

Sensor Unit

Manual

- Follow the manual to properly install this product on the car. Using an installation method or parts other than the one specified may result in an accident or injury. We are not responsible for such accidents or injuries.
- To ensure proper operation, read the manual before use. Keep the manual at hand after reading.
- Check the compatibility of your smartphone/tablet (hereafter, terminal). Also consult the terminal manual before use.

Precautions (please follow)

- To ensure proper operation, read the "Precautions" thoroughly before use and keep it at hand after reading.
- Follow the precautions described here to prevent any harm to users and others and damage to property from occurring.
- The following sections describe the level of harm and damage which may occur when this product is used incorrectly by not following the described precautions.
 - This section describes the risks of death or serious injury that are imminent when this product is used incorrectly.
 - This section describes the risks of death or serious injury that may occur when this product is used incorrectly.
 - This section describes the risks of minor injury and property damage that may occur when this product is used incorrectly.
- The following signs describe the precautions that you should follow.
 - This means "prohibited" (Do Not).
 - This means do not disassemble.
 - This means do not use around water or wet it.
 - This means do not handle with wet hands.
- This means, "must follow the instruction" (Has to be carried out).
- This means to unplug the Vehicle Power Charger from the power outlet.



WARNING

- **Do not operate a terminal while driving. Do not operate complex functions or watch images that require you to look at the terminal screen for a long time while driving. Park the car in a safe spot to operate such functions. Also, do not gaze at the screen while driving.**

You might not be able to look ahead carefully and may result in a traffic accident.

- **Do not use, store and leave this product near fire, in direct sunlight and in a high temperature environment such as in a sun-heated vehicle.**

It may result in a fire, burn or injury.

- **Do not place in a cooking appliance such as a microwave oven or in a high-pressure container.**

It may result in a fire, burn, injury or electric shock.

- **Do not disassemble or remodel.**

It may result in a fire, burn, injury or electric shock.

- **Do not wet with water, drinking water or pet's urine, etc.**

It may result in a fire, burn, injury or electric shock.

- **Do not apply strong force or impact, or do not throw.**

It may result in a fire, burn, injury or electric shock.

- **Do not bring a charging terminal and external connecting terminal into contact with electrically-conductive foreign objects (a piece of metal or pencil lead, etc.). Also, do not insert them inside this product.**

It may result in a fire, burn, injury or electrical shock.

- **Do not install in a place where it interferes with driving or is detrimental to the safety of a passenger.**

Installation of this product in places where it interferes with driving such as places that obstruct the visibility or ancillary safety equipment such as an airbag or near brake pedal may result in a traffic accident, injury or damage.

- **Do not place under direct sunlight for a long period of time.**

It may deform or discolor the cabinet and/or result in a fire.

A part of this product may be heated and may cause a burn.

- **Do not use damaged cords and cables.**

It may result in a fire, burn or electric shock.

- **Do not touch the cord of an adaptor or cigarette-lighter socket with wet hands.**

It may result in a fire, burn or electric shock.

- **Perform the following actions immediately when abnormalities such as unusual smell, heat, change in color or shape occur while using, charging or storing this product.**

- **Unplug the Vehicle Power Charger from a cigarette-lighter socket.**

Failure to do so may result in a fire, burn, injury or electric shock.

- **Install securely.**

If this product falls due to harsh braking, it may result in a traffic accident or injury.

- **Should liquid such as water get into this product, unplug the Vehicle Power Charger from the cigarette-lighter socket immediately.**

Failure to do so may result in a fire, burn or electric shock.

- **Unplug the Vehicle Power Charger from the cigarette-lighter socket before cleaning.**

Failure to do so may result in a fire, burn or electric shock.



CAUTION

- **Do not place this product on an unstable surface such as on the top of a loose pedestal or a tilted place.**

It may result in an injury if it falls.

- **Do not keep this product wherever there is a lot of moisture and dust or in a high temperature environment.**

It may result in a fire, burn or electric shock.

