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Introduction

Welcome to the user manual for One Giant Leap's range of power meters for paddlesports.

If you have any questions, please get in touch with us at support@onegiantleap.co.nz.

Getting Started

This 'Getting Started' section of the user manual is designed to guide you through the set up process of the power meter.

Assemble the power meter

To assemble the power meter you will need to attach blades to each shaft section. It is **very important** that the blades are aligned with the zero angle on the shaft as detailed in Step 4 below.

The following steps will guide you through the assembly process.

Step 1

- Identify the left shaft section (it is the shaft section with the length scale and it is the shortest of the two).



- Identify the right shaft section (it is the shaft section with the connection clamp and it is the longest of the two).

Assemble the power meter



- Assemble the paddle (without applying glue) to check that the blades fit the shaft.
-

Step 2

- Apply a few layers of tape over the heat shrink to prevent overheating and melting of the heat shrink.

Assemble the power meter



- Apply tape to the blade at its throat.

Assemble the power meter



Step 3

- Assemble the left and right shafts and set the offset angle to zero.

Assemble the power meter



Step 4

- Align the left blade so that the face of the blade is aligned with the zero angle.

Assemble the power meter



Step 5

- Using a pen, mark this alignment on the tape applied in Step 2.
-



Step 6

- Rotate the right blade so that it is aligned with the left blade.
 - Take care ensure that the alignment marks scribed on the left blade remain aligned.
 - This step can be done using an assembly jig. If you don't have access to an assembly jig – you can either use a spirit level (go to Step 7) or two level surfaces (go straight to Step 8).
-

Step 7

- Place a level across the left blade a measured distance from the tip of the blade.
- Rotate the shaft and blade together until the blade is level.
- Clamp/secure the shaft so that it doesn't move.

Assemble the power meter



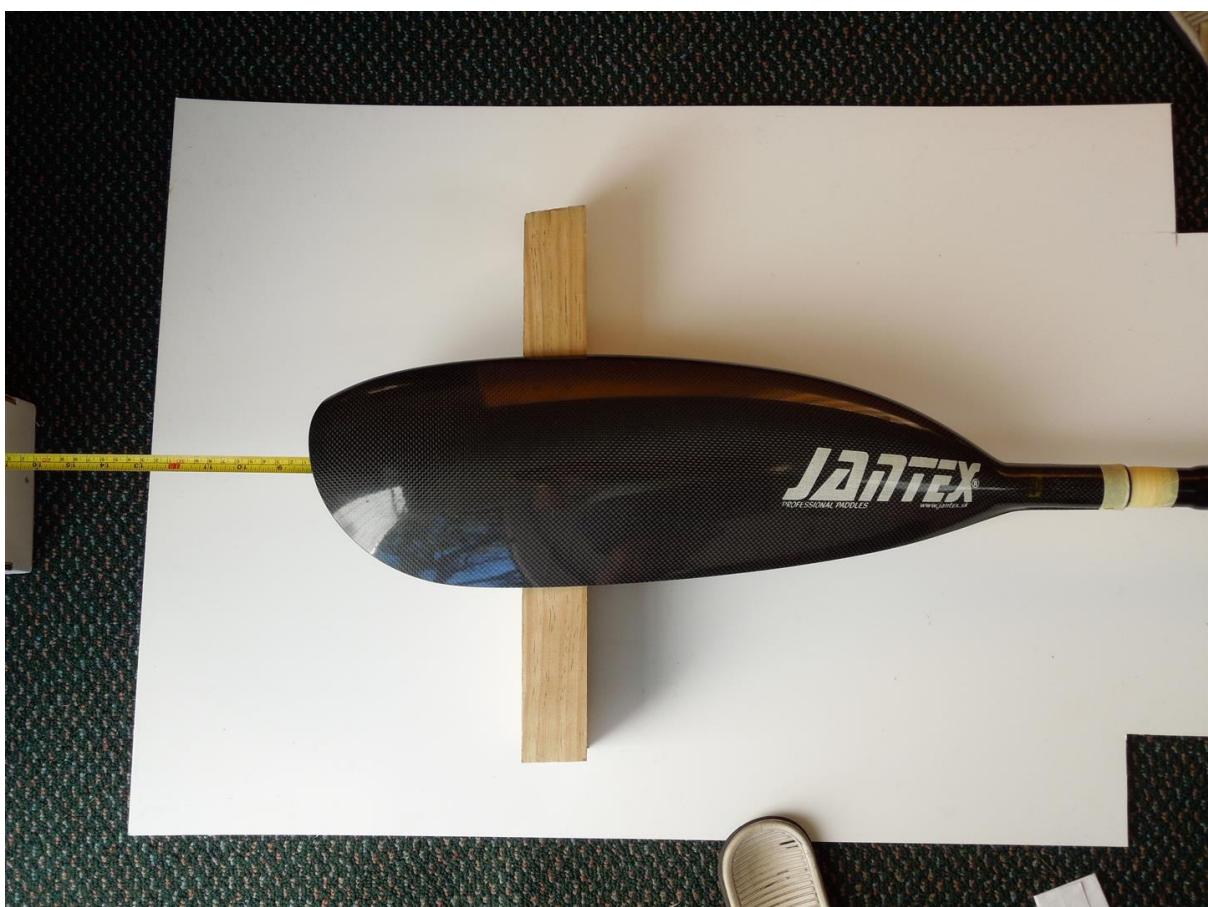
- Place the level onto the right blade, the same measured distance from the tip.
- Rotate the blade until it is level.
- Using a pen, mark this position by scribing alignment marks (see Step 5).



Step 8

- Set up two level surfaces (e.g. chairs or pieces of wood on concrete).
- Space the surfaces so that the blades rest on the surface an equal distance from each tip.
- Rotate the right blade so that both left and right blades lay flush onto the bearing surface.
- Using a pen, mark the position of the right blade by scribing alignment marks (see Step 5).

Assemble the power meter



Step 9

- Remove the blades and prepare for gluing. Use the scribed marks to position the blades when gluing the blades on.
 - Ensure that the surfaces are clean and free of dust and wax/grease. It is recommended that the surfaces are sanded with medium grade sand paper to aid the adhesion of the hot melt glue.
-

Step 10

- Apply glue to the shaft. If you don't have a hot melt glue application gun, heat up the glue stick with a heat gun then apply the melted stick to the shaft.





Step 11

- Apply a gentle heat to the blade and the shaft to prolong the workable time of the hot melt glue.
- Take care not to overheat the blade or shaft.



Step 12

- Whilst the glue is in a hot and workable condition, twist on the blade so that the markings align.
 - Make sure that the glue is hot when doing this. If the glue begins to set before the blade can be located, gently heat up the shaft and blade until the glue melts again.
-

Step 13

- Wipe off the excess glue. It is recommended that some of the excess glue be left on the paddle to prevent water entering the join connection.
 - Leave the glue to set for 5 – 10 minutes. Check that the alignment marks are still aligned before removing the tape.
-

Assemble the power meter

Install the Windows Desktop App

The Windows Desktop App is needed to communicate with the power meter and is used to change the settings stored on the power meter. The application can be installed on a Windows PC or tablet with a full-sized USB port.

You will need to have an ANT+ USB stick connected to your laptop/tablet in order to use the Windows Desktop App.

The following steps will guide you through the installation process.

Step 1

Ensure the following prerequisites are installed:

- Microsoft .NET Framework 3.5 SP1
 - Microsoft .NET Framework 4
 - Microsoft Visual C++ 2008 Redistributable Package (x86)
-

Step 2

Proceed to download and run the following application:

- Windows Desktop App

Charge the power meter batteries

Each shaft section of the power meter contains a rechargeable lithium-polymer battery. On a single charge, the battery will provide enough energy to power the power meter for 12 hours of paddling.

The power meter will automatically enter a 'deep sleep' mode when it senses no movement *or* a 'low power' mode when it senses movement, but no force is being applied.

You may need to charge the batteries before you can start using the power meter. The following instructions will guide you through this process.

You will need to locate the two charging cables, the aluminium extender (shown below) and a 5V charging source (USB or 5V wall adaptor) to charge the batteries.



Left shaft

Charge the power meter batteries

- Charge the left shaft section by inserting the charging cable into the charging port located at the end of the shaft and the USB connector into a computer (or USB charger).



Right shaft

- Insert the charging cable into the aluminium extender.

Charge the power meter batteries



- The extender will allow the charging cable to be inserted into the charging port located inside the end of the right shaft section.

Charge the power meter batteries



The easiest way to determine the battery level of each shaft section is to use the Windows Desktop App. When both shaft sections are connected, the status of each battery will be displayed (as shown below) on the right-hand side of the Windows Desktop App.



The status of each battery will be represented using one of the following descriptions:

- New
- Good
- OK
- Low
- Critical

Charge the power meter batteries

Typically, the GPS watch will alert you (with a notification on the screen lasting 5 seconds) when the battery status of either shaft section becomes 'Low'.

Measure the 'Athlete Specific' settings

The 'Athlete Specific' settings need to be set initially and updated *whenever* you:

- change the location of your hands along the shaft
- change your overall paddle length*
- attach a new set of blades to the power meter*

*due to the fact that you may inadvertently change the location of your hands with respect to the blade tip in this scenario

There are two 'Athlete Specific' settings to measure and input:

1. *Blade tip to top hand distance (e.g. 1250mm)*
the distance between the blade tip and the pushing hand (the hand furthest away from the blade in the water during a stroke).
 2. *Blade tip to bottom hand distance (e.g. 650mm)*
the distance between the blade tip and the pulling hand (the hand closest to the blade in the water during a stroke).
-

Note: **Blade tip to top hand** will always be a larger number than **Blade tip to bottom hand**.

Note: Applying tape over the shaft in the location of the measured hand positions (as shown below) can help ensure that the athlete's hand positions do not change during paddling.



The following steps will guide you through the process of measuring the distances and updating these settings on the power meter using the Windows Desktop App.

Step 1

- Attach the end of the measuring tape to the tip of the left (or right) blade.
- All measurements must be made from the same blade tip.

Note: When measuring the two distances outlined in Step 2 & Step 3 below, please ensure that the measured distance is the **same** regardless of whether it was measured from the **left** or the **right** blade tip. This will be the case if the athlete is holding the paddle symmetrically.



Step 2

- Determine the position of the top hand (the hand farthest from the blade in the water) by measuring to the knuckle of your middle finger.
- This value is the 'Blade tip to top hand distance'.
- The 'Blade tip to top hand distance' is 1250 mm in the example image below.

Measure the 'Athlete Specific' settings



Step 3

- Determine the position of the bottom hand (the hand closest to the blade in the water) by measuring to the knuckle of your middle finger.
- This value is the 'Blade tip to bottom hand distance'.
- The 'Blade tip to bottom hand distance' is 650 mm in the example image below.

