POWER BOX

USER'S MANUAL AND INSTRUCTIONS

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FSA PowerBox by power2max

1. Quick Start Guide

⚠ WARNING

Please read the user's manual carefully before installation and use. Improper installation can cause accidents In case of doubt, consult a professional bicycle mechanic. Observe the indicated torque values when installing screws and bolts.
Before going on a ride, get to know the functions and operation of your power meter. Get a checkup from a sports physician before starting your training program. Pay attention to traffic and road conditions before checking any data.

Introduction

Congratulations! Your PowerBox power meter is an excellent choice for accurate power training. Please read these instructions and follow them for correct use. Failure to follow the warnings and instructions could result in damage to product not covered under warranty, damage to bicycle; or cause an accident resulting in injury or death. Since specific tools and experience are necessary for proper installation, FSA recommends that the product be installed by a qualified bicycle technician. FSA & Vision assume no responsibility for damages or injury related to improperly installed components

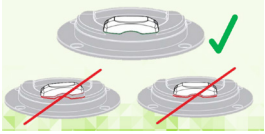
Specification

These instructions are for the installation of the following FSA components only

K-Force Team Edition
PowerBox Direct Mount 2X BB386EVO
CKM-OS8505CC/86/PBox

Installation and operation:

1. Remove the battery isolation strip by pulling it out of the battery compartment
   (You do not need to open the battery compartment.) Check if the battery cap is in the correct position.
   Correct battery cap position



2. The LED indicator is now flashing green. Please pair the power meter to your cycling computer
   (observe computer manufacturer's instructions).
3. Install the crankset to the bicycle (observe manufacturer's instructions and torque values!).

After installing, check the function of the front derailleur and adjust as necessary.
Finished! Now, go ride and have fun with your FSA PowerBox!

1. Download APP

Download and install the Power2max APP from Google Play.

Here is the Play Store Link to our App
https://play.google.com/store/apps/details?id=org.saxonar.p2m_ng_service

Note: iOS app is https://apps.apple.com/app/id1380651289?fbclid=IwAR1BhROlHv1yfoUxpgc866Og8iK8QN1DF_B7yHgosXZPkpxFzB5Ny0Dg_TA

2. Register PowerBox

Register your FSA PowerBox in the power2max app or in the p2m portal.
If your FSA PowerBox did not come with a registration key you can register below steps.

1. Take a picture of your PowerBox and make sure the serial number (S/N) is visible.
2. Upload the picture into the portal at MANAGE POWER METERS, enter the serial number of your power meter and click on REQUEST REGISTRATION. Our team will check your power meter and your serial number and register your power meter to your account.

3. PowerBox Upgrade Website

System upgrades available here, enter your personal data.
Here is the App Portal Link : https://apps.power2max.com/portal/index.php

4. Purchase additional functions

"The 「upgrades」 listed below are individually available for €50.00 (EU) or USD $50.00 (outside the EU)."

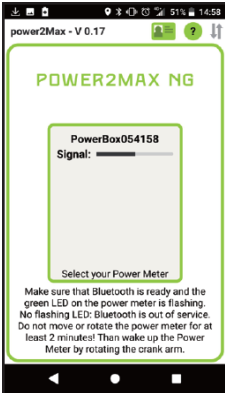
1. Bluetooth
2. Balance
3. Torque
4. Smoothness

5. Choose Your Preferred Payment

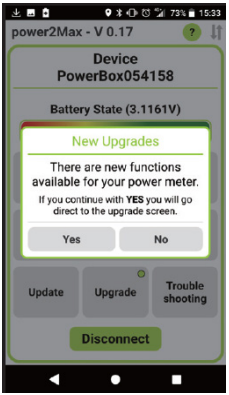
5 kinds of payment including credit card, debit card and bank transfer.

Power2Max APP

The dedicated Power2Max APP allows your PowerBox and Smartphone to work seamlessly.
Even smarter after each update.
Please check the APP guide.

