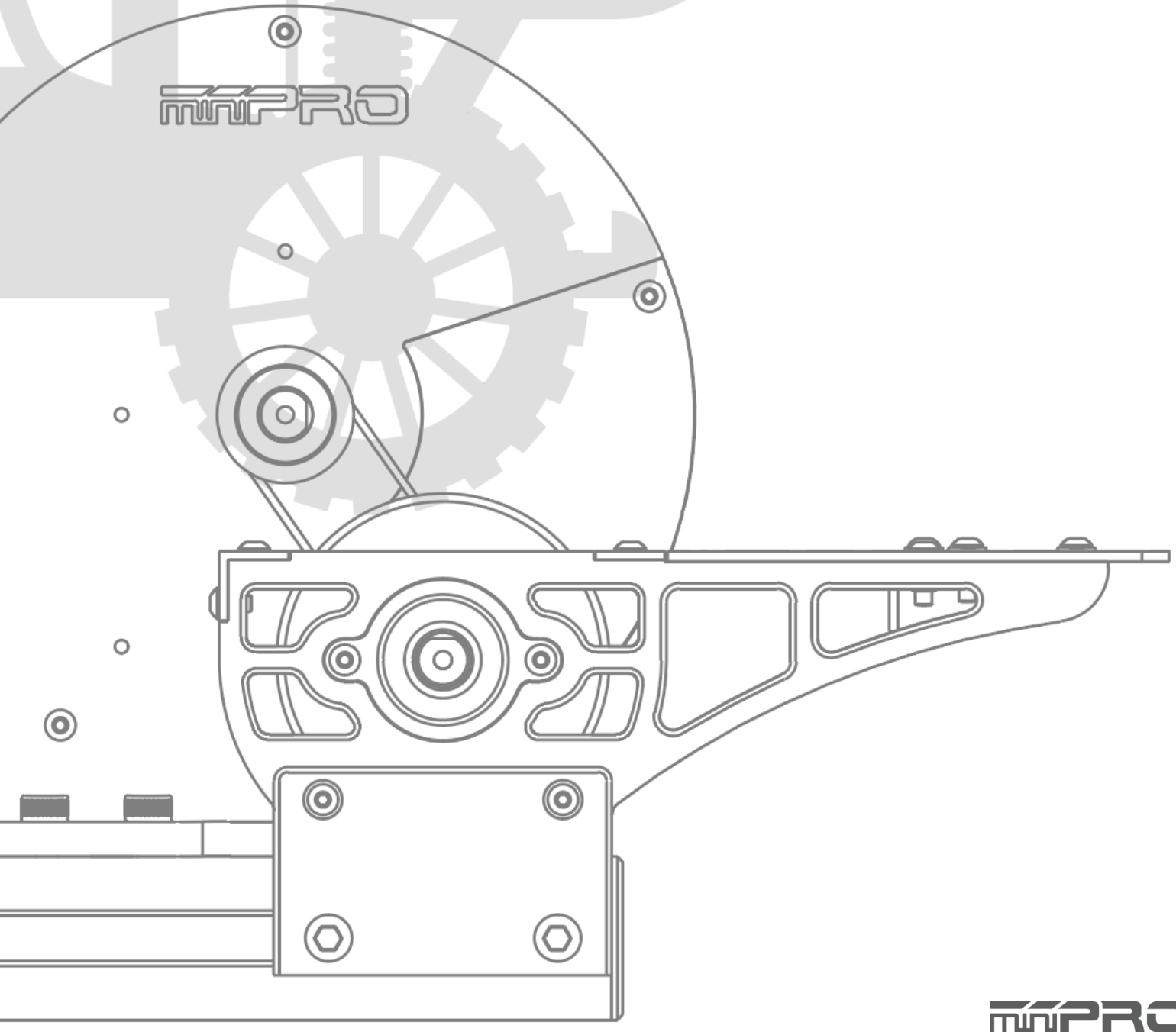
CHASSIS DYNO V2

Instruction Manual

REV2.1



USING THIS GUIDE

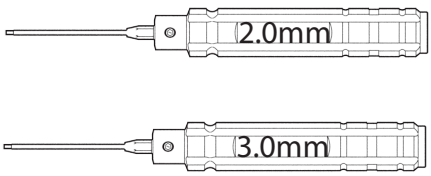
Before Using the Dyno

This dyno is a high-quality analyzing tool intended for persons aged 18 years and older with previous experience building and operating Radio Control vehicles. 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.

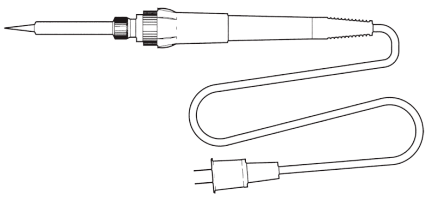
Before building and operating your dyno, YOU MUST read through all of the operating instructions and instruction manual and fully understand them to get the maximum enjoyment and prevent unnecessary damage. Read carefully and fully understand the instructions before beginning assembly. Contents of the 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

Hex: 2.0mm, 3.0mm

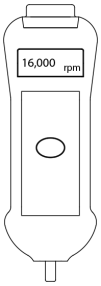


Soldering Iron



* Only for Electric Vehicles

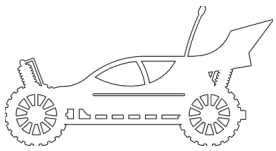
IR Tachometer (Optional)



EQUIPMENT REQUIRED

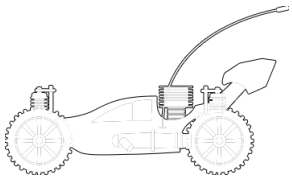
Vehicle

Electric Powered

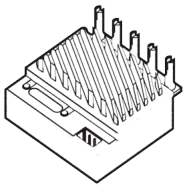


OR

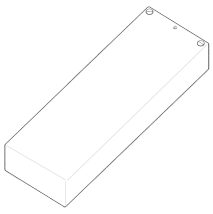
Gas Powered



Electronic Speed Control (ESC)