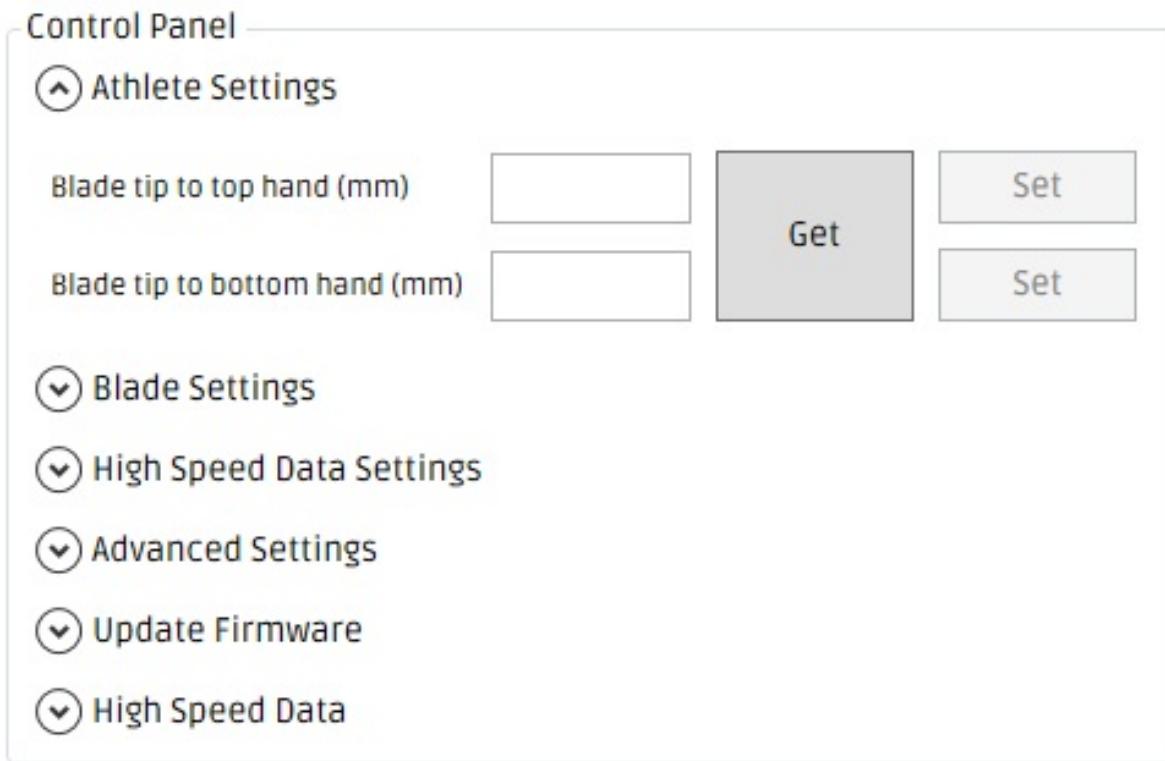


Step 4

- Open the One Giant Leap Windows Desktop App.
- Connect to the power meter.
- Expand the 'Athlete Settings' tab.

To set the 'Blade tip to top hand distance' & the 'Blade tip to bottom hand distance' both the left and right shaft sections need to be connected.

The 'Set' buttons will be enabled only when both shaft sections are connected. If the 'Set' buttons are disabled (as shown in the below image), gently shake both shaft sections and wait 10 - 15 seconds to give them time to reconnect.



Step 5

- Enter the 'Blade tip to top hand distance' into the 'Blade tip to top hand distance (mm)' field in millimetres e.g. 1250
 - Click the 'Set' button.
 - If the 'Blade tip to top hand distance' was successfully set, you should see 'Success. Parameter has been updated (Left)' & 'Success. Parameter has been updated (Right)'.
-

Step 6

- Enter the 'Blade tip to bottom hand distance' into the 'Blade tip to bottom hand distance (mm)' field in millimetres e.g. 650
- Click the 'Set' button.
- If the 'Blade tip to bottom hand distance' was successfully set, you should see 'Success. Parameter has been updated (Left)' & 'Success. Parameter has been updated (Right)'.

Measure the 'Athlete Specific' settings

Measure the 'Blade Specific' settings

The 'Blade Specific' settings need to be set initially and updated *whenever* you:

- attach a new set of blades to the power meter.
-

There are two 'Blade Specific' settings to measure and input:

1. *Blade tip to datum line distance*

the distance between the blade tip and the datum line mark on the shaft.

2. *Blade type attached to shaft*

the make and model of the blades you have attached to the shaft e.g. Jantex Beta

Large

The following steps will guide you through the process of measuring the distances and settings them on the power meter using the Windows Desktop App.

Blade tip to datum line distance

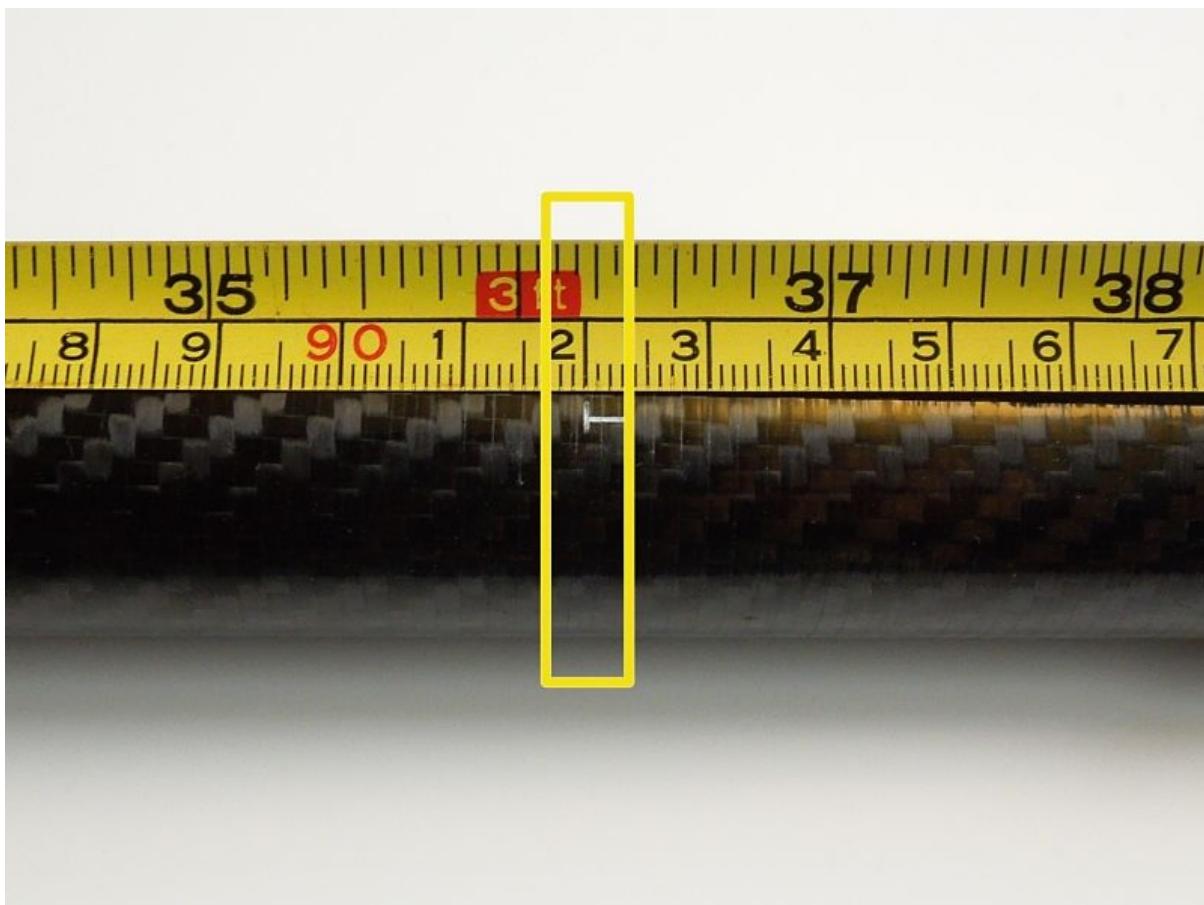
the distance between the blade tip and the datum line mark on the shaft.

Step 1

- Attach the tape measure to the tip of the left blade.

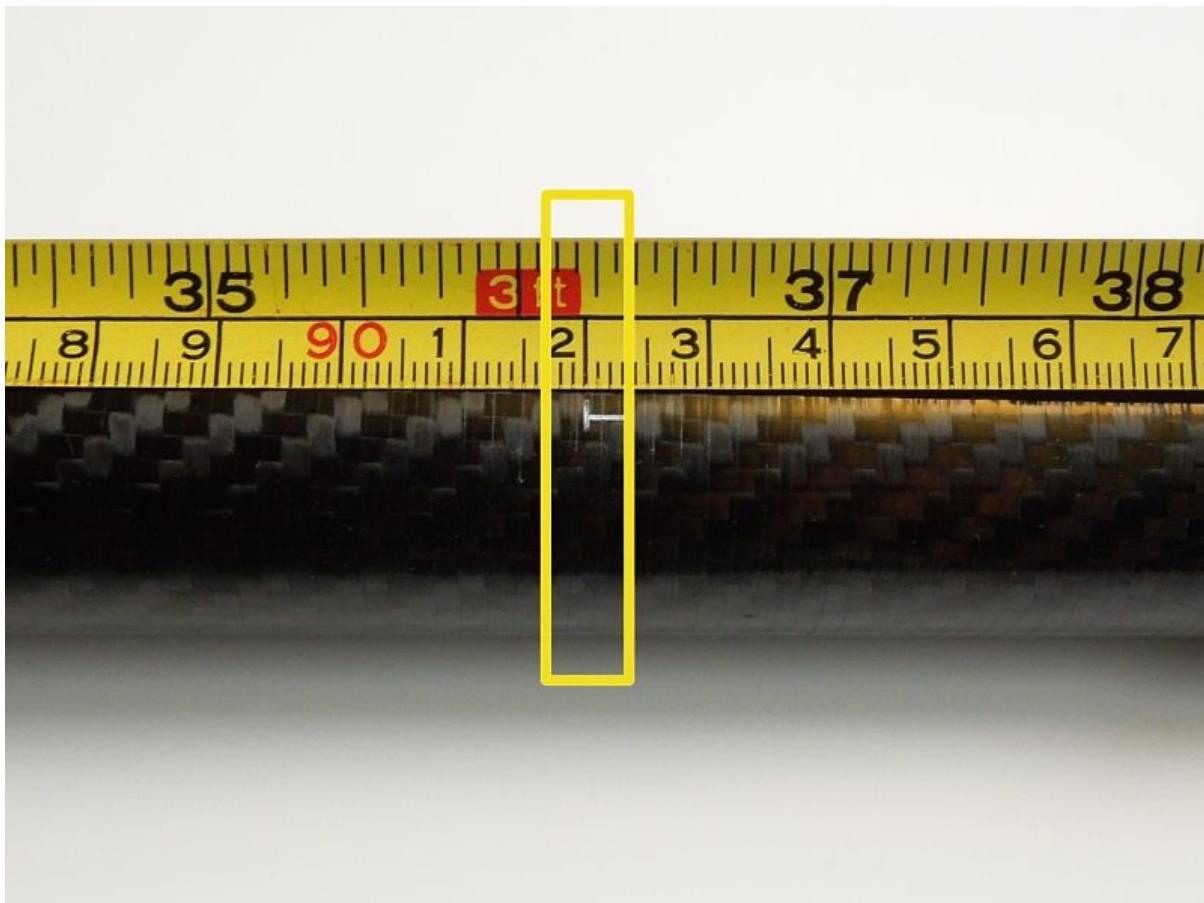


- Measure the distance from the left blade tip to the engraved mark on the left shaft section. This mark is known as the 'left datum line'.
- In the example image the measurement is 920 mm.



Step 2

- Attach the end of the tape measure to the tip of the right blade.
- Measure to the distance from the right blade tip to the engraved mark on the right shaft section. This mark is known as the 'right datum line'.
- In the example image the measurement is 920 mm.



