Favero ELECTRONICS F-PM2 Sensor User Manual

Contents

ELECTRONICS F-PM2 Sensor

Product Information

Specifications:

- Product Name: F-PM2 Sensor
- Manufacturer: Favero Electronics srl
- Description: Electronics sensor for bicycle pedal power meter
- FCC ID: 2ATKD-FPM2
- IC: xxxxxxx

Safety

This product has been exclusively designed for racing bicycles and for road cycling on smooth pavements or tracks. The F-PM2 sensor cannot be used without a pedal body. Carefully read this document and follow the given instructions to avoid damaging the device, compromising its correct functioning, and/or causing damage to things and/or injuries to people. Keep this manual in a safe place for future reference. In case of doubts or clarifications, please contact Favero Electronics srl. Use your bicycle in a safe and responsible manner. Make sure that all your bicycle parts are properly installed and periodically checked. The incorrect installation and/or maintenance of the F-PM2 sensor may cause accidents, possible damages to things and/or injuries to people as well as the early degradation of the product and its performance.

Installation Instructions

1. Tighten the F-PM2 sensor to the crank arm with a tightening torque of 35-40 Nm.
2. If the F-PM2 sensor shows signs of damage, cracks, loose parts, and/or wear, please take it to a specialized mechanic for professional check, maintenance, and repair. This check must be made in case of falls and/or accidents.
3. Before using the F-PM2 sensor, gain full knowledge of the functioning of the automatic pedal clip/release system. Activate the brakes, then put your feet on the ground and exercise clipping and releasing your shoes from the pedals until you become familiar with the maneuver and can perform it with the least effort.
4. Adjust the tension of the pedal spring as required before using the F-PM2 sensor. Excessive tension may make shoe release difficult, while insufficient tension may lead to accidental release at any time, even when not required.
5. Ensure that the shoes' threaded holes where the screws will be inserted are not damaged or worn. Periodically check that the cleats are well tightened to the shoes. Maintain the cleats and other fixing components clean from dirt and debris to always ensure proper functioning.

Maintenance

If the F-PM2 sensor is not used for long periods, charge the battery at least every 3 months to avoid the risk of irretrievably damaging the device. Do not expose the F-PM2 sensor to excessively high heat sources and do not store it in direct sunlight.Do not throw the F-PM2 sensor in the fire as it may explode. Do not dispose of the F-PM2 sensor in household waste. Do not disassemble, cut, compress, bend, drill, or in any way damage the F-PM2 sensor. The internal batteries of the F-PM2 sensor may explode if damaged.

FAQ

- **Can I use the F-PM2 sensor without a pedal body?**
  No, the F-PM2 sensor cannot be used without a pedal body.
- **What should I do if the F-PM2 sensor shows signs of**

damage?

If the F-PM2 sensor shows signs of damages, cracks, loose parts, and/or wear, please take it to a specialized mechanic for professional check, maintenance, and repair.

- **How often should I charge the battery if the F-PM2 sensor is not used?**

  If the F-PM2 sensor is not used for long periods, charge the battery at least every 3 months to avoid the risk of irretrievably damaging the device.
- **Can I dispose of the F-PM2 sensor in the household waste?**

  No, do not dispose of the F-PM2 sensor in household waste. Contact appropriate disposal facilities for proper disposal methods.

Product information

Product name	F-PM2 sensor
Manufacturer	Favero Electronics srl via R. Lombardi, 64 31030 Arcade (TV) – ITALY
Description	Electronics sensor for bicycle pedal power meter

Safety

-  This product has been exclusively designed for racing bicycles and for road cycling on smooth pavements or tracks.
-  The F-PM2 sensor cannot be used without a pedal body. Carefully read this document and follow the given instructions to avoid damaging the device, compromising its correct functioning and/or causing damage to things and/or injuries to people.

This document contains important information on the installation, use and maintenance of the F-PM2 sensor. Keep this manual in a safe place for future reference. In case of doubts or clarifications, please contact Favero Electronics srl.

- Use your bicycle in a safe and responsible manner. Make sure that all your bicycle parts are properly installed and periodically checked.
- The incorrect installation and/or maintenance of the F-PM2 sensor may cause accidents, possible damages to things, and/or injuries to people as well as the early degradation of the product and its performance.
- Tighten the F-PM2 sensor to the crank-arm with a tightening torque of 35-40 Nm. If the F-PM2 sensor shows signs of damages, cracks, loose parts, and/or wear, please take it to a specialized mechanic for professional check, maintenance, and repair. The above check must be made in case of falls and/or accidents.
- Before using the F-PM2 sensor, it is recommended you gain full knowledge on the functioning of the automatic

pedal clip/release system. Activate the brakes, then put your feet on the ground and exercise clipping and releasing your shoes from the pedals until you become familiar with the maneuver and can perform it with least effort.

