



TgForce Sensor User Guide

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Product Overview

Thank you for choosing the TgForce Impact Running Sensor. The sensor and its associated App provide real time tibial shock feedback and additional features. This document provides instructions on installing and operating the sensor. It also provides mandatory regulatory information. Please check tgforce web site at <http://tgforce.com> for the latest information.

We recommend following the guidelines in this instruction manual before using the TgForce Sensor.

Getting Started

What's included



Tgforce Sensor



Velcro Band



USB Charging cable

+ Free Mobile App on the Appstore



Apple iOS Requirements

- iPhone 4S+, iPad 2nd Generation+, iPod Touch 5th Generation
- iOS Operating System 7.1 or later

Downloading the TgForce App

You will need to download the free TgForce App to use your sensor.

1. Click on the App Store on your iOS device.
2. In the search toolbox, enter TgForce.
3. There will be an icon with an add feature that says "Free". Click this icon. A new green icon will appear asking "Install App". Tap it.
4. Once the download is complete you can find TgForce App on your device.

Charging and activating the sensor

Charging

Before first use, it is recommended to fully charge the TgForce sensor. Plug the provided USB charging cable into any USB port. Charging your sensor will take approximately 1-2 hours. When charging is complete, the orange LED indicator light will turn off.

Activating the sensor

Slightly shaking the sensor will activate it. If the sensor was in sleep mode, LED indicator light will flash red 5 times (or blue if an iOS device with TgForce App is active nearby). Note that the sensor does not have an On/Off Switch. If the sensor has been unused for more than 10 minutes, it will enter sleep mode to preserve battery charge. It will also enter sleep mode if the sensor is not paired within 2 minutes,

Pairing the TgForce Sensor

The TgForce App will automatically look for a nearby TgForce sensor and establish pairing. You can confirm pairing has been successful by looking at the Bluetooth icon in the upper left corner of the TgForce App. When successful pairing is established, the sensor LED indicator will flash blue 5 times. Alternatively, you can pair the sensor manually by selecting the Settings Tab and 'TgForce Sensor'.



Pairing has been successfully established.



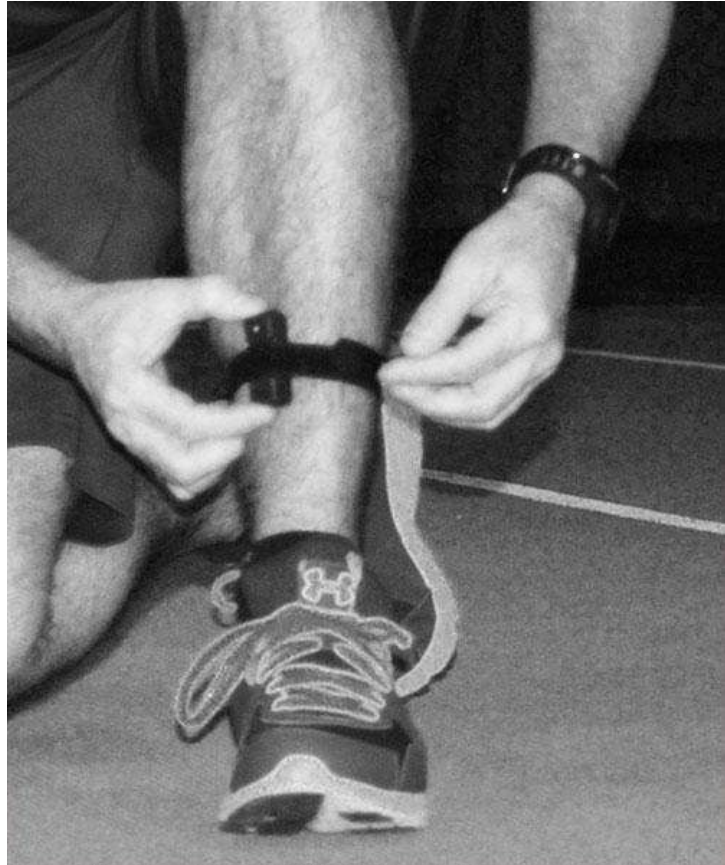
There is no pairing with the TgForce sensor. Try shaking the sensor until pairing occur.

