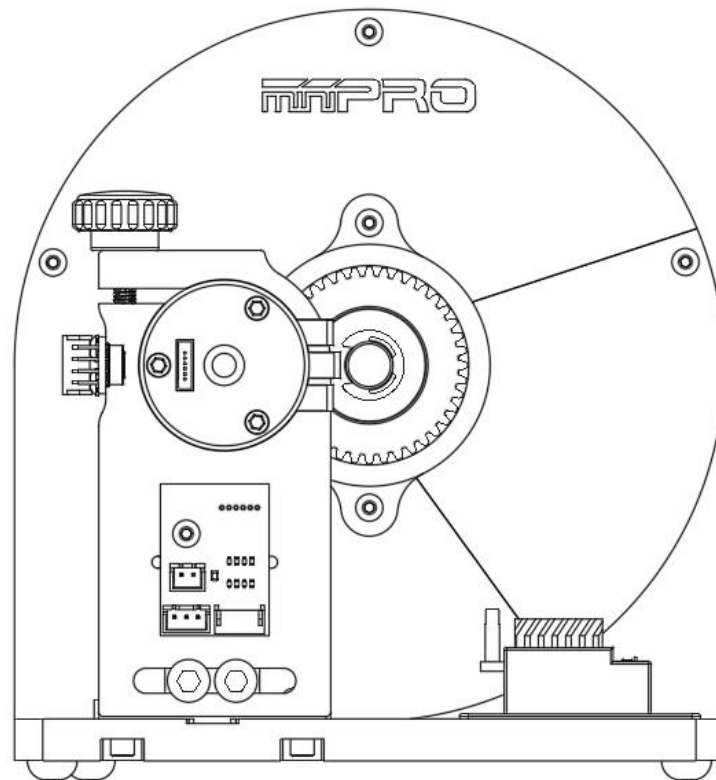# MINIPRO® R/C INERTIA MOTOR DYNO

ASSEMBLY GUIDE

REVISION 3.1

MINIPRO, LLC. 400 S Elliot Rd. Ste D-263, Chapel Hill, NC, 27514
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Email: info@miniprousa.com
Website: www.minipro.com

SAFETY PRECAUTIONS

1. This is not a toy. This product is intended for people aged 18 years and older with previous experience building and operating Radio Control (R/C) equipment.
2. Make sure that dynamometers and motors under test are equipped with appropriate safety guards.
3. Make sure that all electronic products are earth grounded.
4. Do not exceed dynamometer and sensor specifications.

TABLE OF CONTENT

MOTOR DYNO DIAGRAM

Figure 1: Dyno Controller Board V3.0 Ports Diagram

ITEM	FUNCTION
1	Flywheel unit.
2	Flywheel base
3	Motor holder
4	Thumb screw to tight the test motor.
5	Test motor pinion.
6	I.R. Temp sensor (sold separately)
7	BLDC Sensor (sold separately)
8	Electronic Speed Control (ESC) (not included)
9	Dyno Controller Board V3.0 and later.
10	USB Connection for Windows PC.
11	ESC Throttle Connection

MOTOR DYNO UPGRADE KIT ASSEMBLY

1.
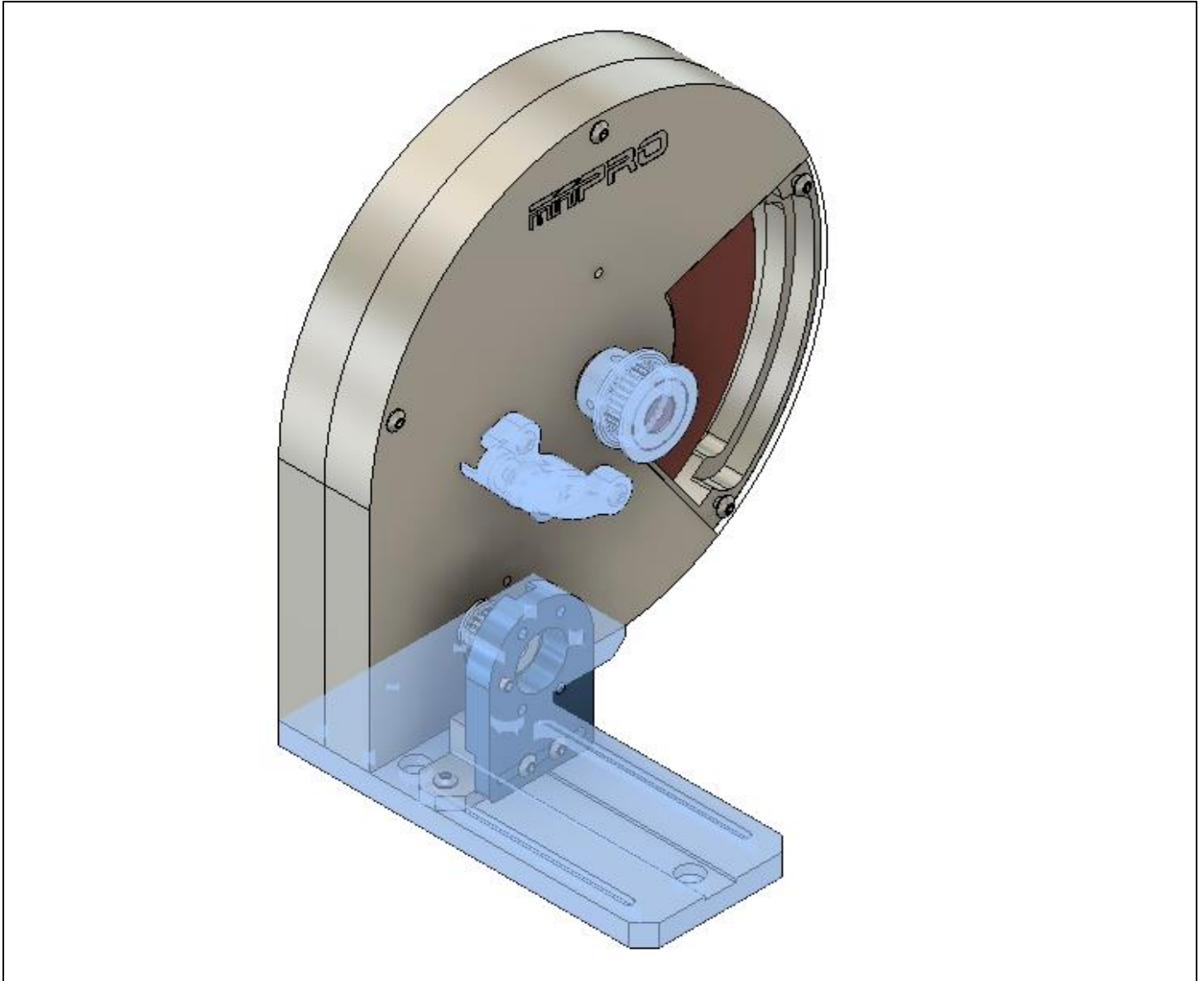
Remove the flywheel pulley, belt tensioner and base from the flywheel unit.
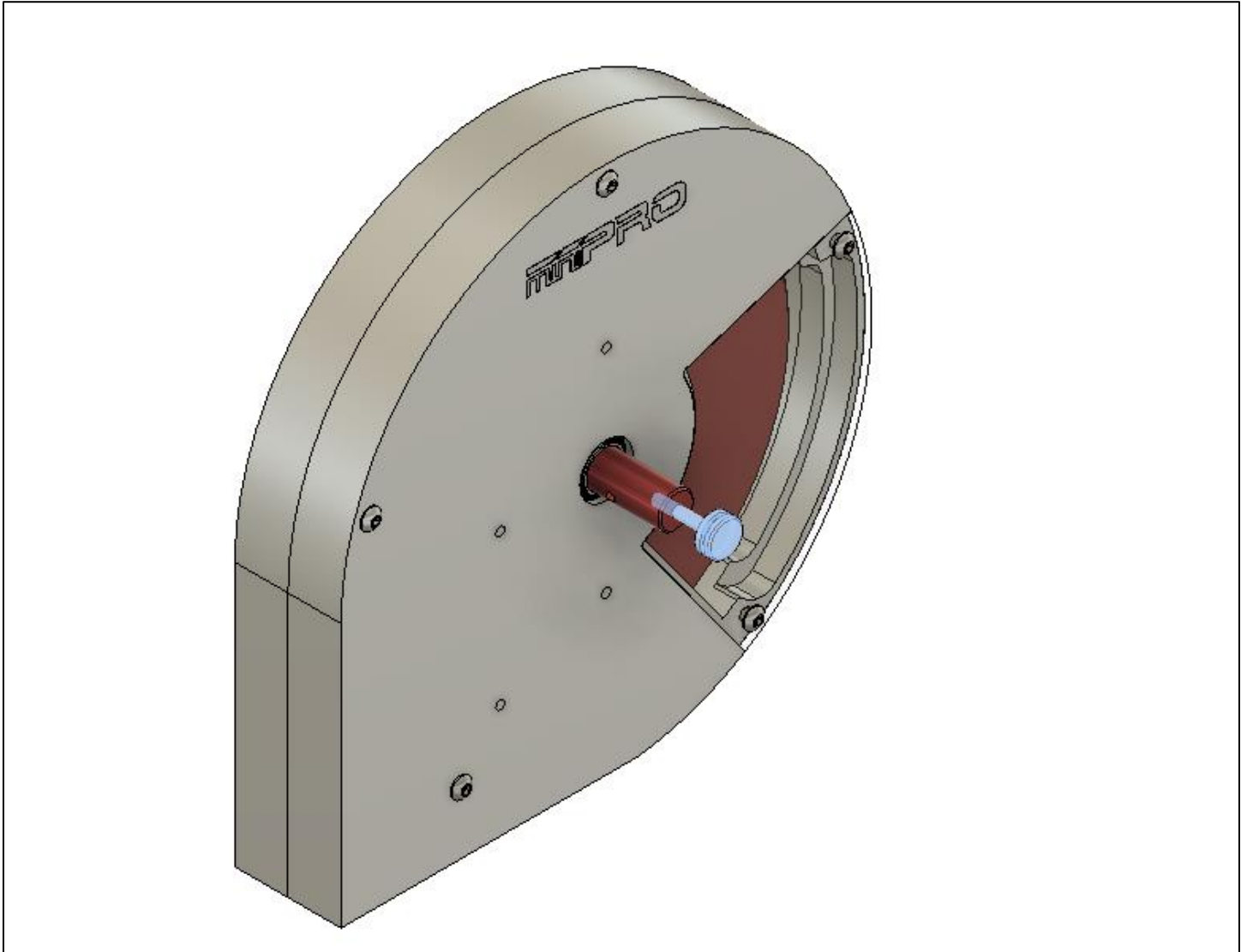
2.

