Installation Manual (for dealers)

Pedaling Monitor Sensor SGY-PM910H

Please read the *Important Information for the User* in the product box for product warnings and other important safety information.

Table of Contents

Introduction

| Features | 3 |
|---------------|---|
| Manuals | 3 |
| Compatibility | 4 |

Getting Ready

| Product Configuration | 5 |
|--|------|
| Accessories | 5 |
| Before Starting Installation | 6 |
| Installation Procedure | 6 |
| Eliminating Static Electricity during Installation | 6 |
| Checking Operation of the Sensors | 7 |
| Installing the Magnets | 9 |
| Checking the Position of the Magnets and Magnetic | |
| Sensors | 9 |
| Selecting the Type of Magnets | 9 |
| Installing Patch Type Magnets | . 11 |
| Installing Arm Type Magnets | .13 |
| Calibrating the Magnets and Fixing Them in Place | |
| - | 15 |

Pairing and Calibrating

| Before Pairing and Calibrating | 18 |
|---|----|
| Pairing and Calibrating Procedure | 18 |
| Placing the Bicycle in a Secure Work Position | 18 |
| Pairing the Pedaling Monitor Sensor | 19 |
| Specifying the Device Number to Pair it | 21 |
| Checking Device Numbers | 22 |
| Calibrating the Zero Point | 23 |
| Calibration | 23 |
| Checking the Calibration | 24 |

Troubleshooting

| Troubleshooting | 25 |
|---|-----|
| Error codes | .31 |
| Assembling the Chainring and Installing the Right | |
| Transmitter | 32 |

Specifications and Support

| Care, Maintenance, and Storage | . 34 |
|--------------------------------|------|
| Specifications | . 35 |

Features

This product is a sensor system that analyzes the pedaling of a bicycle in real time. It calculates the direction and intensity of the force acting on the pedals and calculates pedaling efficiency.

Description of components

- Strain gauge unit: Detects the strain on the crank and calculates the direction and intensity of the force on the crank.
- Magnet: Used to detect the angle of rotation.
- Transmitters: Send information from the strain gauge unit and the magnet to the Cyclocomputer.

Switching modes

The push switch in the right transmitter changes the system to the following modes.

Pedaling monitor mode:

Used in combination with the Cyclocomputer SGX-CA500/CA900. This mode calculates pedaling efficiency and maximizes the functionality of the product. In this User's Manual, the case when it is used with SGX-CA500 is described as example.

 Power meter mode: Used with a Cyclocomputer that supports ANT+™.

This product is ANT+ certified.

Visit http://www.thisisant.com/directory/ for a list of compatible products and apps.



Manuals

The product's manuals consist of this User's Manual and an Installation Manual.

User's Manual:

Explains how to pair the product with the Cyclocomputer and calibrate the sensors.

Installation Manual (for dealers):

[For American Users] http://www.pioneerelectronics.com [For Canadian Users] http://www.pioneerelectronics.ca

[For European Users] http://www.pioneereeu

Explains details about handling methods. The product installation methods (for dealers) are also described as references.

Important Information for the User:

Important Information for the User provides detailed information related to safety.

Compatibility

Crank sets

The product is compatible with the following crank sets.

| Crank sets | Remarks |
|-----------------|--|
| SHIMANO FC-9000 | Crank lengths of 165 mm, 167.5 mm, 170 mm, 172.5 mm, 175 mm, crank set of 50-34T, 52-36T, 52-38T, 53-39T, 54-42T, 55-42T are compatible. * |
| SHIMANO FC-6800 | Crank lengths of 165, 170, 172.5, 175 mm, crank set of 50-34T, 52-36T, 53-39T are compatible. * |

* Descriptions in this manual are for a 170 mm crank set.

This product is designed to be used for recreational cycling and cycle training applications only and is not designed to withstand racing conditions.

Additionally, this product is designed to be used while cycling on paved roads only. Any damage or malfunction arising from use in racing or riding on dirt roads, cobblestone or any other unpaved roads will not be covered by the manufacturer's limited warranty.

Installing, pairing, and calibrating the product requires specialized techniques and tools. Ask the shop where you bought the product to install, pair, and calibrate it.

Accessories

This product contains the following parts.



Getting Ready

Installing, pairing, and calibrating the product requires specialized techniques and tools. Ask the shop where you bought the product to install, pair, and calibrate it.

Installation Procedure

The product is installed in the order shown here.

- 1. Checking operation of the sensors (page 7)
- 2. Installing the magnet rings (page 9)
- 3. Calibrating the magnets and fixing them in place (page 15)

Eliminating Static Electricity during Installation

Before starting the installation, touch a large metal object (such as a door knob or metal table) to discharge any static electric charge in your body.

Eliminate static electric charge occasionally while installing the product.

Getting Ready

Before installing the sensors, confirm that they operate correctly.

1 Remove the right transmitter's cover.

Use a hex wrench (2 mm) to loosen the screw and remove the cover.



· Be careful not to lose the removed screw.

2 Remove the left transmitter's cover.

Turn the cover to the left so the triangular arrow points to [OPEN] and remove it.



· Be careful not to drop or lose the battery when removing the cover.

3 Remove the batteries to check the conditions of the LEDs.



After removing the batteries, do not re-install immediately, wait at least one minute and then install them again.

4 Install the batteries, and confirm that the LEDs light green for 10 seconds.

- Right transmitter: Install the battery. However, do not install the battery cover at the moment, so you can check the LED.
- Left transmitter: After installing the battery, place the cover with the triangular arrow pointing to [OPEN], and turn it with coin to [CLOSE].

Right side

Left side



- · Be careful not to drop or lose the battery when installing it.
- Do not use batteries other than CR2032
- Install the cover firmly to ensure water resistant performance.

5 Push the push switch in the right transmitter for less than 2 seconds to confirm the sensor mode is set to the pedaling monitor mode.

By pushing the push switch in the right transmitter for less than 2 seconds, the LEDs on the right transmitter blink green. After that, if the LEDs light green for 10 seconds, the sensor is set to pedaling monitor mode.