- **The Vehicle Power Charger is for use only in vehicles with a negative ground. Do not use in vehicles with a positive ground.**

It may result in a fire, burn or electric shock.

- **Do not short a charging terminal while connected to the cigarette-lighter socket. Also, do not bring a charging terminal into contact with body parts such as hands and fingers.**

It may result in a fire, burn or electric shock.

- **Do not place heavy items on cords and cables.**

It may result in a fire, burn or electric shock.

- **Be careful that it does not catch fire.**
Turn off the power and do not use this product in a place (such as gas stations) where inflammable gases (such as propane and gasoline) are generated. Otherwise, it may in turn lead to the product catching fire or exploding.
- **Only use this product in vehicles.**
Do not use this product other than in vehicles. Otherwise, it may result in electric shock or injury. Do not use this product in ships, aircraft, motorcycles, or while mountain climbing. Positional errors can occur or maps cannot be displayed, and may result in accidents. Also, it may result in overheating, burst or ignition due to salt damage, etc.
- **Do not continue using when it is broken.**
Do not use this product when there are malfunctions such as the LED not lighting. Contact your retailer. If you continue using with malfunctions, it may result in an accident, fire or electric shock.
- **Do not cut cables short.**
Cables may come with a fuse. Do not cut them short. The protecting circuit may fail and it may result in a fire.
- **Do not branch wires.**
Do not branch wires from one cable. If you use a power source by branching wires, cable will be heated and it may result in a fire or electric shock.
- **Keep this product out of reach of small children.**
It may in turn lead to accidental ingestion or result in injury.
- **When unplugging the Vehicle Power Charger, hold and pull the adaptor, not pulling the cord of the adaptor.**
Failure to do so may result in a fire, burn or electric shock.
- **Use this product with the specified power source and voltage.**
DC adaptor: DC12V (vehicles with negative ground only)
- **Should the fuse of the accompanying Vehicle Power Charger blow out, make sure to use a specified fuse.**
Failure to do so may result in a fire, burn or electric shock. Refer to this manual to confirm the specified fuses.
- **Wipe the dust off the Vehicle Power Charger.**
Failure to do so may result in a fire, burn or electric shock.

- **Unplug the Vehicle Power Charger from the cigarette-lighter socket when you do not use the product for a long period of time.**
Failure to do so may result in a fire, burn or electric shock.
- **Should liquid such as water get into this product, unplug the Vehicle Power Charger from the cigarette-lighter socket immediately.**
Failure to do so may result in a fire, burn or electric shock.
- **Unplug the Vehicle Power Charger from the cigarette-lighter socket to clean this product.**
Failure to do so may result in a fire, burn or electric shock.
- **Depending on certain physical or medical conditions one may have, itchiness, rash or eczema can occur. When abnormalities occur, discontinue the use of this product and consult with your doctor.**
- **When you use the route guide of the navigation, follow the actual traffic rules.**

Precautions for Handling

- This product can increase in temperature depending on the environment and usage. Be cautious of an increase in temperature, it may in turn lead to an injury or accident.
- Set the volume of the terminal at such a level that you can hear the noise from outside the vehicle while driving. If you drive when you cannot hear noise from outside, it may in turn lead to an accident.
- Use this product with appropriate screen brightness while driving.
- Set up this product with the cables tied together with the Cable Clamper (a promotional sample) to allow for unencumbered driving operation. It is dangerous and may result in an accident when a cable wraps around the steering wheel, shifter or brake pedal.
- Place wires in such a manner that cords will not be caught in moving parts of the vehicle such as the vehicle body, screw parts and seat rails. It might cause the breaking of wires or short circuits and may in turn lead to an accident, electric shock or fire.