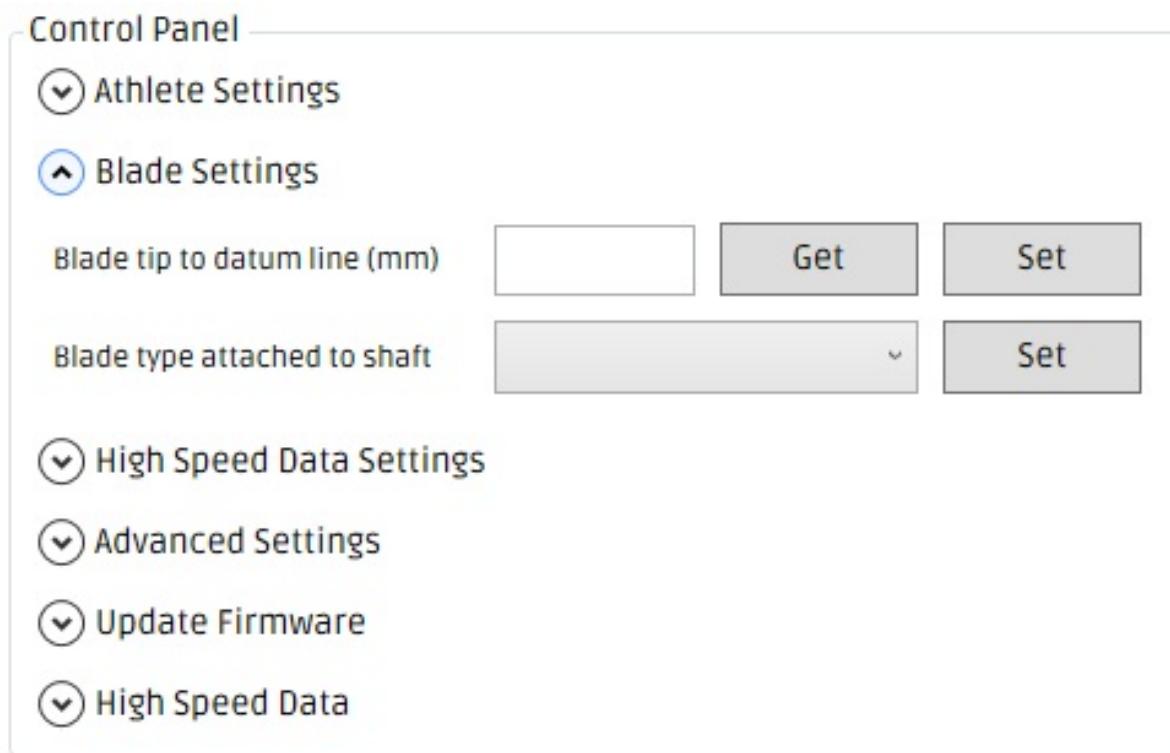
Step 3

- The distance from the left blade tip to the left datum line should be equal to the distance from the right blade tip to the right datum line. If you find that they differ, you will need to reposition one of the blades on the shaft so that the measurements match.
 - This distance is known as 'Blade tip to datum line distance'.
-

Step 4

- Open the One Giant Leap Windows Desktop App
 - Connect to the desired power meter
 - Expand the 'Blade Settings' tab
 - To set the 'Blade tip to datum line distance' both the left and right shaft sections need to be connected.
 - The 'Set' button will be enabled only when both shaft sections are connected.
-

- If the 'Set' button is disabled (as shown in the below image), gently shake both shaft sections and wait 10 - 15 seconds to give them time to reconnect.



Step 5

- Enter the 'Blade tip to datum line distance' into the 'Blade tip to datum line distance (mm)' field in millimetres e.g. 920

Control Panel

⌄ Athlete Settings

⌄ Blade Settings

Blade tip to datum line (mm)

920

Get

Set

Blade type attached to shaft

▼

Set

⌄ High Speed Data Settings

⌄ Advanced Settings

⌄ Update Firmware

⌄ High Speed Data

- Click the 'Set' button.
- If the 'Blade tip to datum line distance' was successfully set, you should see '*Success. Parameter has been updated (Left)*' & '*Success. Parameter has been updated (Right)*'

Control Panel

▼ Athlete Settings

▲ Blade Settings

Blade tip to datum line (mm)

920

Get

Set

Blade type attached to shaft

▼

Set

▼ High Speed Data Settings

▼ Advanced Settings

▼ Update Firmware

▼ High Speed Data

-LOW PRIORITY SEARCH

- Search List
- Extended Messaging
- Scan Channel Support
- Ext Channel Assignment
- Proximity Search
- Advanced Burst
- Event Buffering
- Event Filtering
- High Duty Search
- Selective Data Update
- Single Channel Encryption

Request sent.

Success. Parameter has been updated. 920

Success. Parameter has been updated. (Right)

Success. Parameter has been updated. (Left)



Blade type attached to shaft

the make and model of the blades you have attached to the shaft e.g. Jantex Beta Large.

Step 1

- To set the 'Blade type attached to shaft' both the left and right shaft sections need to be connected.
- Select the appropriate blade type from the drop-down box directly to the right of 'Blade type attached to shaft'.

Control Panel

Athlete Settings

Blade Settings

Blade tip to datum line (mm)

Blade type attached to shaft

High Speed Data Settings

Advanced Settings

Update Firmware

High Speed Data

- Click the 'Set' button
- If the 'Blade type attached to shaft' was successfully set, you should see 'Success. Parameter has been updated (Left)' & 'Success. Parameter has been updated (Right)'.

Control Panel

▼ Athlete Settings

▲ Blade Settings

Blade tip to datum line (mm)

Get

Set

Blade type attached to shaft

Brača I max

Set

▼ High Speed Data Settings

▼ Advanced Settings

▼ Update Firmware

▼ High Speed Data

-EXTENDED MESSAGE PUBLISHING

- Scan Channel Support
- Ext Channel Assignment
- Proximity Search
- Advanced Burst
- Event Buffering
- Event Filtering
- High Duty Search
- Selective Data Update
- Single Channel Encryption

Request sent.

Parameter sent to device.

Success. Parameter has been updated. (Right)

Parameter sent to device.

Success. Parameter has been updated. (Left)

Success. Parameter has been updated. (Left)



Perform a zero offset calibration

Each shaft (left and right) contains a total of *three* channels which are used to measure the force being applied to the paddle.

These three channels are designated **A, B & C** for reference.

The output of a channel when the shaft is experiencing no force is referred to as the **zero offset**. Each channel on each shaft has an associated zero offset.

The zero offset can drift a small amount with a change in temperature. This is why manufacturers of power meters typically recommend performing a zero offset calibration on a semi-regular basis.

Note: After performing a number of zero offset calibrations, it will quickly become clear how frequently or infrequently a zero offset calibration is required. If the zero offsets vary by no more than **one** between zero offsets calibrations, then there is little to be gained from performing a calibration regularly.

The zero offset of a channel will be between 0 and 1000. A typical zero offset will change no more than 2-5 between calibrations. A difference of 10 or more is an indication that either a bending force is being applied to the shaft; that there is an issue with that particular channel or that you recently travel from an extremely hot or cold climate.

The following steps will guide you through the process of performing a zero offset calibration.

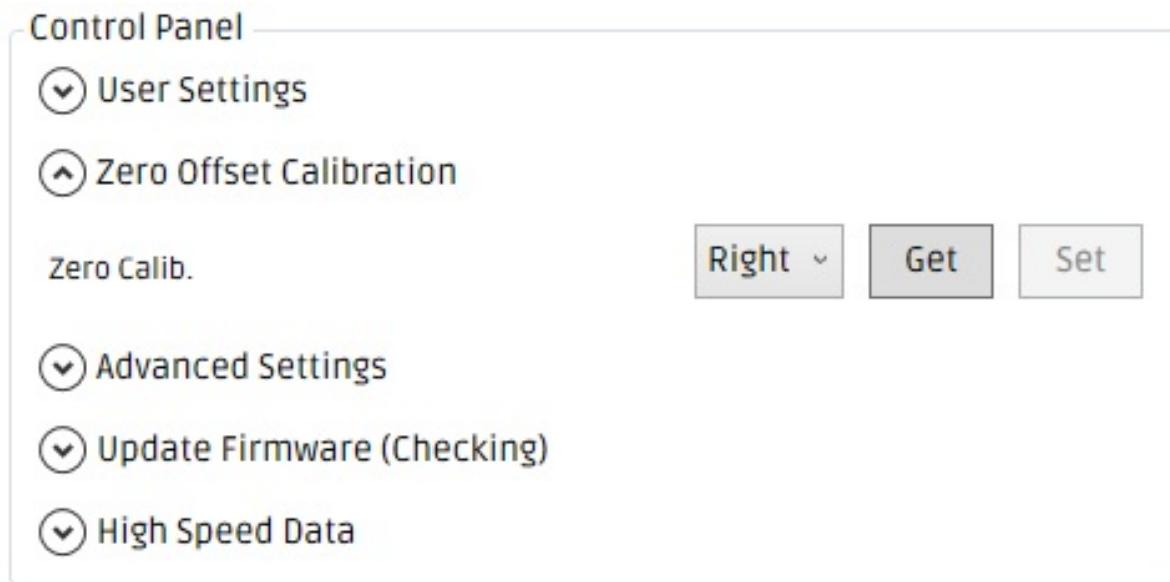
Step 1

- Place the paddle up against a wall or flat on the floor to ensure no bending force is being applied to the shaft.
 - Open the Desktop App and search for the power meter.
-

Step 2

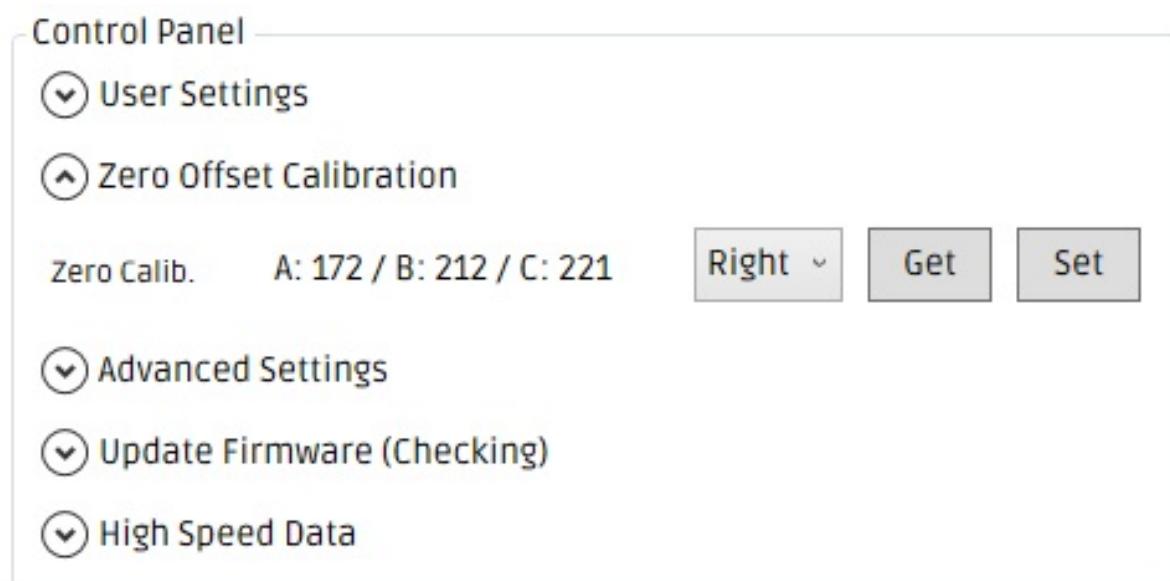
Perform a zero offset calibration

- Expand the 'Zero Offset Calibration' tab.
- Select a shaft (e.g. Right) from the drop-down box.



