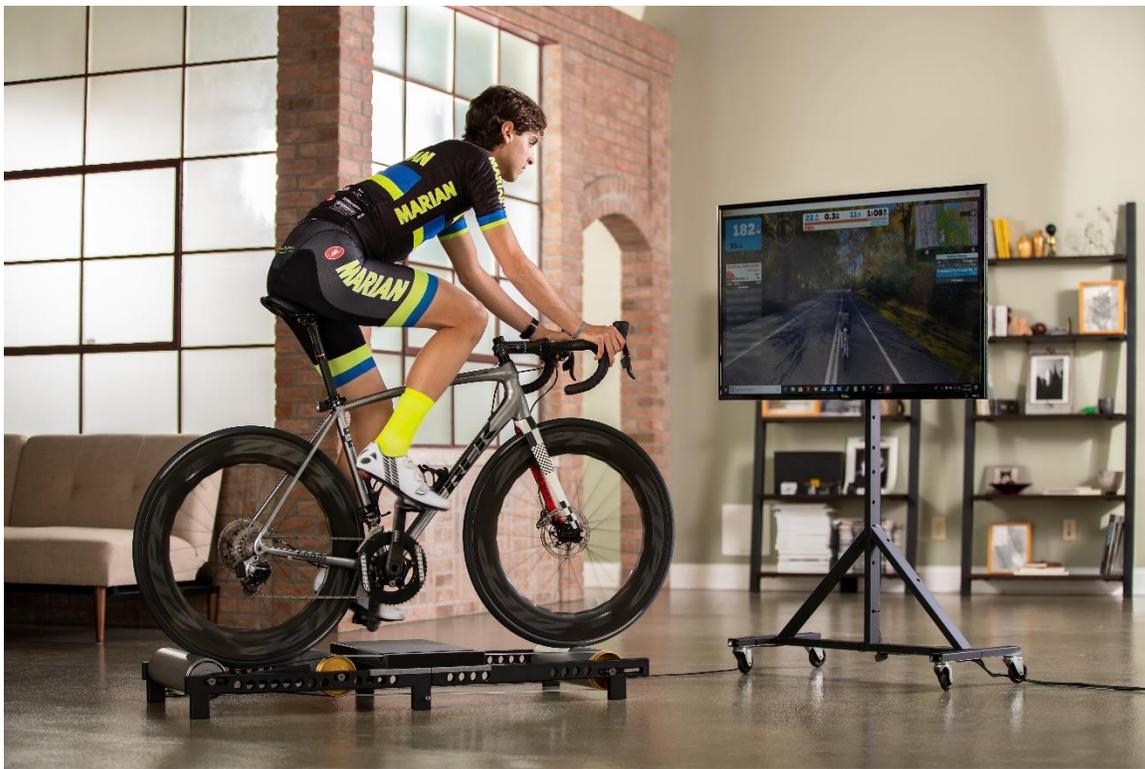


# *TruTrainer*

## *Premium Cycling Rollers*

### *SmartLoad Manual*



### **⚠ CAUTION:**

**Read all precautions and instructions before using this product.**

## Overview

The SmartLoad option will allow you to control the amount of load the rollers absorb via your smartphone by pairing with our Bluetooth Low Energy (BLE) radio. It also will allow connection via an ANT+ channel or Bluetooth Low Energy (BLE) radio through an internet connection to a 3<sup>rd</sup> party bicycle training simulation software. The ANT+ radio uses the Fitness Equipment Control (FEC) protocol and the BLE radio uses the Fitness Machine Service for 3<sup>rd</sup> party connectivity. Third party providers typically charge a monthly fee to use their system.

Please visit the Apple Store or Google Store to download the TruTrainer SmartLoad app for your iPhone or Android device. Our app can be downloaded free of charge and there is no monthly service fee.

***ALERT:*** *Our app allows you to simultaneously establish a BLE and ANT+ connection; we have programmed the SmartLoad device to not respond to ANT+ commands from the 3<sup>rd</sup> party provider if you are connected to the SmartLoad device via a BLE connection.*

***ALERT:*** *The initial releases of our app were not compatible when using Dark Mode viewing settings on Android or iPhones. Our latest releases work well with these modes. If you are experiencing problems with Dark Mode, please install the latest versions of our TruTrainer SmartLoad app.*

The ANT+ connection is established through an ANT+ dongle attached to a USB cable attached to your personal computer. You will require an ANT+ dongle and compatible cable to connect to a computer with internet connection. These can be purchased separately from our online store and are available from many electronics dealers.

When using a 3<sup>rd</sup> party provider, you can use your bike's power meter as the power source and the SmartLoad roller as the control device.