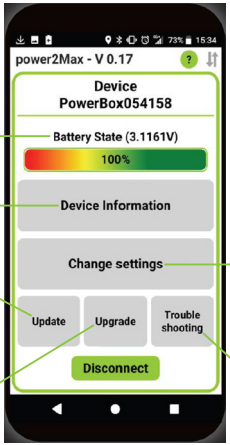


Pairing your PowerBox
Tap your smart phone for searching your PowerBox, please keep PowerBox awakening (LED indication flash green once per second)



Upgrade functions
Offer you the chance to buy additional functions such as Bluetooth connectivity, Left/Right leg, Power Balance and torque.

Firmware Update
It is a free process that allows you to have always the latest firmware installed on your PowerBox.



Battery Status
Check current battery status

Device Information
All hardware and fireware details

Update
Check your PowerBox is installed with latest firmware

Upgrade
Unlock addition functions through online order

Change Settings
Customized page for advanced user, such as turn off auto zero and ANT+

Trouble Shooting
Send a message to P2M with report to check

Upgrade guide for FSA PowerBox power meters

All FSA PowerBox power meters are fully-fledged power meters and measure the total power output of both legs.
The basic functions are:
- power
- cadence (no additional external sensor needed)

The upgrades offer you the use of additional functions:
- Bluetooth Connectivity
- L/R Balance.

To proceed to the upgrade
Please prepare:
- PowerBox serial number
- PowerBox key*

- Download and install the power2max App from Google Play or from https://play.google.com/store/apps/details?id=org.saxonar.p2m_ng_service&hl=en_US&pli=1.

If your FSA PowerBox did not come with a registration key, please take a picture of your Powerbox and make sure the serial number is visible.

Go to the https://www.power2max.com/en/powerbox-software-upgrade/ page to buy your upgrade.

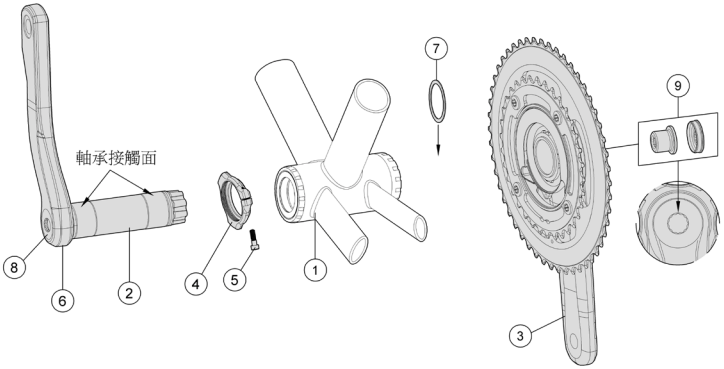
2. PowerBox Crankset Installation

2.1 Road PowerBox Crankset Installation Instructions

Specification

Item Number / Model Name

K-Force Team Edition PowerBox Direct Mount 2X BB386EVO



Components

Follow the assembly order in the illustration:

① Bottom Bracket Shell x1
② Crank Spindle x1 (Pre-installed on Left Crank)
③ Right Crank Arm x1
④ Preload Nut x1
⑤ Preload Nut Set Screw x1
⑥ Left Crank Arm x1
⑦ 0.5 mm Spacer x1 (not included in crankset)
⑧ Crank bolt x1 (Pre-installed on Left Crank)
⑨ QR Self Ext. Crank Bolt x1 (Pre-installed on Right Crank)

Crankset Installation

1. Ensure the Bottom Bracket Shell ① is BB386EVO compatible. (Note : Follow the BB installation instruction for BB will be installed).
2. Lightly grease the spindle bearing contact surface ② and insert from non-drive side.
   ⚠CAUTION Take care the spindle ② does not damage plastic bearing covers during installation.
3. Install the Right Crank Arm ③ onto the Spindle. Use 8mm hex wrench to tighten the QR Self Extracting Crank Bolt ⑨ to 388-418 kgf.cm / 38-41 Nm / 336-363 in.lbs. Do not tighten crank bolt over 418 kgf.cm / 41 Nm / 363 in.lbs.
4. Adjust preload nut ④ until crank contact BB assembly. Tighten preload nut set screw ⑤ with 2.5mm allen to a torque 26-36 kgf.cm / 2.5-3.5 Nm / 22-31 in.lbs to secure preload nut.
   ⚠CAUTION Ensure correct torque is used. The 0.5mm spacer ⑦ may be used only to adjust CL to ensure shifting performance.
   ⚠CAUTION Do not remove Left arm crank bolt ⑧ unless removal of left arm is necessary. For left arm removal, see below instructons. For service always use 8mm hex wrench to remove the Right Crank Arm ③ .