Install the E-clip adapter with (2) set screw(s) on the center hole of the flywheel.

3.
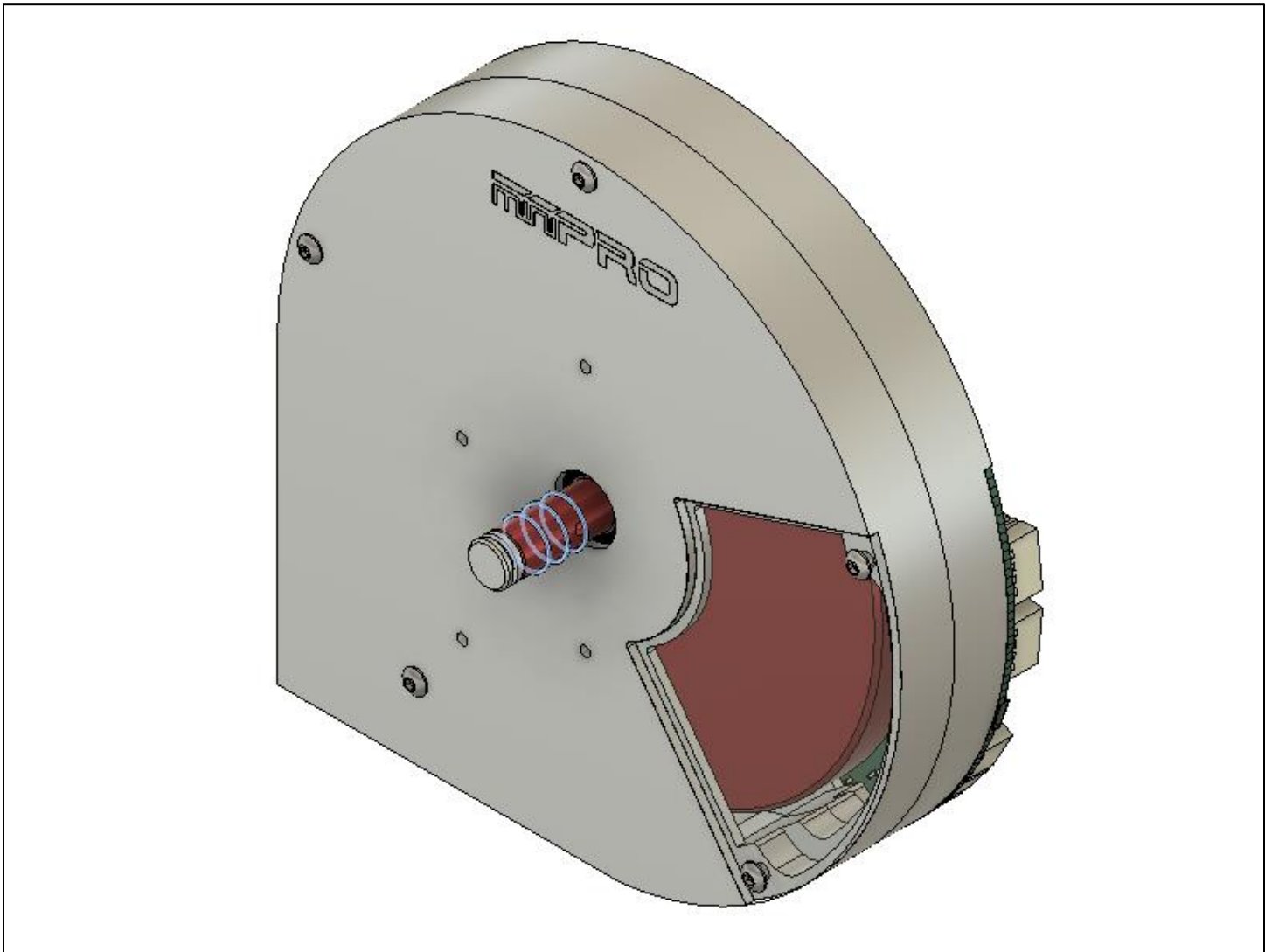
Install the (3) spacers on the flywheel's shaft.

3.
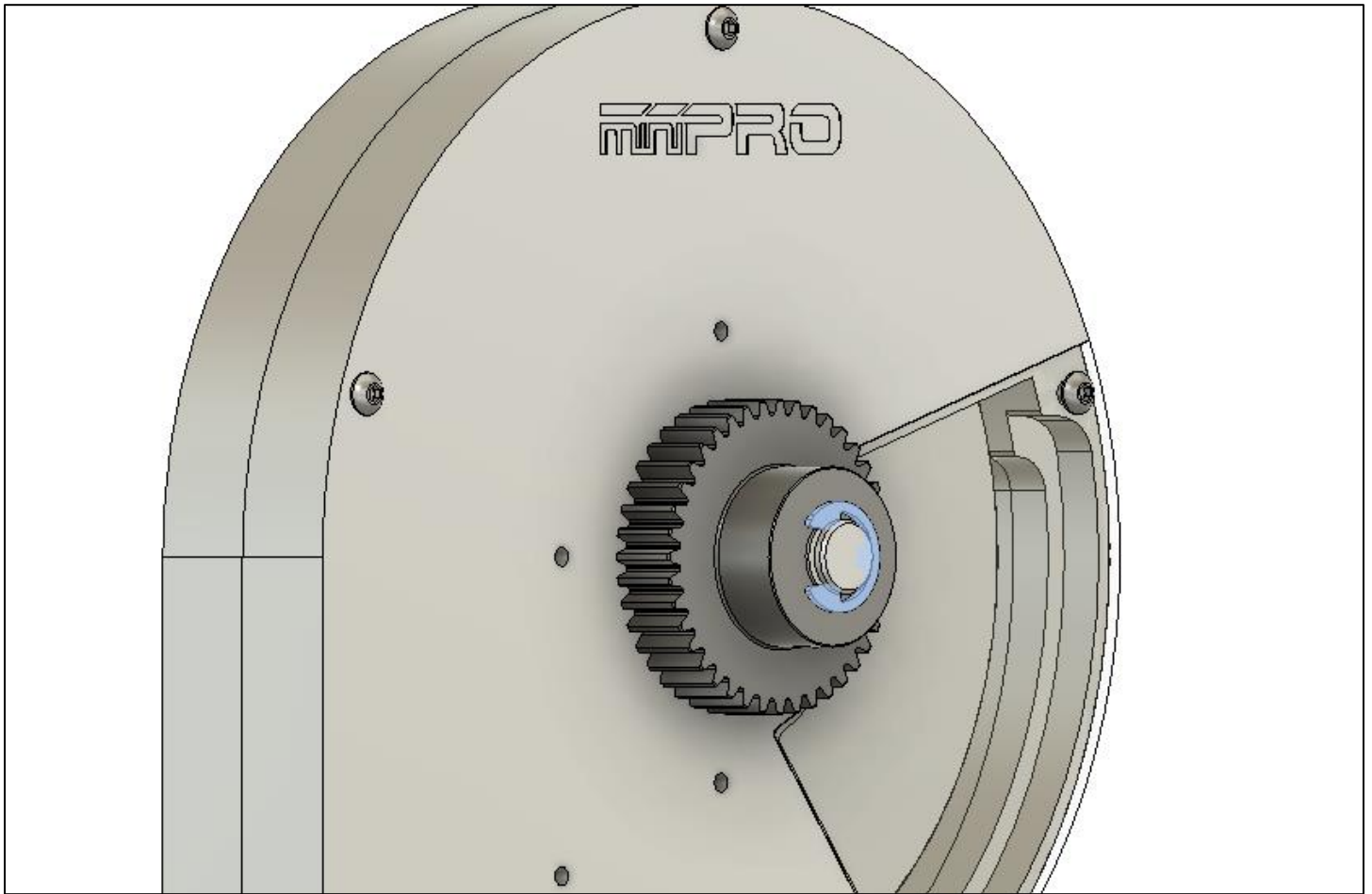
Install flywheel gear and e-ring.