 $\textcircled{1} \quad \textbf{Push switch}$

② LED

- If the LEDs do not light for more than 5 seconds after installing the batteries, remove the batteries once, and after more than 1 minute, install them again. If the LEDs still do not light, the battery may be almost empty. Replace the battery with a new one.
- If the LEDs light red, refer to Troubleshooting (page 25).

If the LEDs light orange for 10 seconds, the sensor is set to power meter mode.

By pushing the push switch in the right transmitter for more than 2 seconds, the LEDs on the right transmitter blink green. After confirming the blink, release the push switch. When the blinking stops, the LEDs on the left and right transmitters light green for 10 seconds and the sensor mode changes to pedaling monitor mode.

- If the pairing between the left and right transmitters fails, the LEDs blink red 5 times.
- Please do not push the push switch for more than 5 seconds. Doing so changes the mode to calibrate the magnet position.
- It may take about 10 seconds to switch the sensor mode depending on the radio transmission conditions.

6 Install the right transmitter cover.

Use a tool that can measure the torque to tighten the screws.

Tightening torque: 30 cN•m

· Install the cover firmly to ensure water resistant performance.

Install the magnets on the bicycle.

There are two types of magnets, install one type on the bicycle.

Checking the Position of the Magnets and Magnetic Sensors

This system measures the rotations of the cranks by magnets passing over magnetic sensors in the left and right transmitters. Check the position of the magnets and the left and right magnetic sensors before installing the magnets on the bicycle.





Magnetic sensor (right-side junction box)

1) Magnetic sensors



Magnet (patch type)



② Magnets

Selecting the Type of Magnets

There are arm type and patch type magnets. The type that you can install on the chain stay depends on the shape of the bicycle. This section explains how to chose the type of magnets to use.

1 Install the crank set, on which you have installed the sensors, on the bicycle.

Refer to the instruction manual for the crank set you are using for the procedure to install the crank set.

2 Adjust the position of the cranks.

- Left side: Rotate the crank to the position where the crank lines up with the chain stay when looking at the crank from the side.
- Right side: Rotate the crank to the position where the right transmitter lines up with the chain stay when looking at the crank from the side.

Left transmitter



Right transmitter



3 Select a type of magnet according to the following table.

| Crank | Position to measure | Measured results | Type of magnet |
|--|---|-----------------------------|--------------------------|
| Right Distance between c Right Distance between c Left Distance between left | Distance between chainring adapter and chain stay | Over 4.5 mm Under 9.1 mm | Patch type |
| | | Over 1.5 mm | Arm type ^(*1) |
| | Distance between left transmitter and chain stay | | |
| | 12 | Over 6 mm Under 13.7 mm | Patch type |
| | Concor State | Over 3 mm | Arm type ^(*2) |

*1 The chainring adapter and the arm type magnet must be installed so the distance between them is under 5.0 mm. *2

The left transmitter and the arm type magnet must be installed so the distance between them is under 9.6 mm.

• The patch type magnet may not be installable, depending on the shape of the chain stay. If this is the case, install the patch type magnet on the seat tube, or choose the arm type magnet.

If you install the patch type magnet on the seat tube, confirm that the position and results of the measurement are as shown below. - Right side: Distance between chainring adapter and seat tube: Between 4.5 mm and 9.1 mm - Left side: Distance between left transmitter and seat tube: Between 6 mm and 13.7 mm

Installing Patch Type Magnets

This section explains how to Install patch type magnets (temporarily).

The left crank is used as an example for this explanation, but the right crank uses the same procedure.

- If the position in which you will install the patch type magnet is dirty, remove any dirt with cleaner before you install it.
- The patch type magnets can also be installed on the seat tube. If you install the patch type magnet on the seat tube, confirm that the position and results of the measurement are as shown below.
 - Right side: Distance between chainring adapter and seat tube: Between 4.5 mm and 9.1 mm
 - Left side: Distance between left transmitter and seat tube: Between 6 mm and 13.7 mm
- The procedure to install the magnet on the seat tube is basically the same as installing it on the chain stay. However, if you install the magnet on the seat tube, be careful of its orientation. Install the magnets so their long sides align with the circle along which the magnetic sensors pass.

Installed on chain stay



1 Apply masking tape to temporarily hold the magnet.



• Do not remove the non-adhesive backing paper from the back of the magnet at this time.

2 Rotate the crank set to confirm the position the magnetic sensor passes over.

The position to install the magnets is along the circle around which the magnetic sensors pass.



EN

Installed on seat tube



3 Temporarily install the magnet on the chain stay.

- Install the magnet on the chain stay so it is positioned on the circle confirmed in step 2.
- Guideline for installation position (position over which magnetic sensors pass)
 Left side: Position on a radius about 53 mm from the center of the BB
 Right side: Position on a radius about 42 mm from the center of the BB



4 Slowly rotate the crank set one rotation.

Confirm that the magnets do not interfere with the crank, transmitter or chainring adapter.

5 Confirm the position of the magnets.

Confirm that the magnets are positioned on a line square to the magnetic sensors. After that, measure the distance between the magnet and magnetic sensor and the chainring adapter, and confirm it is within the following range. • Left side:

Distance between the magnet and magnetic sensor: Between 3 mm and 10.7 mm



• Right side:

Distance between magnet and chainring adapter: Between 1.5 mm and 6.1 mm



If you cannot install it on a line square to the magnetic sensor, because the chain stay is angled or for some other reason, use a patch type magnet and install it on the seat tube.

This completes the temporary installation of the magnet on the chain stay.

After you have completed the temporary installation of the right and left magnets, calibrate the magnets and fix them in place (page 15).

The magnets are only temporarily attached, they must be calibrated and fixed in place.

EN

Installing Arm Type Magnets

This section explains how to install arm type magnets (temporarily). The left side of the bicycle is used as an example for this explanation, but the right side uses the same procedure.

- The position of the arm type magnets must be checked periodically.
- The left and right side arm type magnets have different shapes. They do not operate correctly if they are installed reversed left to right.