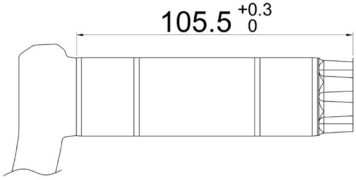
Left Arm Removal in case of need to change spindle

1. Use a 8mm hex wrench to remove drive arm ③ with the self extracting bolt ⑨ .
2. Remove drive side (right) crank arm ③ self extracting collar ⑨ using a 10mm Hex.
3. Remove the left side crank bolt ⑧ using a 10mmm hex wrench.
4. Install the self extracting bolt and self extracting collar ⑨ in to the left crank arm ⑥ . Ensure the self extracting collar is in completely tightened.
5. Loosen the self extracting bolt to remove left arm.

   ⚠CAUTION Apply threadlocker (Loctite 242 or equivalent) on the Crank bolt ⑧ at least 6 threads for new spindle installation. Use and allow to cure according to threadlocker instructions. Check the Spindle dimension is correct. Refer to Fig. 1 before proceeding next installations.

   ⚠ WARNING Always use a calibrated torque wrench to tighten crank bolt ⑧ and ⑨ .
   Check bolt torque 388-418 kgf.cm / 38-41 Nm / 336-363 in.lbs before each ride to ensure they have not loosened during use.

Fig.1 Spindle dimension (w / o Preload Nut ④)



3. Declaration of Conformity

Saxonar GmbH hereby declares that PowerBox power meters comply with the essential requirements and further relevant regulations of the 1999/5/EG Directive. You can view the complete text of the declaration of conformity at www.fullspeedahead.com

RoHS declaration of conformity
Saxonar GmbH certifies that this product and its packaging are in compliance with the directive 2002/95/EG of the European Union on the Restriction of Hazardous Substances in Electrical and Electronic Equipment (commonly known as RoHS)

⚠ WARNING

- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. **Do NOT** dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information.
- Non-rechargeable batteries are not to be recharged.
- **Do NOT** force discharge, recharge, disassemble, heat above (manufacturer's specified temperature rating) or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
- **Battery Type:** CR2450
- **Nominal Voltage:** 3V
- **Operation Temperature:** -10℃ ~ +50℃

- Ensure the batteries are installed correctly according to polarity (+ and -).
- **Do NOT** mix old and new batteries, different brands or types of batteries, such as alkal ine, carbon-zinc, or rechargeable batteries
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.

4. Warranty

4.1 Scope of Warranty

Full Speed Ahead (FSA) warrants all FSA and Vision products to be free from defects in materials or workmanship for a period of two years after original purchase unless otherwise stated in the full warranty policy. The warranty is non-transferable and valid to the original purchaser of the product only. Any attempt to modify the product in anyway such as drilling, grinding, and painting will void the warranty For more information on warranty policy and instructions for completing a warranty claim, check out the Full Warranty Policy found at our website: https://www.fullspeedahead.com/en/technology

4.2 Warranty Disclaimer

The warranty does not apply to products that are not installed and/or ad adjusted professionally or in accordance with Full Speed Ahead's owner's manual. Full Speed Ahead owner's manuals can be downloaded at www.fullspeedahead.com.

This warranty does not apply to damages to the product as a result of accidents, crashes or incorrect use, not observing manufacturer's specifications or other circumstances in which the product was subject to loads or forces that the product was not intended for.

This warranty does not apply if the product was modified; this includes but is not limited to any attempt at opening or repairing any electronic and associated components including motors, controllers, batteries, wiring, switches and charging units.