4.
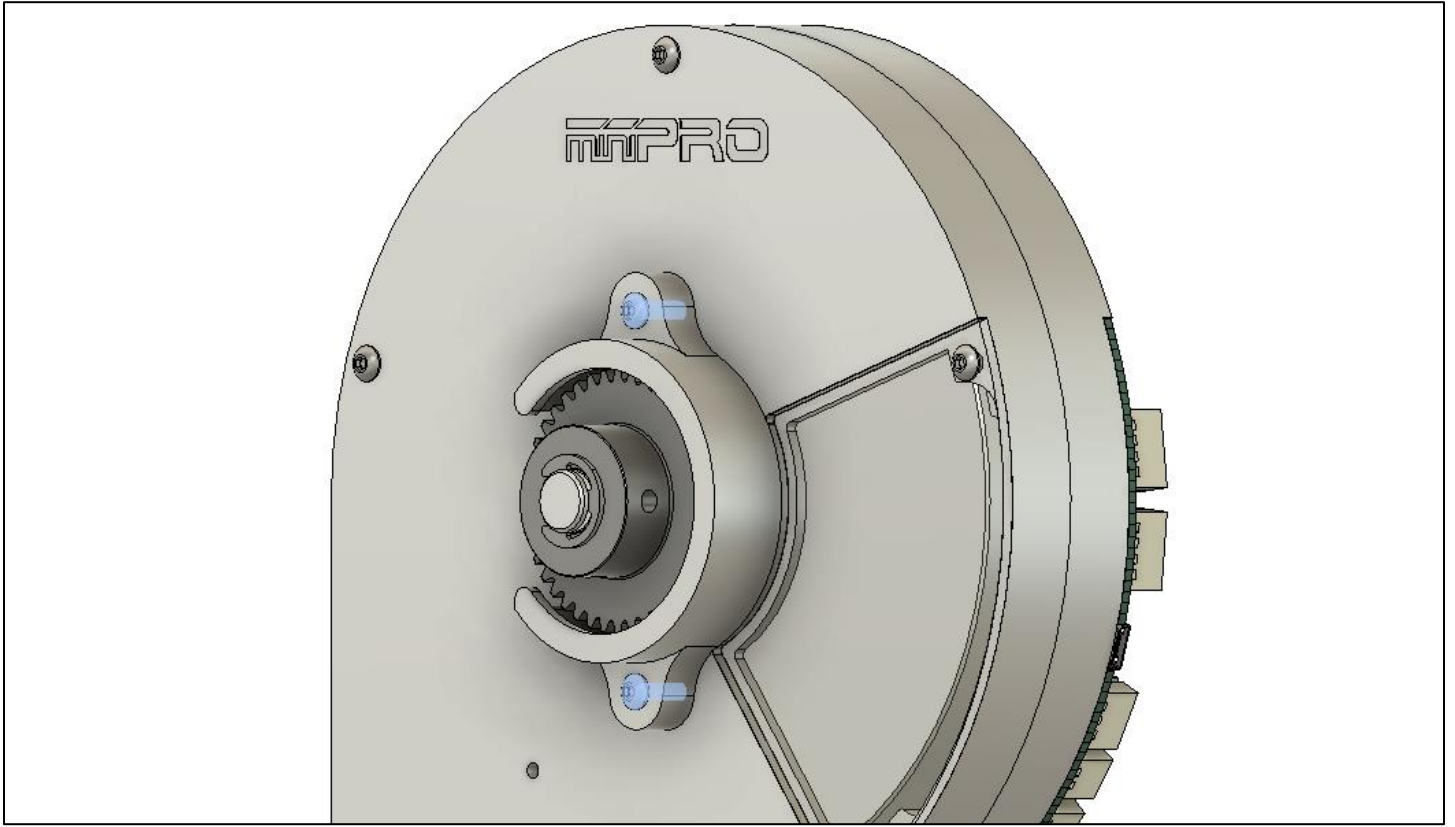
Using a 2.0mm hex tool, install the gear shield with (2) round head screw(s).

5.

Using a 2.0mm hex tool, remove dyno controller board V2 and install newer controller board. Next, follow the steps for Motor Dyno Assembly.

1.
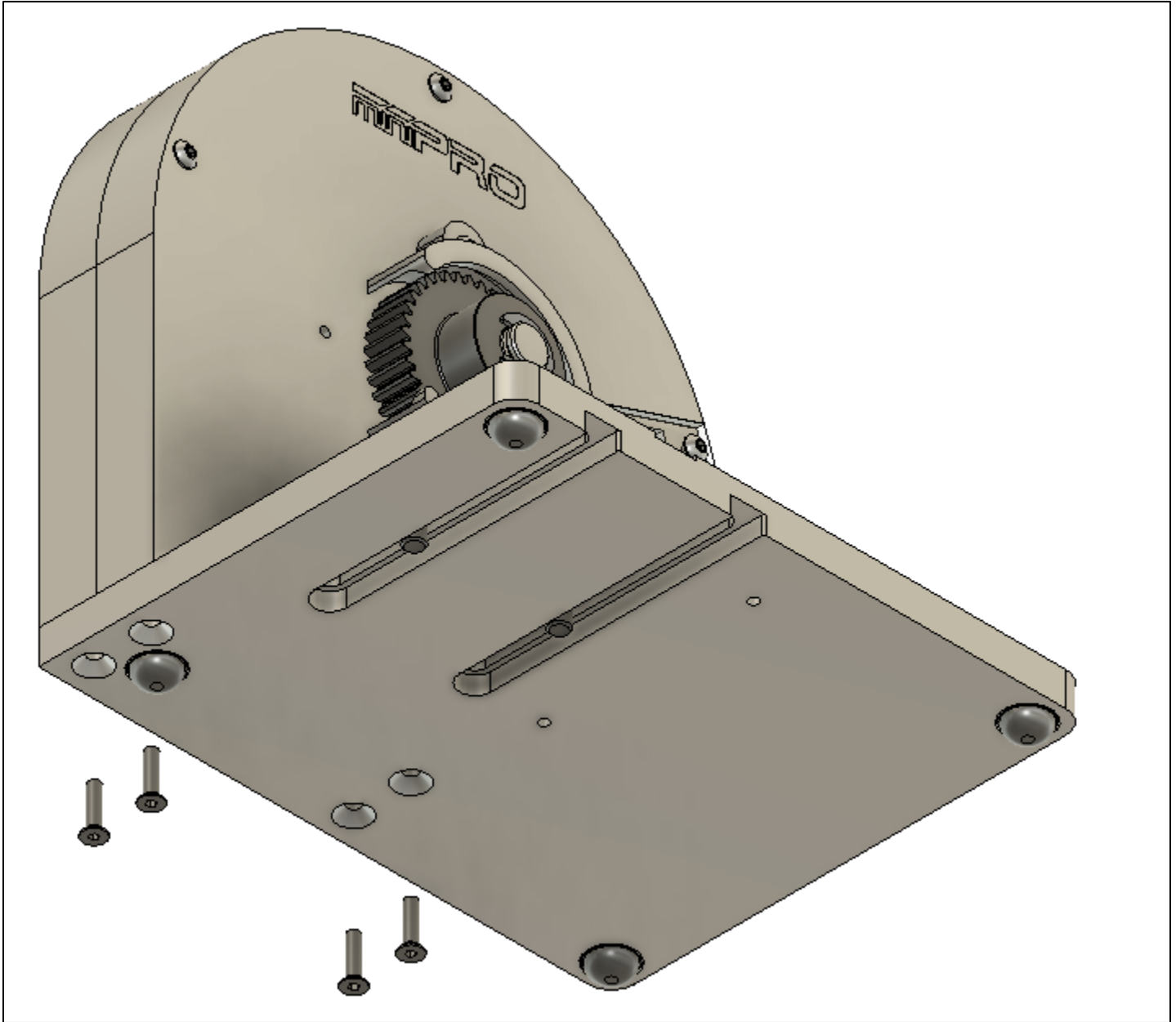
Using a 2.0mm hex tool, install (4) flat head screw(s) underneath the base and flywheel unit.