Attaching the TgForce Sensor

For accurate measurement, the sensor must be attached to the anteromedial aspect of the distal tibia (in front and toward the middle of the lower extremity). Use the provided Velcro band. The Sensor must be attached in way that is tight enough so it does not slide on the skin.

It is very important to have the sensor visual LED indicator on top; the charging hole must be downward.

Note: The sensor can also be attached using Adhesive tape such as the 3M Nexcare Water Resistant Adhesive Tape. If the sensor cannot be attached firmly with the Velcro band, use this method.



Start Running

Push the Start button on the app. Once you start running, you should see Impact data being received and displayed.

If Audio feedback is activated (in the Settings menu), you will be notified in your earphone if the impact level is above the gMax threshold.

You can adjust the gMax threshold in the Settings menu.



Getting to know the TgForce App

The main Session view

PPA

The PPA (Peak Positive Acceleration) of the Tibia while running is displayed in real time in g unit. It is the maximum acceleration that occurs during the impact phase of running.

AVG

This is the average PPA for the session. Calculated over the displayed number of steps.

Cadence

Number of steps per minute - counting both feet.

gMax Red threshold line

The gMax threshold can be adjusted in the Settings menu. The top PPA value will switch from blue to red every time the impact value is higher than the gMax threshold value. If Audio Feedback is enabled, an audible sound (selectable in the settings menu) will also be generated.

Start/Stop

After a session has been started with the Start Button, only the Session screen is available. The Settings and History screens are available after stopping a session.

Stopping the session will provide 3 options: Saving the data in history, Discard the session data and Resume the session.



The History view

Each session can be recorded for later review and analysis. Selecting the History Tab provides a table with all the session recorded. You can review the latest 1000 steps of each session on a chart, export the data by email for analysis in a 3rd party software (csv format) or delete the session data.

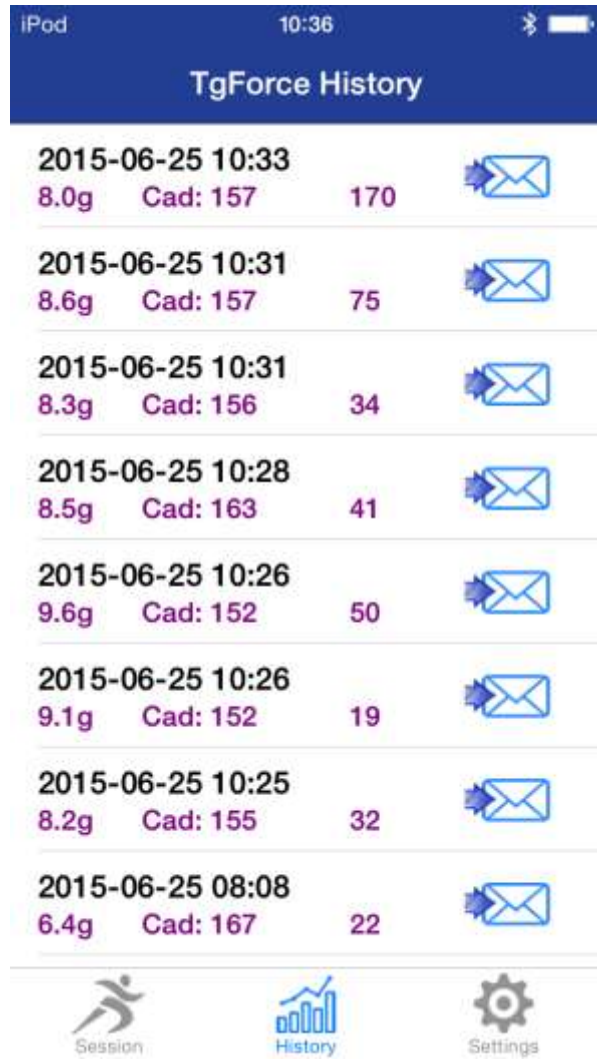
For each session, the following information is displayed:

- Start Date-Time of the session
- Average PPA (Peak Positive Acceleration) during the session
- Average Cadence of the session
- Total number of steps during the session.