Precautions for Use

- Install this product without the cable touching any metal parts of the vehicle. If there is a possibility that it might touch any metal parts, wrap the touching part with protective tape to protect the covering of the cable. Otherwise, it may result in a fire or electric shock.
- The terminal can break from high/low temperature or vibration. Do not install this product in such a place that can cause damage.
- Remove this product after use.
- Be aware that depending on the type vehicle you have, you may not be able to install this product.
- **Do not place this product in direct contact with hot air or cold air from air conditioning.** It may result in deformation or malfunction.
- **Read the manual attached to the terminal thoroughly.**
- **Do not place the product near the air conditioning outlet of your vehicle.** The sudden temperature change will cause dew condensation and the internal part will be eroded, which may result in malfunction.
- Avoid extreme high or low temperatures. Use this product at a temperature between 0-45 degrees Celsius.
- **Using this product near general electronics such as phones, TVs or radios may cause a negative influence. Use this product as far as possible from these electronics.**
- **When connecting external connection equipment to an external connecting terminal, do not insert it at an angle or do not pull it when inserted.** It may result in malfunction or damage.
- **It is not abnormal if the terminal becomes warm while in use or in charging. You can continue using the product.**
- **Charge the terminal in an environment where the surrounding temperature is within the appropriate range stated in the manual.**
- **When you charge this product using the Vehicle Power Charger, do not use it while the engine is off.** It may result in depletion of the car battery.
- **Do not apply a strong impact. Do not deform the charging terminal.** It may result in malfunction.
- **Be cautious when using this product while driving a car.**
Holding and using a cell phone while driving is subject to penal provisions. However, that will not apply when such use is unavoidable: aiding the injured and/or sick or maintaining public safety.

- A place such as the dashboard of an vehicle tends to become hot due to direct sunlight. The inside of a vehicle can also become hot under direct sunlight. When using the terminal attached to the Cradle, use it within the ranges of temperature and moisture stated in the manual. When this product is used, kept and left under high temperature, it may result in deformation or malfunction of the device, or leakage, development of heat, bursting, igniting, or degradation of performance or life of the battery pack.
A part of the case can also become hot, and it may result in a burn.
- Do not use, keep or leave under the environment where the sun is very strong and do not keep the terminal under direct sunlight.
When used, kept and left for a long time, the device will be hot and it may result in deformation and malfunction of the device, or leakage, development of heat, bursting, igniting, or degradation of performance or life of the battery pack. A part of the case can also become hot, and it may result in a burn.
- When installing the terminal to the Cradle, stow it securely so it does not fall in case of sudden acceleration, sudden braking or driving through a curve or rough road. The device falling may result in an accident or injury, or may in turn lead to damage to the terminal and surrounding objects.
- This product may not be used in a vehicle with glass such as metallic glass (heat reflective glass) that does not let radio waves through because GPS signals cannot be received inside of the vehicle. Check with your car manufacturer/dealership.
- Carry this product with care. When too much force is applied, the internal base will break and it may result in malfunction. Do not place the product under heavy objects in your bag. It will not be eligible for warranty even if there is no damage to the outside of the product.
- Do not wrap cables and cords around the plug. It may result in an electric shock, ignition or fire.
- Do not leave this product on top of the dashboard. It may result in malfunction.
- Be careful when continuing to use the terminal for a long period of time while charging. The temperature of the terminal may rise and may cause deterioration of the battery pack.

Driving safety

- It is very dangerous when a driver operates the terminal while driving because he/she will be distracted while looking at the screen, and it may result in an unexpected serious accident. Park the vehicle in a safe place first when the driver needs to operate the terminal.
- Set the volume of the terminal at such a level that you can still hear noise from outside the vehicle while driving. Driving without hearing noise from outside may in turn lead to an accident.
- Be aware that listening to the sounds of the terminal at a high volume which stimulate your ears continuously for a long period of time, may in turn lead to a negative effect on your hearing.

Positioning immediately after power activation

- This product displays the current location by GPS positioning (→refer to "navigation mechanism"). It may take approximately 5 minutes to figure out the accurate current location (until GPS positioning is completed) immediately after power activation.

Environmental conservation

- To protect the environment, avoid excessive idling while parking. Excessive idling leads to the battery running out.