1 Attach the cushion provided to the magnet's arm.

Remove the non-adhesive backing paper from the cushion and stick it to the base of the arm (the part that touches the chain stay).



2 Rotate the crank set to confirm the position the magnetic sensor passes over. The position to install the magnets is along the circle around which the magnetic sensors pass.



- **3** Temporarily install the magnet on the chain stay.
 - Use the cable ties provided to install the magnet on the chain stay so it is positioned on the circle confirmed in step 2.



• You need to adjust the position of the magnets to confirm their operation, so do not tighten the cable ties too much.

4 Slowly rotate the crank set one rotation.

Confirm that the magnets do not interfere with the crank, transmitter or chainring adapter.

• Use a pair of snips to cut the excess parts off the magnet's cable ties if they interfere with the crank, transmitter or chainring adapter. When you do this, remember to leave a long enough piece of the cable tie so you can tighten it.

5 Adjust the position of the magnets.

Adjust the position of the magnets so they are positioned on a line square to the magnetic sensors. After that, measure the distance between the magnet and magnetic sensor and the chainring adapter, and confirm it is within the following range.

· Left side:

Distance between the magnet and magnetic sensor: Between 3 mm and 9.6 mm



• Right side:

Distance between magnet and chainring adapter: Between 1.5 mm and 5.0 mm



If the chain stay is angled, or for some other reason, loosen the screw on the base of the magnet to adjust the angle. After adjusting the angle, tighten the screw to the specified torque.

Tightening torque: 30 cN•m



• Do not adjust the angle of the arm type magnet to more than XX° from the chain stay.

This completes the temporary installation of the magnet on the chain stay. Lightly tighten the cable ties so the temporarily installed magnet does not move.

After you have completed the temporary installation of the right and left magnets, calibrate the magnets and fix them in place (page 15).

The magnets are only temporarily attached, they must be calibrated and fixed in place.

Calibrating the Magnets and Fixing Them in Place

Switch the sensors to magnet calibration mode, then confirm that the temporarily attached magnets are operating correctly. After you confirm the magnets are operating correctly, fix the magnets in place and then calibrate them.

- The patch type magnets cannot be removed and re-attached once they are fixed in place. Before you fix the magnets in place, carefully confirm the positions where they are installed.
- · The position of the arm type magnets must be checked periodically after they are fixed in place.
- **1** Place the bicycle in a level place and mount it on something like a trainer. Adjust the front wheel so that the front and back wheels are the same height.
- **2** Rotate the bicycle's crank set at least three rotations to activate the left and right transmitters.
- 3 Confirm that right and left transmitters are in the "Pedaling Monitor" mode. See "Checking Operation of the Sensors" (page 7) regarding how to confirm the modes. Next, leave the right transmitter's cover, which you removed to confirm the mode, off and continue to the next step.

4 Press and hold down the switch on the right transmitter for at least 5 seconds.

The LED flashes orange 3 times, and the sensor switches to the magnet calibration mode. The sensor stays in the magnet calibration mode for 30 minutes after the LED flashes. If you do not finish calibrating the magnets within 30 minutes, switch the sensor to the magnet calibration mode again.



- · If the left and right transmitters cannot communicate, the right transmitter's LED flashes red five times.
- Power cannot be measured while the sensor is in the magnet calibration mode.
- If you briefly press the switch while in the magnet calibration mode, the left and right transmitter's LEDs flash orange 5 times, and the sensor exits the magnet calibration mode. The calibration data is destroyed when this happens.

5 Rotate the bicycle's crank set slowly at about 30 rpm, and confirm that the LED lights green for each rotation.

If the LED lights green, then the magnet sensors are correctly recognizing the magnets. Continue to the next step.

If the LED lights red, then you are turning the crank set too fast. Turn it slowly at about 30 rpm.

If the LED does not light, then the magnet sensors are not correctly recognizing the magnets. Refer to "Installing the Magnets" (page 9), and check if the magnets are installed in the correct positions.



6 Rotate the bicycle's crank set at least four more rotations.

Confirm that the LED lights green for each rotation. Continue to the next step to fix the magnets in place.

7 Fix the magnets in place.

Be careful not to move the magnets from their adjusted positions when you fix them in place.

· Arm type

Use needle nose pliers to tighten the cable ties to fix the magnets in place, then use snips to cut off the excess parts of the cable ties.





Patch type

Keep the magnet attached to the tape as you lift up the tape. When you do this, leave one side of the masking tape attached, so the magnets remain in their adjusted positions.

Remove the non-adhesive backing paper from the back of the magnet, and then re-stick the masking tape back the way it was. Press on the magnet, through the masking tape, to fix it in place, then remove the masking tape.





8 Rotate the bicycle's crank set slowly at about 30 rpm, and confirm that the LED lights green for each rotation.



Confirm that the left and right LEDs light green for at least seven rotations.

• If the LED lights red, then you are turning the crank set too fast. Turn it slowly at about 30 rpm.

9 Press and hold down the switch on the right transmitter for at least 5 seconds.

The LEDs light green for 10 seconds. The calibration data is saved and the sensor exits the magnet calibration mode.

- In step 8, if you rotate the crank fewer than 6 rotations or if there are vibrations while calibrating the magnet, the LED lights red for 10 seconds and the sensor exits the magnet calibration mode. You must re-calibrate the magnets.
- To exit the magnet calibration mode while calibrating, briefly press the switch during the calibration. The left and right transmitters' LEDs flash orange 5 times, the calibration data is destroyed and the sensor exits the magnet calibration mode. In addition, 30 minutes after switching to the magnet calibration mode, the calibration data is destroyed and the sensor exits the magnet calibration mode.

10 Install the right transmitter's cover.

Use a tool to measure the torque when you tighten the screws on the right transmitter's cover.

- Tightening torque: 30 cN•m
- Install the cover firmly to ensure water resistant performance.

This completes the calibration of the magnets and fixing them in place.

Before Pairing and Calibrating

This section describes how to pair and calibrate the pedaling monitor sensor that is installed on the bicycle to the Cyclocomputer SGX-CA500.

• See the User's Manual or the User's Guide (online manual) of the Cyclocomputer SGX-CA500 regarding how to operate it.