Exporting Data, select the envelope - You can use this feature to export the raw data from the session. You need to have the Email feature of your iOS device adequately configured for using this function. The format is CSV (comma separated value).

Review Chart: Select the session, a detailed chart will be displayed.

Deleting a session, slide your finger from right to left. A red 'Delete' Box will appear. Confirm action by selecting it.



The screenshot shows the 'TgForce History' app interface on an iPod. The status bar at the top shows 'iPod', '10:36', and battery level. The app title 'TgForce History' is centered. Below the title is a list of sessions, each with a date-time, average PPA (g), average cadence (Cad), total steps, and an envelope icon for exporting data. At the bottom, there are three navigation icons: 'Session' (a person running), 'History' (a bar chart), and 'Settings' (a gear).

Date-Time	Average PPA (g)	Average Cadence (Cad)	Total Steps	Action
2015-06-25 10:33	8.0g	157	170	Envelope
2015-06-25 10:31	8.6g	157	75	Envelope
2015-06-25 10:31	8.3g	156	34	Envelope
2015-06-25 10:28	8.5g	163	41	Envelope
2015-06-25 10:26	9.6g	152	50	Envelope
2015-06-25 10:26	9.1g	152	19	Envelope
2015-06-25 10:25	8.2g	155	32	Envelope
2015-06-25 08:08	6.4g	167	22	Envelope



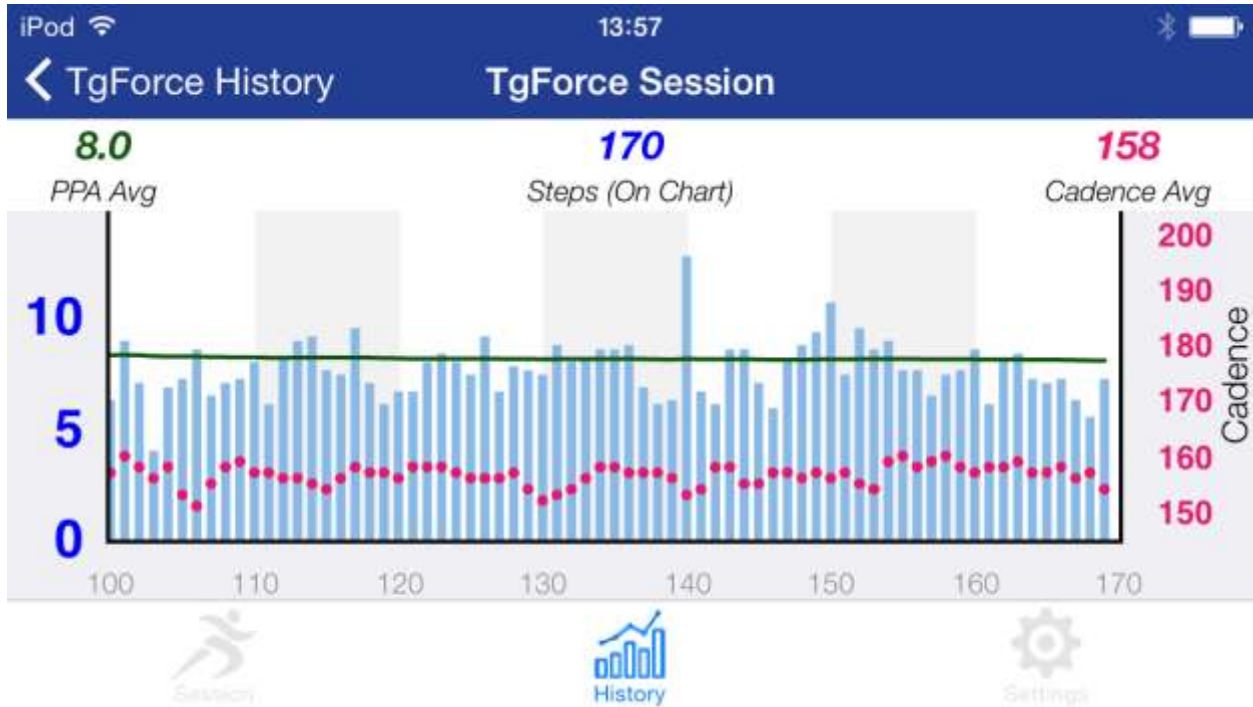
This screenshot shows a single session entry from the 'TgForce History' app. The session details are: '25 07:32', 'ad: 160', and '40' steps. An envelope icon is visible to the right of the steps. A red 'Delete' button is overlaid on the right side of the session entry. Below this entry, the start of another session is visible: '2015-07-25 07:29'.

