specifications of the dyno may vary without prior notice.

TOOLS REQUIRED

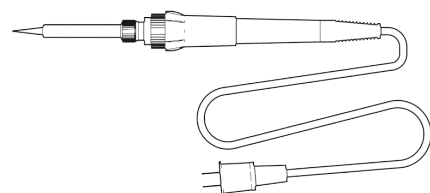
Allen: 1.5mm, 2.0mm



Phillip Screw Driver



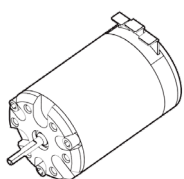
Soldering Iron



EQUIPMENT REQUIRED

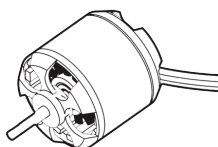
Electric Motor

540/550 Motor

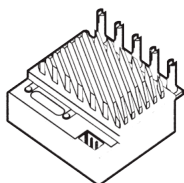


OR

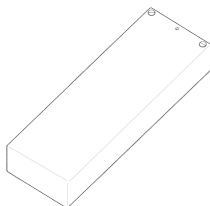
Outrunner Motor



Electronic Speed Control (ESC)

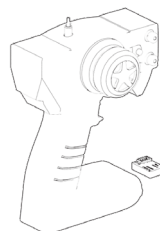


Battery



Throttle Controller

R/C Transmitter and Receiver



OR

Servo Tester

OR

ESC Controller Sensor*
(Sold by miniPRO)

* Additional USB port is required.

Windows PC



Operating System: 7, 8, or 10
(1) USB Port for Dyno

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Tools Required.....	2
Equipment Required.....	2
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(Attopilot) Volt. & Current Sensor ..	10
(Pololu) ESC Controller Sensor.....	11
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DYNO FEATURE HIGHLIGHTS

This is a universal motor dynamometer (dyno) that is ready to test electric motors out of the box. Featuring an onboard electrical board equipped with an optical rpm sensor that measures motor speeds at up to 100,000 rpm. The board is also equipped with auxiliary ports for an external LCD screen, throttle controller, and different types of sensors for measuring voltage, current, and temperature.

Its interchangeable motor mounts and pulleys give the option to test 540, 550 and Outrunner motors. A balanced flywheel (inertia mass) is enclosed by a high grade aluminum 6061 cover to provide safety. The flywheel is replaceable, that means you are not limited to the same load when testing your motors.

This dyno is great tool for motor analysis, ESC (boost) adjustment, brushless sensor adjustment, gearing calculation, acceleration testing, kV measuring, voltage drop, current draw, power, and torque output analysis.

1. Front Cover

2. Belt

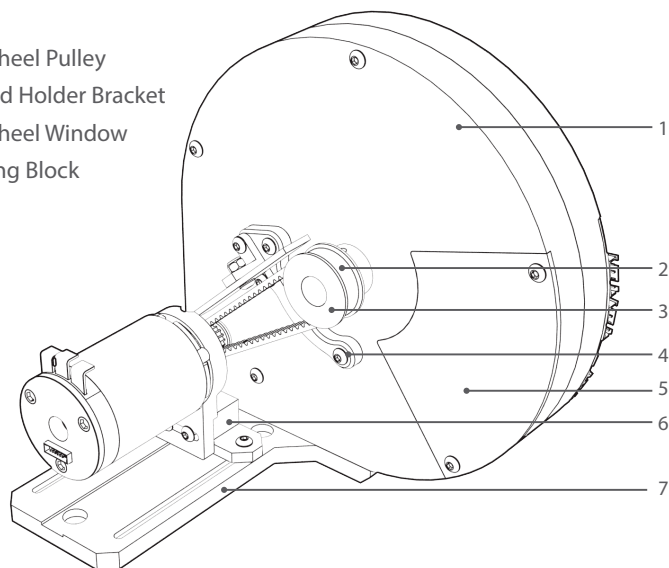
3. Flywheel Pulley

4. Shield Holder Bracket

5. Flywheel Window

6. Sliding Block

7. Base

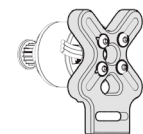
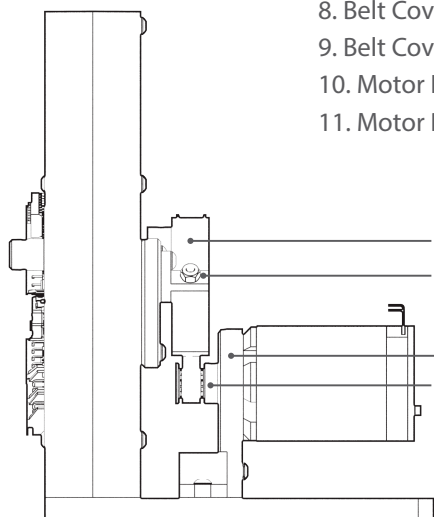


8. Belt Cover

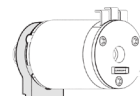
9. Belt Cover Holder

10. Motor Holder*

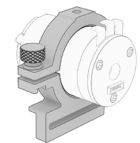
11. Motor Pulley



10 Outrunner



540/550



Quick Swap
OR
Custom Mount

13. Rear Cover

14. Flywheel

15. Reset

16. Electronic Board

17. Temp. Port #1

18. Temp. Port #2

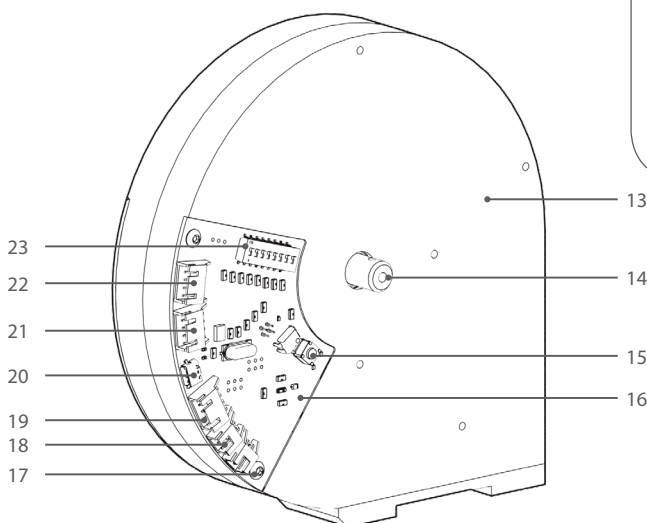
19. Voltage and Current Sensor Port

20. Micro USB Port

21. Auxiliary Port#2

22. Auxiliary Port#1

23. Switches

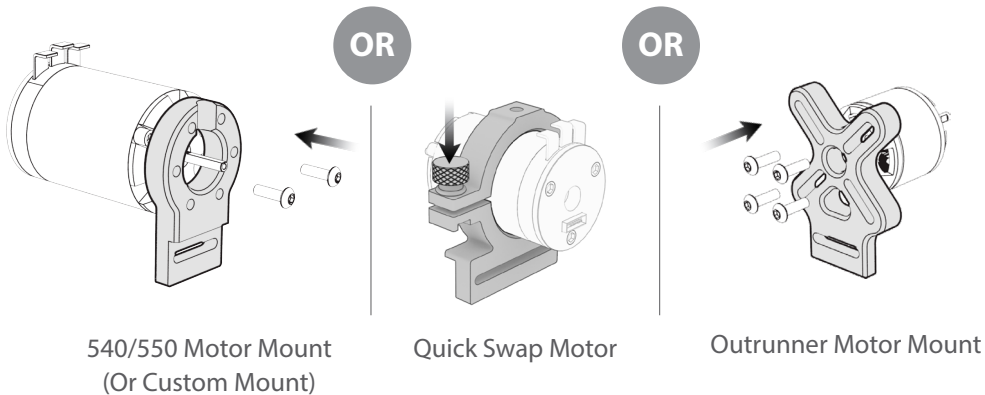


* May not be included in your kit. Please verify the included content in your purchased kit.