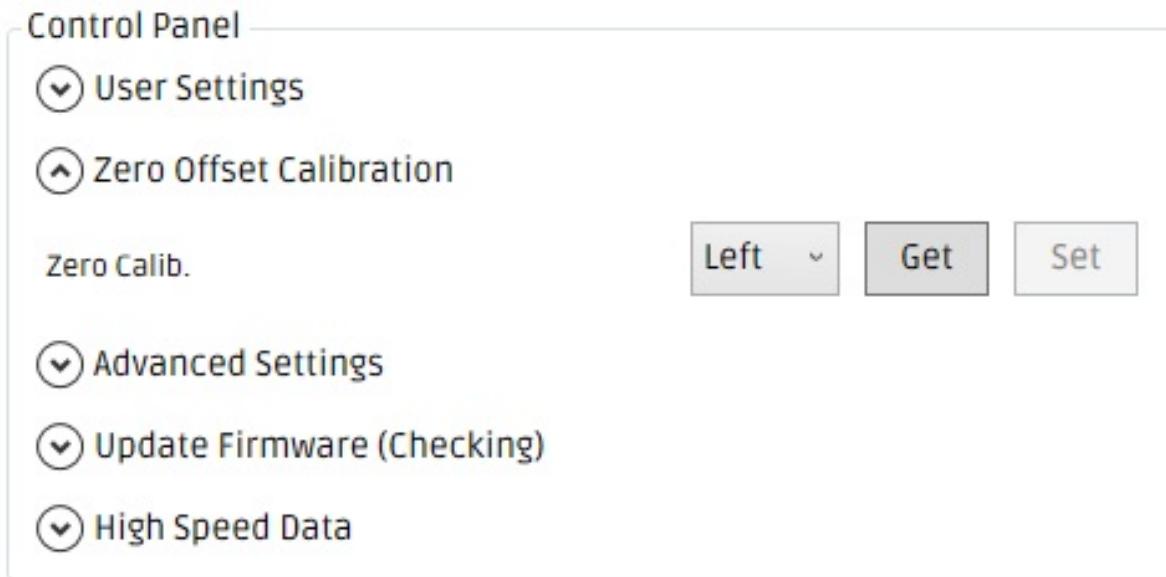
Step 3

- Click the 'Get' button to retrieve the current output of the three channels.
- The 'Set' button will become enabled once the Desktop App receives the response from the shaft.
- Click the 'Set' button to send a message to the power meter to store these values as the new zero offsets.



Step 4

- Select the remaining shaft (e.g. Left) from the drop-down box.
- Repeat **Step 3**.



Real-time Data

A list of all the Garmin products which are compatible with the power meter can be found [here](#).

Refer to the 'Owner's Manual' of your Garmin product for instructions on 'Pairing Your ANT+ Sensors'.

The 'Owner's Manual' of popular Garmin products are listed below for your convenience.

- [Forerunner 910XT Owner's Manual](#) (English)
 - [Forerunner 920XT Owner's Manual](#) (English)
 - [Edge 500 Owner's Manual](#) (English)
 - [Edge 510 Owner's Manual](#) (English)
 - [Edge 810 Owner's Manual](#) (English)
 - [Edge 800 Owner's Manual](#) (English)
-

A list of all the compatible Suunto products can be found [here](#).

A list of all the compatible Magellan products can be found [here](#).

Pairing with a Garmin Forerunner 910XT

Step 1

- Power on the Garmin Forerunner 910XT and confirm that the 'Sport' is set to **Bike**.

Note: You can identify that the watch is in Bike mode by the cyclist symbol that appears at the bottom of the screen when navigating the settings menu (pressing the Mode button). A symbol of a runner, swimmer or skier indicates that the 'Sport' is incorrectly set.

- If the 'Sport' is set to **Bike**, then go straight to **Step 3**. If the 'Sport' is *not* set to **Bike**, then please complete **Step 2** below.
-

Step 2

- Press and hold the Mode button.
 - Select '**Bike**' from the list of sports.
 - Select '**Bike 1**' from the list of available bikes.
-

Step 3

Navigate through the settings to set '**Power Meter Present**' to '**Yes**' for *Bike 1*.

- Press mode and using the up/down buttons, highlight the option Settings, then press Enter.
 - Select Bike Settings, then press Enter.
 - Using the up/down buttons navigate to highlight Bike 1, then press Enter.
 - Using the up/down buttons navigate to highlight ANT+ Power, then press Enter.
 - Change '**Power Meter Present**' to '**Yes**'.
-

Step 4

- Shake the power meter unit to wake it from sleep.

Single power meter present

Select 'Search' on the 910XT.

Multiple power meters present

Select 'Sensor Details' and manually enter the Serial Number of the power meter you wish to pair. (The serial number can be found on the packaging in which the power meter was shipped).

- Once paired, a '**Power Meter Detected, Calibrate?**' message will appear. Select '**No**'.
- You have now successfully paired a power meter with a Garmin Forerunner 910XT.

Pairing with a smartphone

Coming soon...

High Speed Data

High Speed Data is the recording of pushing hand force (N), pulling hand force (N) and power (W) at 50 times a second (a sample every 20 milliseconds).

The high frequency at which the data is sampled allows for individual strokes to be analyzed; left and right imbalances to be identified; and stroke-timing in team-boats to be investigated.

In a sports science laboratory environment, High Speed Data would be the tool of choice for a biomechanist, whereas a physiologist would be predominately interested in Real-time Data.

By selecting a section of the data, average force and power curves can be generated. This condenses all of the strokes contained in the selected area into a single representative stroke (based on the average of the selected strokes). Technique is represented by the force and power curves. Each athlete has their own characteristic curve, or stroke profile.

How to change the High Speed Data settings

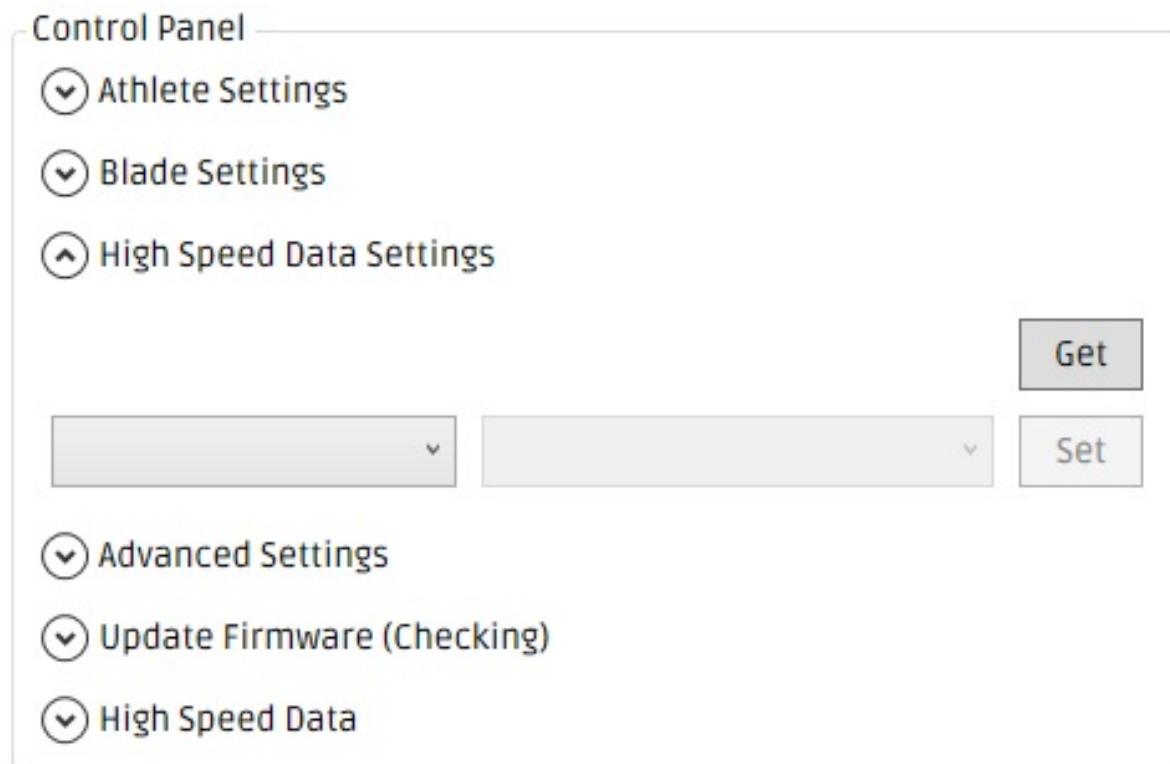
The High Speed Data settings allow you to specify:

1. which metrics are recorded
2. the length of time a single recording will last

The following steps will guide you through the process of changing the High Speed Data settings using the Windows Desktop App.

Step 1

- Open the Windows Desktop App
- Connect to the desired power meter
- Expand the 'High Speed Data Settings' tab



Step 2

- Select which metrics you want to record

1. Power & Force

Records power (W), pushing hand force & pulling hand force (N).

2. Force

Records pushing hand force & pulling hand force (N).

3. Power & Force (Slalom)

Records power (W), pushing hand force & pulling hand force (N). Unlike 'Power & Force', negative forces (reverse strokes) are recorded. Should only be used if negative forces (reverse strokes) are expected.

Control Panel

▼ Athlete Settings

▼ Blade Settings

▲ High Speed Data Settings

Get

Power & Force

▼

Set

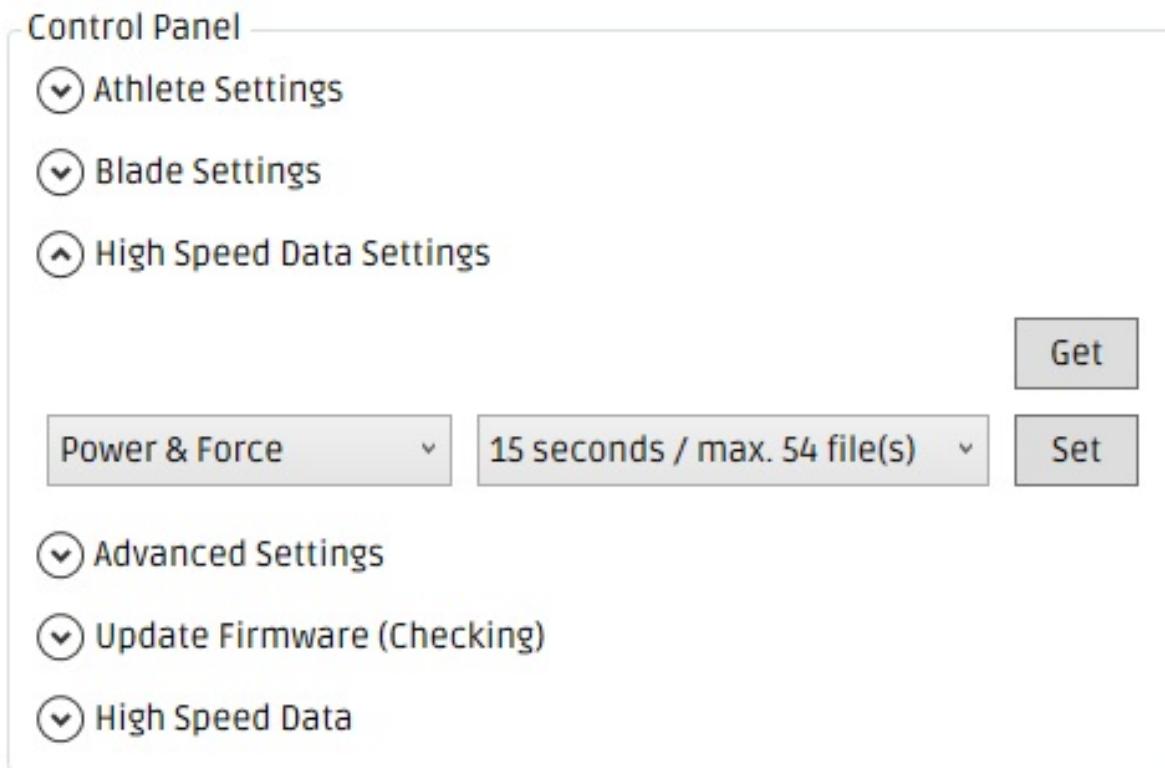
▼ Advanced Settings

▼ Update Firmware (Checking)

▼ High Speed Data

Step 3

- Select the length of time you want each recording to record for every time you initiate a High Speed Data recording.