Date-Time	Average PPA (g)	Average Cadence (Cad)	Total Steps	Action
25 07:32	ad: 160		40	Envelope, Delete
2015-07-25 07:29				Envelope

The Review chart

The latest 1000 steps can be analyzed using the Review chart. The chart provides impact and cadence data for the selected session. The chart is scrollable and zoomable for reviewing running data with a high level of precision.

Also available on the review screen is the PPA and Cadence Average for the last 1000 steps. The Review screen can be displayed in the portrait or landscape mode.



The Settings view

TgForce Sensor

If more than one TgForce sensor is active nearby, you can select one using this function. You also use this function to pair with a new sensor. Each sensor has a specific ID number to differentiate them from other sensors. Use this function if you encounter issues with automatic pairing of the sensor.

gMax Warning & Adjustment

This is where you can adjust the impact threshold for receiving and displaying warnings. The red line in the Session view chart will be set at this value.

Audio Feedback

If activated, the iOS device will generate either a 'Beep' or a 'Drum' sound when the impact level is above the gMax threshold

Real Time Graphic

For selecting bar or line chart in the session view

Advanced Settings

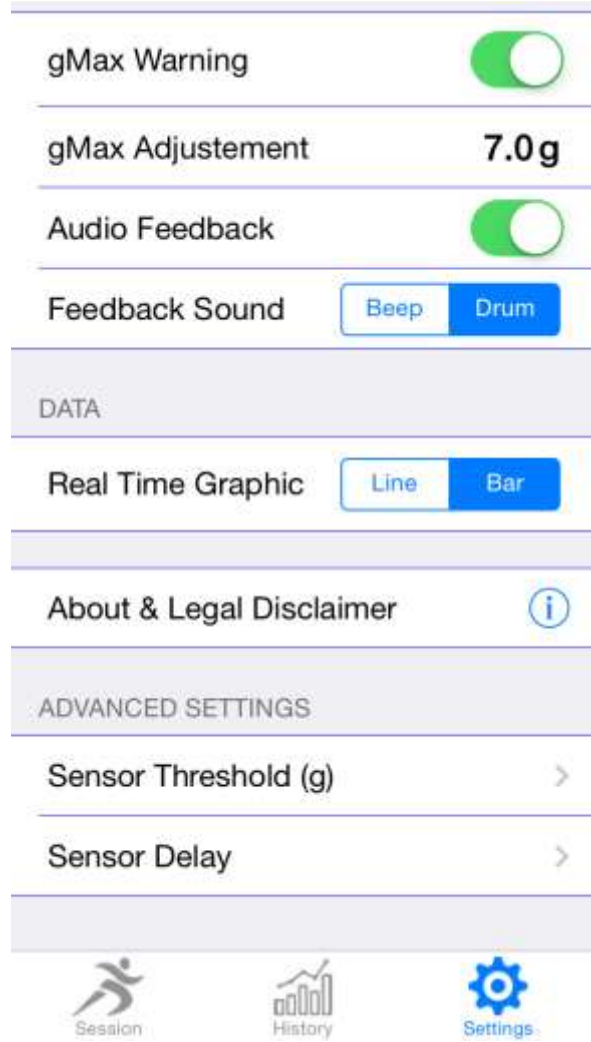
You can fine tune the sensor performance using the sensor threshold and sensor delay adjustments

Sensor Threshold

This is the minimal impact level required (in g units) for activating the sensor PPA detection algorithm. If the sensor is not detecting steps, you may want to reduce the threshold. If the sensor is too sensitive, you may want to increase this value.