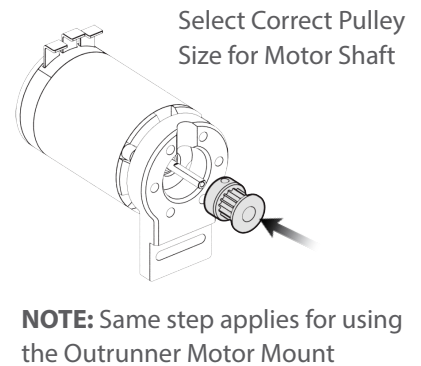
ASSEMBLE THE DYNO

The dyno its already been pre-assembled. All you need to do is install the base plate, mount the motor's belt and pulley.

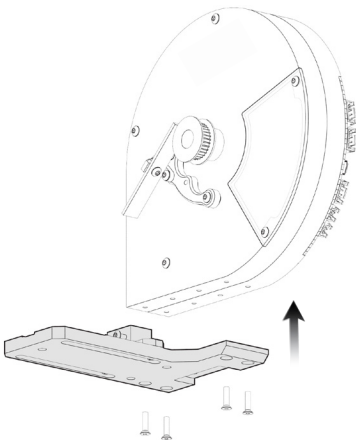
1 Screw on the motor on the mount



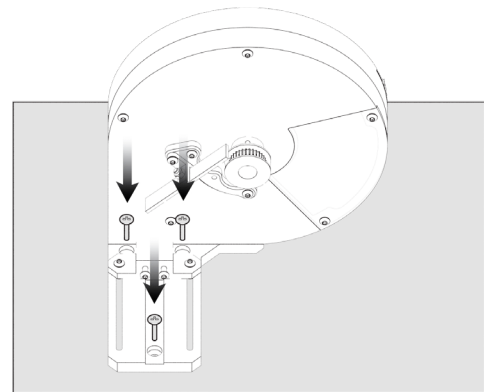
2 Install the Motor Pulley



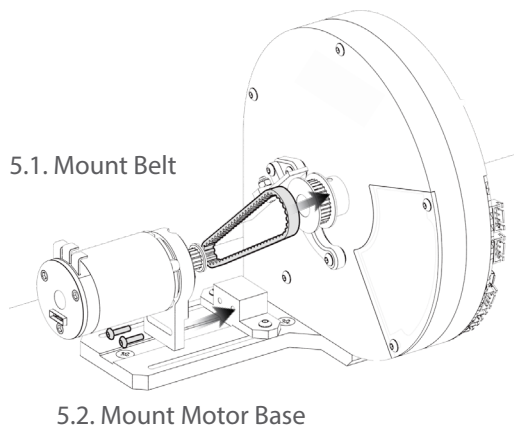
3 Install the Base



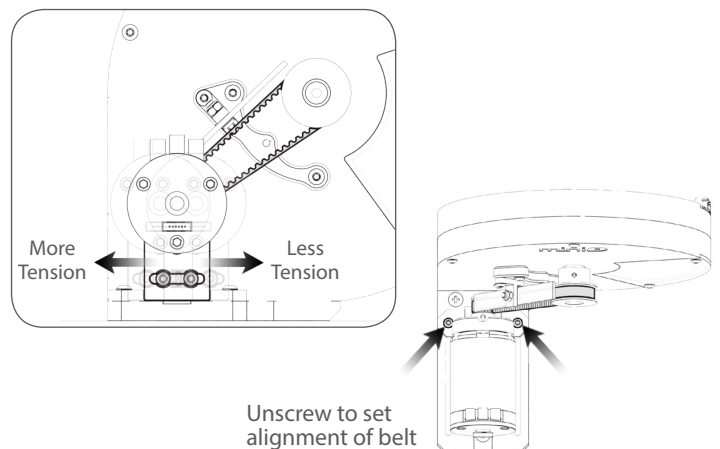
4 Attach the Dyno to a Baseboard



5 Mount the Motor



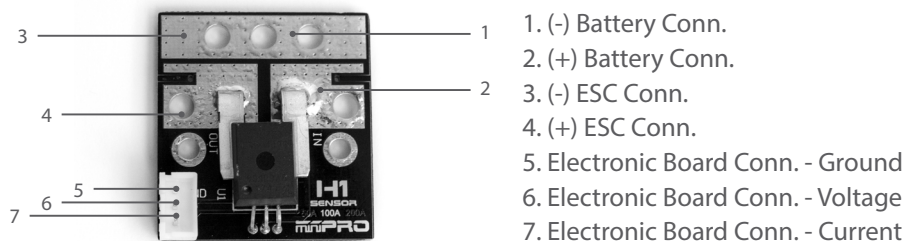
6 Adjust the Belt Tension and Position



ELECTRONIC CONNECTIONS

miniPRO H1 Voltage and Current Sensor Connection

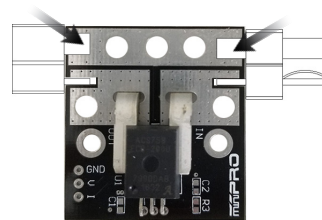
Voltage and Current Sensor Diagram



NOTE: This diagram applies to the 50A, 100A, 150A and 200A sensor.

1

Solder Wires or Connectors



Solder the connectors of your preference OR 14 gauge wires. Try to keep the wires as short as possible to reduce the electrical losses

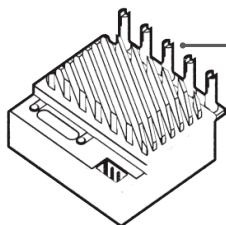
2

Connect Transmitter, Receiver, and ESC to the Motor

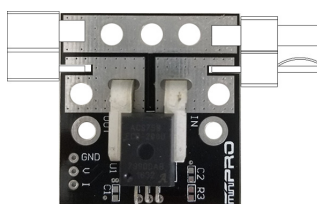
Please refer to the ESC, Transmitter, and Receiver manufacturers' instruction manual.

3

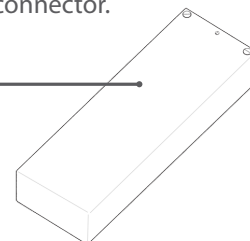
Connect Sensor



3.1. Connect the ESC's battery port to the sensor's ESC connector. See above sensor diagram for more information.



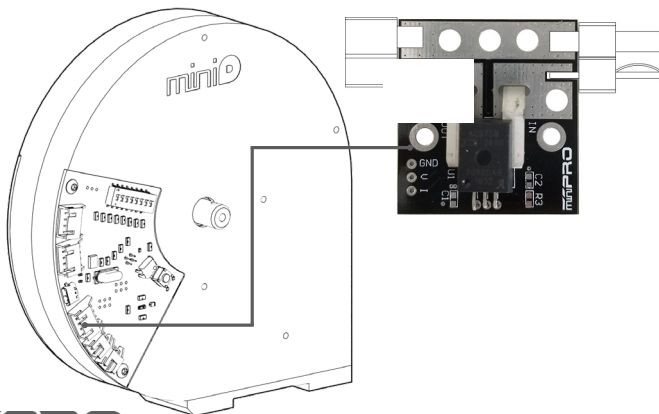
3.2. Connect the battery to the sensor's battery connector.



3.3. Turn ON the ESC and make sure it powers on. **If the sensor starts to overheat, disconnect the battery immediately.**

4

Connect Sensor to Electronic Board



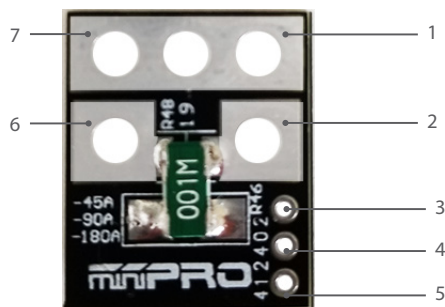
IMPORTANT: You must calibrate the sensor each time the dyno is powered.