Warranty claims are also void if the serial number or manufacturing code has been altered, made illegible or removed.

Normal wear and tear are excluded from warranty. Normal wear of components can take place as a result of appropriate use, not adhering to FSA maintenance recommendations and /or riding in conditions that are not recommended

The following components are subject to “normal wear” :

- Dust seals
- Sockets/bushings
- Airtight O-rings
- Mechanical seals
- Moveable rubber parts
- Foam rubber rings
- Stripped threading/screws (aluminum, titanium, magnesium or steel)
- Tools
- Batteries

The warranty for the batteries and the power meter does not apply to damages resulting from power surges, a lack of maintenance or any other inappropriate use.
Damages that are caused by third-party components are excluded from this warranty.
Damages resulting from the use of parts that are not compatible or appropriate or are not authorized for use for FSA PowerBox crankset are excluded from this warranty.
The warranty shall not cover any damages that are caused by commercial use (rentals).

5. PowerBox Power Meter Operation

Your PowerBox power meter has an LED light to indicate its function. This enables you to easily test functionality and operate the system in a quick and uncomplicated way.

1. Remove the isolation strap by pulling it out of the battery compartment. Check if the battery cap is in the correct position.
2. Now, the LED indicator light flashes green for approximately one minute.
3. Connect the power meter to your head unit (observe manufacturer's instructions). As long as the green LED indicator light blinks, the PowerBox power meter is emitting signals that can be received by an ANT+ or Bluetooth enabled head unit. Pair your power meter-compatible computer with your PowerBox power meter. Observe the respective manufacturer's manual. Pairing your computer unit is only necessary when operating the power meter for the first time. Numerous PowerBox power meters on different bicycles should be put into operation one after another to avoid unwanted connections between different PowerBox power meters and computer head units. You can repeat the pairing of your ANT+ enabled computer unit at any time. To do so, you just have to activate your PowerBox power meter by turning the crankarm. Your PowerBox power meter then signalizes its availability for pairing by blinking its green LED indicator light for one minute.

You need an ANT+-compatible computer unit that supports the power-only profile (PWR). For example, suitable computer units are:
CYCLEOPS: Joule 2.0 and 3.0
GARMIN: Edge 500/510/520/800/810/820/1000, Forerunner 310XT/910XT
O-SYNCE: navi2coach, Macro X and Macro High X
You can find a current list of compatible products at the ANT+ Alliance:
http://www.thisisant.com/directory/fullspeedahead-road-rotor-3d-plus-bcd-110-or-130/
The data for power and cadence are calculated and transmitted via ANT+.

6. Using Your Power Meter

Using your PowerBox power meter is as easy as the initial operation and installation is.

6.1 Before your ride
When your bicycle isn't being used, the PowerBox power meter is in standby. Once the crank is moved, the PowerBox power meter is activated automatically, and it begins emitting a signal. This is shown by the blinking of the green LED indicator light.

6.2 During your ride
Your PowerBox power meter updates the parameters power and cadence in 1 second intervals; they are transmitted per ANT+ protocols.

6.3 Zero-point adjustment and thermal correction
To ensure a precise power measurement, the zero-point (the measured value when no torque is present) is automatically determined by your PowerBox power meter.
The zero-point adjustment compensates for influences caused by temperature variations and mechanical zero-point shifts. It is possible to repeatedly set the zero point at the head unit, but it isn't necessary! This is performed by the system automatically when it is not under power. "Not being under power" means a stop in pedaling for at least two seconds during a ride. If a de-powering as described above is not possible, for example during a long mountain climb, then your PowerBox power meter automatically compensates for temperature. Thus your PowerBox guarantees a reliable power measurement.

6.4 Battery life
Battery life is approximately 400 hours. Battery life can be decreased by low temperatures and by transporting your bicycle, for example in your car.

6.5 After your ride
Your PowerBox power meter independently enters standby mode approximately two minutes after ending your ride. This reduces electricity consumption and increases battery life.