Pairing and Calibrating Procedure

Use the following procedure to pair and calibrate the product.

- 1. Placing the bicycle in a secure work position (page 18)
- 2. Pairing the pedaling monitor sensor (page 19)
- 3. Calibrating the zero point (page 23)
- 4. Checking the calibration (page 24)

Placing the Bicycle in a Secure Work Position

Place the bicycle in a level location, such as on a repair stand or indoor trainer. Be sure to secure it so that it will not fall while you are working.

Pairing the Pedaling Monitor Sensor

This section describes how to pair the pedaling monitor sensor to the Cyclocomputer SGX-CA500. It is necessary to pair the sensors on both the left and right sides. The right-side pedaling monitor sensor is used as an example in this description. The procedure to pair the left side is the same as for the right side.

1 Check that the right transmitter and the left transmitter are in "Pedaling monitor mode".

• See page 7 to switch the modes.

2 Rotate the bicycle's crank set more than three rotations to start the left and right transmitters.



• You have only 5 minutes to pair to the Cyclocomputer. If the transmitter stops while you are pairing, turn the crank set one revolution to start the transmitter and continue the pairing.

3 Press the [MENU] button on the SGX-CA500 and then tap [Sensors].



4 Tap [Connect New].



5 Tap [Device Type] and then [Pedaling Monitor R].

A list appears when you tap [Device Type]. Scroll down the list and then tap [Pedaling Monitor R].

| Connect New Sensor | | | Device Type | |
|---|----|--|--------------------|---|
| Device Type Spe | ed | | Power | 0 |
| Search | | | Pedaling Monitor L | 0 |
| Specified Search | | | Pedaling Monitor R | 0 |
| For the left pedaling monitor sensor, press [Pedaling Monitor L]. | | | | |

6 Tap [Search].

A [Searching. Please wait.] message appears. The information about the sensor appears when the sensor is found.

| Connect New Sensor | Searching | |
|-----------------------------------|-------------------|--|
| Device Type Pedaling Monitor R | | |
| Search | -}¦⊱ Please wait. | |
| Specified Search | Cancel | |
| Dovice Number | | |

7 Check the information about the sensor.

The pairing is successful if the transmitters' device numbers and the number in [Device Number] match and if "OK" appears in [Error Rate].

| Pedaling Monitor R | |
|---------------------|----|
| Device Number | |
| | 1 |
| Manufacturer Number | |
| | 48 |
| Error Rate | |
| | ОК |
| | |

• See page 22 regarding the device numbers of the transmitters.

If "Processing..." appears in [Error Rate], the information from the sensor is not being received correctly because transmission conditions are bad. Make sure that the sensor you are pairing is activated, then bring the SGX-CA500 closer to the sensor and do the pairing operation again.

• Pairing may fail because of interference in the 2.4 GHz band. If "Processing..." appears even while holding the sensor near the SGX-CA500 during pairing, try pairing it again in a location separated from any microwave ovens, wireless LAN, Wi-Fi, or other interference.

You may not be able to pair the sensor you want to pair if multiple sensors are activated. If this is the case, bring the SGX-CA500 closer to the sensor you want to pair, or specify the device number. (page 21)

Specifying the Device Number to Pair it

To specify the device number of the sensor, do the following procedure before searching for the sensor.

1 Check [Specified Search] in the sensor's pairing menu.



2 Tap [Device Number].

| Connect New Sensor | itor n |
|--------------------|--------|
| Search | |
| Specified Search | |
| Device Number | 1 |

3 Enter the device number and tap **4**.



See page 22 regarding the device numbers of the transmitters.

When you input the device number, make sure that the number you specify is displayed in [Device Number] on the sensor's information confirmation screen.

Checking Device Numbers

Device numbers are used when you specify the sensor's device number to pair it to the Cyclocomputer.



Device number



Calibrating the Zero Point

This section describes how to use the Cyclocomputer SGX-CA500 to calibrate the zero point of the pedaling monitor sensor that is installed on the bicycle. Zero point calibration is a function to store the zero point (no-load), where no forces act on the crank, in the sensor memory.

- The right-side pedaling monitor sensor is used as an example in this description. The procedure to calibrate the left side is the same as for the right side.
- Please do not push the push switch in the right transmitter while calibrating the sensor or showing [Force Preview] with the Cyclocomputer SGX-CA500.
- 1 Mount the bicycle on a trainer or some other safe stand.
- **2** Position the crank arm so it is perpendicular to the ground, pointing downward.



3 In the sensor screen of the SGX-CA500, tap [Pedaling Monitor R] and then [Calibration (Zero)] in order.



4 Tap [Start Calibration].



The calibration starts.

If the calibration is successful, "Success" appears in the [Result] field.

If "Failure" is displayed, the sensor may be calibrated in unstable condition that the crank is moving. Calibrate again with the crank stopped.

• This product has a correction function for the zero point fluctuation caused by varying temperatures. The accuracy of this function improves when the sensor is calibrated in different temperatures. This function cannot measure correctly if you calibrate or check the sensor before it is acclimated to the outside temperature.

The right side pedaling monitor sensor calibration is finished. Calibrate the left side in the same way. After finishing the calibration of the pedaling monitor sensors on both sides, check the calibration (page 24). Check that the sensors were calibrated correctly.

It is necessary to check the calibration of the sensors on both the left and right sides. The right-side pedaling monitor sensor is used as an example in this description. The procedure to check the left side is the same as for the right side.

1 Position the crank arm so it is perpendicular to the ground, pointing downward.



2 In the sensor screen of the SGX-CA500, tap [Pedaling Monitor R] and then [Force Preview] in order.



- **3** Confirm that the values that appear on the SGX-CA500 Force Preview are within the range shown below.
 - Tangential Direction Force: 0 ± 3 N

| Radial Direction Force: 0 ± | : 3 N |
|-----------------------------|-------|
| Force Preview (R) | |
| Tangential Force | |
| - | -2 N |
| Radial Force | |
| | 0 N |
| | |

Checking the calibration of the right side is finished. Check the calibration of the left side in the same way.