- Before using the F-PM2 sensor, adjust the tension of the pedal spring as required: if the tension is excessive, shoe release may be difficult; if the tension is insufficient, accidental release may occur at any time, even when not required.
- Make sure the shoes' threaded holes where the screws will be inserted are not damaged nor worn.
- Periodically check that the cleats are well tightened to the shoes.
- Maintain the cleats and the other fixing components clean from dirt and debris to always ensure efficient clipping and release. Periodically check the conditions of the cleats; if they are worn out, immediately replace them with spare parts authorized by Favero Electronics srl. To avoid accidental release, whenever the pedal cleats are replaced make sure that the spring tension is correctly adjusted.
- Do not use an F-PM2 sensor with standard walking shoes or cleats different from those supplied as your foot may slip and cause you to fall. Do not use mountain bike shoes.
- Pay particular attention when walking with cleated shoes on. To avoid cleat deterioration do not walk long distances with these shoes.
- Consult a physician before starting a physical activity or modifying your training program.
- F-PM2 sensor is designed for maximum cyclist weights of 120 kg (265 lbs). Cyclists exceeding the weight limit specified risk personal injuries and may cause injuries to people and/or damage to things.
- Do not use aggressive chemicals to clean F-PM2 sensors, such as: gasoline, gas oil, and petrol by-products in general, alcohol, industrial or all-purpose degreasers, etc.
- Periodically check that the pedal body cap is tightened as specified in the User Manual.
- If the F-PM2 sensor is not used for long periods, charge the battery at least every 3 months, to avoid the risk of irretrievably damaging the device. Do not expose the F-PM2 sensor to excessively high heat sources and do not store it in direct sunlight.
- Do not throw the F-PM2 sensor in the fire as it may explode. Do not dispose of the F-PM2 sensor in household waste. Do not disassemble, cut, compress, bend, drill or in any way damage the F-PM2 sensor. The internal batteries of the F-PM2 sensor may explode if damaged.

Disposal

-  It is recommended to dispose of the F-PM2 sensor at the end of its useful life in an eco-friendly manner by recycling components and materials and disposing of in sorted waste collection systems.

The symbol of the crossed dustbin on the device or packaging indicates that the F-PM2 sensor must be disposed of separately from other wastes at the end of its useful life. The sorted waste collection of the device at the end of its life is organized and managed by the producer. Therefore, the user who wants to dispose of this device shall contact the producer and follow the producer's procedure for sorted waste collection.
The sorted waste collection of the used device performed by sending it to a recycling, treatment, and environmentally compatible disposal facility contributes to avoiding possible negative effects on the environment and health and favors the reuse and/or recycling of the device materials. The improper and/or illicit disposal of an F-PM2 sensor by its owner entails the application of fines as per the applicable laws and regulations

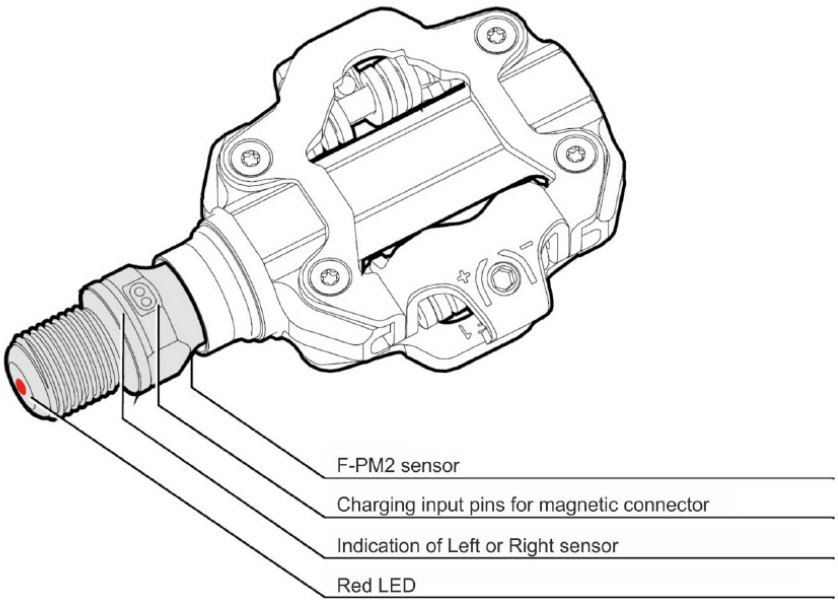
Product Description

The F-PM2 sensor is an electronic spindle used to make a pedal as a cycling power meter (“final product”). A cycling power meter is a device on a bicycle that measures power, cadence and other quantities produced by the rider.