Calibration Instructions:

- 4.1. Open the miniPRO for Windows application and connect the dyno to the application.
- 4.2. Connect the power source to the sensor and make sure the ESC is turned off.
- 4.3. Push the reset button from the back of your dyno; and the current should read zero or close.
- 4.4. Power your ESC and you should be ready to start your testing.

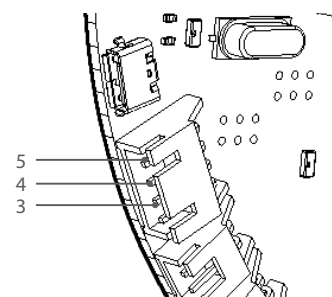
miniPRO A1 Voltage and Current Sensor Connection

Voltage and Current Sensor Diagram

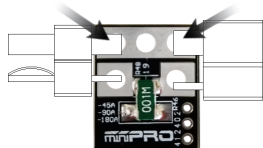


1. (-) ESC Conn. (Black)
2. (+) ESC Conn. (Red)
3. Electronic Board Conn. - Current
4. Electronic Board Conn. - Voltage
5. Electronic Board Conn. - Ground
6. (+) Battery Conn. (Red)
7. (-) Battery Conn. (Black)

Voltage and Current Board Diagram



1 Solder Connector

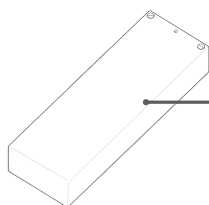


Solder connectors of your preference
OR 14 gauge wires

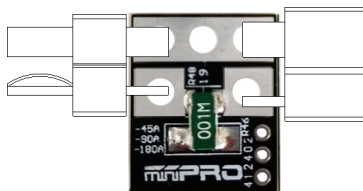
2 Connect Transmitter, Receiver, and ESC to the Motor

Please refer to the ESC, Transmitter, and Receiver manufacturers' instruction manual.

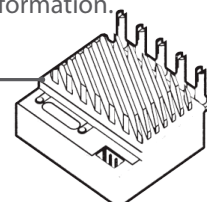
3 Connect Sensor



3.1. Connect the battery to the sensor's battery connector.

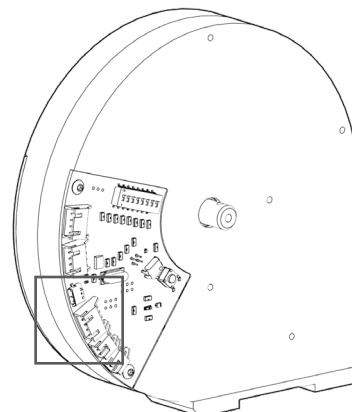
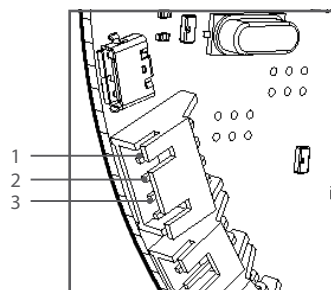
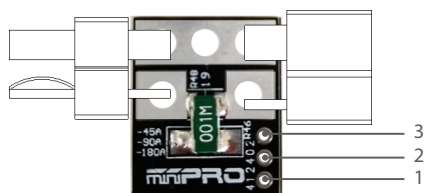


3.2. Connect the ESC's battery port to the sensor's ESC connector. See above sensor diagram for more information.



3.3. Turn ON the ESC and make sure it powers on. **If the sensor starts to overheat, disconnect the battery immediately.**

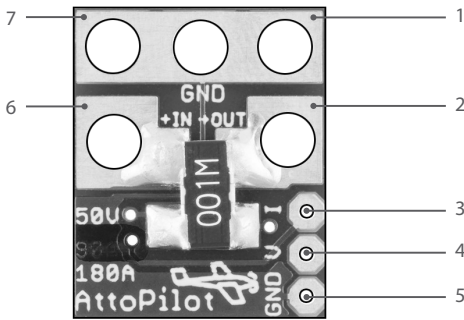
4 Connect Sensor to Electronic Board



Connect the sensor in the electronic board with the provided cable.

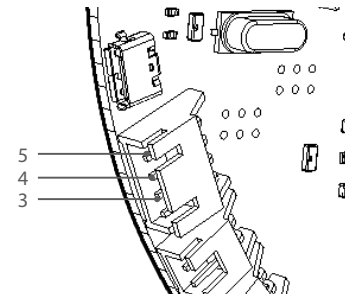
Attopilot Voltage and Current Sensor Connection

Voltage and Current Sensor Diagram

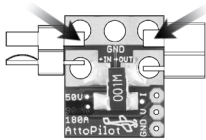


1. (-) ESC Conn. (Black)
2. (+) ESC Conn. (Red)
3. Electronic Board Conn. - Current
4. Electronic Board Conn. - Voltage
5. Electronic Board Conn. - Ground
6. (+) Battery Conn. (Red)
7. (-) Battery Conn. (Black)

Voltage and Current Board Diagram



1 Solder Connector

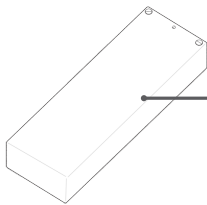


Solder connectors of your preference
OR 14 gauge wires

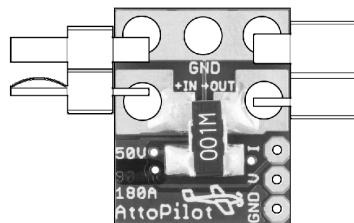
2 Connect Transmitter, Receiver, and ESC to the Motor

Please refer to the ESC, Transmitter, and Receiver manufacturers' instruction manual.

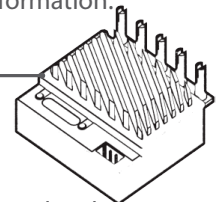
3 Connect Sensor



3.1. Connect the battery to the sensor's
battery connector.

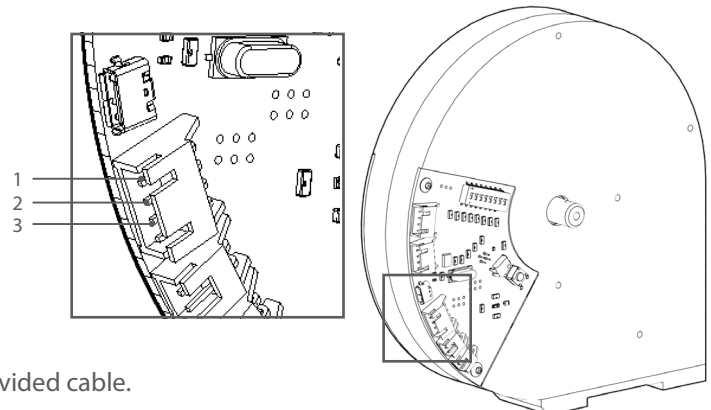
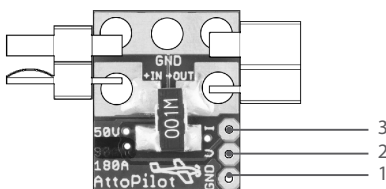


3.2. Connect the ESC's battery port to the
sensor's ESC connector. See above sensor
diagram for more information.



3.3. Turn ON the ESC and make sure it powers
on. **If the sensor starts to overheat, disconnect the battery immediately.**

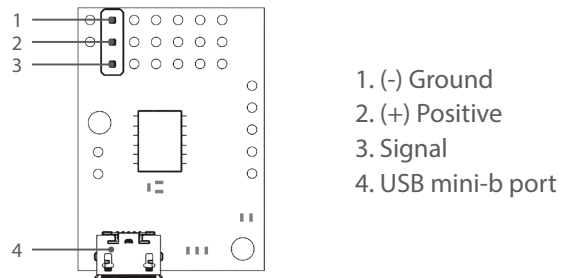
4 Connect Sensor to Electronic Board



Connect the sensor in the electronic board with the provided cable.