After finishing the calibration, pedal a bicycle to confirm that the pedaling vector display appears. If the vector is not displayed, perform the calibration again.



Refer to the following suggestions if you have any problems installing or using the product. If you cannot solve the problem, please contact your dealer or visit our web site.

Installation

| 0 | Solution | | ution |
|--|--|--|---|
| Symptom | Cause | User | Dealer |
| A sensor installed on the crank set is coming into contact with the frame, Di2 battery, brake, or other provided component. | The frame is not supported. Depending on the shape of the frame being used, a crank that has sensors installed may not be installable because it comes into contact with the frame. Even when two frames have the same model number, a difference in size and/or year may make installation impossible. When the Di2 battery is under the chain stay, installation that provides contact with the Di2 battery may not be possible. | Take your bicycle to your retailer and ha the frame is supported. Since actual me about whether a frame is supported car | Perform colling the product confirm that |
| the transmitter and cover. | The crank set is not supported. | Contact your dealer. | the crank set is supported. Shimano genuine chainrings are supported. |
| I cannot assemble the outer chainring correctly. | The installation has been done incorrectly. | Contact your dealer. | The gap between the junction box and the outer chainring is too narrow. Refer to the documentation for the crank set when assembling the chain ring, and install it so the spider arm does not contact the junction box. |
| There is a noise when I am riding. The transmitter and cover rattle. | The screws for installing the sensor have become loose. The double-sided tape or the parts of the sensors have deteriorated. | Contact your dealer. You may need to replace the double- sided tape or the parts of the sensors if they deteriorate. (This is a paid service.) | Check the screws for fixing the right transmitter, and then retighten them. Check if the parts of the sensors are installed correctly. If replacements are needed, please visit our website. |
| The chain ring rattles. | The crank set is not correctly assembled. The chain ring adapter is not correctly installed. The chain ring bolt has become loose. | Contact your dealer. | Check if the chain ring adapter is installed correctly. Press on the chainring in a clockwise direction to eliminate any play as you tighten the chainring bolts to the specified torque. Retorque the chain ring bolt periodically. Refer to the documentation for the crank set. Fix the position of the right transmitter after assembling the chainring. |
| When the right transmitter's cover and left battery's cover were installed, the seal was weak. | The rubber gasket is deteriorating. | We recommend periodically replacing the rubber gaskets inside the right transmitter and left transmitter's battery cover. (This is a paid service.) Using the equipment while the rubber gaskets have deteriorated may damage the product. Contact your dealer. | Replace the rubber gaskets. If replacements are needed, please visit our website. |
| There is sand or oil on the rubber gasket in the transmitter. | | It is necessary to replace the rubber gaskets if bicycle oil, cleaner, mud, or sand has gotten on them, even if they are not deteriorated. (This is a paid service.) Contact your dealer. | Replace the rubber gaskets. If replacements are needed, please visit our website. |

Magnet

| Symptom | Causa | Solution | |
|--|--|--|--|
| Symptom | Cause | User | Dealer |
| I cannot install the magnet on the chainstay. | The installation of the magnet or the selected magnet type is incorrect. | _ | There are two types of magnets, patch type and arm type. You need to choose the appropriate type depending on the distance between the magnet and the left transmitter or the junction box, and the shape of the frame. |
| The left transmitter and chain ring adapter are obstructing the magnet. | The installation of the magnet or the selected magnet type is incorrect. | _ | Measure the distance from the sensor to the magnet, and install the magnet correctly. |
| The arm type magnet rattles. | The cable ties for fixing the magnet arm in place have become loose. Or, the screws for adjusting it have become loose. Or, the cushions for installation have deteriorated. | Contact your dealer. | Check if the magnet is installed correctly. The cable ties and cushions are consumables. Replace them if they have stretched or become loose because of age or deterioration. If replacements are needed, please visit our website. |
| The magnet is rubbing. | A stone or something is stuck in the gap between the magnet, transmitter, and junction box. | Remove any stones or other things stud clean the magnet and the sensor. Stones or other things stuck in the equi | k in the gap and use a damp rag to prent may damage it. |
| Magnet calibration fails. | The magnet calibration was not finished while in the magnet calibration mode. | _ | Check the magnet calibration mode. The system exits this mode automatically after 30 minutes. Also, pushing the push switch on the right transmitter during the magnet calibration mode cancels this mode and the LEDs blink orange 5 times. |
| The left and/or right LEDs light red when the magnet calibration is finished. | The magnet has been detected correctly less than 6 times. | _ | Confirm that the LEDs of the left and right transmitters light green more than 7 times. |
| During magnet calibration, the red LED lights when a magnet passes a sensor. | Crank rotation is too fast. | _ | The crank rotation speed should be less than one rotation per second. |
| During magnet calibration, the LED does not light when a magnet passes a sensor. | The installation of the magnet has been done incorrectly. | _ | Check the magnet installation. The LED will not light when the crank is rotated if magnets are not positioned correctly and/or if they are too far from the sensor. |
| | A magnet other than the provided magnets is attached to the frame. | _ | Check if there is a magnet other than the provided magnets attached to the frame. This product will not operate properly if there are magnets installed for another brand of power meter, etc. |