The final product is composed by the F-PM2 sensor and a pedal body. The pedal body acts as a mechanical adapter between the F-PM2 sensor and the cleat installed under the cyclist’s shoe. Since there are different cleat standards on the market, the manufacturer can develop different pedal bodies to fit each cleat type.

- The F-PM2 sensor can be installed on the right or left or both cranks of the bicycle, the only difference is the thread direction, with no influence on the internal functioning of the sensor.
- The F-PM2 sensor measures power, cadence, left/right balance, and a few other cycling metrics.
- The F-PM2 sensor transmits the measured data using the following two radio protocols:
  - Ant+,
  - Bluetooth Low Energy (BLE).

Both protocols use the ISM 2.4 GHz band. The transmission uses the same antenna and the same RF circuit, in time-sharing mode, as the duty cycle of each protocol is very low. The F-PM2 sensor has an internal rechargeable Li-ion cell. Charging is done using a custom external magnetic connector and a regular USB cable, which plugs into a standard USB charger.



Warnings

Please carefully read this manual and the safety instructions before installing the product. An incorrect installation may lead to accidents and possible damage to things and/or injury to people.
If you have any doubts about your ability to install the product, we recommend you to ask for the assistance of a specialized mechanic. An incorrect installation may cause or result in irreparable damage to the product which shall not be covered by the warranty. Before starting to ride, check that the force necessary to release your shoe from the pedal is suitable.

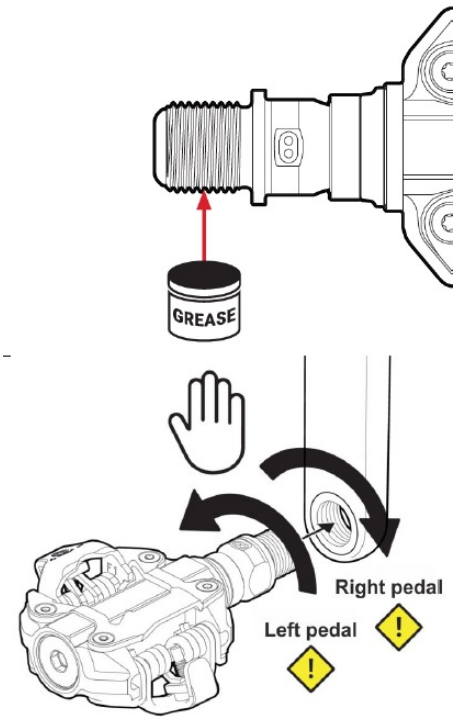
Switching on

The f-PM2 sensor will automatically switch on by turning the pedals or starting to ride and will automatically switch off after 5 minutes of inactivity.

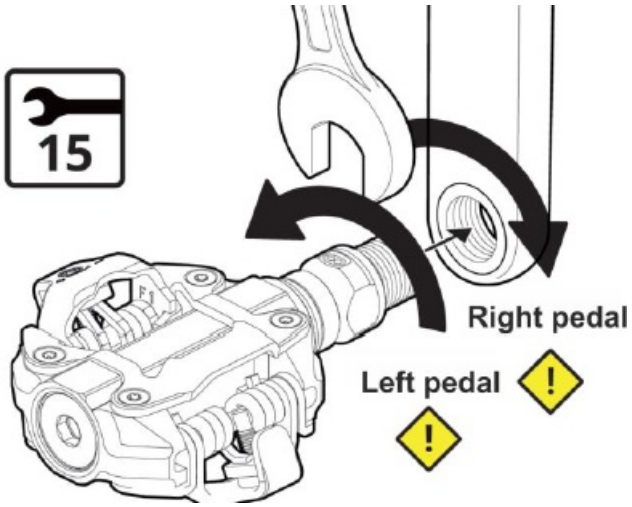
- When using If the LEDs do not blink, charge the battery. F-PM2 sensor for the first time, connect it to the supplied battery charger for a few seconds to switch it on. Follow the same procedure if “Travel mode” has been activated from the Favero F-PM2 sensor app.