2a.
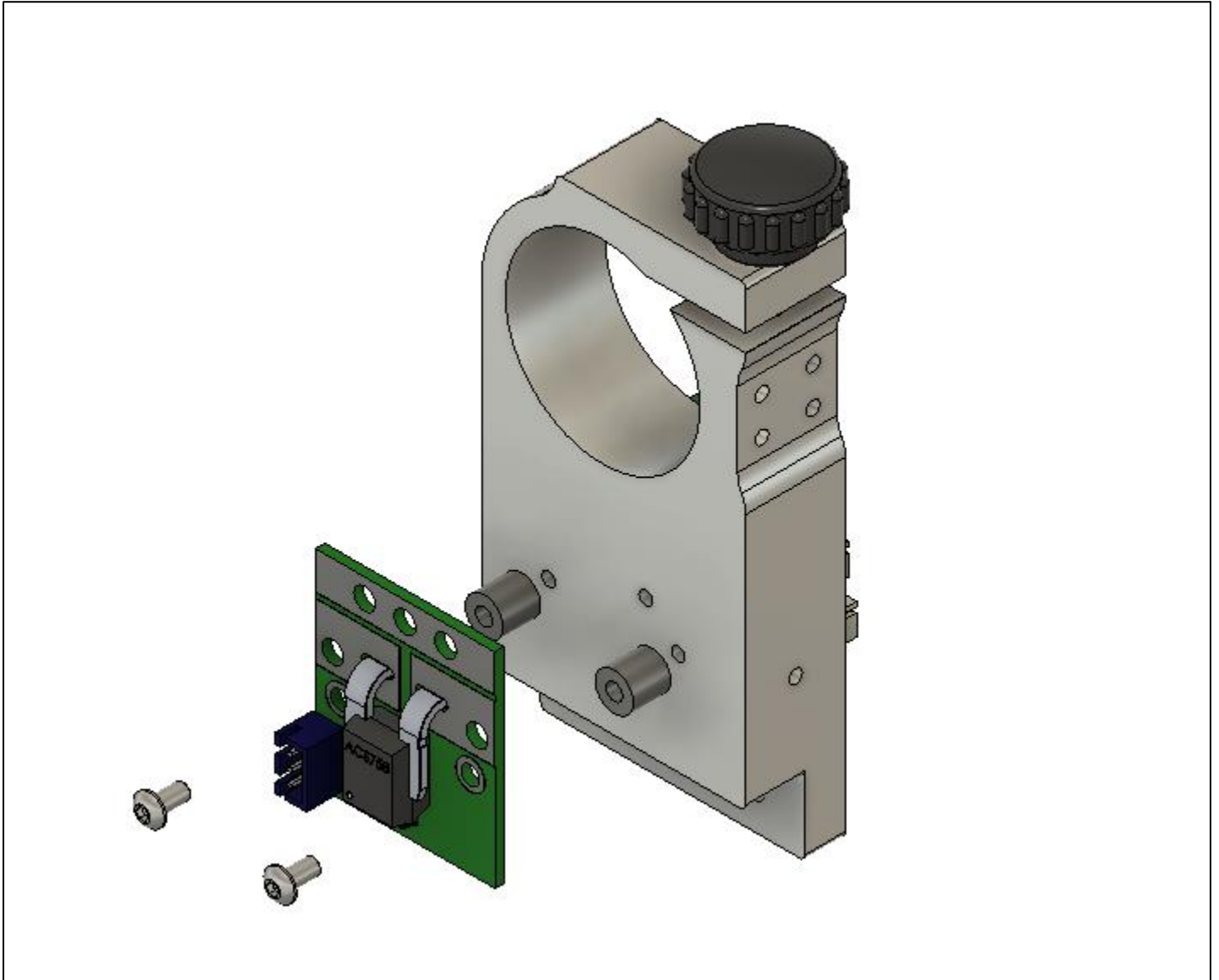
After you solder your H1 Voltage Current Sensor (refer to H1 Voltage Curent Sensor Manual), using a 2.0mm hex tool, install the sensor with (2) spacer(s) and (2) round head screw(s) on the motor holder. Make sure to install in correct orientation. *This sensor is sold separately.*

2b.
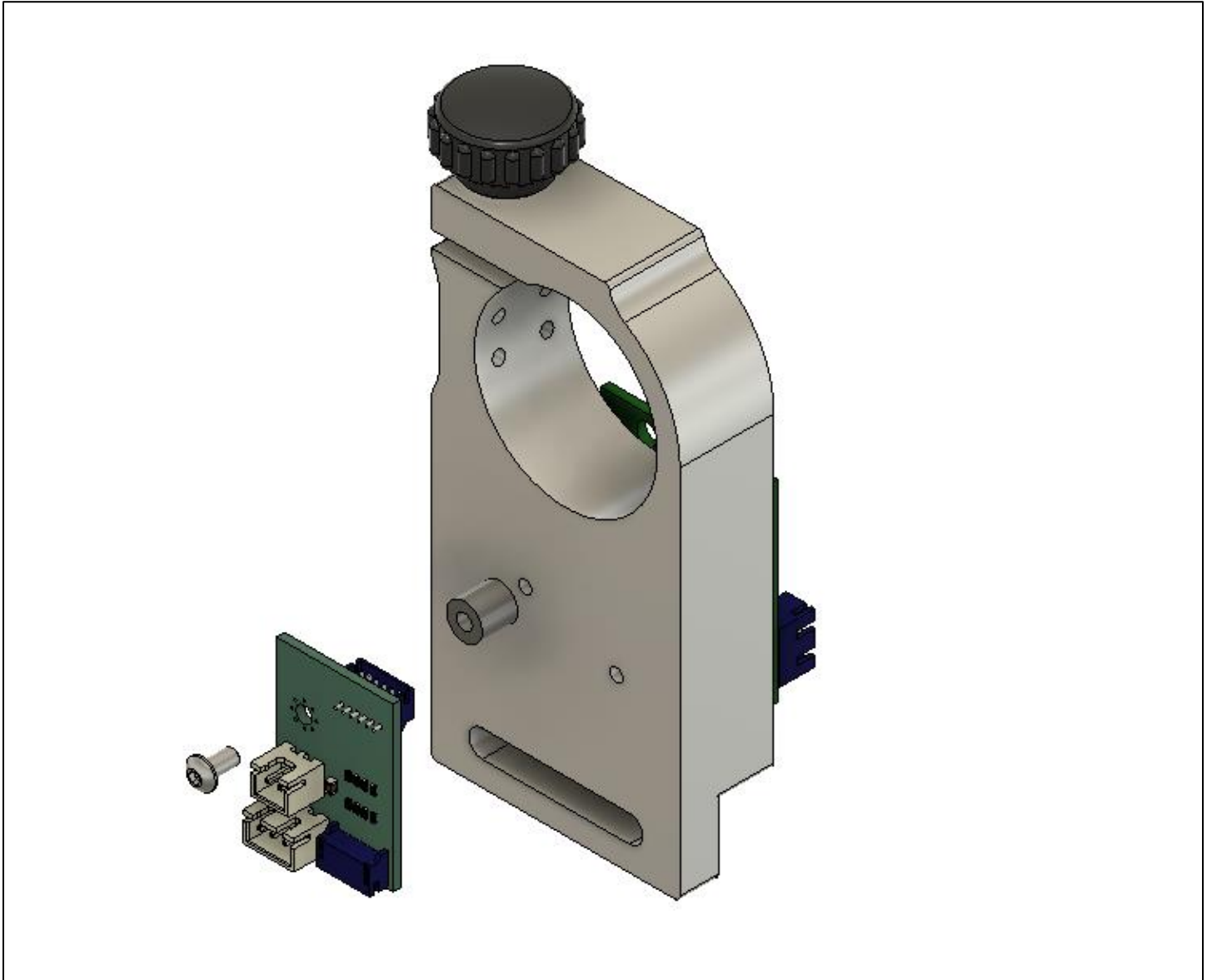
Using a 2.0mm hex tool, install the BLDC sensor with (1) spacer(s) and (1) round head screw(s) on the motor holder. *This sensor only works on BLDC sensored motors and is sold separately.*