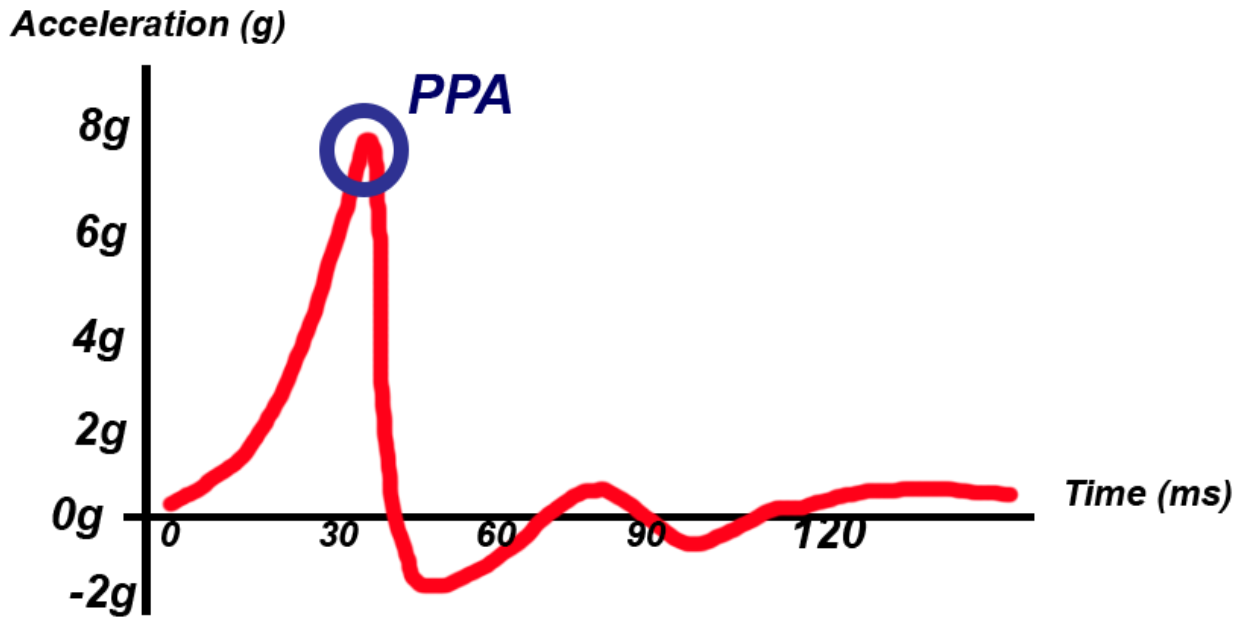
Sensor Delay

To reduce potential false step detection, the sensor will wait a certain amount of time after each step before listening to new impact signal. You may want to modify this value for special conditions or for other applications.



Understanding Peak Positive Acceleration (PPA) Value

The sensor and the internal algorithm have been designed for measuring the Peak Positive Acceleration (PPA) of the tibia. This value is obtained during the initial foot contact.



Treadmill & Pavement Running

Depending on the type of treadmill used, there may be an important variation in impact level between treadmill and pavement running. In many cases, the treadmill running surface will absorb a significant portion of the impact. The TgForce sensor is initially set for normal pavement running. If the recorded cadence is sometimes incorrect, you should adjust the sensor threshold (g) level (see calibration section).