Step 4

- Click 'Set' to send the settings to the connected power meter.
- To confirm the settings have been received by the power meter, click 'Get' and the current settings stored on the power meter will be displayed.

Control Panel

▼ Athlete Settings

▼ Blade Settings

▲ High Speed Data Settings

Power & Force

15 seconds

Get

Power & Force

15 seconds / max. 54 file(s)

Set

▼ Advanced Settings

▼ Update Firmware (No Update Available)

▼ High Speed Data

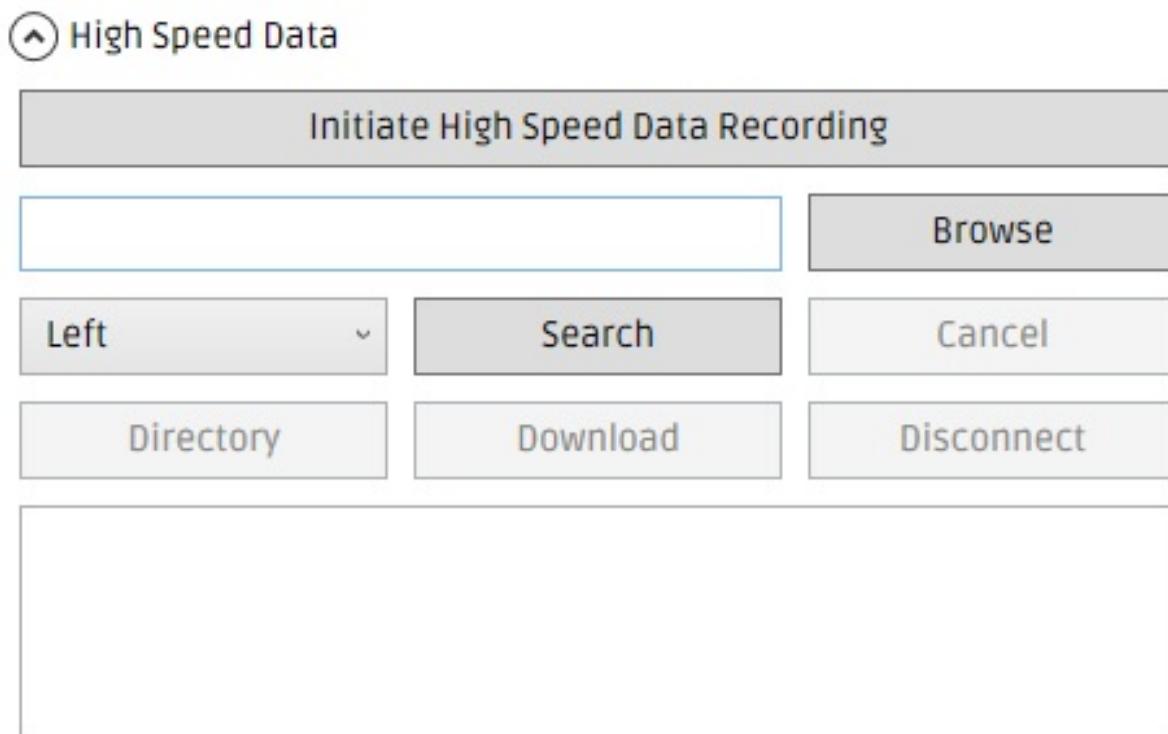
How to start a High Speed Data recording

You can trigger the recording of a High Speed Data file in two separate ways - both methods are functionally identical and will give you the same results.

Once a High Speed Data has been triggered, the power meter does not need to remain within wireless range of the device that triggered the recording. The power meter will proceed to record High Speed Data for the preset length of time set in the High Speed Data settings regardless of whether the triggering device remains within range.

Option 1

- Click the 'Initiate High Speed Data Recording' button on the Windows Desktop App (found under the '*High Speed Data*' tab)



The Windows Desktop App will display the number of seconds remaining. Exiting the Windows Desktop App or disconnecting from the power meter will *not* prevent the High Speed Data recording from completing.

Option 2

- Select 'Calibrate' on your GPS watch or ANT+ display

The following is the process for the Garmin Forerunner 310XT:

1. Press and hold mode
2. Highlight Bike # (choose a number corresponding to bike with power meter)
3. Press Enter
4. Press mode repeatedly to access the Main Menu Select Bike Settings
5. Select Bike #
6. Select ANT+ Power
7. Select **Calibrate**

Whilst on the calibration screen the ANT+ display (GPS watch) will display the number of seconds remaining. Exiting the calibration screen will *not* prevent the High Speed Data recording from completing.

Note: The High Speed Data file is stored on the internal memory of each shaft of the power meter. The **left shaft** section stores the data for the **left stroke** - whilst the **right shaft** section stores the data for the **right stroke**.

How to download High Speed Data

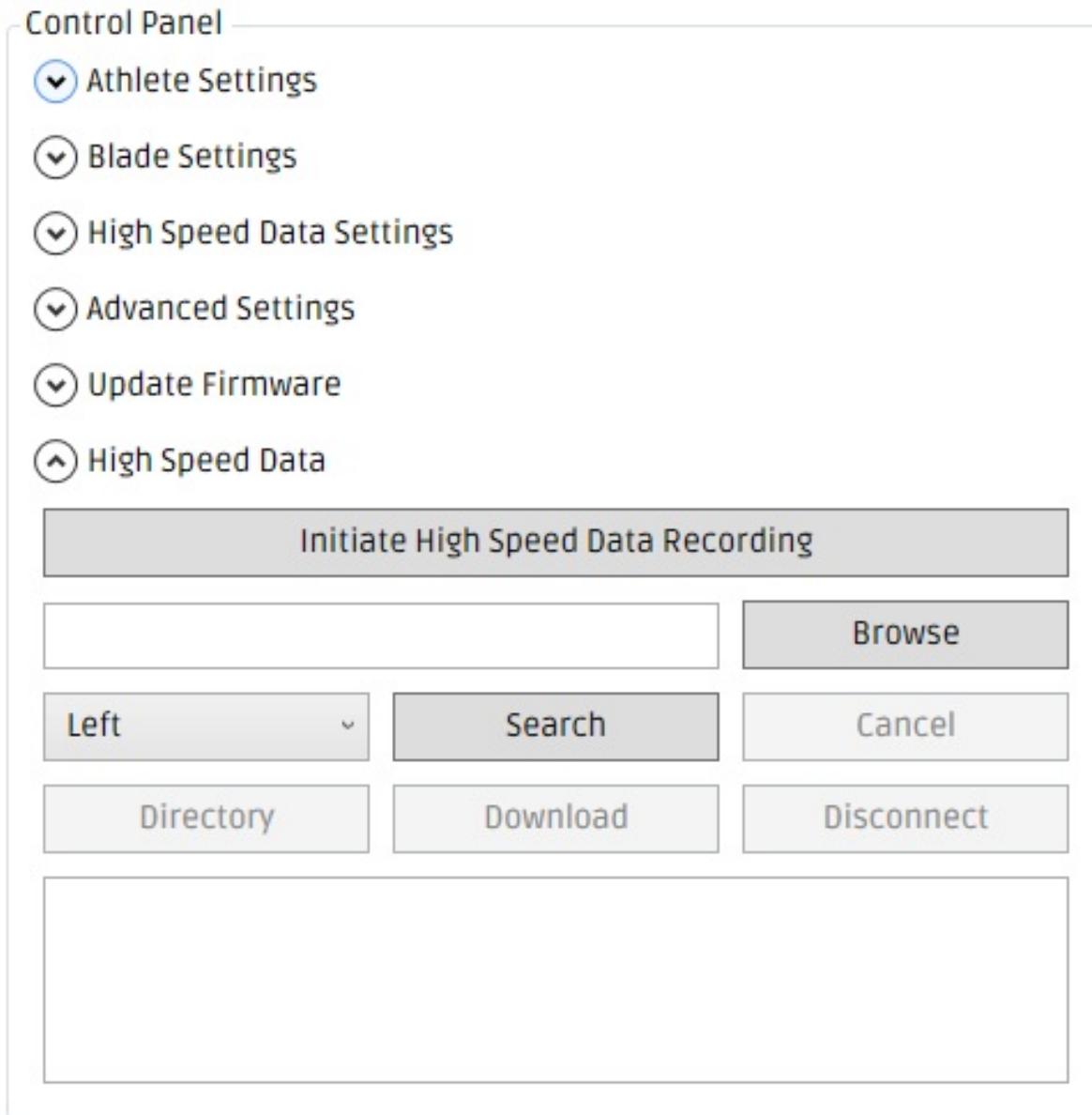
When a High Speed Data file is recorded, the data pertaining to the *left stroke* is stored on the **left** shaft section and the data pertaining to the *right stroke* is stored on the **right** shaft section.

To retrieve the complete data set for a High Speed Data recording, you need to download one file from the **left** shaft section in addition to the corresponding file from the **right** shaft section. It does irrelevant which order you download the files.

The following steps you guide you through the process of connecting to the file system of each shaft section and downloading the High Speed Data files.