EN

Sensor Connection

| Sumatom | Causa | Solution | |
|---|--|--|--|
| Symptom | Cause | User | Dealer |
| The pedaling monitor sensor cannot pair to the Cyclocomputer. | The sensor is in sleep state. | Activate the transmitter by rotating the the sensor automatically enters a sleep | bicycle's crank set at least three times. It is still for five minutes. |
| | There are no batteries in the sensors. Or, the positive and negative terminals of the batteries are reversed. The sensors' batteries are dead. | Confirm that the batteries (CR2032, 3V right pedaling monitor sensors. Insert th on the right transmitter until you hear a left transmitter, rotate the battery cover batteries, check to confirm that the LED Replace the batteries. If the LED does n batteries are loaded, remove the batteri then re-load them. If the LED still remai low. Replace the batteries with new one Use Cyclocomputer sensor information level is 2.5 V or less under normal temp Battery voltage is reduced by low tempor | are correctly installed in the left and be batteries with the + mark up. Press click. After loading a battery into the to its proper position. After loading is lit green. not light for more than five seconds after es, wait for at least one minute, and ns unlit, it means that battery power is es. to check the batteries. If the battery rerature, replace the batteries. eratures, which may result in unstable |
| | The sensor's operating mode is not correct. | operation. Check the operating modes of the left a | nd right pedaling monitor sensors. |
| | The device numbers are not set correctly. | Check the device numbers of the left and right sensors, and then pair them | |
| | There is a different 2.4 GHz wireless device or a microwave nearby. | Pairing may fail or require a long time b microwave ovens or other wireless devi devices and move the sensor closer to The attempt to pair to the sensor times after 30 seconds, move to a location wh and try to pair again. | ecause of the interference from ces. Move away from any other wireless the Cyclocomputer. out after 30 seconds. If they do not pair there there is no electronic interference |
| | The sensor and Cyclocomputer are too far apart. | The sensors have a wireless range of a by the existing radio wave environment to the Cyclocomputer. | bout 10 meters, but this could be limited Move the sensor as close as possible |
| | The Cyclocomputer does not operate normally. | Check the Cyclocomputer's charge and operations. Confirm if a different ANT+ sensor can be paired. | |
| | The magnet is not installed correctly. | Contact your dealer. | Replace the batteries and check the connection. Wait for at least five minutes until the sensor enters the sleep state. Next, rotate the crank at least three times and check the connection again. If a magnet is detected but does not result in activation, check to make sure that the magnet is installed correctly. An incorrectly installed magnet may result in improper operation. |
| | The magnetic field of the magnet is weakening. | Contact your dealer. | Check the distance between magnets and the sensor. Magnetism may have gotten weaker due to age-related deterioration. If operation is possible only when the distance between magnets and the sensor is closer than what is prescribed, replace the magnets with new ones. Please visit our website for more information. |
| | The magnetic field detector is broken. The junction cable of the right sensor has been cut. | Contact your dealer. | See "Calibrating the Magnets and Fixing Them in Place" (page 15) of the Installation Manual (for dealers). If the sensor's LED does not light, please visit our website. |
| | The circuit board in the transmitter is broken. | Contact your dealer. | See "Checking Operation of the Sensors" (page 7) of the Installation Manual (for dealers) . If the sensor's LED does not light, please visit our website. |

| Cumutam | Causa | Solution | |
|--|---|--|--|
| Symptom | Cause | User | Dealer |
| The pedaling monitor sensor in the power meter mode cannot pair to a different company's cyclocomputer. | Pedaling monitor sensor in power meter mode cannot r to a different company's slocomputer. Check that the Cyclocomputer being used supports pairing with power meter. Check that the Cyclocomputer being used supports pairing with power meter. If it does, check the sensor operation mode. If the sensor is in t monitor mode, set it to the power meter mode and connect it. When the sensor is connected to another brand of Cyclocomputand left/right balance can be displayed. Applied forces and ped each rotation angle, and left/right pedaling efficiency cannot be more information about this type of configuration, refer to the o Cyclocomputer's user documentation. | | eed supports pairing with the ANT+ ode. If the sensor is in the pedaling mode and connect it. er brand of Cyclocomputer, total power Applied forces and pedal direction at ing efficiency cannot be displayed. For figuration, refer to the other brand of |
| | The pairing of the left and right sensors failed. | Press the right transmitter switch and check the sensor operation mode. After confirming that the left/right LEDs light orange, connect the sensor to the Cyclocomputer. If the LEDs do not light orange, change the operation mode. After you load batteries, the sensors start in the pedaling monitor mode. | |
| The red LEDs light for 10 seconds when batteries are inserted. | Something is wrong with the strain gauge unit. The circuit board in the transmitter is broken. There is something wrong with the circuit board of the junction box or junction cable for the right sensor. | Contact your dealer. | Please visit our website. |

Calibration

| Symptom | Causa | Solution | |
|--|---|--|---|
| Symptom | Cause | User | Dealer |
| Zero point calibration fails. | There are loads on the cranks or pedals. | Stop the bicycle, remove any load from the cranks and pedals, and then calibrate it. It may fail if a load is applied. | |
| | Water inside the sensors. | Water can get into the sensors when the right transmitter cover and/or the left transmitter battery cover are not attached correctly. Remove the batteries. Afte the interior of the sensors are sufficiently dry, perform zero point calibration again. | |
| | Something is wrong with the strain gauge unit. The circuit board in the transmitter is broken. There is something wrong with the circuit board of the junction box or junction cable for the right sensor. | Contact your dealer. | Please visit our website. |
| Zero point calibration does not finish. | The sensor and Cyclocomputer pairings are not stable. | r Information may not be sent correctly to the sensor depending on the radio wave environment and the distance between the Cyclocomputer and the sensor. Stop the zero point calibration and move the Cyclocomputer closer to the sensor or do the calibration again in a location with a better radio wave environment. | |
| The force preview is not near 0 N after calibrating the zero point in pedaling monitor mode. | There are loads on the cranks or pedals. | Stop the bicycle, remove any load from the cranks and pedals, and then calibrate it. The zero point may be incorrect if a load is applied. | |
| Zero point calibration fails in power meter mode. | There are loads on the cranks or pedals. | ranks Position either the left or right crank at 6 o'clock before calibrating from Cyclocomputer. For more information about calibration, refer to the oth of Cyclocomputer's user documentation. Check that there are no loads on either the left or right cranks or peda Calibration fails if there is a load on either the left or right cranks or per because the left and right zero point is calibrated at the same time for power meter mode. | |
| | This is a problem with either the left or right sensor. | Contact your dealer. | The zero point calibrations are done at the same time for the power meter mode. The zero point calibrations may fail if either the left or right sensor is faulty. Please visit our website. |