Others

- Install the Sensor Unit at the defined place by applying the accompanying Hook and Loop Fasteners (a promotional sample). Do not put any stickers on the main unit other than these fasteners. Otherwise, it may result in malfunction or damage.
- We do not guarantee that this product will fit well with specific purposes of our customers.

Compatible terminals for this product

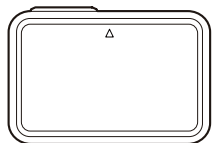
- Refer to the DoCoMo website for the latest information.
- The method of operation can be different depending on the models and versions of software.

Notice

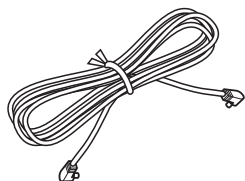
- The terminal may be used by an individual to reproduce materials so long as such use is limited to reproduction of non-copyrighted materials or materials you are legally permitted to reproduce. Infringement of copyright is prohibited by law.
- Be careful when continuing to use the terminal for a long period of time while charging. The battery charge of the terminal can stop working. In such a case, remove the terminal from the Cradle, making sure the temperature has gone down, and then start charging again. Touching the hot part of the device may result in a burn.
- Use the terminal that is fully charged. The battery charge can stop when you use application while charging it in case the remaining battery charge is low.
- Read the terminal manual for details on how to handle the terminal.

Components

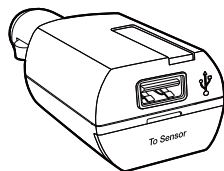
Sensor Unit × 1



Sensor Unit Power Cable (3 m) × 1



Vehicle Power Charger × 1



Smartphone/Tablet Power Cable (1.3 m) (promotional sample) × 1



USB cable for software update (35 cm) (promotional sample) × 1



Hook and loop fasteners (promotional sample) (2 pcs.)



Cable Clamper (promotional sample) (2 pcs.)



Manual (this booklet) × 1

Caution

- This product is for vehicle installation only. Do not use this product outside of the vehicle except for updating the software.
- Only use the USB cable for software updates (a promotional sample).

Capability of this product

This product has a built-in in-car GPS receiver, antenna, acceleration sensor and gyro sensor. With these features, the terminal can be used for high-precision full-fledged navigation.

Caution

- To use this product for navigation, you need to have a compatible smartphone and application.

Eco-illumination feature

This feature supports eco-friendly driving by comparing the fuel consumption of previous driving and the current fuel consumption. When the current fuel consumption is better than the previous consumption records, the green LED of the Sensor Unit lights up. When the current fuel consumption is worse than the previous consumption records, the red LED of the Sensor Unit lights up.

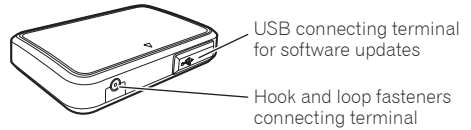
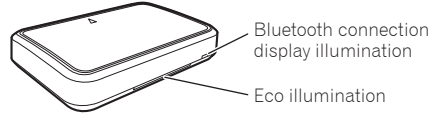
Caution

- Use the information regarding the fuel efficiency which this product displays as a guide.
- When there are no past driving records (i.e., factory default, when previous fuel consumption was not recorded normally, or when eco status was initialized using the terminal), this feature may not work normally.
- You need to have a supporting application in order to initialize the eco status.

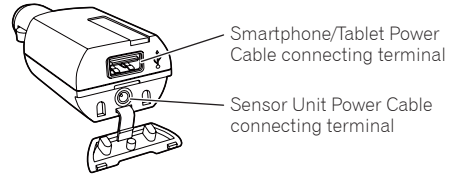
Names and functions of Parts

Names of parts

Sensor Unit



Vehicle Power Charger



Installation in the vehicle

Operating precautions (At the time of installation)

Please be aware that we are not responsible for any failures that arise from users not following the precautions stated in the Manual. Use this product appropriately. The warranty cannot be granted when users do not handle the product properly or the product is used inappropriately beyond common sense such as applying too much force.