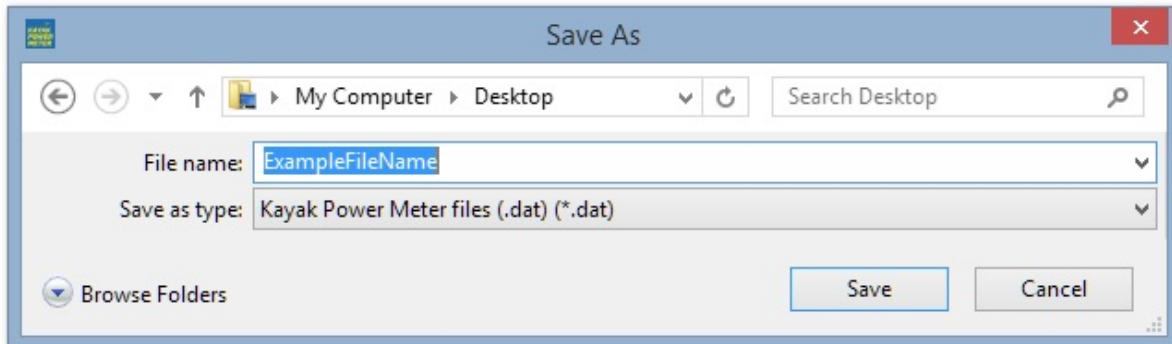
Step 1

- Open the Windows Desktop App
- Connect to the desired power meter
- Expand the 'High Speed Data' tab as shown below



Step 2

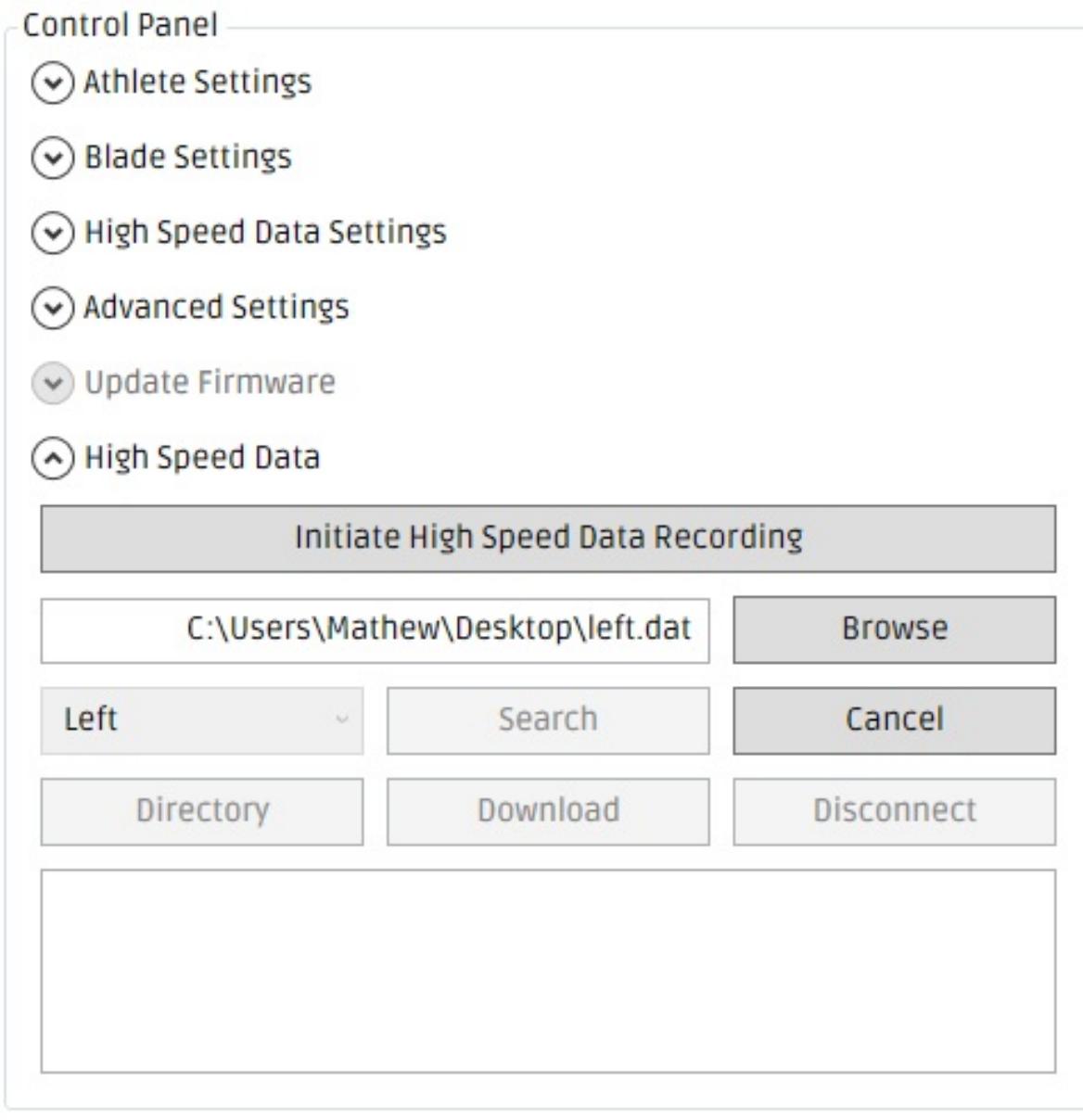
- Click the 'Browse' button. The 'Save As' dialog box should appear (see below)
- Browse to the folder where you wish to download the data
- Enter the filename you wish to save the data as into the 'File name' input box



- Click the 'Save' button
-

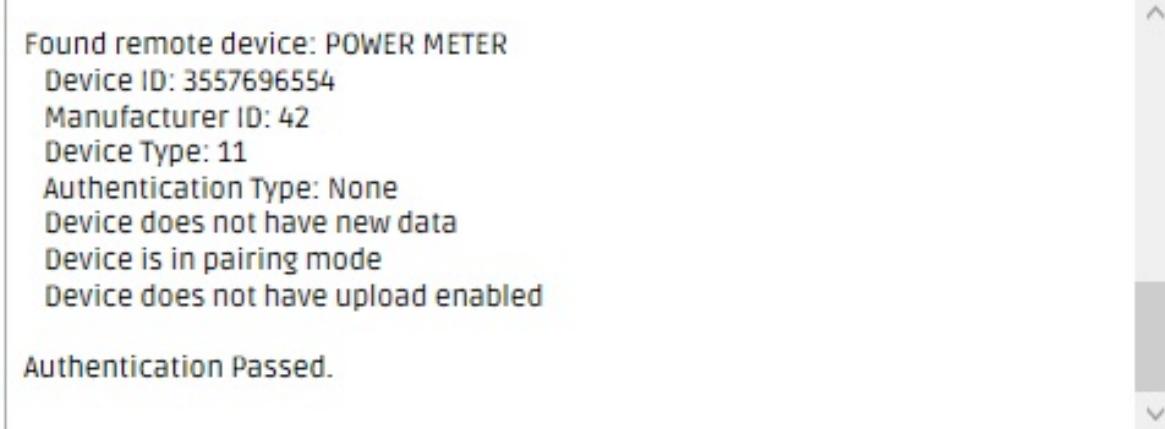
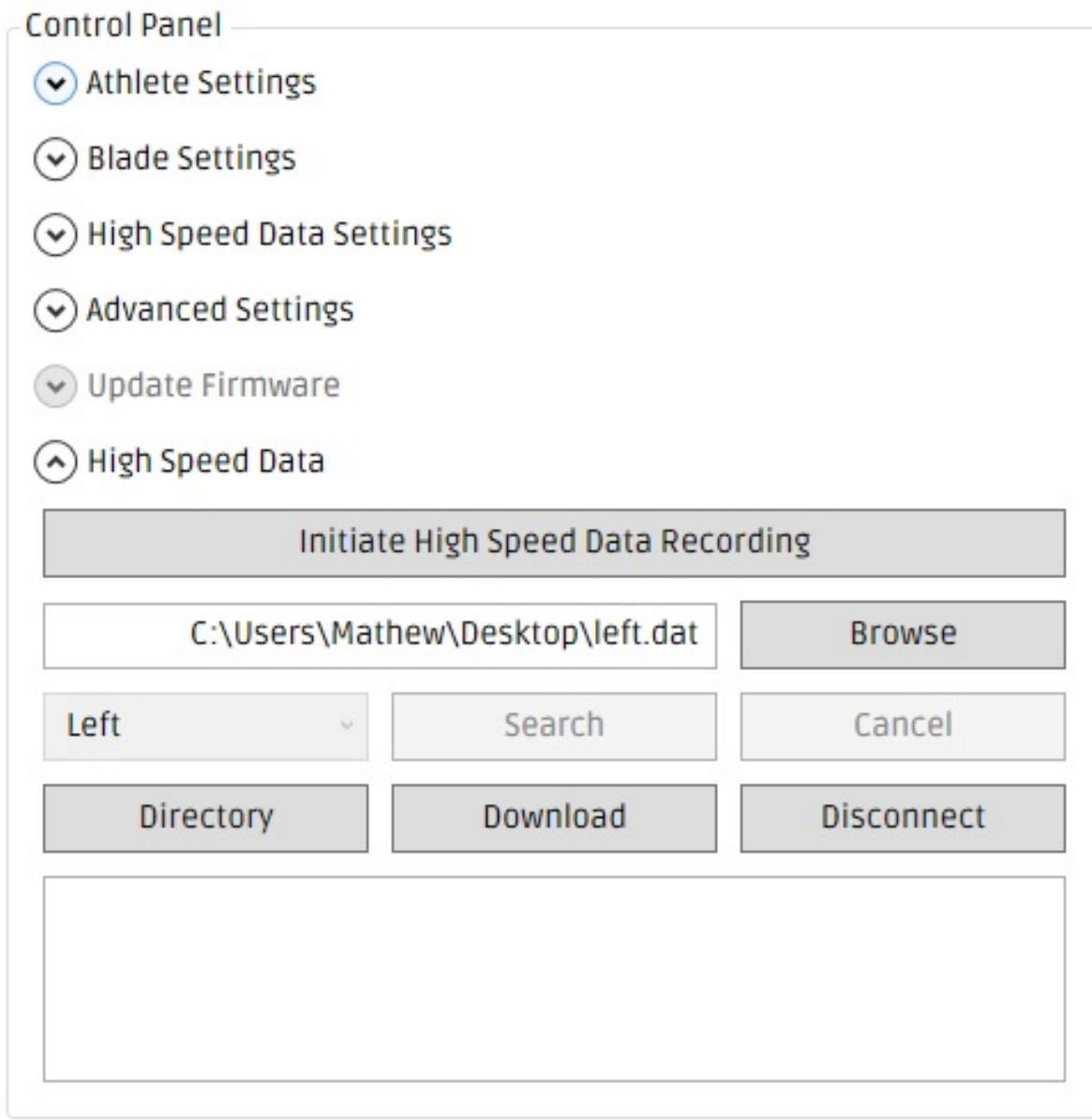
Step 3

- Set the drop-down box to either *Left* or *Right* depending on which shaft section you wish to download data from
- Click the 'Search' button
- The Windows Desktop App will start searching for the shaft section you have selected