6.6 Battery change
To change the battery, remove the battery cap. Pull out the empty battery and insert a new battery. Pay attention to the correct position of the positive pole and negative pole. Close the battery cap and check if it is in the correct position.

6.7 Turning the power meter on and off
You can turn off your PowerBox power meter yourself by removing the battery. You can turn your PowerBox power meter back on by inserting the battery again.

NOTE: When transporting your bicycle, the PowerBox power meter is activated. Therefore, it is recommended to turn off the power meter for longer transports. You should generally turn it off when transporting your bike in a plane.

6.8 After a crash
The PowerBox power meter was developed to have a high level of reliability. Usually, crash forces are generally completely absorbed by the crankarms and the bottom bracket. Crash damage to a PowerBox power meter is thus almost completely ruled out.
In the interest of your own security and health, you should do the following checks:
Could the cranks have sustained any damage? The cranks could suffer from hairline fractures that you may eventually not recognize. This could, over time, result in sudden failure. Therefore, replacement is recommended. If anything is rattling around the crankset, this could indicate potential damage. Examine all mechanical connections.

7. Maintenance and Care

The battery cap should be checked occasionally to see whether it is seated correctly and, if necessary, it should be replaced so that it maintains its waterproof seal.
After longer rides in the rain, please examine if water has penetrated the battery cover. Should this be the case, allow this area to dry out while having removed the battery and with the battery cap off. You can assist in this process by using an absorbent cloth.
Do not use thinners or solvents to clean your PowerBox power meter. Use clear water or soapy water and a soft sponge or rag.

⚠ WARNING
Do not clean your power meter with a high-pressure power hose.

8. Disposal

 The symbol of the crossed-out garbage pail on wheels, which can be found on the product, the documentation and the packaging, means that electrical and electronic products, batteries and accumulators need to be discarded separately in the European Union. Do not dispose of these products in general household garbage. Separate these products from other garbage in order not to damage people's health or the environment due to un.

9. Accessories, Replacement Parts

If needed, you can order accessories or replacement parts for your PowerBox cranksets at www.fullspeedahead.com.

10. Repair

To a certain degree, repairing a PowerBox power meter is possible. If repairs are needed, please contact FSA.

11. Service, Calibration and Control of Function

The PowerBox power meter is calibrated at the factory and doesn't have to be newly calibrated within the warranty period. Regardless of this fact, you still have the option of ordering a calibration and function control by contacting FSA. In this case, we will examine your PowerBox power meter on the outside, perform a new factory calibration and control of function. In addition to your PowerBox power meter, you also receive a new test and approval certificate.

⚠ WARNING
Ordering a calibration and function control can be advisable after a crash, among other things. However, it does not extend warranty coverage and only excludes a possible liability resulting from mechanical damage that has not been identified.

12. Troubleshooting

1. Green LED indicator light doesn't blink after activation
   Battery is low - change battery

2. Red LED indicator light blinks after activation
   Power meter error - turn off and then on. If this is unsuccessful, contact an FSA Service center.

3. Power meter does not pair with a head unit
   Battery is low - change battery
   Computer unit is not in pairing mode - place computer unit in pairing mode
   Power meter is in standby - activate power meter by rotating the crank.
   Transmission is flawed - avoid sources of disturbance such as Wi-Fi networks, microwaves, mobile phones and other active power meters.

4. Power meter shows no function
   Battery is low - change battery
   Operating software is in an undefined state (the power meter has “crashed”) - Turn off and then on by removing and inserting the battery. If this is unsuccessful, contact an FSA Service center.

5. Power measurements are not plausible
   The zero point has changed uncontrollably - during a ride: do a zero point adjustment by depowering.

6. Water intrusion into the battery compartment
   battery cap has not been closed correctly - remove battery and let area dry, insert battery again and close battery cap battery cap is damaged or worn - remove battery and let area dry, insert battery again and close battery cap.