2c.
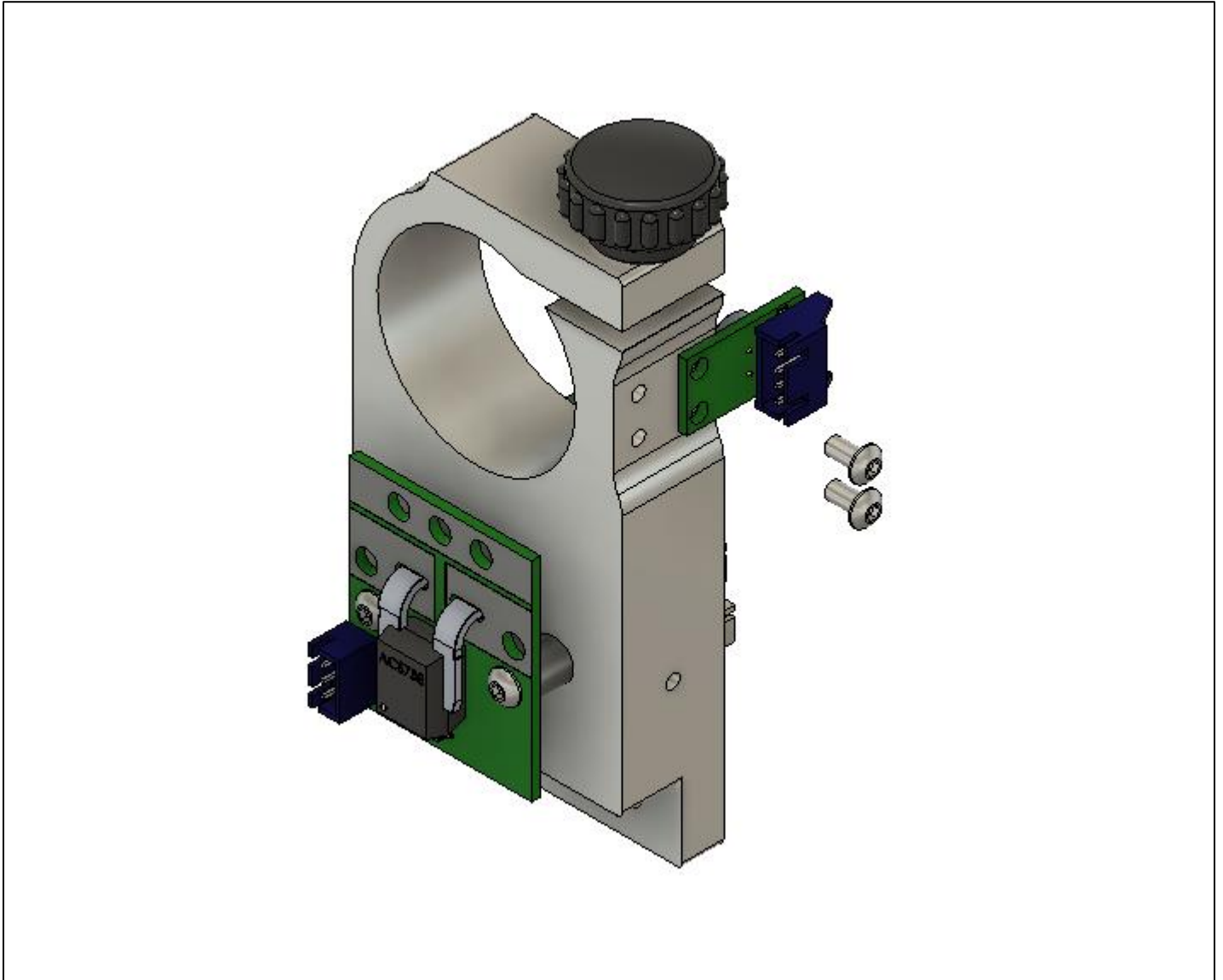
Using a 2.0mm hex tool, install the I.R. Temp sensor with (2) round head screw(s). *This sensor is sold separately.*

2d.
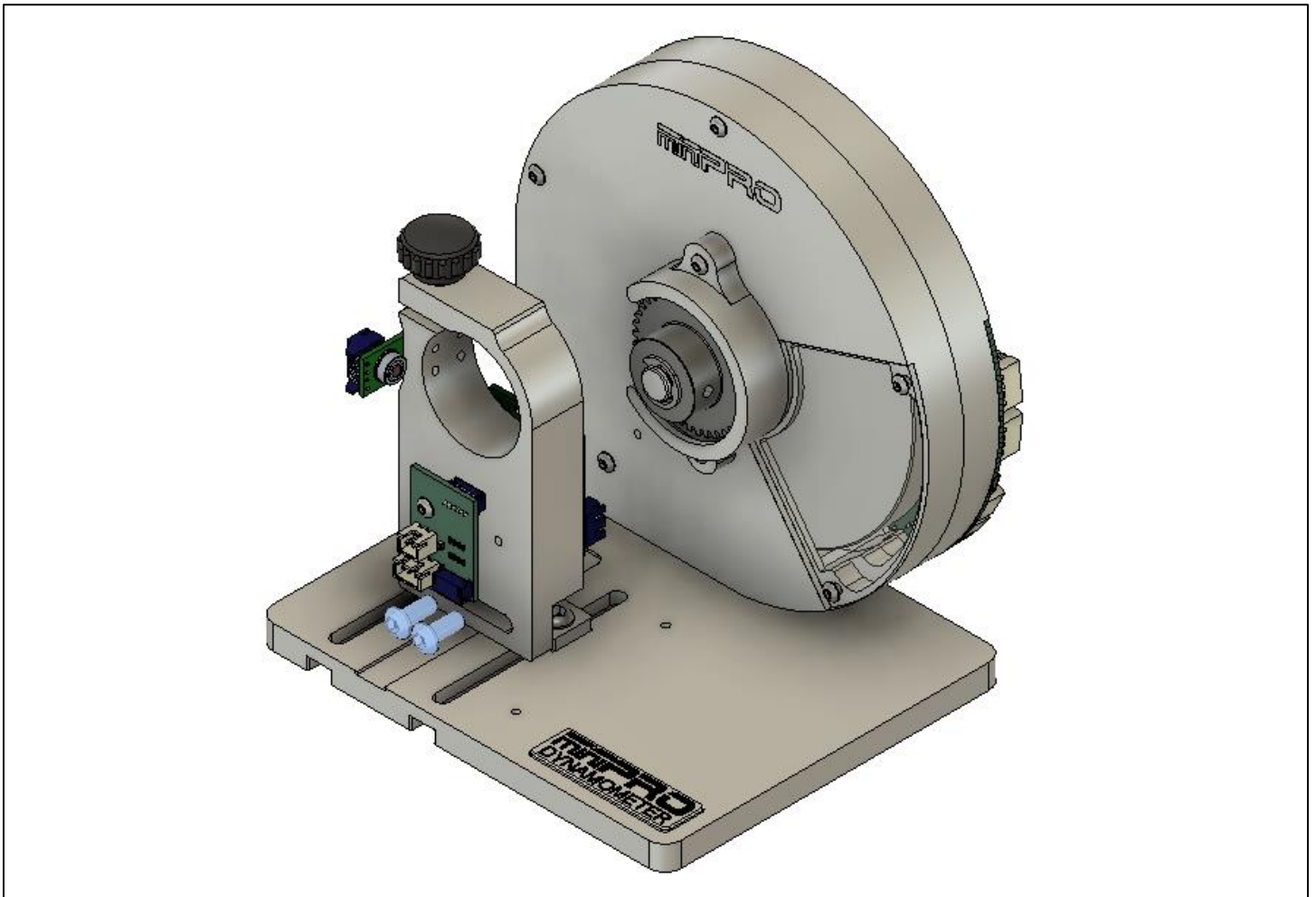
Using a 3.0mm hex tool, install motor holder with (2) round head screw(s).

3.
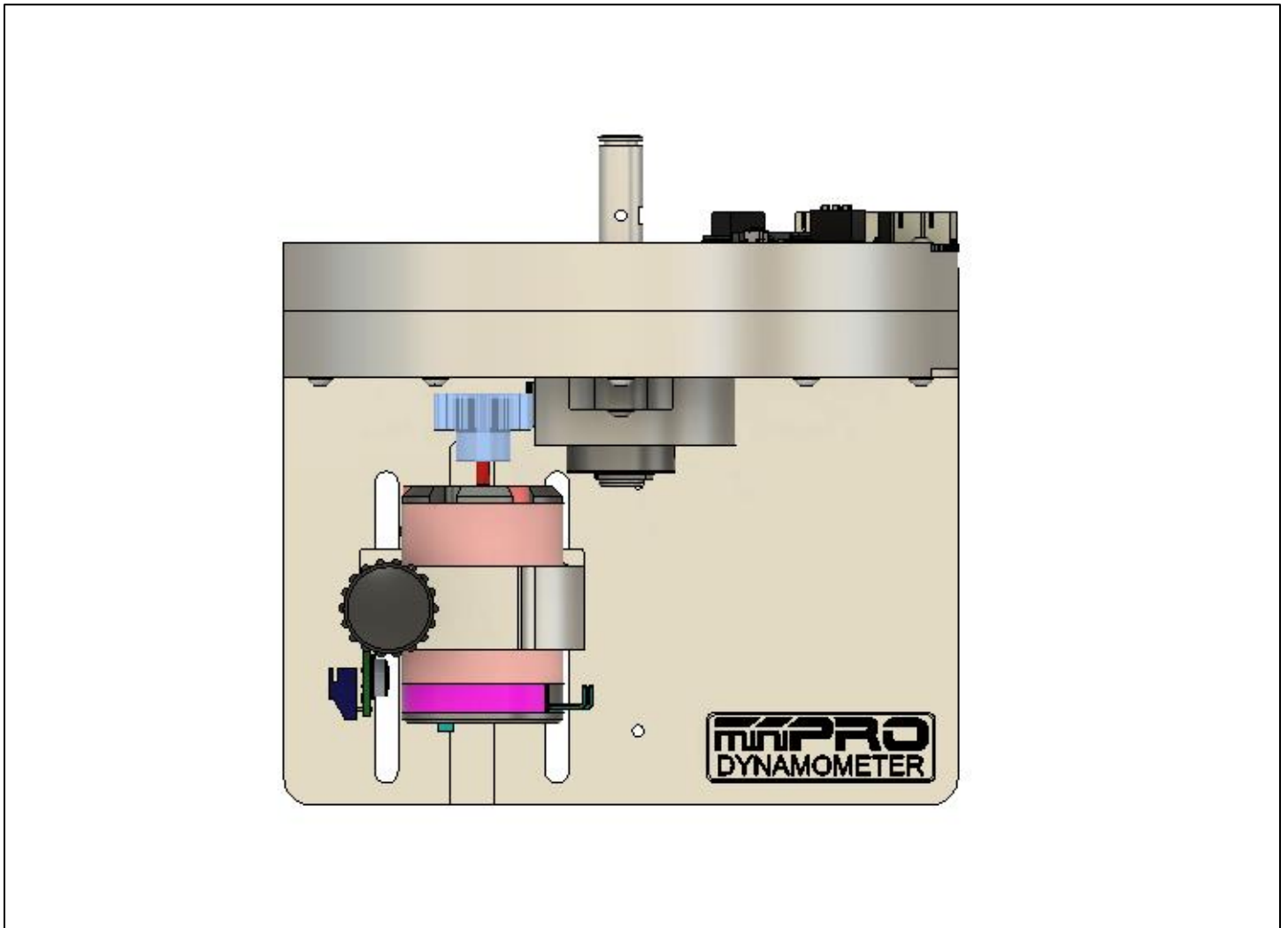
Using a 2.0mm hex tool, install the pinion to the motor. Slide the test motor to the holder and tight thumb screw.