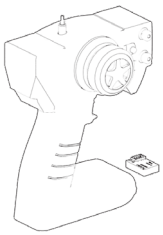
Battery



* Only for Electric Vehicles

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

CONTENTS

CONTENTS

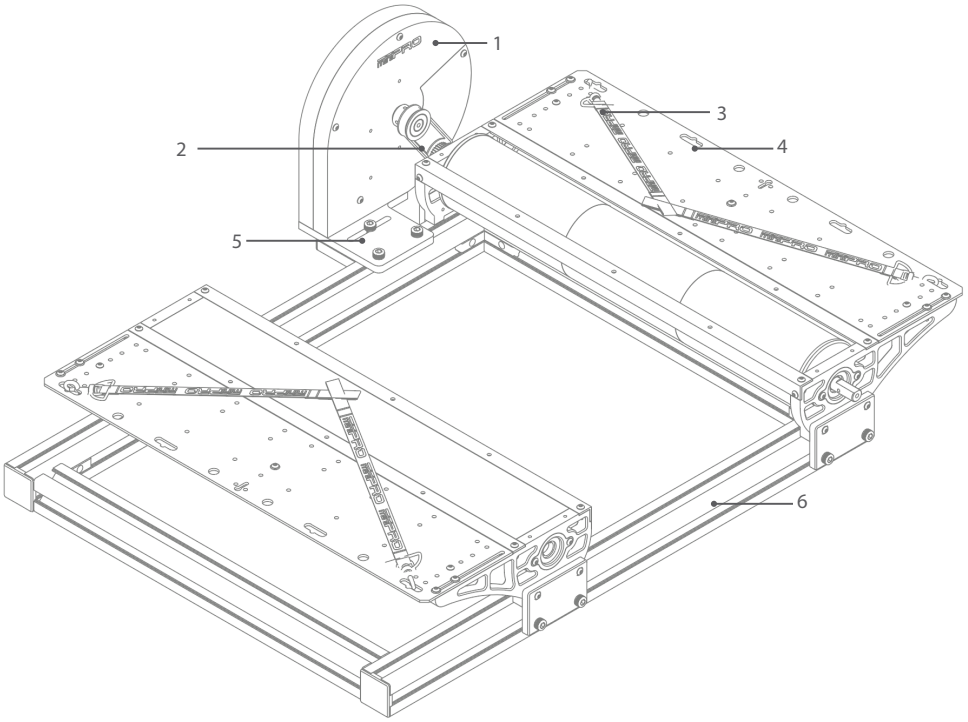
DYNO FEATURE HIGHLIGHTS

This is a universal chassis dynamometer (dyno) that is ready to test gas or electric vehicles out of the box. Featuring an onboard electrical board equipped with an optical rpm sensor that measures motor speeds at up to 50,000 rpm. The board is also equipped with external ports for an external LCD screen, throttle controller, and different types of sensors for measuring voltage, current, and temperature.

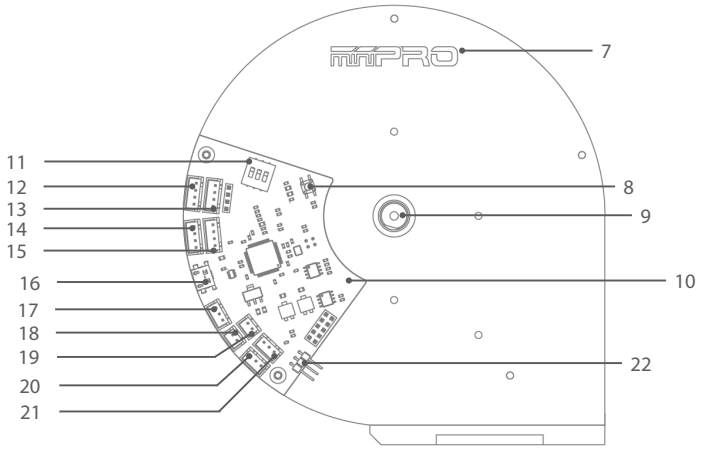
Its adjustable wheelbase and upper deck give the option to test different sizes of vehicles (TC, Truck, Buggies, Motorcicles, etc). A balanced flywheel (inertia mass) is enclosed by a high grade aluminum 6061 cover to provide safety. The flywheel is replaceable, that means you are not limited to the 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. Flywheel Unit
2. Belt (200T)
3. Belt Straps
4. FR/RR Upper Deck
5. Flywheel Base
6. Extruded Frame



7. Rear Cover
8. Reset
9. Flywheel
10. Dyno Controller Board
11. Switches
12. LCD / UART Port
13. Temp. X Port
14. Voltage and Current Sensor Port
15. RPM Ext. Port
16. USB Micro Port
17. Flow Sensor Port
18. Temp. Port #1
19. Temp. Port #2
20. Auxiliary Port#1
21. Auxiliary Port#2
22. SERVO / ESC Port *



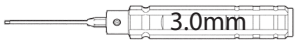
* May not be included in your kit. Please verify the included accessories in your purchased kit.

ASSEMBLY GUIDE

Part I. Frame Assembly

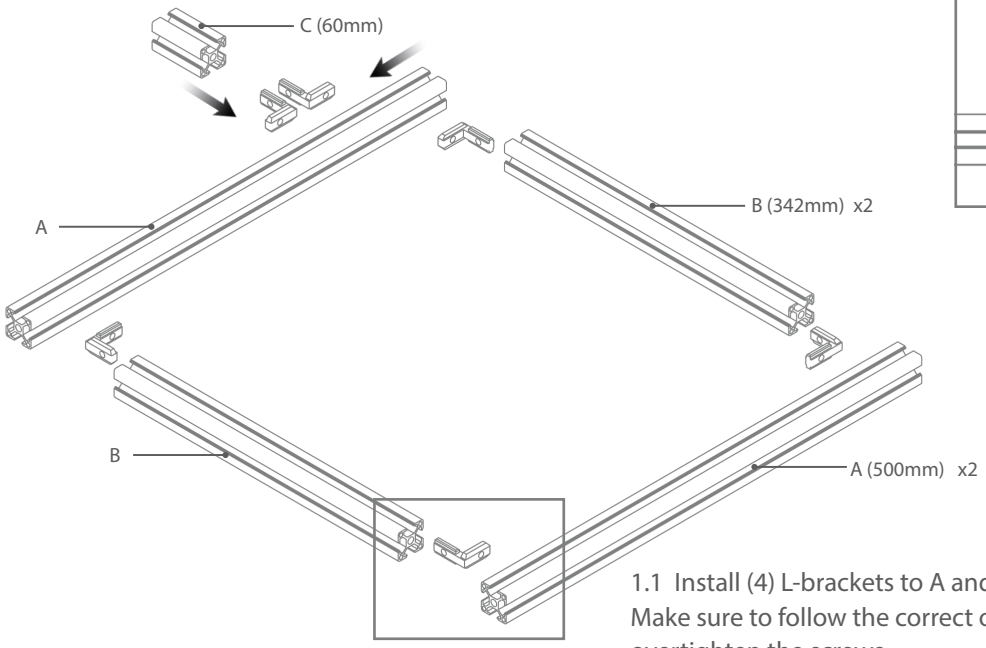
Build Time: 10min

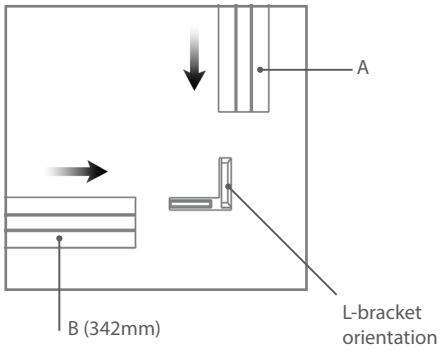
Tools



1 Install L-brackets to the extruded frames

Note: Do not overtighten the screws yet because later it will need adjustment.

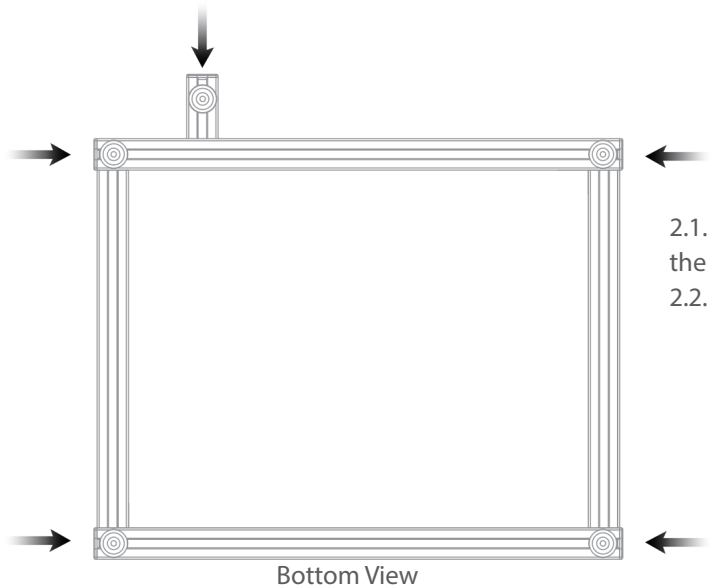




1.1 Install (4) L-brackets to A and B extruded frames on all (4) corners. Make sure to follow the correct orientation for each L-bracket. Do not overtighten the screws.