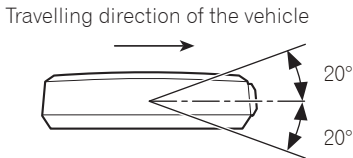
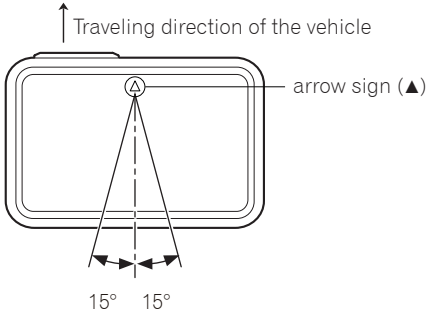
Precautions

- Remove and keep this product avoiding direct sunlight, high temperature and high moisture after use. Do not leave this product on the dashboard. It may in turn lead to deformation.
- Wipe any dirt from the installation site, and install the product after the site has become dry.
- Install the product on places such as the following:
 - * On the dashboard where it is flat without unevenness.
 - * A place where the vibration is not too intense, or a stable place.
 - * A place which does not obstruct the button operation in the vehicle.
- Do not install the product in the following places:
 - * Windshield.
 - * A place where rain tends to hit.
 - * A place where baggage can contact the product.
 - * A place where hot and cold air from the air conditioning can directly blow on the product.
- Do not paint the Sensor Unit. Performance of the built-in GPS may be lowered.
- Some vehicles with glass such as metallic glass (heat reflective glass) that does not let radio waves through do not let the signals from GPS satellite through. In this case, change the position of the product installation on the dashboard.

Installation method (Sensor Unit)

⚠ Precautions

- Refer to the “checking Cradle information” section (→p.17), and install the Sensor Unit at a place where it can receive GPS information properly.
- For improvement of the self-positioning accuracy, install the Sensor Unit as described below.



- Sensor Unit has a built-in GPS antenna. Install the Sensor Unit at a level site where GPS satellite signals are not intercepted.



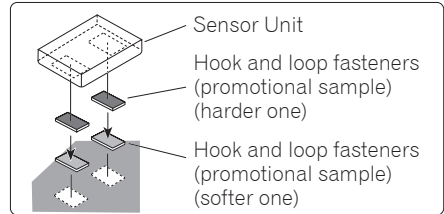
1 Connect the included Sensor Unit Power cable to the Sensor Unit.



Sensor Unit Power Cable connecting terminal

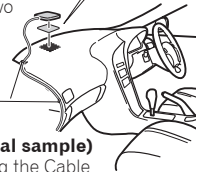
2 Install using the accompanying Hook and loop fasteners (a promotional sample).

Stick it on the Sensor Unit in such a way that the reset button on back side of the Sensor Unit is not covered. Refer to the “how to delete pairing information” section (→p.17) for the location of the reset button.



Hook and loop fasteners (promotional sample)

Make sure to use these fasteners. Remove the protective stickers on the back side, and stick them on two dips on the back side of the Sensor Unit.



Cable Clamper (a promotional sample)

Bundle and draw the cord using the Cable Clamper (a promotional sample) at several places,

Connecting Vehicle Power Charger

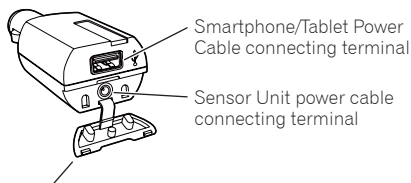
⚠ Warning

- Use the accompanying Vehicle Power Charger to connect.
- The accompanying Vehicle Power Charger is intended for use only with this product. Never use the Vehicle Power Charger for other products.
- Check that all the terminals are securely connected before use.

