

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 3rd 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 3rd 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 3rd 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 3rd party provider, you can use your bike's power meter as the power source and the SmartLoad roller as the control device.

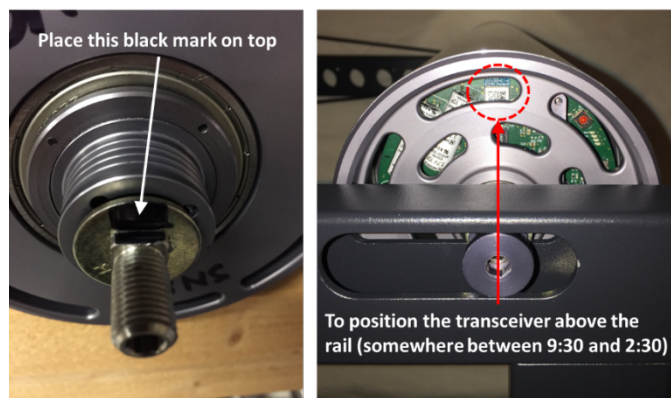
Cautions:

- 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.

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 3rd 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 3rd 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 3rd 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. 3rd 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 3rd 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). You will need to have **both** the **nRF Device Firmware Update (pictured below)** application as well as the **TruTrainer SmartLoad (pictured below)** application installed on your phone to accomplish this. You can find both on your phone's application store. The upload occurs over a Bluetooth Low Energy (BLE) wireless connection once the SmartLoad device is put into bootloader mode.



nRF Firmware Update App



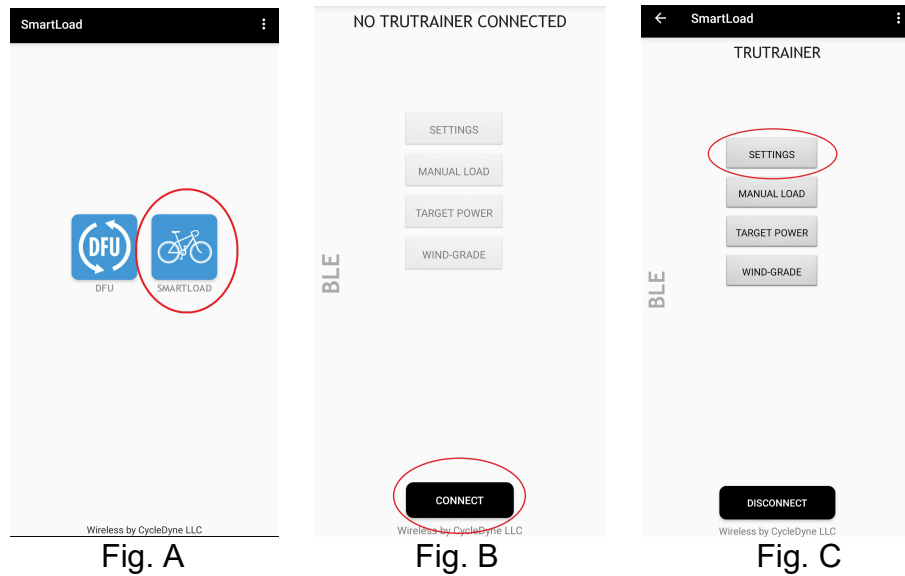
TruTrainer SmartLoad App

*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.***

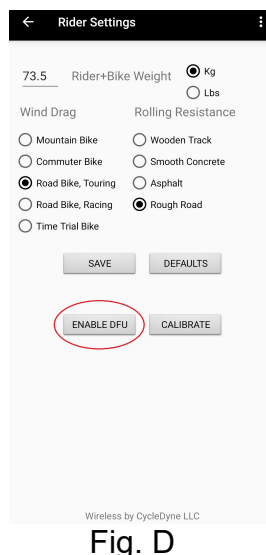
Important: Before starting the firmware update, make sure your phone or tablet's screen timeout / auto-lock setting is increased or temporarily disabled so the screen stays awake during the entire update process. If the device goes to sleep or the screen turns off during the update, it can interrupt communication with the SmartLoad and may cause the update to fail.

Here are the steps to perform a DFU:

1. If you haven't already downloaded the latest firmware ZIP file to your phone, do so now. Latest firmware can be found on our website: www.trustrainer.com under the "Support" tab. Do **not** unzip the file.
2. Ride for a few minutes to put a full charge on the device.
3. 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.



4. Open our smartphone app, select the SmartLoad functionality button show in Fig. A and connect to the TruTrainer device (Fig. B)
5. Once connected, press the Settings button (Fig. C) to bring up the Rider Settings screen.



6. Put the SmartLoad device into bootloader mode by pressing the “Enable DFU” (Fig D) 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.
7. **Exit the SmartLoad smartphone app.**

8.  Open the nRF Firmware Update application on your smartphone.

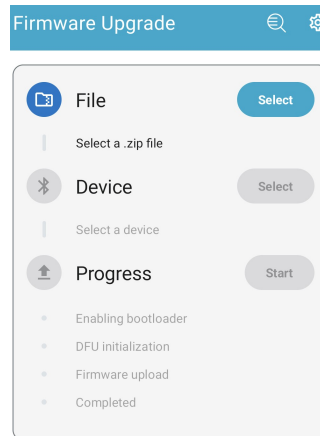


Fig. E

9. Follow the steps presented in Fig. E
- File Select – Browse for the ZIP file on your phone
 - Device Select – “TT_DFU” should be visible as a connectable device. ***If it is not visible, you have not properly set the SmartLoad to DFU mode, return to step 1.***
 - Select Start – You will be able to watch a progress bar from 0% to 100%. ***At this time, it is recommended you continue pedaling to make sure the roller stays powered on through the entire update.***
10. When the firmware upload is complete, the system will reset and start up in normal mode.