1.2 Install (2) L-brackets to the C extruded frame. Do not overtight the screws.

2 Install the edge covers and rubber feets



Bottom View

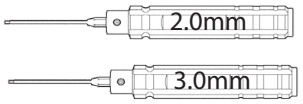
2.1. Install (5) rubber feets with T-nuts at the bottom of the chassys dyno.

2.2. Install the (5) plastic edge covers.

Part II. Roller Holder Assy.

Build Time: 20min

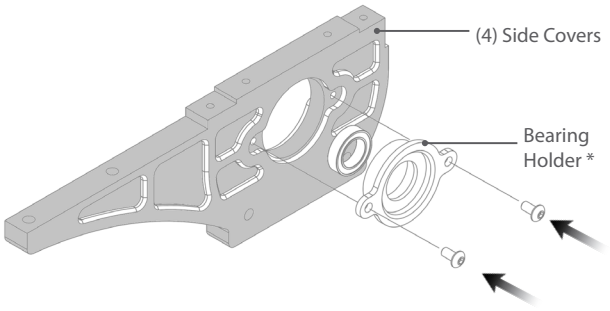
Tools



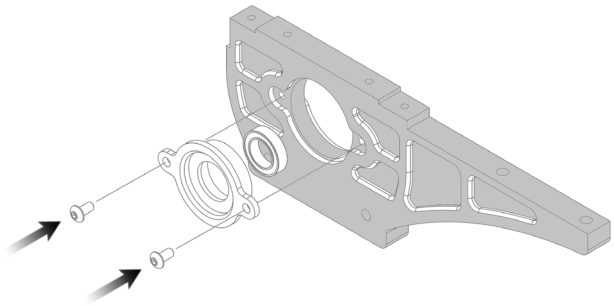
3 Install the bearing holders to the side covers *

Note: Make sure you install (2) left side and (2) right side bearing holders.

(2) Left Side Cover



(2) Right Side Cover

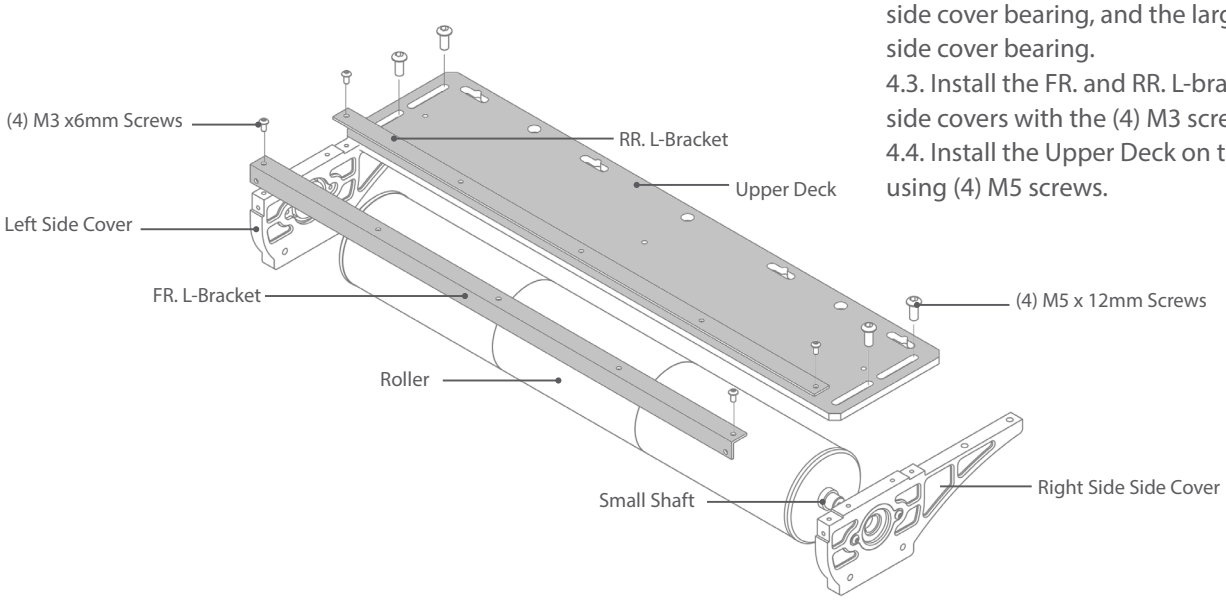


3.1. Make sure the bearing is installed on the bearing holder.
3.2. Install the bearing holder on the Side Cover using (2) M3x6mm hex screws
3.3. Repeat the process for the remaining side covers. Make sure you install (2) left side and (2) right side.

4 Install rollers, side covers, upper deck, and L-shape brackets *

Note: Do not overtighten the screws.