EN

| 0 1 | - | Solution | |
|--|---|---|---------------------------|
| Symptom | Cause | User | Dealer |
| The torque chart is not near 0 N after calibrating zero point in power meter mode. | There are loads on the cranks or pedals. | Position either the left or right crank at 6 o'clock before calibrating from the Cyclocomputer. For more information about calibration, refer to the other brar of Cyclocomputer's user documentation. Remove any load from the left and right cranks and pedals, and then calibrate the zero point. The zero point may be incorrect if a load is applied. The zero point may be incorrect if there is a load on either the left or right cranks or pedals. Because the left and right zero point is calibrated at the sar time for the power meter mode. The value that is displayed following calibration with another brand of Cyclocomputer is the total of the left/right calibration values. Values may vary | |
| The torque value does not appear correctly if there are | The crank length is not set correctly. | Contact your dealer. | Please visit our website. |
| loads on the cranks or pedals when paired to a different company's cyclocomputer while in the power meter mode. | The calibration may not have been done correctly. | Contact your dealer. | Please visit our website. |

Display

| 0 | 0 | Solu | ution |
|---|--|---|--|
| Symptom | Cause | User | Dealer |
| The power value is not correct. The left and right sides of the vector chart or efficiency display are obviously different. The proportions of the left | The zero point is incorrect. | Installing the cranks and pedals can cause a slight change in the zero point. Be sure to calibrate the zero point after installing cranks and pedals. When using the pedaling monitor mode, calibrate the zero point for both the le and right sensors. Calibrate the zero point with pedals installed | |
| and right power values are obviously different. When pedaling with only one leg, the side not being pedaled is extremely far from 0 W. | Temperature (air temperature) learning is not performed. | If there has been a change in temperature of 4°C or more since the last zero point calibration, calibrate the zero point again. Also, accurate measurement will not be possible if calibration is performed before the sensor is acclimated to external air temperature. It takes at least 20 minutes for the sensor to become acclimated to the current outside temperature. This device uses a temperature (air temperature) learning function to automatically calibrate its zero point as the temperature changes. This function maintains accuracy as the temperature changes during a ride. As the temperature varies, it is necessary to calibrate the zero point more than twice, so the most recent six times are used for calibrating using this function. The results of the zero point calibration are recorded if the temperature varies more than 4°C from the zero point calibration recorded previously. | |
| | There is a problem with the temperature (air temperature) learning result. | Check if a change in temperature has caused a change in the zero point. After the crank has become sufficiently acclimated to the external temperature, check the Force Preview. Next, move to a location where the external temperature is different, wait for 20 minutes, and then check the Force Preview again. If there is a major difference between the zero points, it could mean there is a problem with the learning function. If this happens, use the ZeroCal application to initialize the sensor whose zero point is off. Learning function results are stored in a log file, and can be checked using the Cyclo-Sphere screen and the device information window. | |
| | The calibration under load may not have been done correctly. | Contact your dealer. | Please visit our website. |
| | This is a problem with either the left or right sensor. | Contact your dealer. | Please visit our website. |
| The power value and/or vector are not displayed occasionally. | The sensors' batteries are dead. | Replace the batteries. If the LED does not light for more than five seconds a batteries are loaded, remove the batteries, wait for at least one minute, and then re-load them. If the LED still remains unlit, it means that battery power i low. Replace the batteries with new ones. Use Cyclocomputer sensor information to check the batteries. If the battery level is 2.5 V or less under normal temperature, replace the batteries. Battery voltage is reduced by low temperatures, which may result in unstable operation. Frequent replacement of batteries is recommended during winter. | |
| | A magnet other than the provided magnets is attached to the frame. | Contact your dealer. | Check if there is a magnet other than the provided magnets attached to the frame. This product will not operate properly if there are magnets installed for another brand of power meter, etc. |
| The vector chart is rotating. | The magnet calibration may not have been done correctly. | Contact your dealer. | Check if the magnets are installed correctly. Correctly calibrate magnets. |

| Commentant | Cause | Solution | |
|---|--|---|--|
| Symptom | | User Dealer | |
| The vector data does not update every few seconds. | The sensor and Cyclocomputer pairings are not stable. | The sensor information may not be received correctly, depending on the radio wave environment. Confirm it in a location that has a good radio wave environment. | |
| When one of the pedals is pushed, the vector display of the other pedal becomes inconsistent. | This is according to the specifications. | A vector may be displayed based on the pedal's weight and centrifugal force. | |
| There is a deviation of several watts when compared to the power values from a different brand of power meter. | This is according to the specifications. | Certain measurement methods and/or use conditions may generate deviation with another brand of power meter. | |
| The cadence does not appear on the Cyclocomputer when rotating the cranks slowly. | This is according to the specifications. | It is not possible to measure the cadence if cranks are rotating very slowly. | |
| The display remains on the Cyclocomputer even when the bike is stopped and the cranks are stopped. | This is according to the specifications. | Information may be displayed for 2 to 3 seconds after stopping. | |
| The display does not appear on the Cyclocomputer immediately after I start pedaling. | This is according to the specifications. | When you start pedaling, the crank needs to rotate to detect the magnet more than two times. After that, a packet of data is sent for every rotation of the crank when the crank is pointing directly up (12 o'clock). Also, a maximum of a 2 second delay may occur from when data is sent to the Cyclocomputer to when it is displayed. | |
| Occasionally, only the left/ right power value is displayed, without vector data on the Cyclocomputer and/or Cyclo- Sphere. | This is according to the specifications. | The product uses three ANT transmissions to send power values and vector data. The first transmission sends the power value, while the second and third transmissions send vector data. The Cyclocomputer refreshes information every second. If data for all three transmissions is available both the power value and vector data are displayed, but transmission timing may result in only the power value being displayed. This is because the product is designed to display and record information as quickly as possible, even if only a power value is available. When pedaling starts out after a stop at a traffic light or after the crank is paused while riding, only the power value may be displayed due to poor wireless LAN connection conditions. Depending on the crank start position when pedaling is started, display of either the left or right pedal may be delayed. | |
| The initial display of the left and right sensors are different on the Cyclocomputer. | This is according to the specifications. | The left and right displays may be 1 to 2 seconds out of sync depending on the angle when pedaling starts. | |
| The display does not update every second when rotating the cranks slowly. | This is according to the specifications. | If the cranks are rotating at less than 60 rpm the update will not happen every second because data is sent for each rotation. | |
| The display of the length of the vectors is not consistent. | This is according to the specifications. | The reference for the maximum length of the vector is the largest force applied in one rotation. The vector display may not be consistent if the force is small. | |
| The efficiency value falls if I pedal on the outside of the pedals. | This is according to the specifications. | Pedaling with your weight on the inside or outside of the pedal reduces the accuracy of the measurement of the force in the radial direction because the reference is the length of the pedal that was set when calibrating (radial direction) with load. The efficiency value may drop when pedaling with your weight on the outside because the force measured in the radial direction is larger than normal | |