ESC Controller Sensor Connection

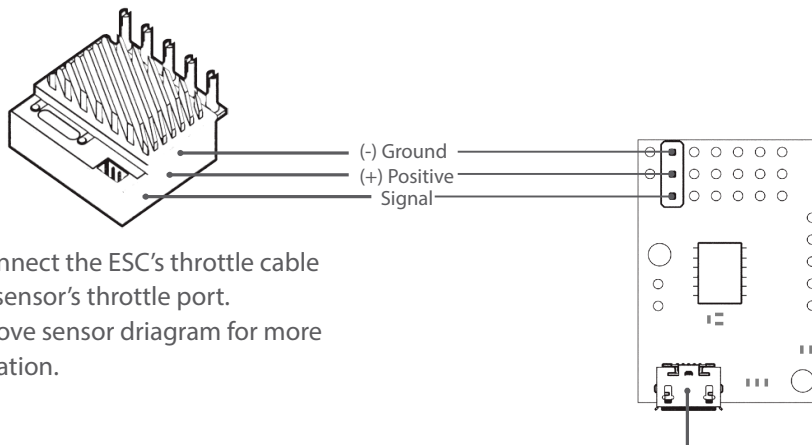
ESC Controller Diagram



NOTE: This sensor its already been pre-programed to be used with the dyno.

1

Connect Sensor



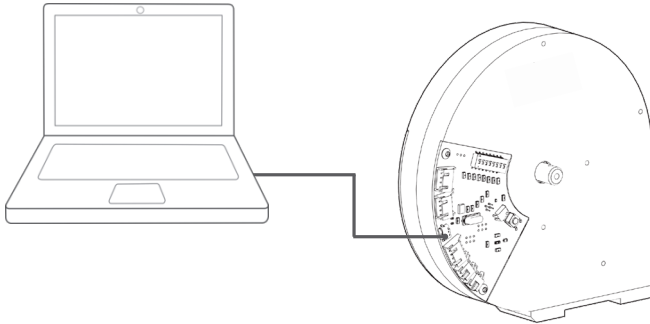
2.1. Connect the ESC's throttle cable to the sensor's throttle port.
See above sensor driagram for more information.

2.2. Connect the sensor to the PC with a mini-b USB cable.

DRIVER INSTALLATION

Electronic Board Driver Installation for Windows 7 and 8

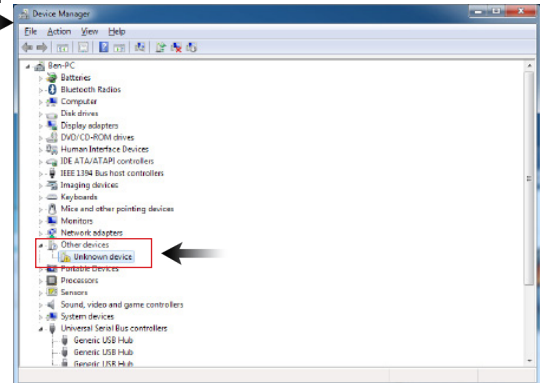
- 1** Download the driver, and connect the dyno to the pc using the micro-b USB cable.



Go to --> <http://minipro.wiki/downloads>

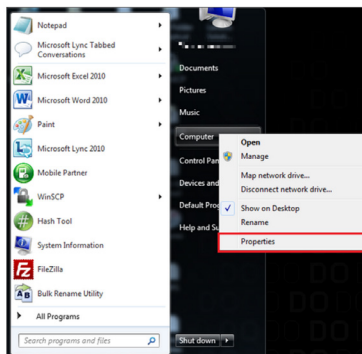
Download the latest driver and extract the driver to a new folder.

- 2** Open the "Device Manager"



NOTE: When you plug the dyno, a new communication port should appear when the driver was installed successfully.

- 3** To open the "Device Manager"



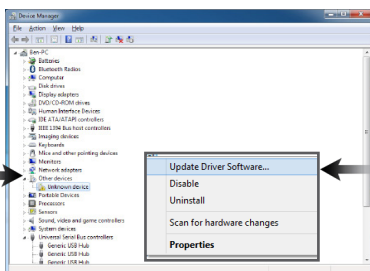
3.1. Go to --> right-click on Computer.

Click Properties

3.2. In the Properties window, click on Device Manager.



- 4** Select "Other Devices" and right click "Unknown device" and then select "Update Driver Software"



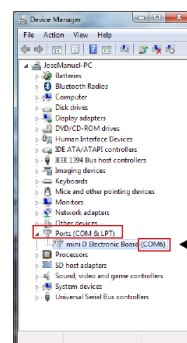
4.1. Select "Browse my computer..."

4.2. Select "Let me pick from a list."

4.3. Select "Have a disk" and locate the driver that was saved earlier.

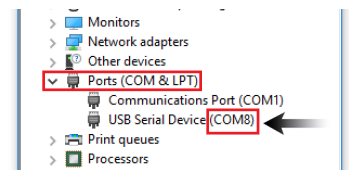
Note: If "Other devices" is not available, then check the USB connection, or otherwise, It might be possible that the driver was already been installed by windows.

- 5** Take note of the new communication port created by the electronic board driver.



OR

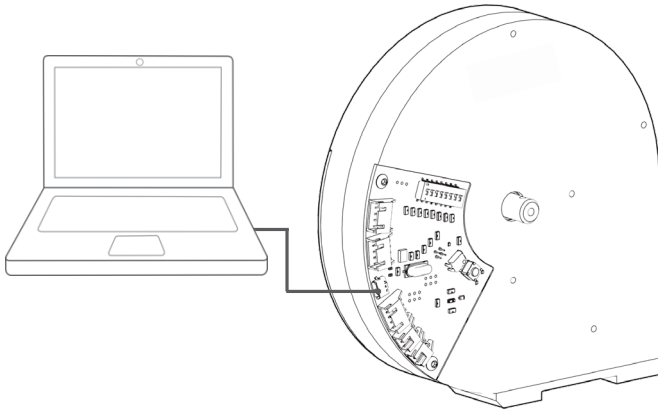
If the driver was automatically installed, it might be available under "Ports."



NOTE: The communication port is required to run the dyno. Above port number may differ from your pc.

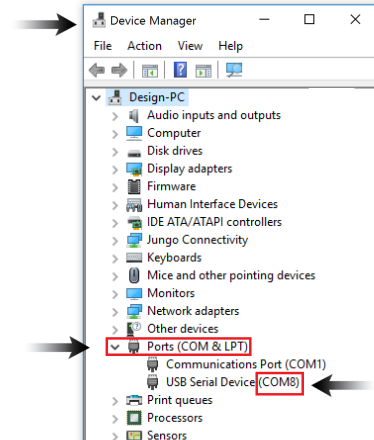
Electronic Board Driver Installation for Windows 10

- 1** Connect the dyno to the pc using the micro-b USB cable.



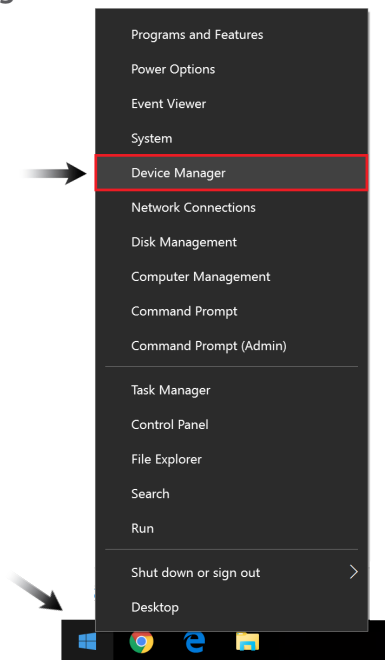
NOTE: It's not necessary to install the electronic board driver.
(Only on Windows 10 Operating Systems)

- 2** Verify the driver was automatically installed by opening the "Device Manager."