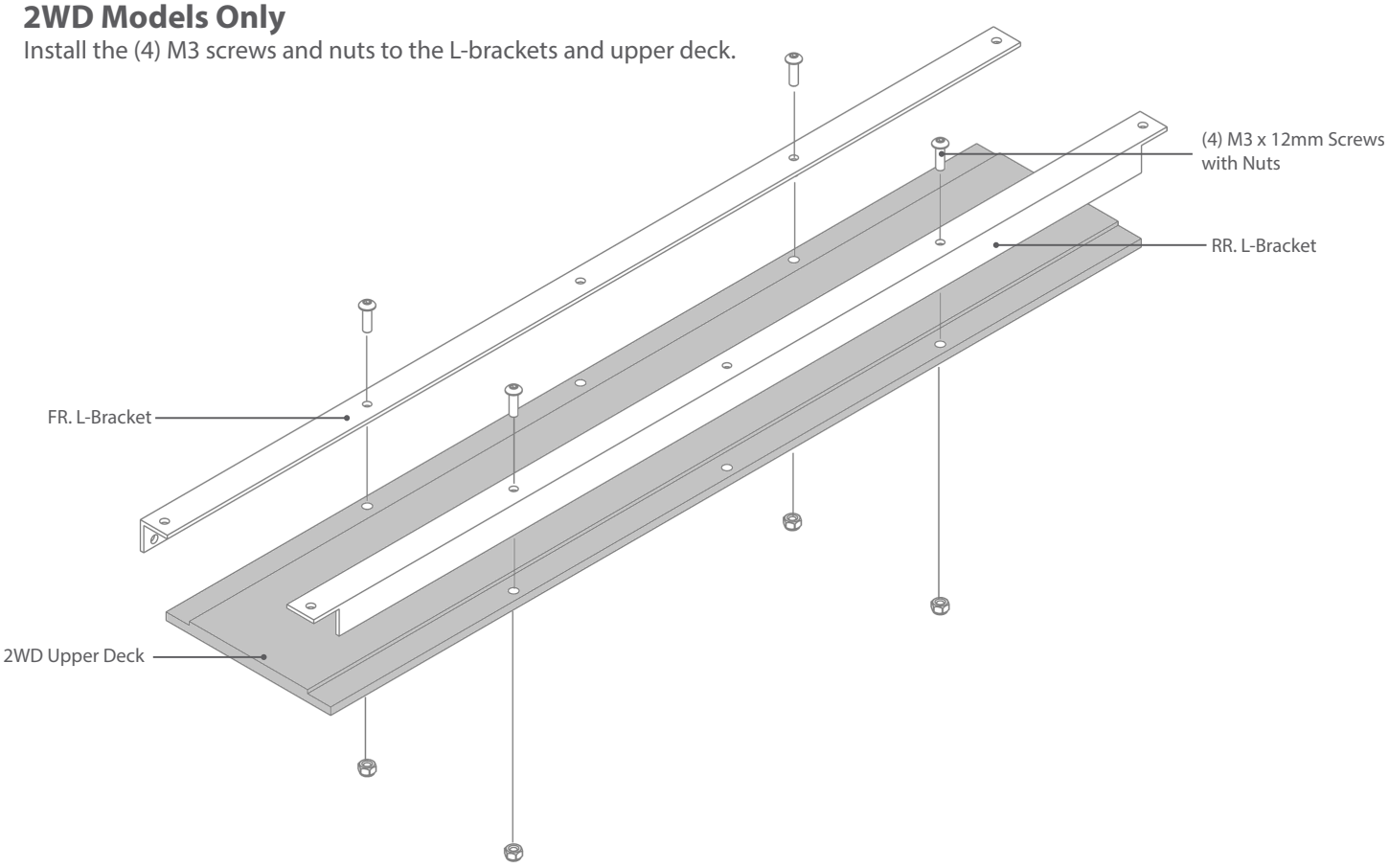
4.1. For 2WD Models see page 8 and skip step 4.2.
4.2. Insert the roller's smallest shaft on the right side cover bearing, and the larger shaft on the left side cover bearing.
4.3. Install the FR. and RR. L-brackets to the both side covers with the (4) M3 screws.
4.4. Install the Upper Deck on the side covers using (4) M5 screws.



* For 2WD models, only (2) two bearing holders and (1) one roller are installed.

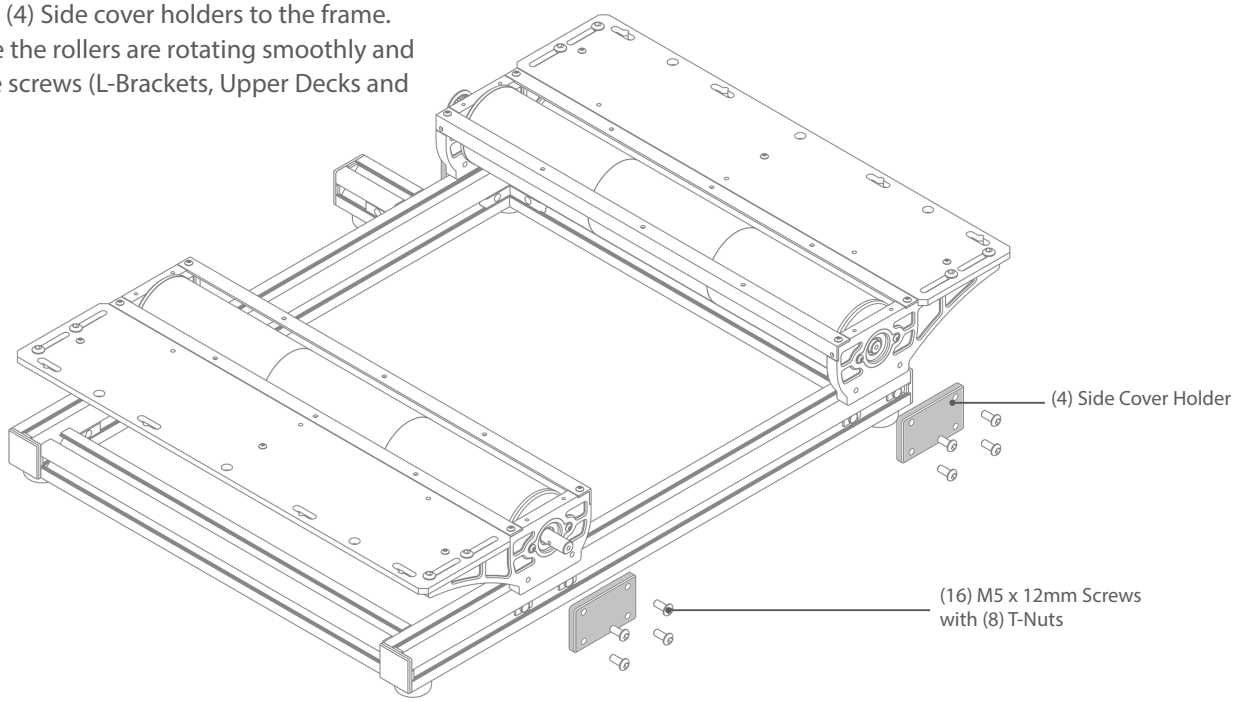
2WD Models Only

Install the (4) M3 screws and nuts to the L-brackets and upper deck.

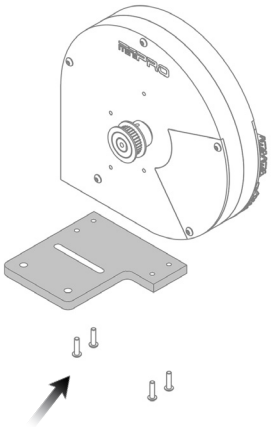


5 Install the Side Cover Holders to the Frame

5.1. Install the (4) Side cover holders to the frame.
5.2. Make sure the rollers are rotating smoothly and tighten all the screws (L-Brackets, Upper Decks and Frames)



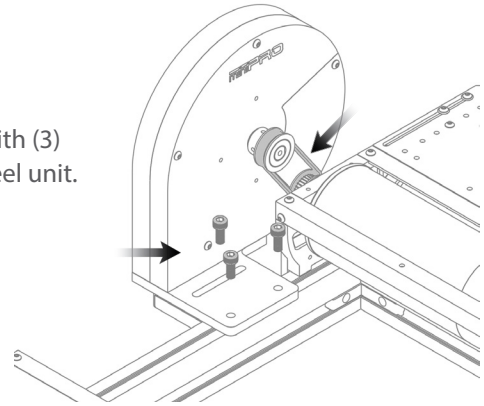
6 Install the Flywheel Base



Install the (4) M3 screws below the flywheel base

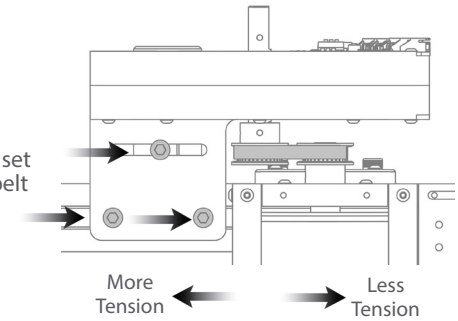
7 Install the Flywheel Assy. , Pulley and Belt

Install (4) M5 screws with (3) T-nuts to fix the flywheel unit.