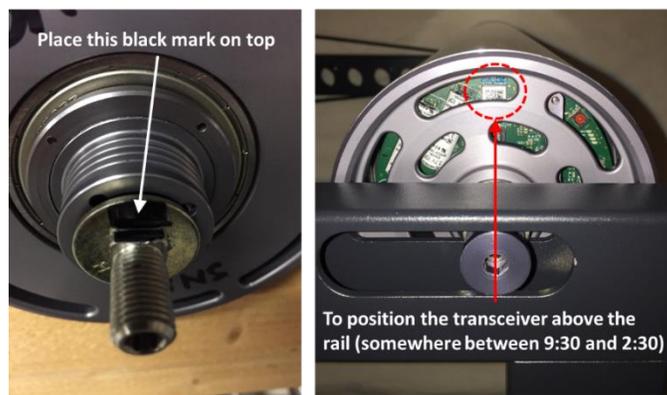
## Cautions:

- Do not poke anything through the slots in the endcaps. Tempting we know, but do not do it! There is rotating equipment inside and objects will cause damage, or you may experience **SERIOUS BODILY HARM** if your extremities or hair gets put or is sucked into the slots of the slots on the endcaps.
- Please keep yourself and anyone else (children, cats, dog, pets etc..) away from of the rollers when in use. The SmartLoad device and roller drums rotates at high speed; and **SERIOUS BODILY HARM** can occur if you get body parts or clothing caught up in them.
- Do not drop the rollers, they will last a long time if you obey this command. If you drop the roller, you will likely damage the bearings which support the internal flywheel.
- Do not get the roller wet, there are electronics inside and they work best when dry and will likely be damaged if they get wet.
- Do not obstruct the slots in either endcap. We need all the cooling flow we can get to maximize the amount of power we can absorb. If you restrict the cooling flow, the device will not perform up to its potential. It is thermally protected so no damage will be done, but clean inlets will allow the device to operate properly.
- Do not continue to ride the rollers if you hear loud noises (scraping, clanking) or experience excessive vibration. These are signs of foreign object damage.

## Set-Up

The SmartLoad roller is ready to use out of the box and is a drop-in replacement for our Classic rear roller assembly. Follow the instructions in our User Manual or refer to our roller assembly instructions to build up or switch out the rear roller assembly. Both documents are available on our website [www.trutrainor.com](http://www.trutrainor.com).

For best BLE signal strength, please install the SmartLoad roller so that the transceiver chip (highlighted by dashed circle) is visible above the roller frame as shown below in the right-hand figure. To help you with this, the flat on the shafts are timed with the chip. Rotate the shaft so that the transceiver chip is at the 12:00 o'clock position; and use a sharpie or marker to put on mark on the flat to identify the top side. If the black mark fades with time, use a sharpie to re-establish the top position.



If you plan to ride with a 3<sup>rd</sup> party provider via the ANT+ radio, place the ANT+ dongle adjacent to the rear roller as shown in the following picture. This will provide the most reliable communication link between the dongle and your personal computer. ***We find that taping the dongle to the top of the rail near the rear roller provides the best connectivity.***



# SmartLoad Operation

The electronics of the SmartLoad roller is self-powered by an internal generator that will allow the unit to function properly for approximately 15 minutes after you stop riding. This allows you a period of non-riding time before you will lose your workout session connection to your smartphone, ANT+ or BLE 3<sup>rd</sup> party provider. The generator starts charging the internal power supply shortly after you begin pedaling and the unit will reach full charge in approximately 3 minutes. We enable wireless control after the rollers have reached 8 mph and disable wireless control when bike speed goes below 6 MPH. If your bike speed drops below 6 MPH, the system will remove all auxiliary load and it will restore load when you exceed 8 MPH. ***If you cannot maintain an adequate bike speed to keep the load active, reduce the difficulty factor.***

Our SmartLoad app provides basic setup and user control schemes. A video explaining use and operation of our app is available at <https://youtu.be/aCWYMNWFVrE>

- Settings  
Used to change rider weight, bike type and course composition. These parameters are required to do wind and grade load calculations. We make them available to 3<sup>rd</sup> party providers, but not all providers use this data. This screen also allows you to put our device into bootloader mode for a software update.
- Manual mode  
Used to control the amount of load above the parasitic loads present in the rollers at a given speed. Allows the user to select between 0 and 100% of the allowable auxiliary load at a speed.
- Constant power mode  
Will automatically adjust load to maintain a requested power independent of bike speed or rider pedaling cadence.
- Wind and Grade mode  
Adjusts load based on bike speed to simulate riding into a head wind or on a grade. User selects head wind and grade.
- Spin Down Calibration  
Procedure that allows the SmartLoad device to calculate the parasitic load present in the rollers. Parasitic load is the load that exists with the SmartLoad device in the no load position.