EN

Error codes

An error code is displayed if an error occurs while setting the crank length or doing calibrations.

| Code | Description of error | Data (radial) | Data (tangential) |
|------|--|-------------------------------------|-------------------------------------|
| 1 | Parameter deviation (mass of load is 0) | - | - |
| 2 | Insufficient battery power | - | - |
| 3 | Failed to calibrate zero point (tangential and radial) | 1: Error | 1: Error |
| | | 0: Normal | 0: Normal |
| 4 | The zero point calibration is very different from the desired | Multiple of detected value of force | Multiple of detected value of force |
| | value. | | |
| 5 | Not used | - | - |
| 6 | Large disruption detected due to vibration during calibration | Degree of instability of detected | Degree of instability of detected |
| | | value of force | value of force |
| 7 | Calibration with load was done before high accuracy zero point | - | - |
| | calibration | | |
| 8 | Exceeded measurement limit during load calibration | Multiple of detected value of force | Multiple of detected value of force |

Assembling the Chainring and Installing the Right Transmitter

Install the right transmitter on the right crank as you assemble the chainring.

If the chainring and chainring adapter have been removed, assemble the chainring and fasten the right transmitter according to the following procedure.

• Refer to the instruction manual for the crank set you are using for the procedure to assemble the chainring.

1 Install the outer chainring on the spider arm.





• Install the right transmitter so it is on the outside of the chainring. Do not install the right transmitter on the inside of the chainring.





2 Install the inner chainring.

Do not insert the chainring bolt at this time.



3 Install the chainring adapter.

Run the junction cable along the guide of the chainring adapter, line up the bolt holes as you overlay the chainring adapter over the inner chainring.





Troubleshooting

4 Insert the chainring bolts into the bolt holes and temporarily install the chainring adapter on the chainring.

Do not tighten the chainring bolts too tightly when you temporarily tighten them.



5 Press on the chainring in a clockwise direction to eliminate any play as you tighten the chainring bolts to the specified torque.

Tighten the chainring bolts in order in a kitty-corner pattern.

Tightening torque: 14 N•m



• Refer to the instruction manual for the crank set you are using for the torque at which to tighten the chainring bolts.

· Periodically inspect and re-torque the bolts on the chainring.

6 Install the right transmitter on the chainring adapter with the 8-mm screws provided.

Check that the right transmitter is installed so it lines up with the chainring.

Press on the right transmitter from the outer side of the outer chainring as you insert the 3 screws, then tighten them to the specified torque.

Use a tool to measure the torque when you tighten the screws.

• Tightening torque: 30 cN•m



This completes the installation of the sensors on the right crank set.

- Use a soft dry cloth or a cloth that has been dampened and wrung out to wipe dirt from the left and right transmitters, the strain gauge unit cover, the magnet, and other accessories.
- Do not use benzene, paint thinner, or other volatile chemicals, cleansers, or chemically treated cloths. Doing so could damage the product or cause the paint to peel off.
- If you are not going to use the product for a long period of time, remove the batteries.

Specifications

| Weight: | About 66 g | | |
|---|--|--|--|
| Dimensions: Pedaling monitor sensor (right side): | | | |
| | Right transmitter: | | |
| | 58.3 mm(W) × 46.1 mm(H) × 21.3 mm(D) | | |
| | Junction box, Strain gauge unit cover: | | |
| | 78 mm(W) × 36.7 mm(H) × 7.3mm(D) | | |
| | Pedaling monitor sensor (left side): | | |
| | 92.5 mm(W) × 34.7 mm(H) × 8.6 mm(D) | | |
| Water resistant: | This device has a water resistance rating of IPX-6/IPX-7. | | |
| Communications method (sensors): ANT+ wireless | | | |
| Battery: | CR2032 | | |
| Operation temperature: | -10 °C to 50 °C | | |

- ANT+ is a Wireless Personal Network protocol with very low power requirements using 2.4GHz frequency band. For more information, visit http://www.thisisant.com/
- · Specifications and design are subject to possible modifications without notice.
- · Illustrations used in this manual may be different from actual ones.

http://www.pioneerelectronics.com http://www.pioneerelectronics.ca http://www.pioneer.eu

Visit **www.pioneer.eu** to register your product. Visitez **www.pioneer.eu** pour enregistrer votre appareil. Si prega di visitare il sito **www.pioneer.eu** per registrate il prodotto. Visite **www.pioneer.eu** para registrar su producto. Zum Registrieren Ihres Produktes besuchen Sie bitte **www.pioneer.eu**. Bezoek **www.pioneer.eu** om uw product te registreren.

PIONEER CORPORATION

1-1, Shin-ogura, Saiwai-ku, Kawasaki-shi, Kanagawa 212-0031, JAPAN

PIONEER ELECTRONICS (USA) INC.

P.O. Box 1540, Long Beach, California, 90801-1540, U.S.A. TEL: (800) 421-1404

PIONEER ELECTRONICS OF CANADA INC.

340 Ferrier Street, Unit 2, Markham, Ontario, L3R 2Z5, Canada TEL: 1-877-283-5901 TEL: 905-479-4411

PIONEER EUROPE NV

Haven 1087, Keetberglaan 1, B-9120 Melsele, Belgium/Belgique TEL: +32 (0)3 570 05 11

©2012 PIONEER CORPORATION. All rights reserved.