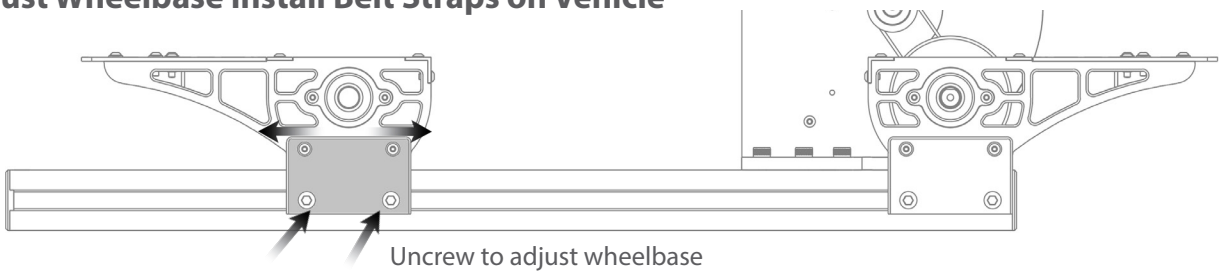
NOTE: If you are using your Motor Dyno Flywheel Assy then you need to remove the belt shield and holder from the dyno.

8 Adjust Belt Tension



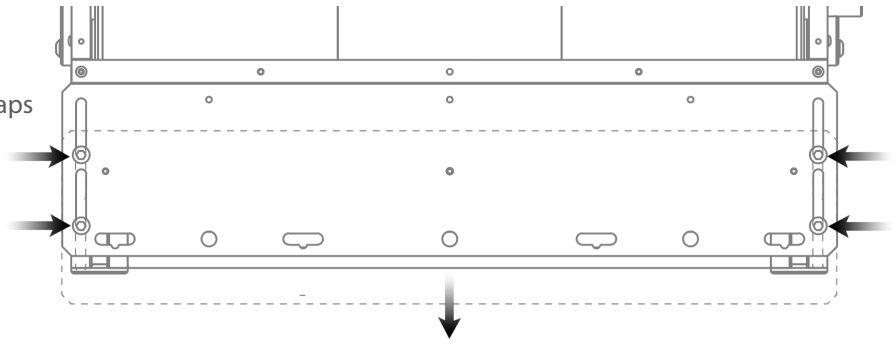
NOTE: Make sure you don't apply too much tension (load) to the flywheel unit to damage in the flywheel.

9 Adjust Wheelbase Install Belt Straps on Vehicle



10 Adjust Tension of the Belt Straps

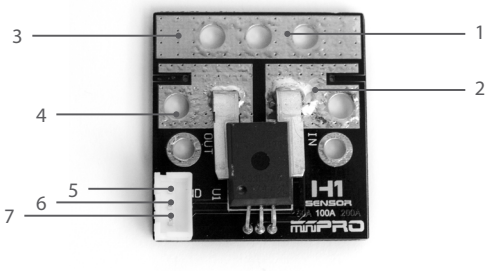
Uncrew to adjust upper deck and tension of the straps



ELECTRONIC CONNECTIONS

MINIPRO H1 Voltage and Current Sensor Connection

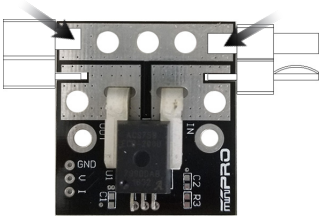
Voltage and Current Sensor Diagram



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

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

1 Solder Wires or Connectors

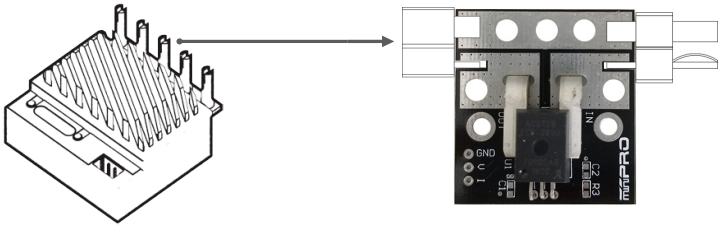


Solder the connectors of your preference OR 14 gauge wires. Try to keep the wires as short as possible to reduce the electrical losses

2 Connect Transmitter, Receiver, and ESC to the Motor

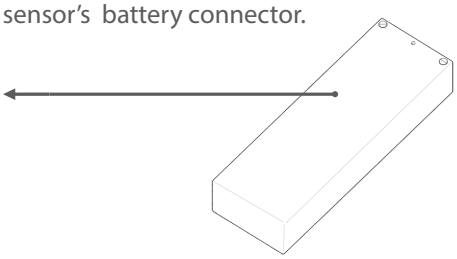
Please refer to the ESC, Transmitter, and Receiver manufacturers' instruction manual.

3 Connect Sensor



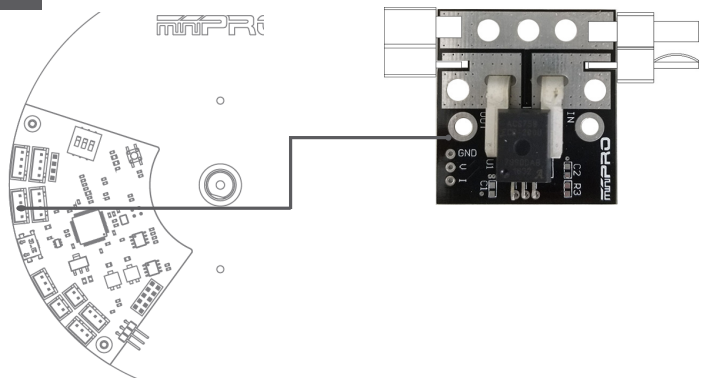
3.1. Connect the ESC's battery port to the sensor's ESC connector. See above sensor diagram for more information.

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

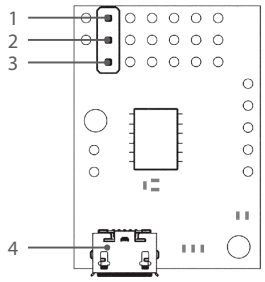


IMPORTANT: You must calibrate the sensor each time the dyno is powered.

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.

Throttle Controller Sensor Connection

ESC/Servo Controller Diagram

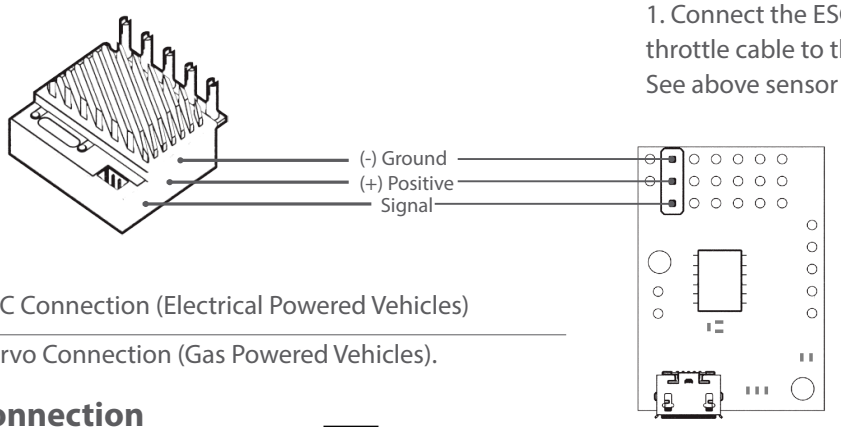


1. (-) Ground
2. (+) Positive
3. Signal
4. USB mini-b port

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

1 ESC Connection

1. Connect the ESC's throttle OR the Servo's throttle cable to the sensor's throttle port. See above sensor driagram for more

