# KIP™ Module

## User Manual

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**Restricted Proprietary Information**

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## Safety

This user manual contains important and useful information regarding the proper installation, operation, care and maintenance of your KIP Module. Carefully read, follow and understand the instructions as detailed in this user manual. Keep this manual in a safe place for future reference.

Do not perform any modifications or adjustments to your KIP module that are not outlined in this manual.

Incorrect installation or servicing may impair performance. Components that have experienced excessive wear, deformations, impacts or other damage require immediate professional inspection or replacement.

## Product Description

Breakaway Innovation’s KIP module has been designed to be implemented in specially designed bicycle cranks to measure a cyclist's power output. All electronics and power supply are self-contained and hermetically sealed within the crank-arm.

The power signals from the KIP module are wirelessly transmitted using the ANT+ protocol. Any ANT+ enabled head-units that support bicycle power device profile should be able to communicate with the KIP module following the procedures outlined in this manual.

# Set up and usage

## Module Modes

The module has four modes:

**Boot Loader Mode** describes the state in which the crank firmware can be updated. This state is achieved by reinstalling the batteries and is indicated by a flashing LED. After the firmware is updated or a cadence pulse is received, the LED will stay on for several seconds then the module will enter Setup Mode.

**Setup Mode** is the same as Normal Mode, however when a cadence pulse is detected the LED will flash. After 5 minutes, Setup Mode will revert to Normal Mode. Each time the module is woken from Sleep Mode it will re-enter Setup Mode.

**Normal Mode** describes when the module is measuring and transmitting data. Every time a cadence pulse is detected the transmitted data is updated. If there are no cadence pulses for 5 minutes the module goes into Sleep Mode.

**Sleep Mode** describes the low power state of the module when it is not in use. In this mode there are no transmissions. A cadence pulse will return the cranks to Normal Mode.

## Activating the module

The module can be activated by inserting the batteries (cold start) or waving a magnet past the RF cover (warm start).

A **cold start** results from the removal and re-installation of the battery cover. A cold start causes the module to enter Boot Loader mode where it waits indefinitely for new firmware or a cadence pulse. Boot Loader mode is indicated by a fast flashing LED.

A **warm start** is the normal starting mode. When the crank has not received a cadence pulse for more than 5 minutes it enters sleep mode. When the crank receives a cadence pulse it instantly returns to normal mode

## Pairing the module

The KIP module can be paired to any device that supports the ANT+ Bicycle Power device profile. Follow the device specific instructions related to pairing new sensor or power meter.

## Zeroing the module

The module supports a zero function. This is accessed using the “calibrate” feature of a supported bicycle head unit. This feature is used to cancel any offset which may appear in the cranks over time or after overloading the cranks.

The procedure for zeroing the cranks is as follows:

1. Wake both the crank arms by rotating the cranks through 2 full revolutions. If the cranks have woken from sleep this can be confirmed by the LED coming on when the rear module cover passes the cadence magnet.

2. With the cranks unloaded and in a vertical orientation, find and activate the “calibrate” option on your head unit. Depending on the head unit used the calibration may be repeated until the calibration screen is exited. Once exited the final zeroing of the cranks can take up to 10 seconds to complete.

   *IMPORTANT*: DO NOT APPLY LOAD TO THE CRANKS DURING CALIBRATION

3. Once zeroing is complete the cranks will return to normal mode.

## Maintenance

Inspect your KIP Module product for wear, looseness or damage including cracks, dents and serious scratches, before and after each use.

WARNING!

Never use high pressure cleaning equipment or chemical products to clean the KIP Module. (Waterproof level: IPX7)

Do not try to disassemble any part of your KIP module other than to replace the batteries.

In case of any electronic failure, service must be performed at an authorised technical service.

## Changing the batteries

The KIP Module batteries are located under the cover. The batteries will need to be changed after 500 hours of use (or 3 years of storage.) Ensure you replace all batteries in both modules.

1. Use a 2mm Allen key to undo the battery cover.
2. Remove the old batteries and install a new pair, the batteries must be SR44 type and be the same charge. The batteries must both be placed with the + terminal facing out.
3. Bolt the battery cover back on ensuring that the light pipe is properly oriented to align with the hole in the battery locator.
4. When the cover is installed the green indicator light will flash while it is in Boot-Loader Mode and has not been initialised. It is required to pass a magnet over the inside face of the module to initialise the unit.
5. The crank arm is now ready for use again.

WARNING!

Do not throw the old batteries away with normal waste; batteries should be disposed of properly according to local regulations.

## Technical Specifications

| | | |
|---|---|---|
| Water Resistance | | IPX7 |
| Operating Temperature Range | | -10°C - 50°C |
| Cadence Range | | 10-200 RPM |
| Maximum | Torque | 230 Nm |
| | Power | 4816 W |
| Accuracy | Torque | ±0.2 Nm < 20 Nm<br><br>±1% > 20 Nm |
| | Power | ±2% * |
| Battery | | User Replaceable:<br><br>2 x SR44 |
| Battery Life | | 500 hours ** |
| Wireless Communications Protocol | | ANT+<br><br>Device Profile: Bicycle Power<br><br>Revision: 2.2 |

* At a standard operating point of 90RPM at 150W per module (or 300W per crank-set)

** With Renata 303 batteries

# Regulatory Statements

## FCC

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT

To comply with the FCC RF exposure compliance requirements, no change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

## CE

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- EN60950-1:2006 +A11:2009 +A1:2010 +A12:2011;
- EN50371:2002;
- EN301 489-1 v1.9.2;
- EN 301 489-3 v1.4.1;
- EN 301 489-17 v2.1.1; and
- EN 300 328 v1.7.1.

## IC

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

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

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## ANT+

This product is ANT+ certified and is compatible with ANT+ displays that support the bicycle power profile.

## Warranty

The KIP module and its components are guaranteed for 2 years against any manufacturer defects or defective materials. In the event of a warranty defect, Breakaway Innovation's sole obligation under this warranty is to repair or replace, at its option, the defective part or product at no charge. Moreover, in some countries, Breakaway Innovation is obliged to ensure any legal warranty defined by law for the customer's protection.