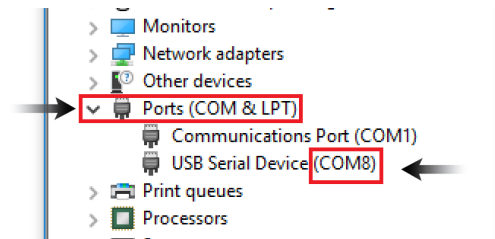


NOTE: When you plug the dyno, a new communication port should appear when the driver was installed successfully.

- 3** To open the device manager, right-click on the Windows Start Button, and click "Device Manager"



- 4** Take note of the new communication port created by the electronic board driver.



NOTE: The communication port is required to run the dyno.
Above port number may differ from your pc.

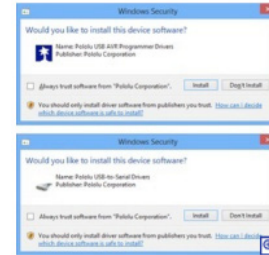
ESC Controller Sensor Driver Installation

- 1 Connect the sensor to the pc using the mini-b USB cable.



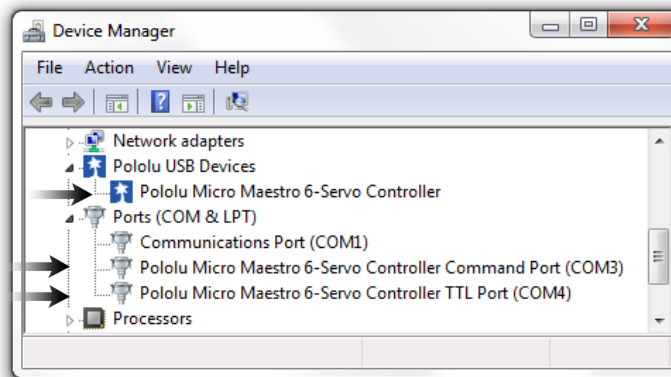
Go to --><http://support.miniprousa.com/095696-Drivers>
Download the latest driver and extract the driver to a new folder.

- 2 Run setup.exe.
The installer will guide you through the steps required to install the sensor.



During the installation, Windows will ask you if you want to install the drivers. Click "Install" (Windows Vista, Windows 7, and later).

- 3 After installing the drivers and plugging the ESC Controller Sensor in via USB, if you go to your computer's Device Manager, you should see three entries for the Sensor that look like what is shown below:



NOTE: After you completed a pololu driver installation, the two COM ports might not rename automatically. You must right click the COM port and select "Update Driver" on each one, or the sensor won't work properly.

- 4 **Done!**
If you have any questions, please go to support.miniprousa.com and submit a ticket.

SOFTWARE INSTALLATION

Install the Software

1 Download Software

Go to--> <http://support.miniprousa.com>

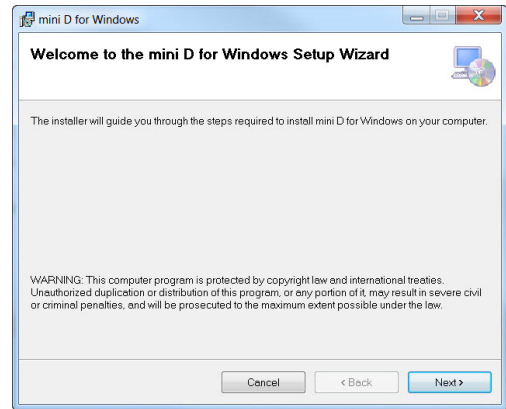
(Downloads->Softwares->Dyno Softwares)

Next, download the latest software and start the installation.

NOTE: You need a serial number to install the application.

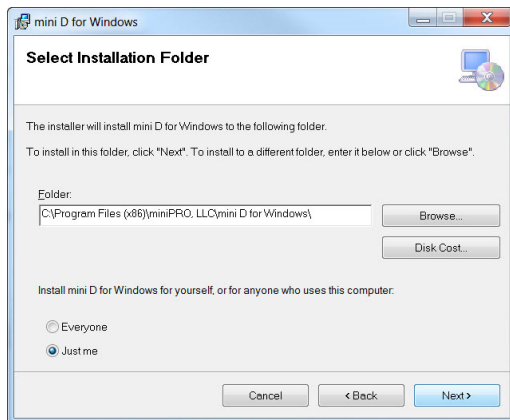
2

Read the Warning Notes and click "Next" if you agree.



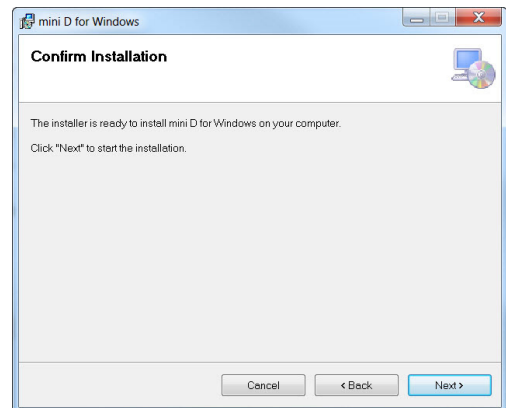
3

Select the location folder where "mini D" will be installed, and then select the person who can use the application. Click "Next."



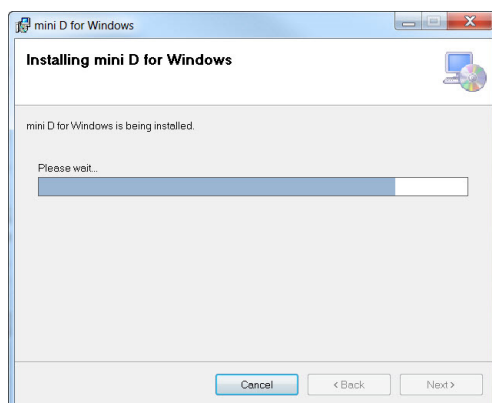
4

Confirm that you want to install "mini D" on your computer, and click "Next" to continue.



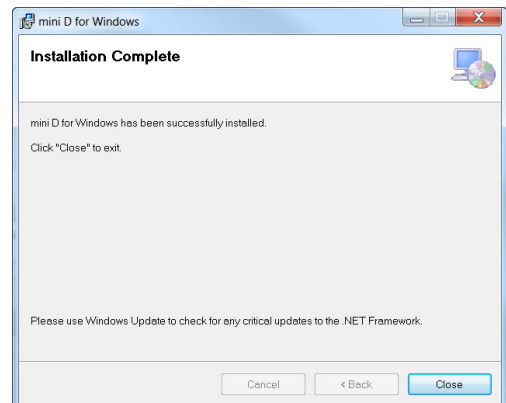
5

Wait a few minutes while "mini D" installs on your computer.



6

When installation finishes, click "Close" and you have successfully installed "Mini D" for Windows.



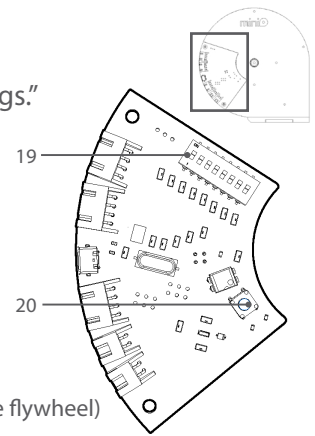
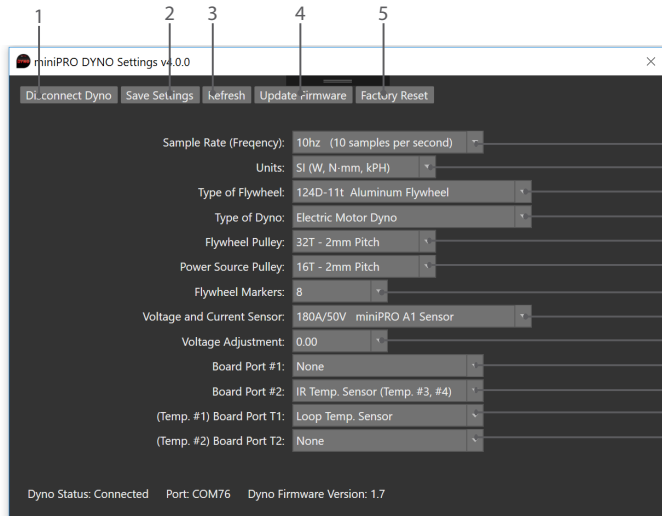
DYNO SETUP

General Settings for Dyno Board

To access the settings of your dyno, you must open the main application and select "Dyno Settings."