13. Technical Specifications

Power source: battery
Battery life: approximately 400 hours of active power measurement
Transmission standards: ANT+ Power Only Profile
Transmitted data:
Power,
Cadence
Accuracy: ±2%
Additional features:
Active thermal correction
Automatic zero-point adjustment
Calibration is independent of chainring selection
No magnet necessary for cadence measurement
Range of measurement and display:
Power: 10 - 2999 W
Torque: 0 - 250 Nm
Cadence: 30 - 250 RPM
Colors: black
LED signals:
Green blinking slow: power meter activated, ANT+/BLE active for pairing with head unit
Red blinking short: power meter error
Directly after activation:
3 x green: battery charged 60 - 100%
2 x green: battery charged 40 - 60%
1 x green: battery charged 20 - 40%
1 x red short: battery charged 10 - 20% (equates to “weak battery”)
1 x red long (5 seconds): battery charged 0 - 10%

Common LED signals						
● 0.5s	0.5s	● 0.5s	0.5s	● 0.5s	Directly after activation	battery charged 60 - 100%
		● 0.5s	0.5s	● 0.5s	Directly after activation	battery charged 40 - 60%
				● 0.5s	Directly after activation	battery charged 20 - 40%
				●	Directly after activation	battery charged 10 - 20%
		● 0.5s			Directly after activation	battery charged 0 - 10%
● 1s	1s	● 1s	1s	● 1s	Directly after activation for 120s	Advertising mode Bluetooth visibility

FAQs and Troubleshooting

Q. Why I can‘t pair my PowerBox with my Smartphone or Tablet?
- Unit does not have BLE upgrade, but customer doesn‘t know.

Q. Why I can‘t see L/R Balance on my headunit?
- Unit does not have L/R Balance upgrade, but customer doesn‘t know.

Q. Why does my headunit show an error message after/during manual zero/offset compensation?
- Please only perform Offset compensation after LED stops flashing (initialization has finished and connections are bonded)

Q. After a short break (coffee or snack) my headunit will not show any values. Why?
- During the short break, the Powerbox fell to sleep and the headunit will not get a signal.
- The headunit starts to search for the PowerBox round about 10 minutes.
- After that nearly all ANT+ headunits stop search mode finally.
- If ride goes on, the PowerBox awakes and starts to broadcast new values, but the headunit did not receive it.
- Possible solutions:
  1. Press break and start, some units will start search mode.
  2. For future: Set auto-breake on headunit or press break for longer stops.

Q. My battery runs out very quick. After … rides my head unit shows “Low Battery”. What’s wrong?
- For customers: Please use NG Service App to check battery state and if battery state is ok, send “Troubleshooting” report for check.
- For shops, dealers or FSA: Measure battery voltage of the battery during work inside PowerBox. (< 2,6V “empty”, > 3V “new”, all between is “ok”)

	Problems	potential source	solution
1	power meter does not react (no LED signaling and not visible via ANT+ and not visible via Bluetooth)	no battery	new CR2450 battery
		battery empty	new CR2450 battery
		battery the wrong way round	turn battery around (Plus to the outside)
		wrong battery type	new CR2450 battery
2	Battery cover leaky (moisture or dirt inside)	battery cover is not placed correctly	place cover correctly (picture)
		battery cover damaged	replace battery cover, position correctly
		crack in the power meter	contact support
3	no LED signal	see 1	see 1
4	LED 5s red	battery empty	new CR2450 battery
5	LED 5s red, than green -> battery charge bigger than 2,6V (can be seen in th app)	Parameterization error	contact support -> will be solved with next app version
6	LED 5s red, than green -> battery charge 0,0V (can be seen in the app)	hardware issue	contact support
7	error message “manual zero”	interferences / jitter	manual zero after advertising signal has stopped (normally not necessary due to “Auto Zero”)
8	no values displayed on bike computer or signal drops while riding (ANT+)	Loss of sync	(1) delete unused sensors from bike computer (2) factory reset bike computer (3) firmware update bike computer (4) only pair used sensors to bike computer
		position of bike computer	move bike computer (few cm are often enough)
		Aero-mount from aluminum	use plastic mount or mount it on the handlebar or stem
		watches (Garmin Fenix, ...)	use on right hand or on handlebar / stem
		external interferences	deactived other signals / smart trainer

14. Copyright

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