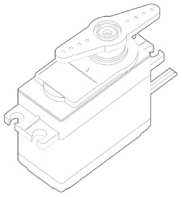


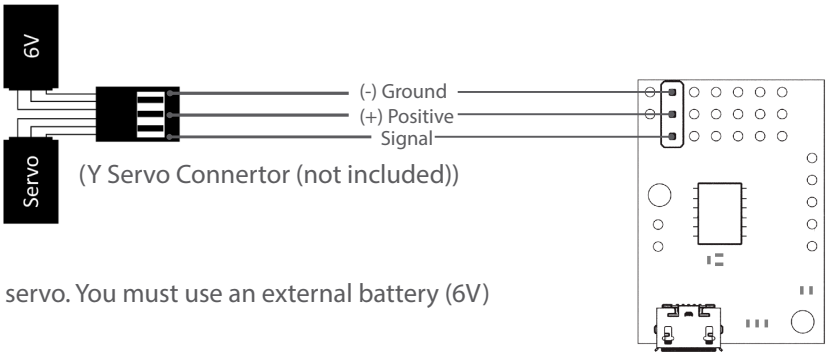
OR

ESC Connection (Electrical Powered Vehicles)

Servo Connection (Gas Powered Vehicles).

Servo Connection





NOTE: The throttle sensor can not power a servo. You must use an external battery (6V) to use the servo.

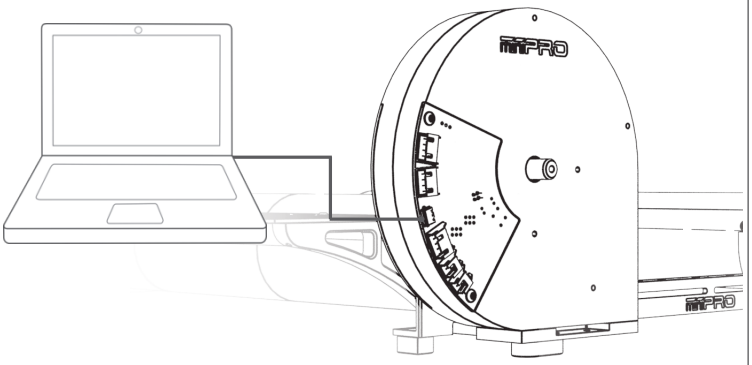
2 Connect the Controller Board to PC

NOTE: To install driver, please refer to page 14 of this manual.

DRIVER INSTALLATION

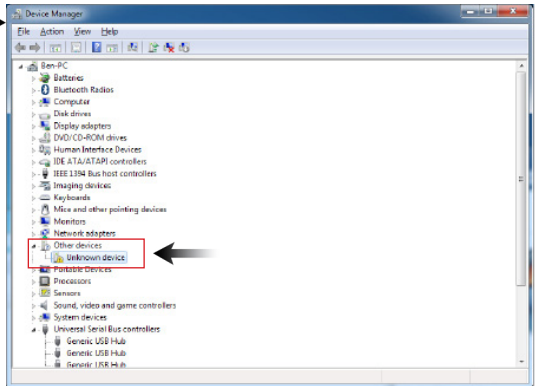
Electronic Board Driver Installation for Windows 7 and 8

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



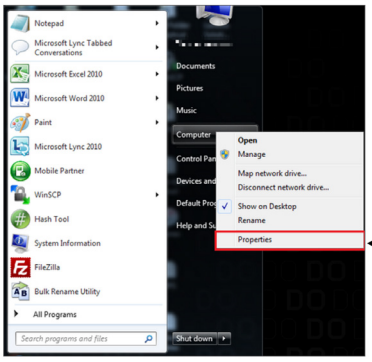
Go to -->https://support.minipro.com/095696-Drivers and download the latest driver and extract the driver to a new folder.

2 Open the "Device Manager"



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

3 To open the "Device Manager"

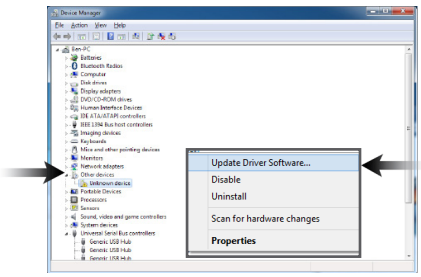


3.1. Go to --> right-click on Computer.

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"



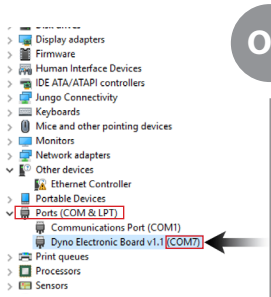
4.1. Select "Browse my computer..."

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

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

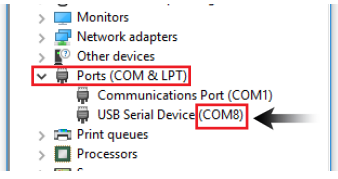
Note: If "Other devices" is not available, then check the USB connection, or otherwise, It might be possible that the driver was already been installed by windows.

5 Take note of the new comunication port created by the electronic board driver.



OR

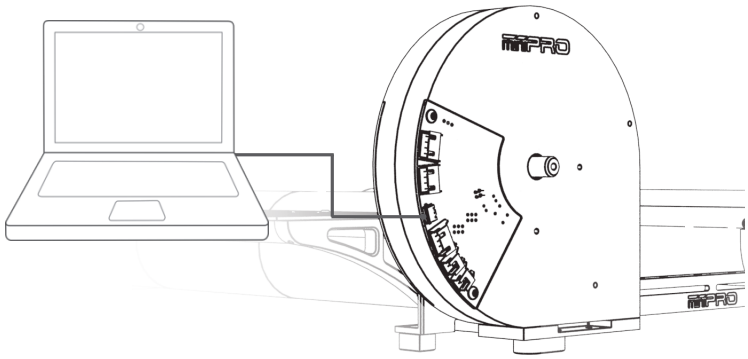
If the driver was automatically installed, it might be available under "Ports."



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

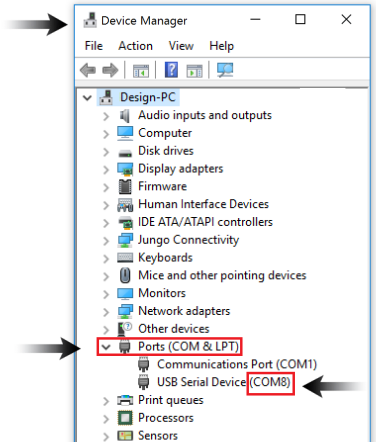
1 Connect the dyno to the pc using the micro-b USB cable.



Go to -->https://support.minipro.com/095696-Drivers and download the latest driver and extract the driver to a new folder.