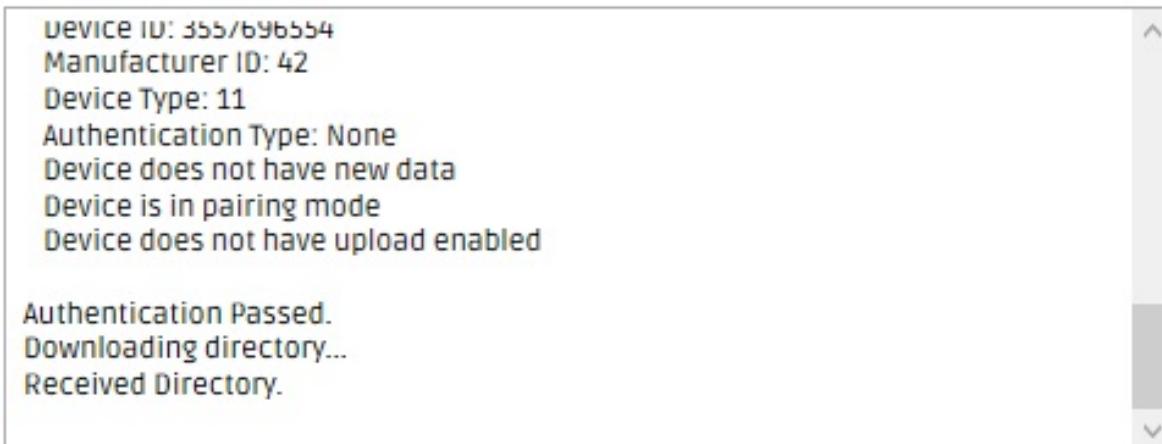
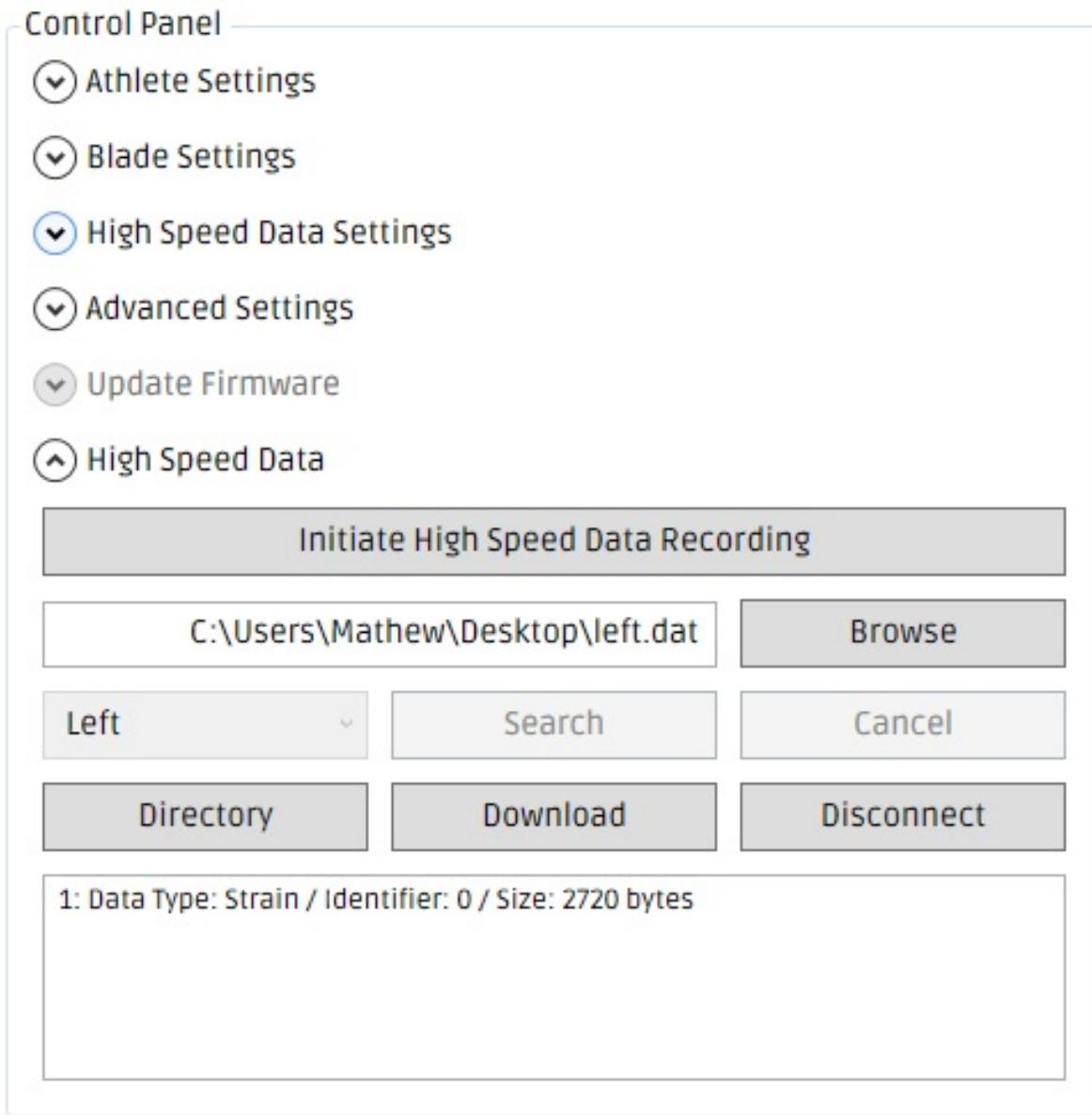
Step 4

- When the shaft section is discovered and connected, the *Directory*, *Download* and *Disconnect* buttons will become enabled



Step 5

- Click *Directory* to download the list of files that are currently stored on the internal memory of the shaft section
- A summary of each file will be displayed in the box at the bottom of the 'High Speed Data' tab In the example image below, only one file is currently stored on the file system



Step 6

- Click on the file you wish to download
- The file will become highlighted - this file is now selected - only one file can be selected at a time
- Click the Download button to download the currently selected file - it will be saved as the filename which is entered in the 'File name' box
- If no file is selected when the *Download* button is clicked, the file at Index 1 will be downloaded (if it exists)



- If the file is successfully downloaded, 'Downloaded file...' should be displayed (see above)

Step 7

- Once you have downloaded the data you require, click *Disconnect*
- You can now select the other shaft section (e.g. Right) from the drop-down box and repeat steps 3 - 6 to download the data from that shaft section

Control Panel

- ▼ Athlete Settings
- ▼ Blade Settings
- ▼ High Speed Data Settings
- ▼ Advanced Settings
- ▼ Update Firmware
- ▲ High Speed Data

Initiate High Speed Data Recording

C:\Users\Mathew\Desktop\left.dat

Browse

Right

Search

Cancel

Directory

Download

Disconnect

1: Data Type: Strain / Identifier: 0 / Size: 2720 bytes

Device does not have new data
Device is in pairing mode
Device does not have upload enabled

Authentication Passed.
Downloading directory...
Received Directory.
Downloading file...
Downloaded file 1, Download size: 2720
Saved to: C:\Users\Mathew\Desktop\left.dat
Disconnected.



How to view High Speed Data

To view and to perform analysis on High Speed Data, it is necessary to use the [Analysis App](#).

Contrary to what you might assume, it isn't a requirement to have an internet connection to view data using the [Analysis App](#). It is only necessary to have an internet connection to load the page initially. Once it is loaded (and as long as you don't close the tab/window), you can continue to view as many files as you wish.

The following steps will guide you through the process of uploading, viewing and analyzing High Speed Data.

Step 1

- Go to our [Analysis App](#).
- Drag-and-drop the High Speed Data file(s) (.dat) anywhere onto the Analysis App web page (except the navigation drawer on the left-hand side of the page).

Note: You can drag-and-drop files individually (one after the other) *or* drag-and-drop multiple files at once.

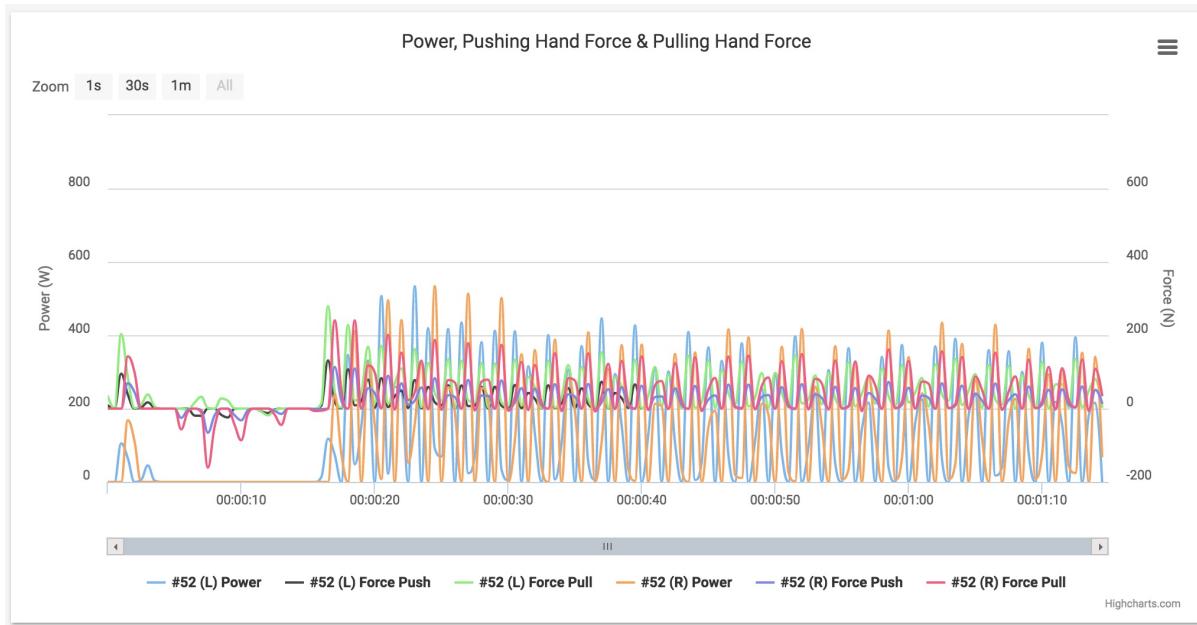
Activity		
Serial #	Push/Pull Hand	Sync Status
52	1432 / 725	Expired Expired
CLEAR ALL		

- For every High Speed Data file you drag-and-drop, the power meter on which it was recorded is identified and will be listed in the 'Activity Table'.
-

Step 2

- The 'Main Chart' is shown below.

How to view High Speed Data



- Zoom-in on the specific section of data you wish to perform analysis. To zoom, simply click and drag your mouse across the x-axis and an area of the chart will progressively become highlighted - starting at the location where you first clicked. Let go of the mouse button when you have highlighted the section you wish to zoom in on.
- Once you are satisfied with the section of data which is currently in view on the 'Main Chart', simply click anywhere on the *background* of the 'Main Chart' to update all of the charts below.

How to synchronize multiple shafts

Kayak Power Meter Pro only feature. Firmware revision 2.04 or greater required.

Located inside both the left and right shaft of a Kayak Power Meter Pro, is a Real Time Clock (RTC) which accurately tracks the time that has elapsed since the last 'sync' was performed.

The RTC is accurate to ± 0.432 Second/Day over the entire temperature range from -45°C to $+85^{\circ}\text{C}$. In other words, the RTC will drift no more than ± 0.432 over the course of 24 hours, even if the temperature varies significantly throughout the day.

If you intended to record synchronized High Speed Data during a training session, then the shafts must be synchronized before any data you record will be in-sync i.e. synchronizing the shafts after recording a file will not result in that particular file being in-sync.

To achieve the highest accuracy, we recommend you perform a 'sync' at the start of a training session. Once the shafts are synchronized, the 'sync' will remain accurate for at least the next 24 hours depending on your accuracy requirements.

You can watch a video [here](#) on the synchronization process, or you can follow the instructions listed below.

Step 1

- Plug in the barrel connector end of the charging cable into each of the shafts, so that every shaft that is to be synchronized has a cable inserted into it.
- Ensure the USB end of the each charging cable is not connected to a power source.

If you are performing a 'sync' using a single Pro charging cable, then go straight to Step 3. If you are performing a 'sync' with a 'sync-box', then go to Step 2.

Step 2

- Plug the USB end of each charging cable into a spare port on the 'sync-box'.

- Plug the barrel connector end of a spare cable into the connector on the 'sync-box'. It is the USB end of this cable that will be used in Step 3.

Step 3

- Insert the USB end of the charging cable into a powered USB port (or USB wall adaptor or external USB battery charger) for less than one second.
 - The Real Time Clock in each of the shafts will all be automatically reset when the cable is removed.
 - The synchronisation process is now complete.
-

Note: If the USB end of the charging cable is powered (5V) for longer than one second, then a 'sync' will not occur and instead the shafts will simply reset.