IMPORTANT: You must wear safety glasses. Make sure to use threadlocker for the pinion set screw.

4.

Install your Electronic Speed Control (ESC) to your motor and place it on the dyno's aluminum base.

DYNO BOARD V3.0 - PORTS DIAGRAM

Figure 1: Dyno Controller Board V3.0 Ports Diagram

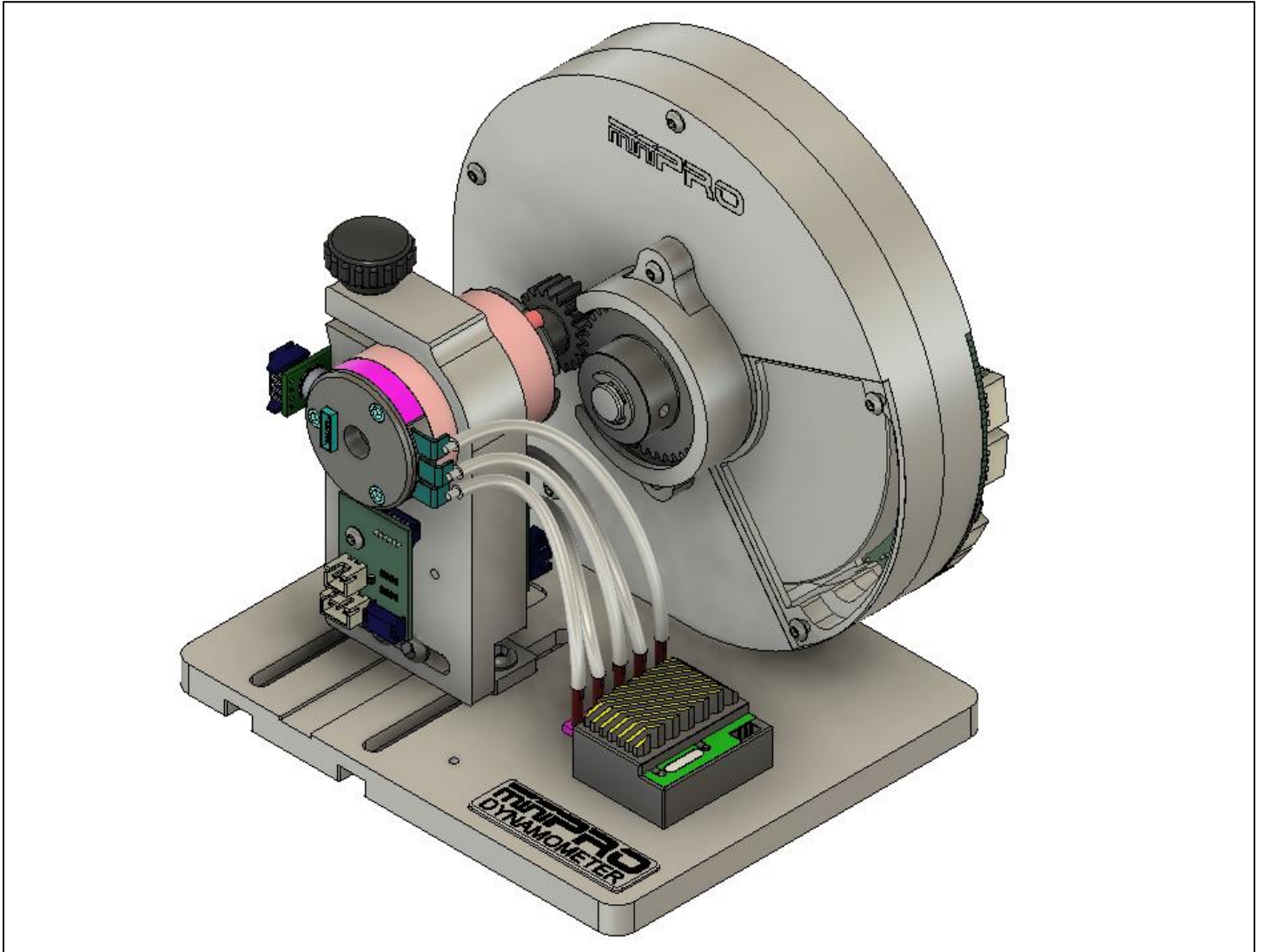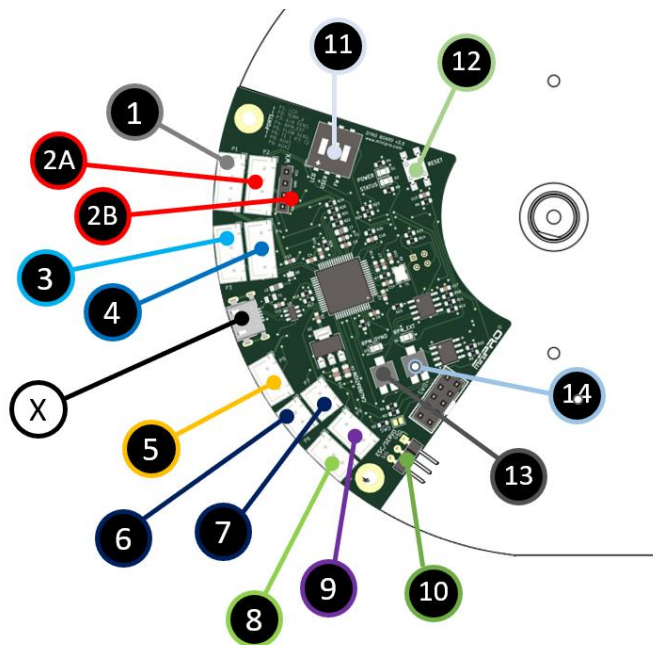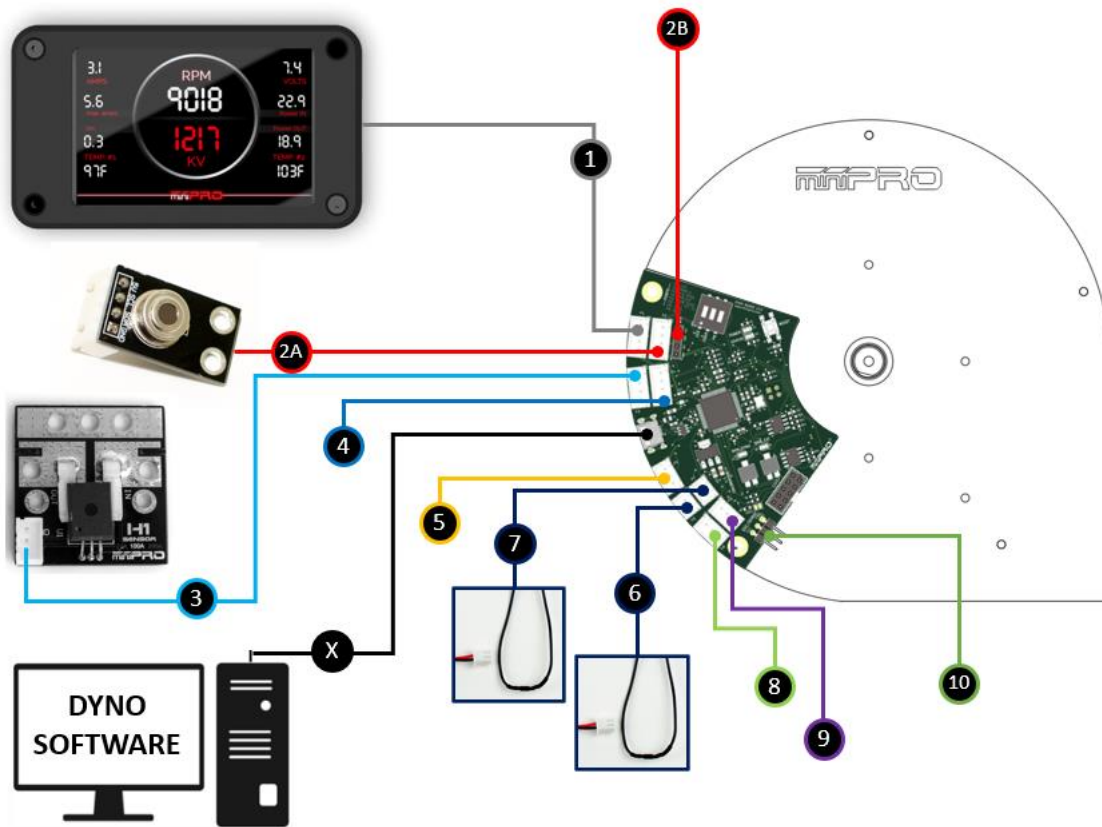| ITEM	FUNCTION
1	Port #1 used for LCD Screen.
2A	Port #2A used for I.R. Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
2B	Port #2B used for All-Weather Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
3	Port #3 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 Pin connector.
4	Port #4 connects to External RPM sensor.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 is Auxiliary port used for custom sensor designed by MINIPRO.
10	Internal Servo/ESC Throttle Controller port. This feature is not enabled and is subject to license fee.
11	Programable Switches. Pin #1 is to enable LCD Screen; Pin #2 is for custom programing; Pin #3 is for Firmware Update.
12	Reset Button. Only used during Firmware Update
13	Dyno RPM Signal tuning.
14	External RPM Signal tuning.
X	Micro USB Cable connects to a Windows PC.