1. Connect/Disconnect the dyno to setup mode
2. Save the settings of your dyno
3. Refresh (re-load) the settings of your dyno
4. Update Firmware Icon

5. Factory reset your dyno settings
6. Set sample rate (Frequency)
7. Set the units of your dyno
8. Set the type of flywheel
9. Set the type of dyno
10. Set the flywheel pulley
11. Set the motor pulley (power source)
12. Number of flywheel markers (black tape on the flywheel)
13. Set the current sensor used
14. Voltage Adjustment
15. Port #1: for LCD
16. Port #2: for IR Temp.
17. Port T1: for Loop Temp. Sensor (Temp #1)
18. Port T2: for Loop Temp. Sensor (Temp #2)
19. Setting Switches
20. Reset Button



Electronic Board

SETUP MODE

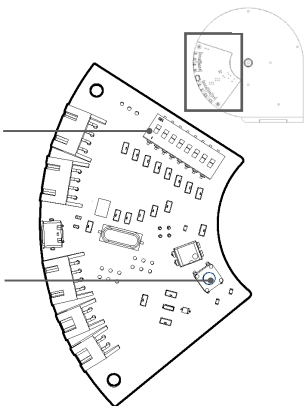
1 Enter Setup Mode

- 1.1. Open the main application
- 1.2. Select "Connect Dyno"
- 1.3. Change *only* Switch #8 to ON (Pin #3 for v2.1 Boards).
- 1.4. Press the Reset button 1-2 times on the board.
- 1.5. The Settings application should load automatically.
- 1.6. (Optional) If the settings application did not load automatically, select "Dyno Settings" and follow the screen instructions.



Switches

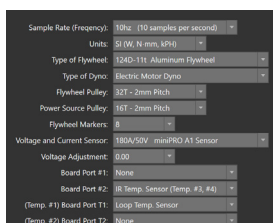
Reset Button



Electronic Board

3 Change your Settings

- 3.1. Select your desired settings
- 3.2. Select "Save" to complete your settings.



4 Change your Switches

- 4.1. When finished, select "Disconnect."
- 4.2. Change *only* Switch #8 to OFF.
- 4.3. Close the Settings Application.
- 4.4. Done! The main application should load automatically.

FIRMWARE UPDATE

General Guide for Dyno Board v2.0

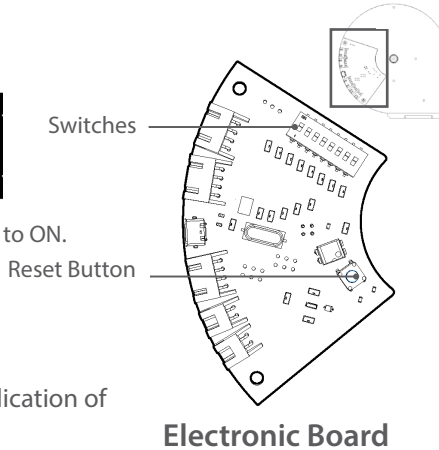
1

Enter Setup Mode



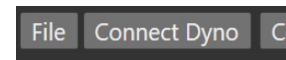
- 1.1. Change *only* Switch #8 (Pin#3 for v2.1 Boards) to ON.
- 1.2. Press the Reset button on the board.
- 1.3. Open miniPRO Application.
- 1.4. Select "Dyno Settings"

NOTE: Make sure you installed the latest application of miniPRO Dyno before you continue.



2

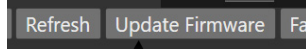
Establish a Connection



NOTE: Make sure *only* Switch #8 is ON.

3

Update the Firmware of your electronic



- 3.1. Select "Update Firmware."
- 3.2. Locate the latest firmware you like to install.
- 3.3. Select "OK" to continue with the update.
- 3.4. Select "OK" after the update is completed.
- 3.5. A Factory reset must start automatically.
- 3.6. Modify your dyno settings.
- 3.7. Select "Save" to complete your settings.
- 3.8. Select "Disconnect."
- 3.9. Change *only* Switch #8 to OFF, press the reset button and close the application.

4

Perform a Factory Reset



- 4.1. If the automatically factory reset from step 3.5 worked; then go to step no. 5.
- 4.2. Select "Factory Reset."
- 4.3. Select "OK" to continue.
- 4.4. Select "OK" to after factory reset is completed.
- 4.5. Modify your dyno settings.
- 4.6. Select "Save" to complete your settings.
- 4.7. Select "Disconnect."
- 4.8. Change *only* Switch #8 to OFF, press the reset button and close the application.

NOTE: Make sure *only* Switch #8 is ON; otherwise, the factory reset will not be successful.

5

Done!

If you have any questions, please open a support ticket in support.miniprousa.com.