Updating the Firmware

The Windows Desktop App will notify you when an update to the power meter firmware is available.

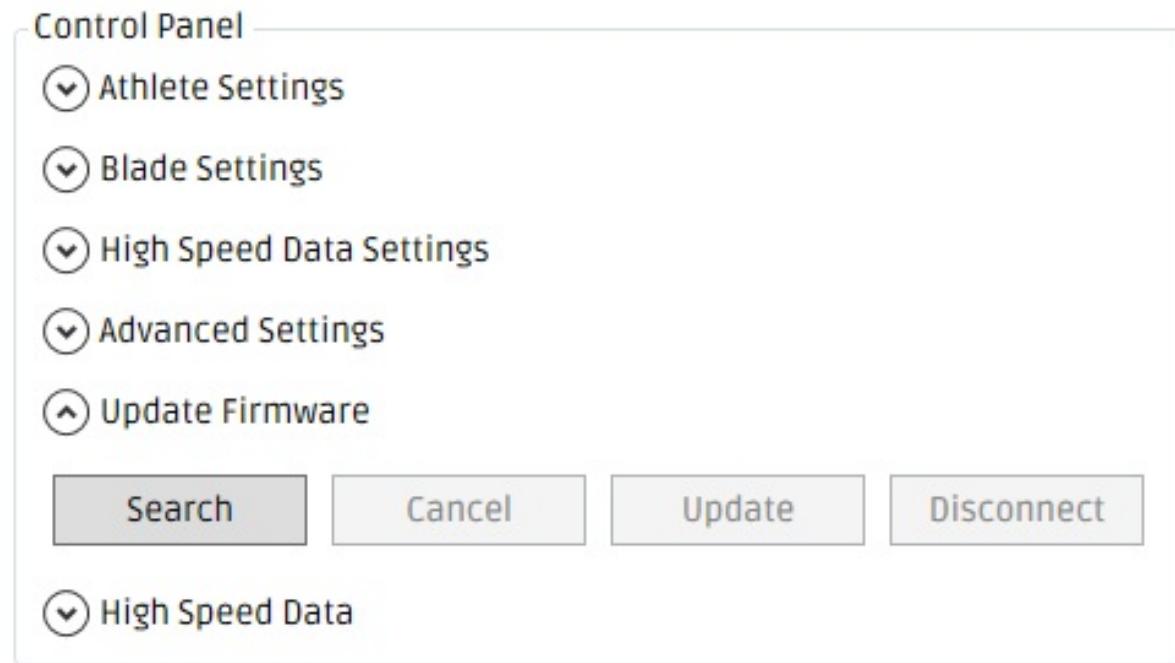
The left and the right shaft section *must* be running identical versions of firmware for the power meter to operate successfully.

Note: There will be a short period of time when the shaft sections are running different versions of firmware during the updating process outlined below - this is expected and permitted.

The following steps will guide you through the process of updating the firmware on an individual shaft section. You will need to complete the process twice - once for the left shaft section and once for the right shaft section.

Step 1

- Open the Windows Desktop App
- Expand the 'Update Firmware' tab.



Step 2

- Ensure the USB connector end of the charging cable is plugged into a 5V charging source (USB port or 5V wall adaptor).
- Click the 'Search' button in the 'Update Firmware' section, then shortly after, insert a charging cable into the **specific shaft section** you wish to update. Please ensure that no charging cable is inserted into *any other shaft section nearby* during this procedure.

Note: Upon inserting the charging cable, the shaft section will be 'discoverable' for the next 10 seconds. If the shaft section is not 'discovered' by the Windows Desktop App in that time (i.e. the 'Update' button does not become enabled), please re-insert the cable.

Left shaft



Right shaft



Step 3

- When the shaft section has been 'discovered', the '*Update*' and '*Disconnect*' buttons are enabled and the 'Found remote device: BOOTLOADER' is printed in the console as shown below.

Control Panel

- (▼) Athlete Settings
- (▼) Blade Settings
- (▼) High Speed Data Settings
- (▼) Advanced Settings
- (▲) Update Firmware

Search Cancel Update Disconnect

(▼) High Speed Data

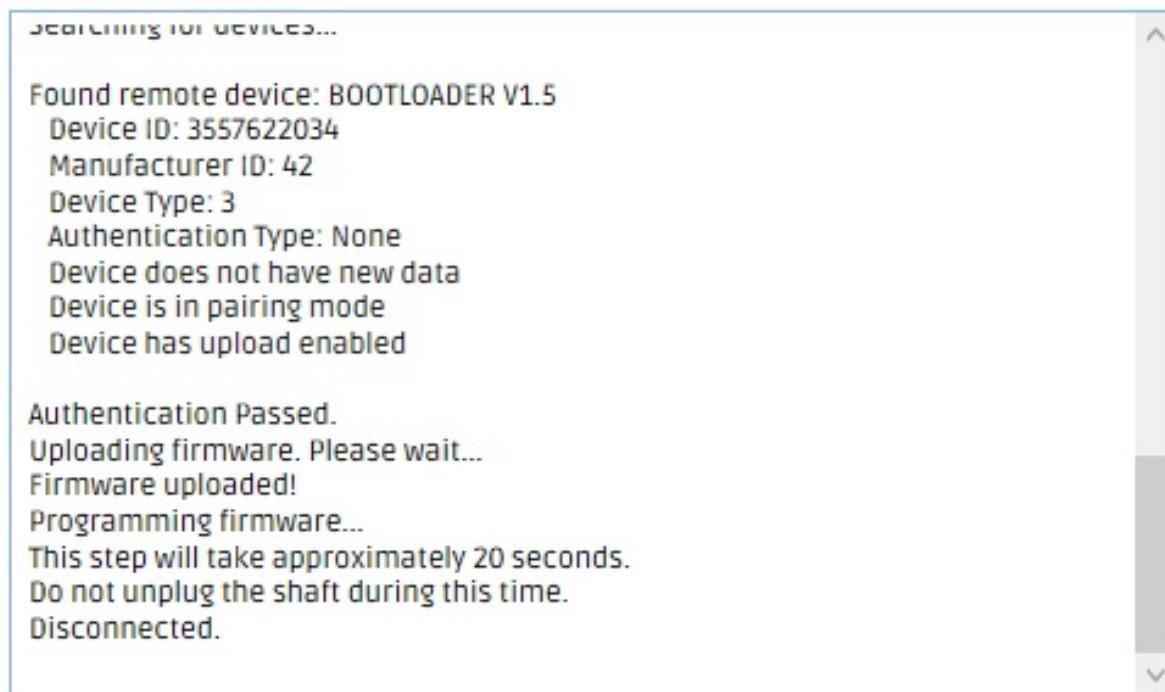
Upon inserting the charging cable, the shaft section will be 'discoverable' for the next 10 seconds.
If the shaft section is not 'discovered' by the Windows Desktop App in that time (i.e. the 'Update' button does not become enabled), please re-insert the cable.

Searching for devices...

Found remote device: BOOTLOADER V1.5
Device ID: 3557622034
Manufacturer ID: 42
Device Type: 3
Authentication Type: None
Device does not have new data
Device is in pairing mode
Device has upload enabled

Authentication Passed.

- Click '*Update*'. The Windows Desktop App will proceed to upload the firmware.
- Once uploaded, the firmware will be automatically programmed (which takes approximately 20 seconds). Do not unplug the shaft during this time.
- When the firmware has been successfully programmed, the device will disconnect from the Windows Desktop App. You will know this has taken place because the '*Search*' button is enabled and '*Disconnected.*' is printed in the console as shown below.



The firmware has now been updated on the shaft section in question. If you have not already done so, you will need to repeat Steps 2-3 to update the firmware on the remaining shaft section.

Garmin Device to TrainingPeaks Sync

The easiest way to get activities saved on a Garmin watch (athlete) to a TrainingPeaks account (coach) is described here.

This method involves the initial setup of a few accounts and sync permissions. Once in place, the athlete will only need to bring their Garmin watch to a computer, laptop or tablet to Sync. The activity data will be automatically transferred to the Coaches TrainingPeaks account.

The Athlete will need to set up their own Garmin Connect and TrainingPeaks accounts, and link these together via an AutoSync. The athlete will also need to install Garmin Express onto their laptop, computer or tablet. A laptop, computer or tablet running Garmin Express (with ANT+ stick plugged in) will transfer activity files from the 910XT to Garmin Connect.

With the AutoSync setup between Garmin Connect and TrainingPeaks, the activity will also be upload to their TrainingPeaks account automatically. The coach, who is linked with each athlete through TrainingPeaks, will be able to view these activities as soon after they transferred.

In summary, the athlete can periodically upload their activity data from their Garmin watch by Syncing their device with Garmin Express. The activity files will automatically make their way to the coaches TrainingPeaks account. With this method, there is no need for the athlete to manually export or email files to the coach.

Athlete setup

Step 1

- Sign up to create a Garmin Connect account [here](#).
-

Step 2

- Sign up to create a TrainingPeaks account [here](#).
-

Step 3

- Link TrainingPeaks with Garmin Connect.
- When this link is made, all activity files that are uploaded by Garmin Express will be transferred to both Garmin Connect and TrainingPeaks:

<https://home.trainingpeaks.com/garminconnect>

Step 4

- Download and install [Garmin Express](#).

Coach setup

When the athlete has set up their own TrainingPeaks account, the coach can add them to their TrainingPeaks Coach account. The coach will now be able to view activities that have been transferred from the athlete's Garmin watch. <http://help.trainingpeaks.com/hc/en-us/articles/204072554-Add-an-Athlete-to-your-Coach-Account>

Activity transfer with Garmin Express

Initial sync

Step 1

- Power on the Garmin watch that you wish to transfer the activity files from, and plug an ANT+ stick into the computer, laptop or tablet that will be running Garmin Express.
-

Step 2

- Open Garmin Express. The first time you run Garmin Express, you will be prompted to '**Add a Device**'.
-

Step 3

- Click '**Add a Device**'. Garmin Express will begin to search for the Garmin watch.
-

Step 4

- When a device is found, make sure that the Serial Number detected matches that of the watch you wish to transfer activities from. After confirming the correct Serial Number, select '**Add Device**'. The watch will proceed to pair with Garmin Express:
-

Step 5

- Once paired, you will need to Sync with Garmin Connect. Select '**Sign In**' and enter your login details for Garmin Connect.
-

Step 6

- With the link now made with Garmin Connect, the final step is to give the Device a Nickname.
 - To complete the setup, press **Finish**.
-

A sync will automatically begin and activity files will be transferred from the Garmin watch.

Depending on the number of files to transfer, this may take several minutes. A notification will appear when the sync process has completed.

The activity files will now be available for viewing in Garmin Connect, and in a minute or two later, TrainingPeaks. If you are linked with your coach via TrainingPeaks, your coach will be able to view your activity at this time also.

Subsequent sync

Transferring data is straightforward in any sync following the initial sync with Garmin Express.

Step 1

- Power on the Garmin watch and plug the ANT+ stick into the computer, laptop or tablet which will run Garmin Express.
-

Step 2

- Open Garmin Express. The Garmin watch will automatically begin to Sync and transfer data, as indicated by the working symbol in the top right corner of the box containing your paired device.
-

Step 3

- When the working symbol changes to a green checkmark, The Sync is complete and any new activities have been transferred to Garmin Connect and TrainingPeaks soon after.