DYNO BOARD V3.0 – SENSORS WIRING DIAGRAM

Figure 2: Dyno Controller Board V3.0 – Sensors Connection Diagram

ITEM	FUNCTION
1	Port #1 connects to LCD Screen.
2A	Port #2 connects to I.R. Temp. sensor *or* All-Weather Temp. sensor.
2B	
3	Port #3 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors.
4	Port #4 connects to External RPM sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 is Auxiliary port used for custom sensor designed by MINIPRO.
10	Servo or ESC connection. This feature is not enabled and is subject to license fee.
X	Micro USB Cable connects to a Windows PC.

⚠️ **Warranty voided if it's not installed according to Figure 2.**

Figure 3: Dyno Controller Board V3.1 Ports Diagram

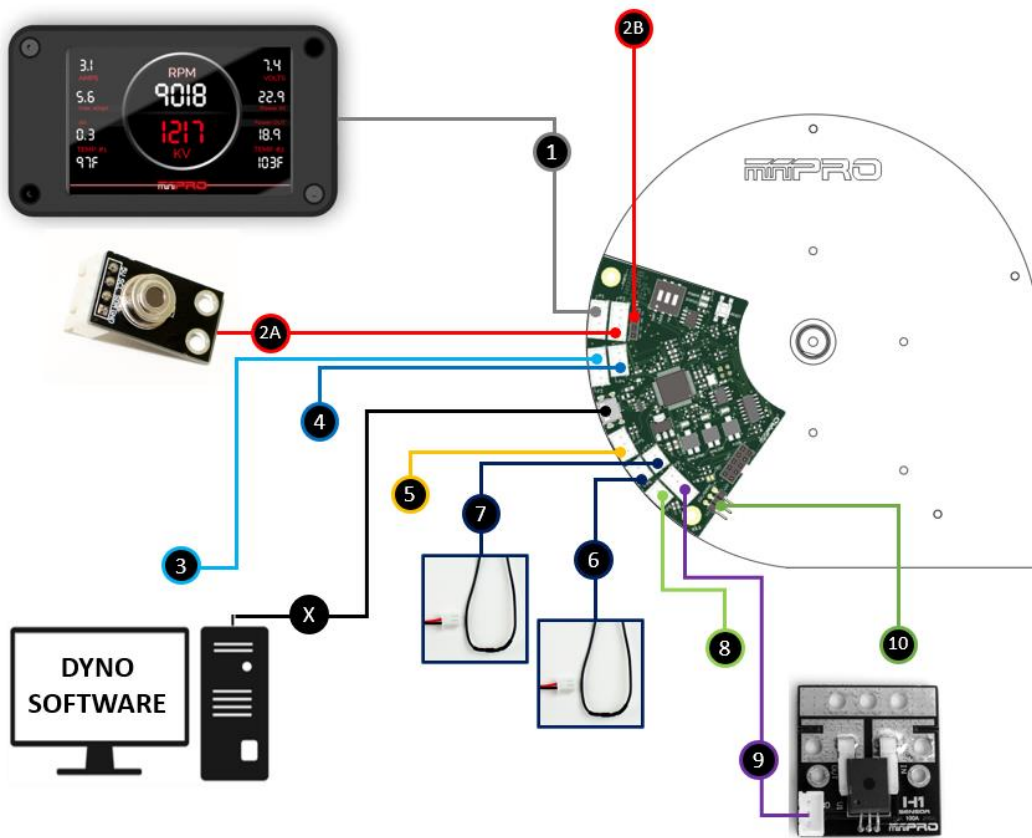| ITEM	FUNCTION
1	Port #1 used for LCD Screen.
2A	Port #2A used for I.R. Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
2B	Port #2B used for All-Weather Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
3	Port #3 8 is Auxiliary port used for custom sensor designed by MINIPRO.
4	Port #4 connects to External RPM sensor.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 Pin connector.
10	Internal Servo/ESC Throttle Controller port. This feature is not enabled and is subject to license fee.
11	Programable Switches. Pin #1 is to enable LCD Screen; Pin #2 is for custom programing; Pin #3 is for Firmware Update.
12	Reset Button. Only used during Firmware Update
13	Dyno RPM Signal tuning.
14	External RPM Signal tuning.
15	Flow Sensor Signal tuning
X	Micro USB Cable connects to a Windows PC.

DYNO BOARD V3.1 – SENSORS WIRING DIAGRAM

Figure 4: Dyno Controller Board V3.1 – Sensors Connection Diagram

ITEM	FUNCTION
1	Port #1 connects to LCD Screen.
2A	Port #2 connects to I.R. Temp. sensor *or* All-Weather Temp. sensor.
2B	
3	Port #3 is Auxiliary port used for custom sensor designed by MINIPRO.
4	Port #4 connects to External RPM sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors
10	Servo or ESC connection. This feature is not enabled and is subject to license fee.
X	Micro USB Cable connects to a Windows PC.

⚠️ **Warranty voided if it's not installed according to Figure 4.**

SOFTWARE INSTALLATION – V5.0 and later

Please refer to the software manual for more information.

Download the software from the provided link and double click the file to begin the installation.
Press Next >> to continue.

Figure 2-1 Software Installation Welcome Screen

Add the Name, Organization and Serial Number.
Press Next >> to continue.
NOTE: Only one license can be used per PC. Additional licenses are available for purchase.
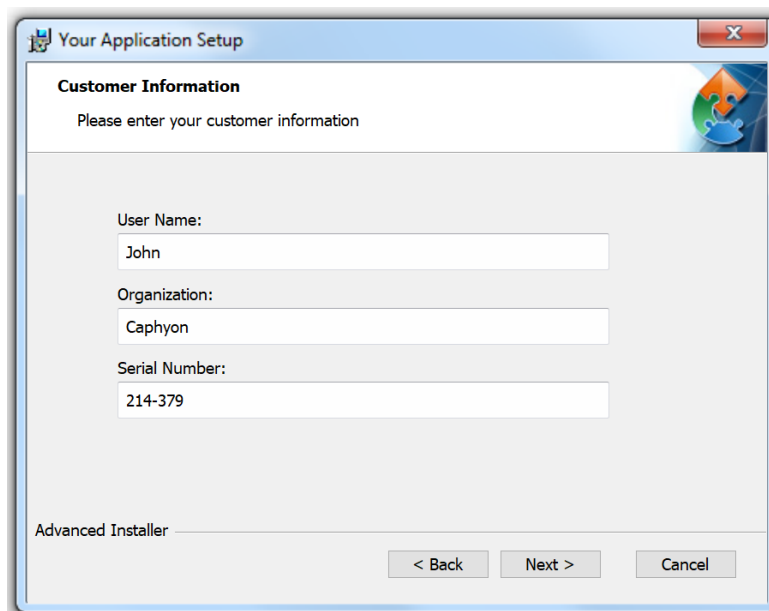

Figure 2-2 Software License Screen

Select the location where the software will be installed.
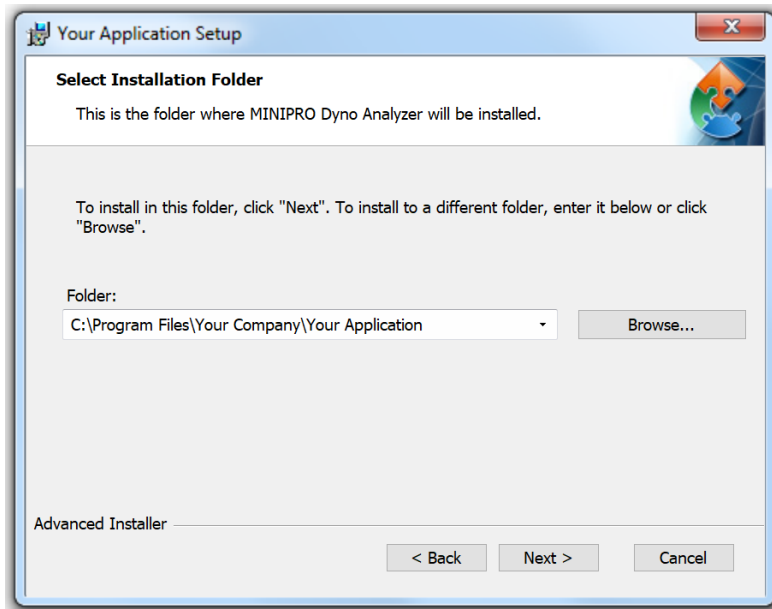Press Next >> to continue.