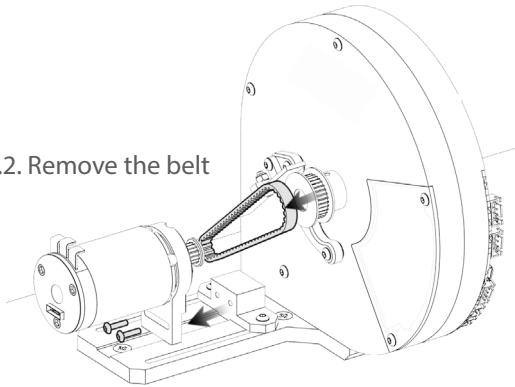
FLYWHEEL CHANGE

Flywheel Replacement Instructions

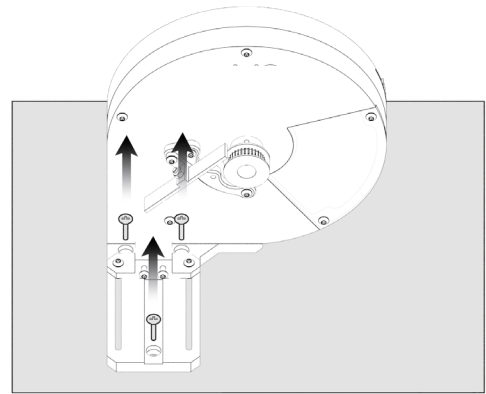
1 Unscrew on the Motor

5.2. Remove the belt

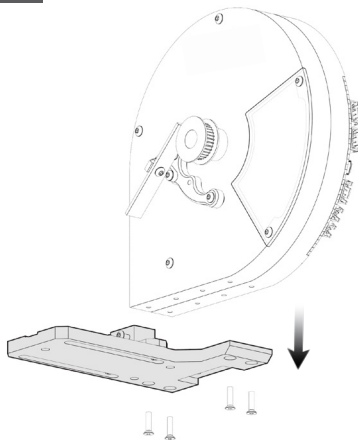
5.1. Unscrew the motor holder



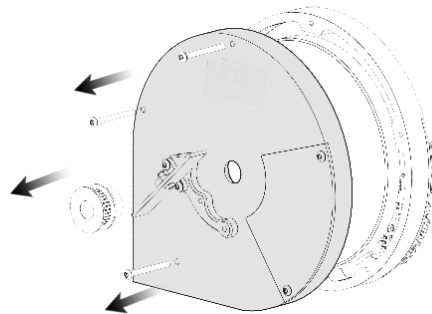
2 Unscrew the Dyno from the Baseboard



3 Remove the Base

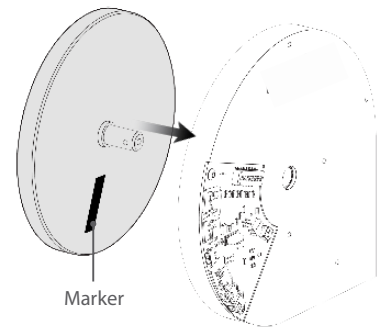


4 Remove the Flywheel Pulley and Front Cover



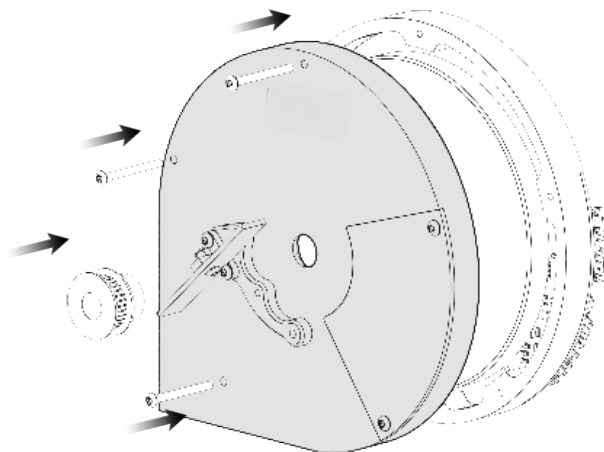
Note: Need to remove the pulley first before removing the front cover.

5 Replace the Flywheel

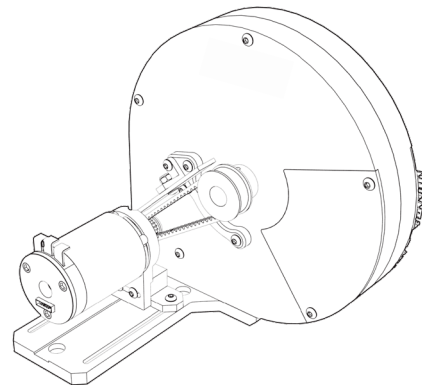


Note: Make sure the marker (black tape) is facing the electronic board.

6 Install the Flywheel Pulley and Cover



7 Assemble the Dyno

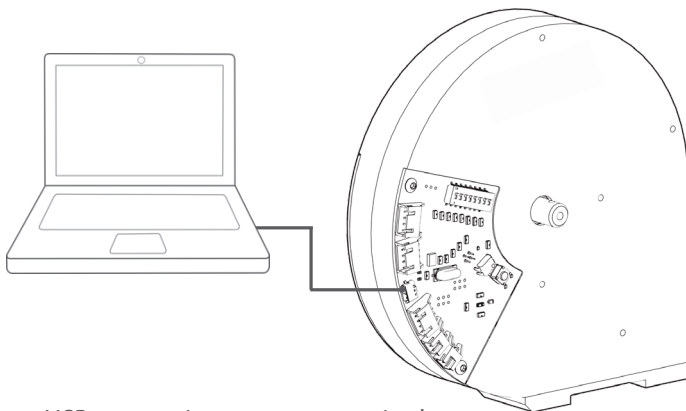


Note: For assembly information please go-to page no. 7 on the instruction manual.

TESTING MOTORS

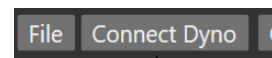
Manual Mode (Ex. Using R/C Transmitter or Servo Tester)

1 Connect the dyno to the PC using the micro USB cable.

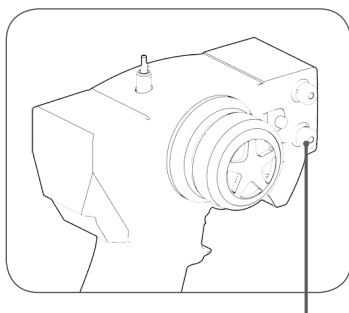


NOTE: (2) two USB connection ports are required.

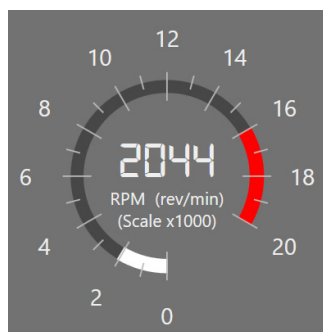
2 Open the Application, and select the click "Connect."



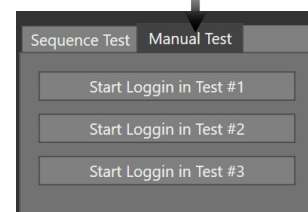
3 Move the motor with your transmitter or servo tester and try to keep a constant RPM.



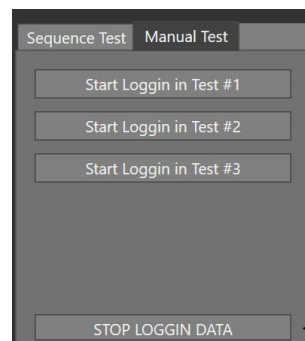
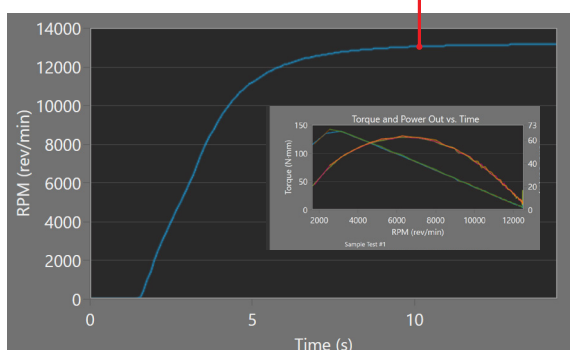
NOTE: By adjusting the throttle trim you can keep a constant RPM.



4 Click "Manual Test Tab" following the Test number (Start Logging) you would like the graph to show and quickly increase the throttle to max.

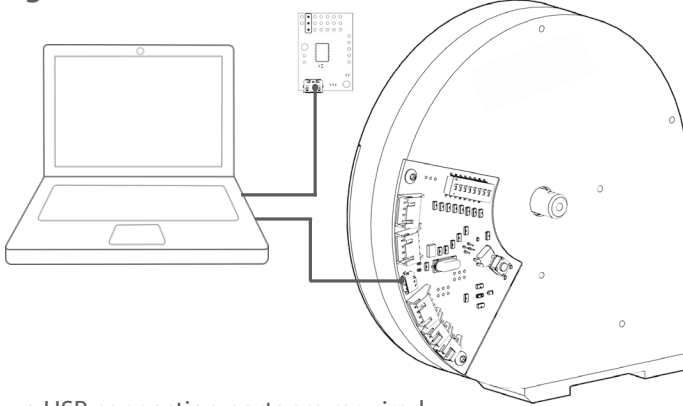


5 When you reach maximum RPM, click "Stop Logging Data."



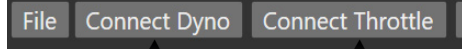
Sequence Mode (Ex. Using Th. Controller Sensor for Servo and ESC)

- 1** Connect the dyno to the PC using the micro-b USB cable, and connect the Throttle Controller Sensor to the PC using the mini-b USB cable.



NOTE: (2) two USB connection ports are required.

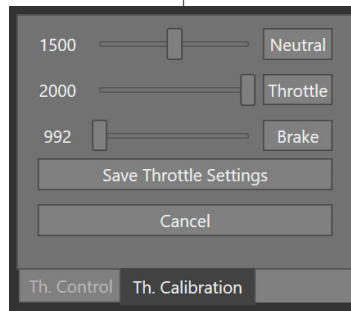
- 2** Open the Application, and select the click "Connect."



WARNING: You MUST have the motor disconnected from the power.