But keep in mind that the TgForce sensor always provides the true value of the tibial shock. It can be used as a good indicator of the impact reduction level.

Sensor Calibration

For best performance, you should make sure the sensor is adequately calibrated. Do a short run with the sensor and make sure that the number of steps indicated on the main session view correspond exactly to the number of steps you did in the session (step count for the leg with the sensor).

If the cadence is sometimes very *low* or the step count displayed is lower than the actual number of steps.

- **Reduce** the sensor impact threshold value (Settings view, Advanced Settings, Sensor Threshold). Try reducing the threshold 1 step at a time.

If the cadence is sometimes very *high* or the step count displayed is higher than the actual number of steps:

- **Increase** the sensor impact threshold value (Settings view, Advanced Settings, Sensor Threshold). Try increasing the threshold 1 step at a time.
- **Increase** Sensor Delay value (ms between each impact).



General Information

Battery life, Charging and Power

The battery will last up to 6 hours with continuous running. Charging your sensor will take approximately 1-2 hours. When charging is complete, the orange LED indicator light will turn off. To save battery, the sensor will enter Sleep Mode if it does not detect any impact for 10 minutes. Simply shaking the sensor will reactivate it.

If the sensor has not been used for more than 3 weeks, you may have to recharge it before using it again.

Note: If the sensor has never been paired with an iOS device, it will scan for a nearby device for 2 minutes after being shaken. If no pairing has occurred, it will go back into sleep mode.

LED Indicator Light

The indicator light on the sensor communicates the current status and let you know it is powered.

- Orange: Battery currently charging - Will turn off when fully charged
- Red: If the indicator light flash red when the sensor detects an impact, it means the sensor is active but not paired to an iOS device.
- Blue: The indicator light will flash blue when paired and actively transmitting data to an iOS device.

App Updates

TgForce team will periodically add new features, updates, and improvement to the TgForce App. It is recommended that you keep your TgForce App updated to the latest version.

Cleaning & using the TgForce sensor in wet condition

The TgForce sensor is sweat-proof and rain-proof. Wipe clean with mild soapy water but do not immerse the unit in water.

Return Policy and Warranty

Kelsec Systems provides a one-year limited warranty. Under conditions of the warranty agreement provided with your TgForce sensor, purchasers will be entitled to repair or replacement for defective TgForce units. This warranty begins from the date of initial purchase. Kelsec Systems may also choose to refund the purchase price of the unit to the purchaser. Warranty information and the TgForce online web store return policy can be found in the TgForce Support Center online at <http://www.tgforce.com/support>.

Specifications

Input Voltage (USB Recharging)	4.0 to 6.0 V
Connectivity	Bluetooth 4.0, 2.4GHz ISM Band
Internal Battery	Lithium Polymer
Dimension (TGF1)	4cm X 2cm X 1.5cm (1.5 in X 0.8 in X .5 in)
Impact range (g)	1g to 23.9g
Impact detection	Mems triaxial accelerometer

Regulatory and Safety Notices

Medical advice

The use of the TgForce sensor is not a substitute for individualized gait analysis and therapy by a trained professional. You should always consult your healthcare provider before beginning any fitness program.

Recycling



The symbol on the product or its packaging signifies that this product has to be disposed separately from ordinary household wastes at its end of life. Please kindly be aware that this is your responsibility to dispose electronic equipment at recycling centers so as to help conserve natural resources. Each country in the European Union should have its collection centers for electrical and electronic equipment recycling. For information about your recycling drop off point, please contact your local electrical and electronic equipment waste management authority or the retailer where you bought the product.

- Do not dispose of the TgForce sensor with household waste.
- Batteries are not to be disposed of in municipal waste stream and require separate collection.
- Disposal of the packaging and your TgForce sensor should be done in accordance with local regulations.



FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet different from that to which the receiver is connected



FCC Statement: TgForce Sensor TGF2 contains FCC ID PI4BL600

Canada Regulatory Conformity

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulation of the Canadian Department of Communications.

"Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada."

Contains IC 1931B-BL600





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