Figure 2-3 Folder Installation Screen

The software is ready to install.
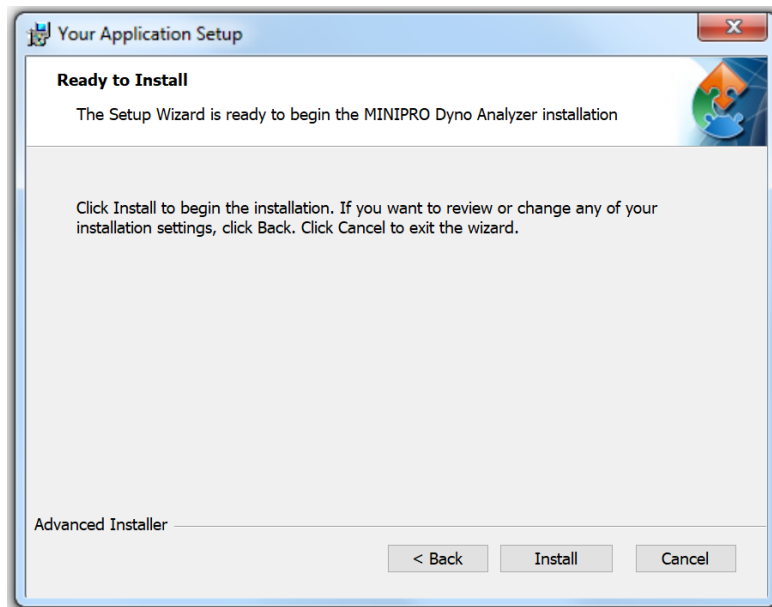Press Install to continue.

Figure 2-4 Ready to Install Screen

The software will begin installation. Please wait until the setup finishes. This may take several minutes.
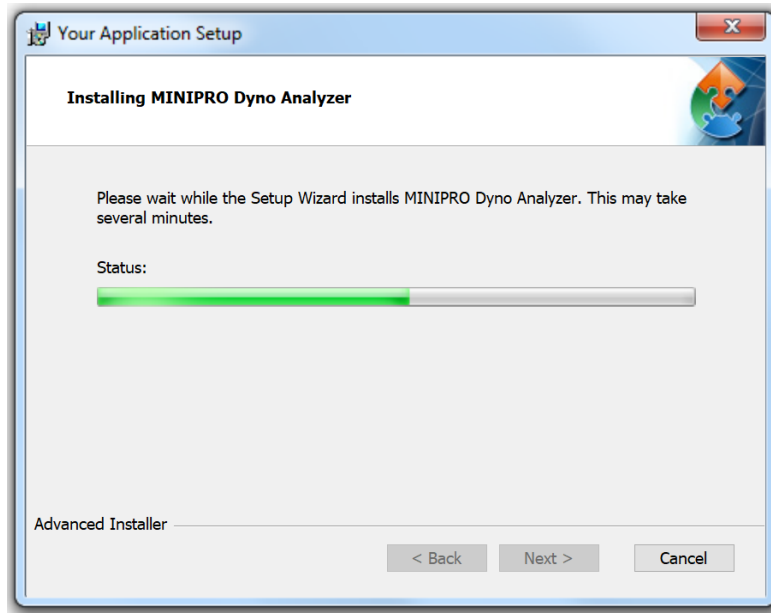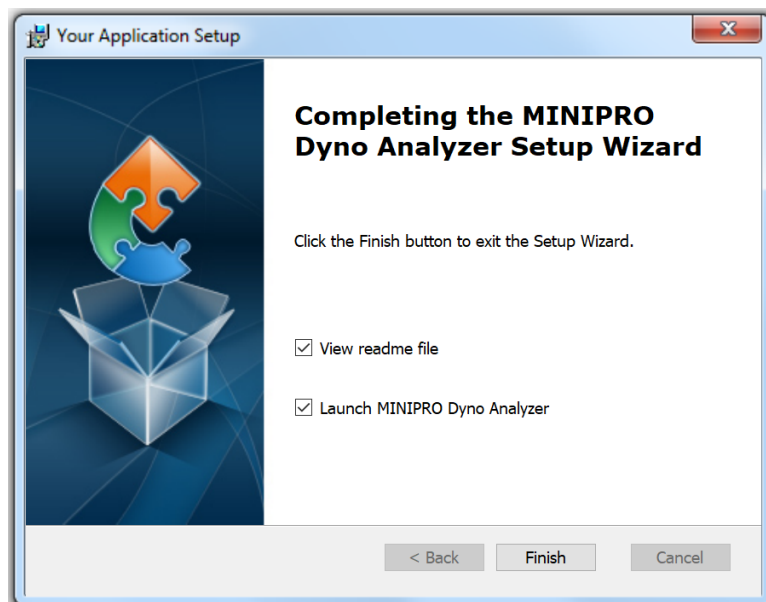

Figure 2-5 Installation Screen

The software finished installing.
Press Finish to complete the installation.

I/O PORTS - SENSORS:

INSTRUCTIONS:

1. Open the MINIPRO Testing Software and Connect the dynamometer to the program.
2. Go-to *Configure Hardware -> I/O Hobby Grade* tab.
3. Connect all necessary sensors.
4. Select the installed sensors from the drop-down (i.e. for voltage and current sensor see *Figure 3*).
5. Press the Apply Settings button. If the software cursor stays busy for longer than 1 min; press Apply again.
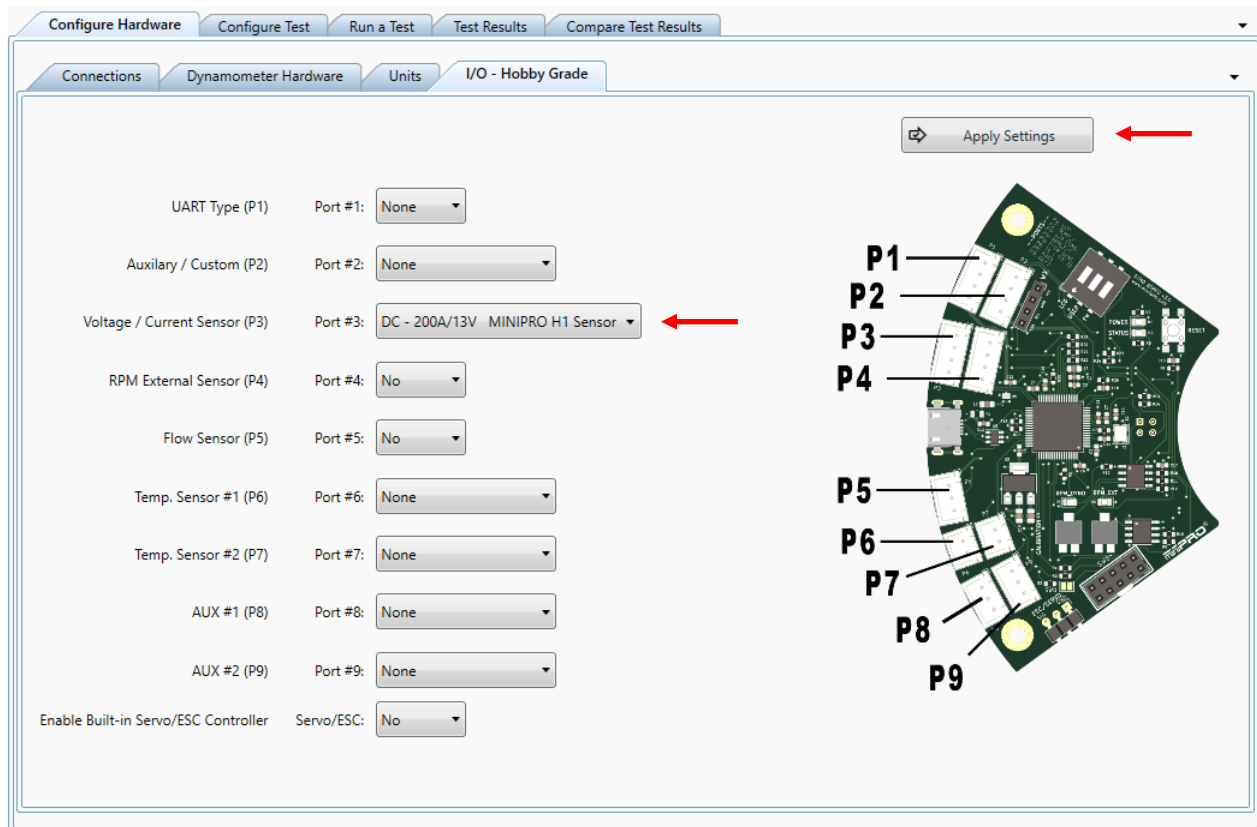6. Press the Save Setup button, and your configuration is completed.

Figure 5: I/O Configuration for V3.X boards