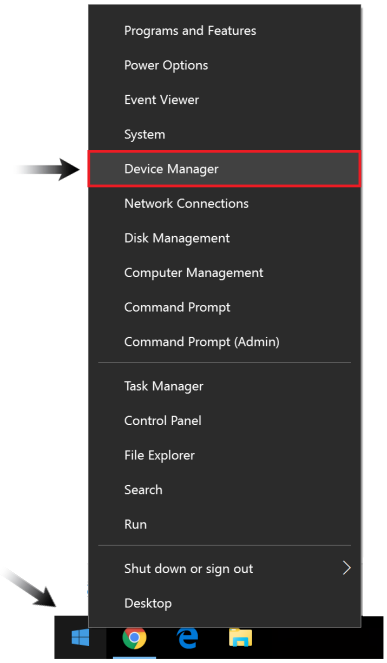
NOTE: The electrinic board driver is installed automatically by Windows 10; however, you must update the driver..

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

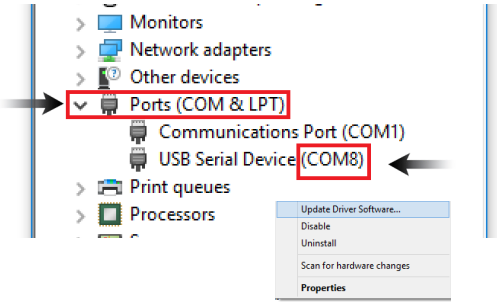


NOTE: When you plug the dyno, a new comunication port should appear when the driver was installed successfully.

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



4 Take note of the new comunication port created by the electronic board driver.



4.1. Right Click and select "Update Driver Software"

4.2 Select "Browse my computer..."

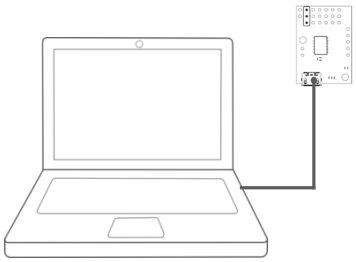
4.3. Select "Let me pick from a list.."

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

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

ESC Controller Sensor Driver Installation

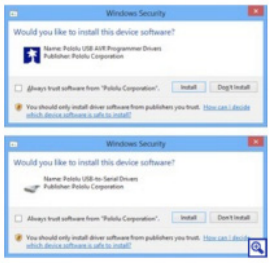
1 Connect the sensor to the pc using the mini-b USB cable.



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

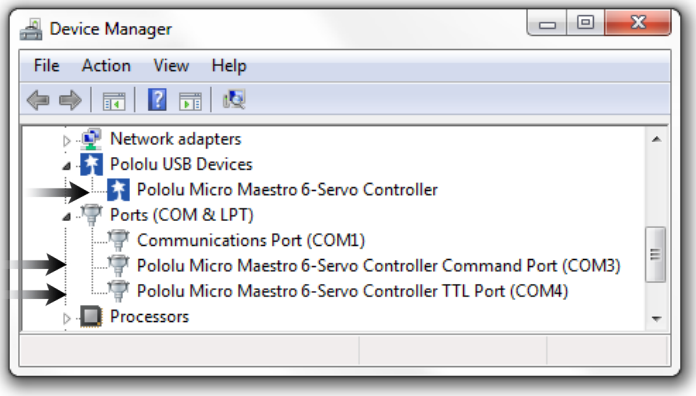
2 Run setup.exe.

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

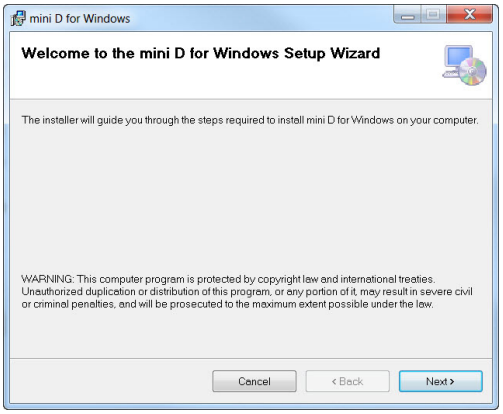
Install the Software

1 Download Software

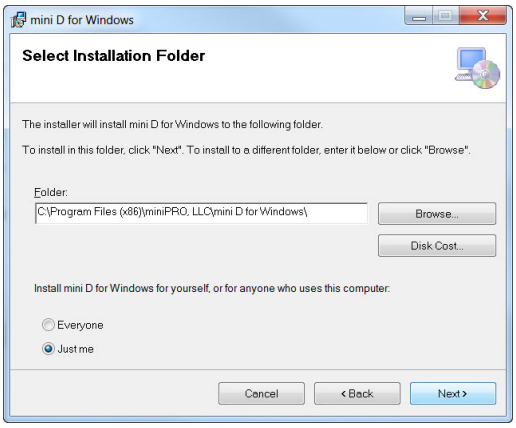
Go to--> https://support.minipro.com/153753-Dyno-Softwares

Next, download the latest software and start the installation.

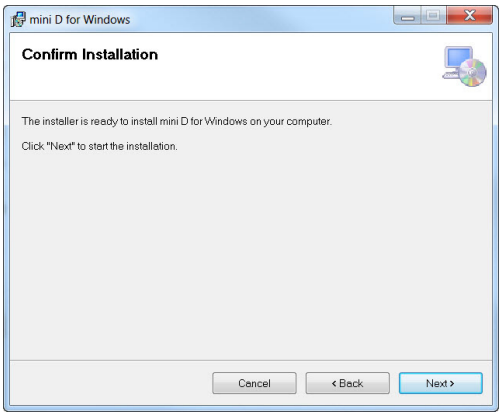
2 Read the Warning Notes and click "Next" if you agree.



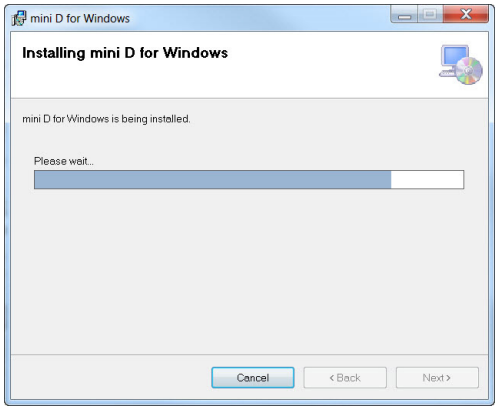
3 Select the location folder where "mini D" will be installed, and then select the person who can use the application. Click "Next."



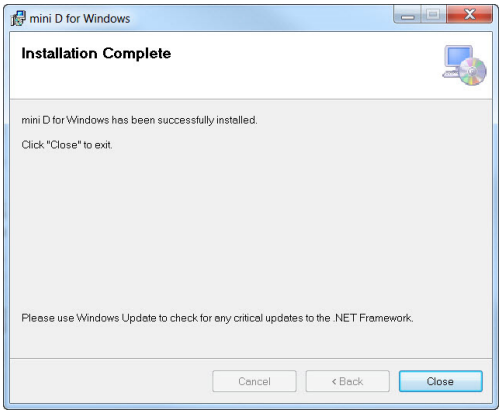
4 Confirm that you want to install "mini D" on your computer, and click "Next" to continue.