Fixing the pedals to the crank-arms

1. Before tightening the pedals, apply a thin layer of grease to the pedal axle thread.
2. Screw the spindle manually



3. Screw with torque 35Nm ± 5Nm



Bike computer configuration

The pairing procedure associates the F-PM2 sensor to the bike computer to start the radio communication between the two devices. Please read the bike computer manual to learn how it performs the search and pairing of a power sensor. Make sure that the F-PM2 sensor is switched on before proceeding. Each F-PM2 sensor has a unique 5-digit identification number (ANT+ ID) written on the packaging. This number identifies F-PM2 sensor in the list of devices that can be paired with the bike computer. Bike computers require that only the left pedal be paired. The left pedal will transmit also the data collected by the associated right pedal.
On Bluetooth bike computers and other devices with Cycling Power Profile (CPP), the left pedal can be recognized by an L that follows the identification number.

Manual and automatic calibration

Each F-PM2 sensor is factory calibrated to ensure its guaranteed precision under any operating conditions, including ambient temperature variations, for which automatic compensation from -10°C to +60°C is active. No return to the Manufacturer is therefore necessary for periodic factory calibration. F-PM2 sensor implements the automatic calibration (zero-offset) functionality, a sophisticated algorithm considering different aspects over time. The only suggested precaution is to store the bike upright (not tilted), with no load applied on the pedals. Automatic calibration is independent of the crank position. Manual calibration is, therefore, not necessary, yet it is possible to keep on performing it in a few seconds via the F-PM2 sensor app or bike computers/third-party apps. By doing so, the values registered by the last automatic calibration will be overwritten by those of the manual one.

Battery charge

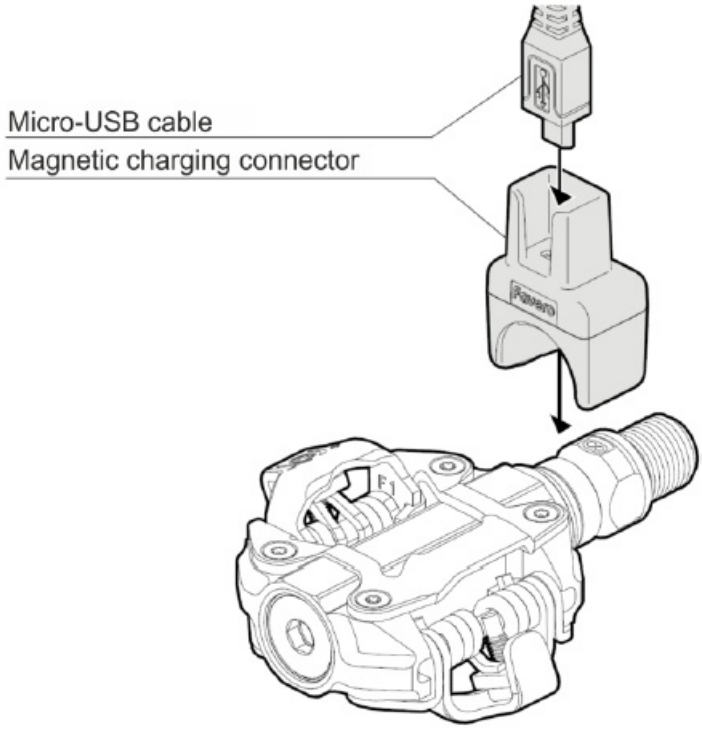
- F-PM2 sensor has an internal rechargeable lithium battery with at least a 50-hour life span. The capacity of each battery is tested during the manufacturing process.

The battery life is very long thanks to the low number of battery charges required. If you use Assioma for 15 hours a week, it is sufficient to charge it once every 3 weeks. The battery can also be charged when it is only partially discharged: this will further increase its life span.

- If the product is not used for long periods of time, charge the battery at least every 3 months in order to avoid the risk of irretrievably damaging the product.

When the battery of a pedal runs low, the bike computer will display a warning. The remaining battery life, after a

low battery warning, will be of about 8 hours.



To charge the batteries, follow the procedure below for each sensor:

- Connect a standard USB battery charger to an electrical socket.
- Connect the USB cable supplied to the battery charger.
- Insert the micro USB connector into the charging magnetic connector.
- If the sensor contacts are wet or dirty, dry or clean them with a dry cloth.
- Connect the magnetic connector to the pedal as indicated in the picture: the LEDs

switch on and remain switched on during the entire recharging. Once recharging has been completed, the LEDS will blink every 0.5 seconds. Recharging a completely discharged battery takes about 6 hours.