The SmartLoad roller is shipped with a default spin down coefficient that will not likely match your setup. You should perform a spin down calibration to achieve the best accuracy. During the first 50 hours of use, you should regularly conduct a spin down calibration as the parasitic

load will change as the system settles. The rollers will stabilize after this period, but tire pressure and ambient temperature influence parasitic load and you may need to regularly perform a spin down calibration to realize maximum system accuracy. The spin down calibration can be performed via your Smartphone. 3<sup>rd</sup> party providers may also allow you to perform a spin down calibration if they comply with all the capability of the ANT+ FEC protocol.

## **Displayed Power**

The power displayed on the SmartLoad application is an instantaneous power. It is broadcast approximately once per second and the display updates at this rate. If you experience oscillations, it is likely that your pedaling stroke is not uniform.

Each of our SmartLoad devices is individually calibrated to provide maximum accuracy. However, our indicated power may not be as accurate as your power meter because we do not directly measure power. We calculate it based on the spin down calibration data and a multi-dimensional map of load versus system parameters. If you have a power meter, we recommend that you use it during training with 3<sup>rd</sup> party providers.

The power displayed accounts for: the parasitic load in the rollers, the load added by the SmartLoad device and the inertial load from changing the speed. The latter will be positive during an acceleration, negative when you are slowing down or zero when you are holding a steady speed.

# Troubleshooting

To aid in troubleshooting communication issues, there are four LED lights on the computer board that are visible during operation. These are located at approximately the 2:00 o'clock position on the non-drive side endcap when the transceiver chip is positioned at 12:00 o'clock.

During normal operation will routinely see flashing green, blue and amber lights. The details of their meaning are shown below:

## Green LED

- Slow flashing: system is charging the power supply
- On and not flashing: system is fully charged
- Fast flashing: system is discharging

## Red LED

- Not flashing: system operating okay
- On and flashing: system abnormality detected

## Blue LED

- Flashing: Advertising for BLE connection
- On and not flashing: Connected to BLE device

## Amber LED

- Flashing: Advertising for ANT+ connection
- On and not flashing: ANT+ channel connected

The red LED is physically located between the green and blue LEDs. If you discover that the red led is flashing during use, please contact us for assistance.

# Device Firmware Update

Should a new version of firmware (software) for the SmartLoad device become available, the following instructions are a guide for performing a device firmware upload (DFU). The SmartLoad device coupled with our smartphone app contains all of the software you will need to accomplish this. The upload occurs over a Bluetooth Low Energy (BLE) wireless connection once the SmartLoad device is put into bootloader mode.

When in bootloader mode, prior to starting the software upload, the red and amber LEDs will be on continuously. If you put the system into bootloader mode, you will not be able to ride in normal mode until the system resets. The reset will happen automatically after the software is uploaded. If you accidentally put the system into bootloader mode, the power supply must completely discharge; and the system will reset into normal mode when you start riding again.

The process works the same whether you use an Android or iPhone. We made a video for the Apple folks to show how our app works. Here is the link: <https://www.youtube.com/watch?v=aCWYMNWFVrE> the last few minutes of the video explains the DFU process.

Here are the steps to perform a DFU:

1. Connect to the device via the SmartLoad app and ride for a few minutes to put a full charge on the device.
2. Dismount the bike if you are not using a fork stand. ***This is the safest way to upload software.*** Alternatively, have a friend perform the following steps while you ride the rollers.
3. Open our smartphone app, select the SmartLoad functionality button and connect to the TruTrainer device.
4. Once connected, press the Settings button to bring up the Rider Settings screen.
5. Put the SmartLoad device into bootloader mode by pressing the “Enable DFU” button on the Rider Settings screen. A separate screen will appear asking whether you want to proceed with this. Press the OK button at the bottom of this screen.
6. Locate the ZIP file on your phone and share it with the TruTrainer app this will open the DFU functionality of our smartphone app and load the file into our Firmware upload page. Alternatively, you can open our SmartLoad app and press the DFU button on the home screen and press the select file text to load

the zip file containing the device firmware update. This requires that the zip package be stored in your phone's file system.

7. After the ZIP file is loaded in the DFU app, Press the connect button at the bottom of the app and select the "TT\_DFU" device from the list of BLE devices that will appear.
8. Once connected, the last step is to tap the Upload text and the software transfer will start. This takes about 3 minutes to push the new firmware to the device.
9. When the firmware upload is complete, the system will reset and start up in normal mode.