3A Calibrate Throttle for ESC

- 3.1. If you already performed the calibration; please ignore this step.
- 3.2 Click on "Th. Calibration Tab" below the Manual Throttle Slider.
- 3.2. Set your ESC to Calibration Mode; and click once the "Neutral, Throttle, and Brake buttons when your ESC's requires it.
- 3.3. Click "Save Throttle Settings."

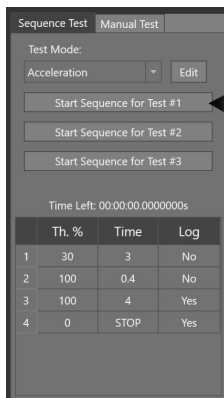


3B Calibrate Throttle for Servo

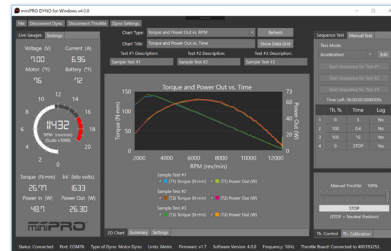
- 3.1. If you already performed the calibration; please ignore this step.
- 3.2 Click on "Th. Calibration Tab" below the Manual Throttle Slider.
- 3.2. Set your Servo to "Neutral, Throttle, and Brake by draggin each slider to the desired position.
- 3.3. Click "Save Throttle Settings."

NOTE: FOR YOUR SAFETY, to perform any calibration, you must have the motor power-off.

4 Click "Sequence Test Tab" following the Test number you would like the graph

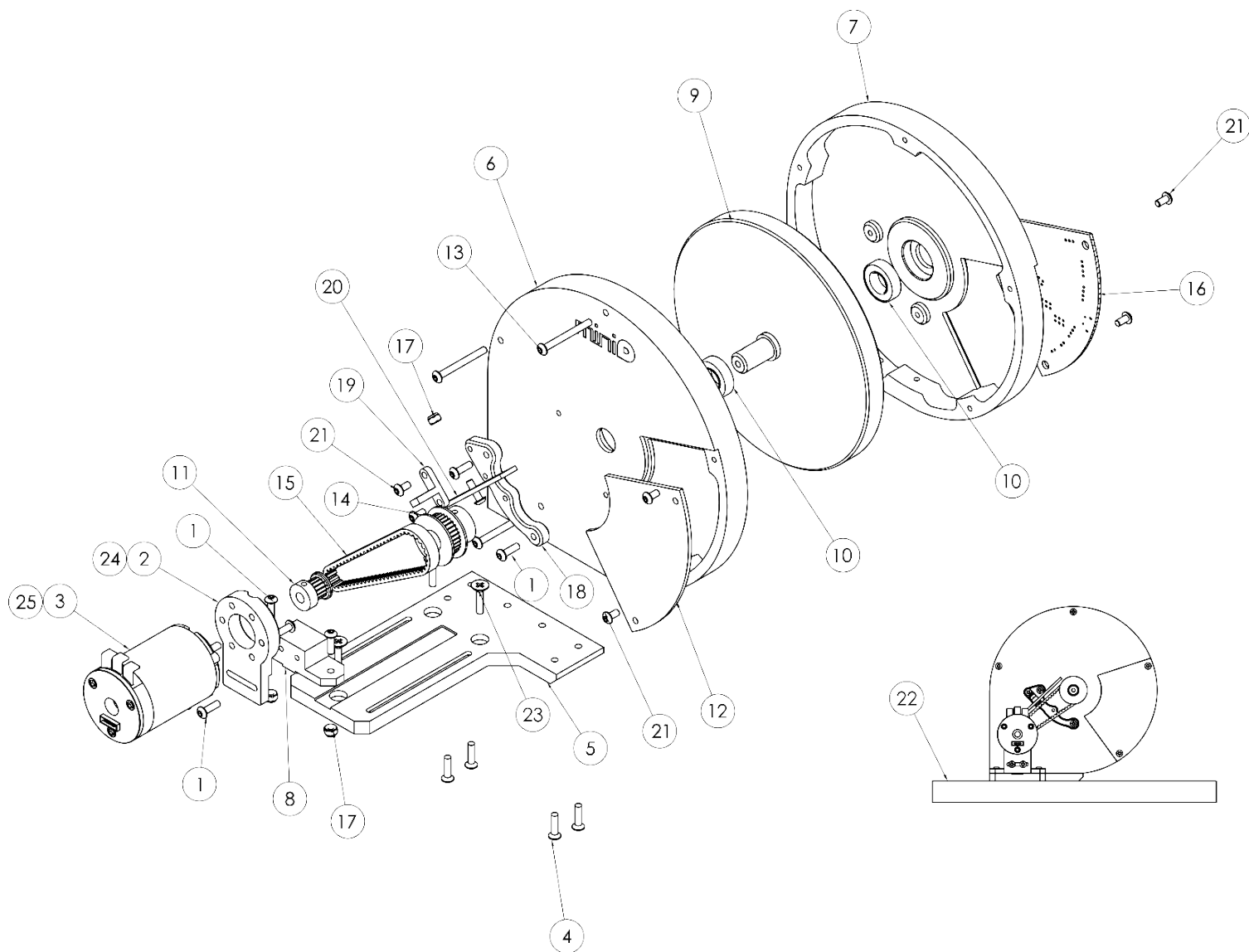


- 4.1. After you click "Start Sequence for Test #1, 2 or 3" the test will begin.
- 4.2. You can modify the sequence settings at any time by clicking "Edit"
- 4.3. Done!



NOTE: You can cancel the Sequence Test at any time by clicking the "STOP" button.

PART LIST



ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL
1	9	0753340770187	ROUND HEAD SCREW - HEX M3X0.5 X 10	STAINLESS STEEL
2	1	0753340770064	540/550 MOTOR HOLDER	ALUMINUM 6061
3	1	NOT INCLUDED	540 OR 550 MOTOR	-
4	4	0753340770293	FLAT HEAD SCREW - HEX M3X0.5 X 12	STAINLESS STEEL
5	1	0753340770040	FLYWHEEL BASE	ALUMINUM 6061
6	1	0753340770002	FR. FLYWHEEL COVER	ALUMINUM 6061
7	1	0753340770019	RR. FLYWHEEL COVER	ALUMINUM 6061
8	1	0753340770057	SLIDER BLOCK	ALUMINUM 6061
9	1	0753340770026	FLYWHEEL, 124D ALU.	ALUMINUM
10	2	0753340770101	DG BEARING: 19X10X5	STEEL
11	1	0753340770262	PULLEY GT2: 16T 3.175ID	ALUMINUM 6061
12	1	0753340770095	CLEAR WINDOW COVER	ACRYLIC, CLEAR
13	3	0753340770170	ROUND HEAD SCREW - HEX M3X0.5 X 30	STAINLESS STEEL
14	1	0753340770125	PULLEY GT2: 32T 10ID	ALUMINUM 6061
15	1	0753340770132	BELT GT2: 78T 6MM	NYLON 6
16	1	0753340770149	MINID V1 ELECTRONIC BOARD	ABS PLASTIC
17	3	0753340770156	FLANGE NUT: M3 X0.5	STEEL
18	1	0753340770071	SHIELD HOLDER BRACKET	ALUMINUM 6061
19	1	0753340770088	SHIELD HOLDER	ALUMINUM 6061
20	1	0753340770163	BELT SHIELD	ACRYLIC, CLEAR
21	6	0753340770279	ROUND HEAD SCREW - HEX M3X0.5 X 6	STAINLESS STEEL
22	1	NOT INCLUDED	BASEBOARD: 10" X 10" X 3/4"	WOOD OR MDF BASE BOARD
23	3	0753340770293	FLAT HEAD SCREW - PHILLIPS #8 X 3/4"	STAINLESS STEEL
24	1	0753340770033	OUTRUNNER MOTOR HOLDER	ALUMINUM 6061
25	1	NOT INCLUDED	OUTRUNNER MOTOR	-

miniPRO
ELECTRIC MOTOR DYNO

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