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



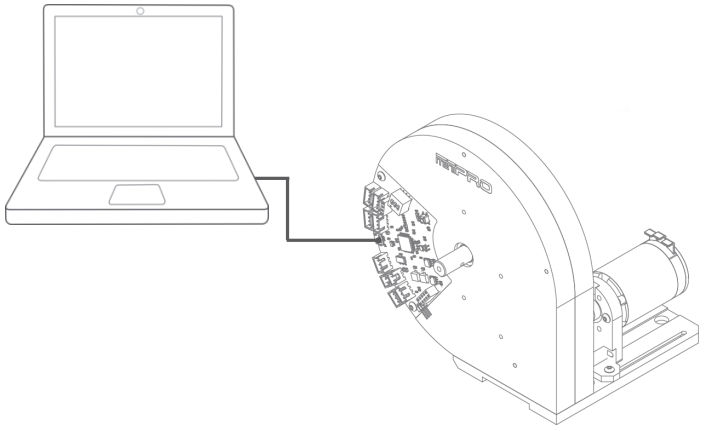
6 When installation finishes, click "Close" and you havesuccessfully installed "Mini D" for Windows.



HOW TO RUN A TEST

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

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

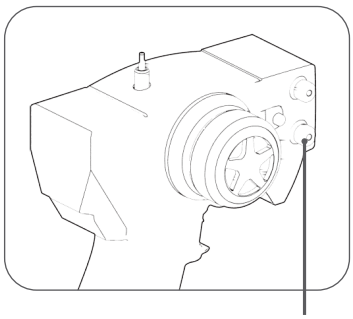


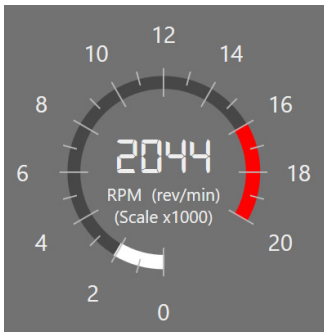
NOTE: (2) two USB connection ports are required.

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

Select the correct COM Port from the drop box menu.

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

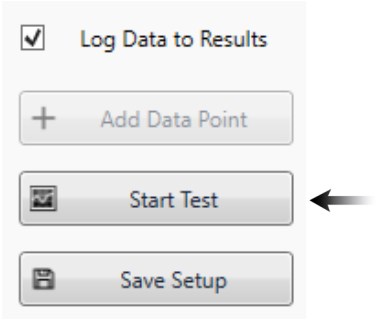




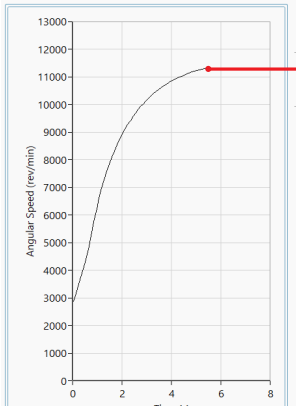
NOTE: By adjusting the throttle trim you can keep a constant RPM.

4 Go-to the "Configure Test" tab and select "No" under the under "Enable Servo/ESC Sequence."

4.1 Go-to "Run Test" tab and click on "Start Test" button.

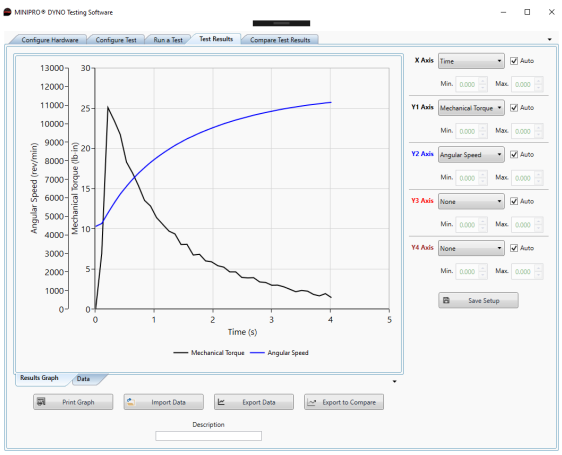


5 When you reach maximum RPM, click "Stop" or press ESC key



Max. RPM as soon torque and power reaches zero.

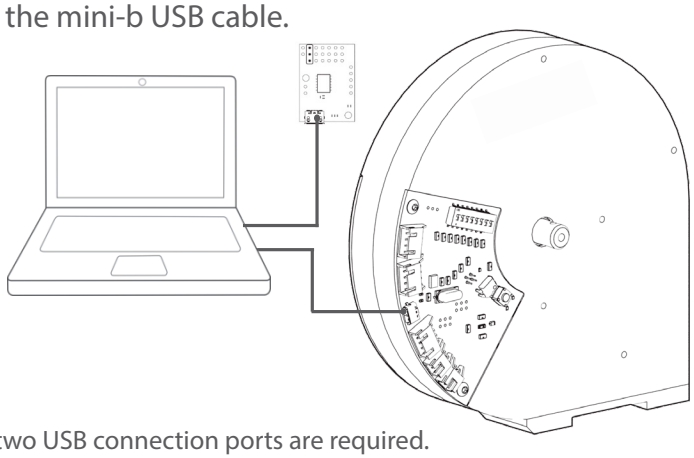
5.1. Once the test is complete. Go-to "Test Results" tab to review your test results.
5.2 You can save, print and export the test results.
5.3 Done!"Stop" button or ESC key.



HOW TO RUN A TEST

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.



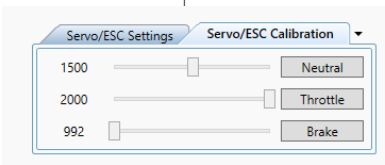
NOTE: (2) two USB connection ports are required.

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

Select the correct COM Port from the drop box menu.

3A Calibrate Throttle for ESC

3.1. If you already performed the calibration; please ignore this step.
3.2 Go-to "Configure Test" tab and select YES under "Enable Servo/ESC Sequence"
3.3. 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."

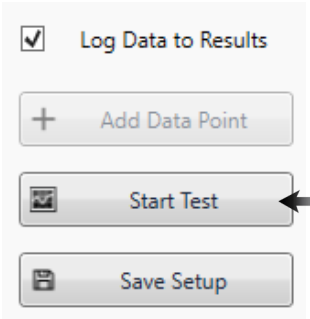


3B Calibrate Throttle for Servo

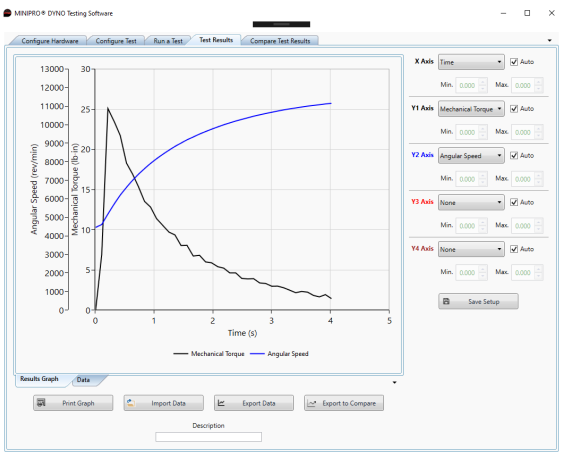
3.1. If you already performed the calibration; please ignore this step.
3.2 Go-to "Configure Test" tab and select YES under "Enable Servo/ESC Sequence"
3.3. Set your Servo to "Neutral, Throttle, and Brake by draggin each slider to the desired position.
3.4. Click "Save Throttle Settings."

NOTE: Refer to your manufacturer's ESC manual for calibration instructions.

4 Go-to "Run Test" tab and click on "Start Test"



4.1. Once the test is complete. Go-to "Test Results" tab to review your test results.
4.2 You can save, print and export the test results.
4.3 Done!



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

MINIPRO

CHASSIS DYNO

www.minipro.com