Inspection and maintenance

- ⚠Carefully inspect the product before starting a cycling session; check all parts for damage, cracks, loose parts, and signs of wear. Do not use the product unless you have carefully checked and replaced any worn or damaged parts.
- ⚠If the product is not in perfect condition, its use may be the cause of accidents, damage to things, and/or injuries to people, as well as the cause of early degradation of the product and its performance

Clean Assioma with a damp cloth. Do not use aggressive chemicals such as: gasoline, gas oil and petrol by-products in general, alcohol, industrial or all-purpose degreasers, etc. Do not use high-pressure cleaners.

- ⚠Periodically check that the screw-cap is correctly tightened. Before each cycling session, check that the pedals and cleats are properly working. If the cleats are worn out, they may cause accidents.

Do not attempt to open or disassemble the sensor as you may damage it and invalidate the warranty. Assistance must be carried out only by a specialized technician, authorized by Favero Electronics.

Technical specifcications

Dimensions H x W x L(mm)	92.8mm x 18mm x 18mm
Weight	55.4 g
Usage	Indoor/Outdoor
IP grade	IP67
Description	Sensor for power measurement for cyclist
Input charging voltage	5Vdc, max 110mA
Internal battery	Lithium cell, model HWE 78380 Nominal voltage 4.2Vdc Capacity 165mAh
Radio protocols	BLE Ant+, single channel 57 = 2457 MHz
Operating Temperature (discharge)	da -10°C a +50°C
Operating Temperature (charge)	da 5°C a +40°C
Max cyclist weight	120 Kg
Certifications	CE
Transmitted data	power (watt), cadence (rpm), L/R balance % (only double side), torque effectiveness (TE), pedal smoothness (PS), IAV Power Phase, IAV Rider Position Cycling Dynamics: Rider Position, Power Phase, PCO
Power measuring accuracy	± 1%
Minimum and maximum power	0 – 3000W
Minimum – maximum cadence	20 – 250 rpm
L/R balance	0 – 100% (double side)

EU DECLARATION OF CONFORMITY

- An object of the Declaration:
  (Identification of the radio equipment):Sensor
- Type/Model: F-PM2

- Firmware Version:1.61
- Intended use: Bike sensor for power measurement for cyclists
- Description of accessories and components that allow the radio equipment to operate as intended approved antenna types, software,:NA

is in conformity with the essential requirements of the Directive 2014/53/EU (RED) and of the Directive 2015/863/EU (RoHS). The product has been tested according to the following standards or technical specifications:

1. Essential requirements for the protection of the health and safety of people, pets and goods, Article 3.1a) of Directive 2014/53/UE
2. Essential requirements on electromagnetic compatibility levels, Article 3.1b) of Directive 2014/53/UE:
    1. ETSI EN 301 489-1 V2.2.3
    2. ETSI EN 301 489-3 V2.3.0
    3. ETSI EN 301 489-17 V3.2.4
3. Essential requirements for the effective use of radio spectrum, Article 3.2 of Directive 2014/53/UE:
4. Requirements of Directive 2011/65/UE (RoHS II) towards the maximum tolerated concentrations of the substances listed in Annex II as amended by the Delegated Directive 2015/863/EU (RoHS III):
    1. EN IEC 63000:2018

The Notified Body Nemko S.p.A. performed the conformity assessment of the technical documentation according to the procedure of Annex III (Module B) of Directive 2014/53/EU and issued the EU-type examination certificate no. 2051-RED-XXXXXX

Signature of the Legal representative: Firma del Rappresentante legale:

FCC Statement

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

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

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This product complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

Favero Electronics srl Model: F-PM2

- **FCC ID**: 2ATKD-FPM2
- **IC**: xxxxxxx

This device complies with Part 15 of the FCC rules subject to the following two conditions:

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

contact

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- **PIVA/VAT/C.F./N. iscr. R.1. Treviso**: IT 04703130262
- **Capitale Sociale:** € 100.000,00 i.v.
- PEC: faveroelectronicssrl.amm@legalmail.it

Documents / Resources

	Favero ELECTRONICS F-PM2 Sensor [pdf] User Manual FPM2, 2ATKD-FPM2, F-PM2, F-PM2 Sensor, Sensor

References

- User Manual