⚠ Precautions

- If your type of vehicle is one for which this product's power will not be off even when the key position of the vehicle is turned to off, unplug the Vehicle Power Charger when this product is not in use. If you forget to unplug, it may result in battery depletion.
- Start the engine after installing this product.
- Bundle cables using the Cable Clamper (a promotional sample) so that they will not interfere with driving.
- Depending on the setting of LEF for the application, the LED of the Sensor Unit sometimes does not light up even when the power of the Sensor Unit is turned on.
- Hold the connector and pull the cable to remove. If you pull only the cable, it may break off.

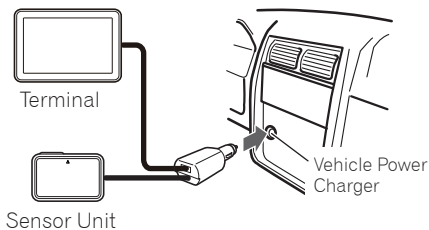
1 Connect each cable to the Vehicle Power Charger.



Sensor Unit Power Cable connecting terminal cover

- Open and pull out the cover.

2 Connect the Vehicle Power Charger to the cigarette-lighter socket.



3 Start the engine.

Eco illumination of the Sensor Unit and the LED on the USB terminal of the Vehicle Power Charger light up to tell you the power is now on.

Terminal setting

Before using the Cradle and terminals together, you need a Bluetooth connection.

Precautions

- When the Cradle and terminals are connected via Bluetooth, avoid operating (such as scanning, pairing and connecting) the Bluetooth with other equipment. The connection may become unstable.
- You need to have a supporting application to set the Bluetooth connection. (→Refer to the "capability of this product" section on page 7.)

How to connect

- The following procedures and the screen display are just examples. The connecting methods of Bluetooth and screen displays vary among terminals.
Read manuals for terminals.

1 Display the Cradle setting menu.

2 Select "Cradle connection setting."

3 Select "search Cradle."

Select Bluetooth under the "Bluetooth setting" section when Bluetooth is not selected.

4 Select "Sensor Unit" under "Bluetooth setting."

Begin pairing.

- Perform search when pairing is not displayed on the terminal list.

5 Select "accept" or "pair" under "Bluetooth pairing request screen."

Blue LED blinks for three seconds when the pairing is completed. The message "Pairing completed" is displayed on the terminal screen.

6 Tap the back key to go back to "Cradle setting."

7 "Connecting completed" is displayed on the screen showing the paired "Sensor Unit" from the list under "Cradle setting."

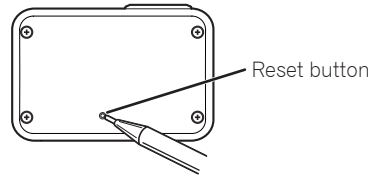
Blue LED of the Sensor Unit lights up at the same time.

- The Cradle can pair information for up to 5 terminals. When you add the information of a new terminal for pairing while there are already 5 terminals registered, the oldest information will be overwritten.

How to delete paired information

Precautions

- Information of all the terminals already paired will be reset.
- The reset button is located at the back side of the Cradle.
- Press the reset button using the tip of a pen.
- Remove the terminal from this product, deactivate the Bluetooth connection, and then press the reset button.



1 Press and hold the reset button for more than 5 seconds while the power of this product is on.

The Blue LED blinks 3 times when resetting is completed.

Checking sensor information

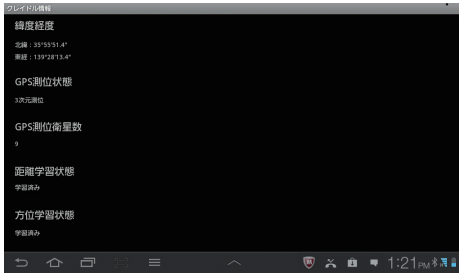
You can check the reception status on the terminal.

Precautions

- When using this function for the first time, the Cradle connection setting needs to be set for positioning information communication (refer to the "terminal settings" section on page 11).
- You need to have a supporting application to check reception status.

1 Display the Sensor Setting menu.

2 Select “Sensor Info.”



Reception status

GPS positioning status is displayed. It may take a few minutes to complete positioning.

No positioning: Positioning cannot be completed.

2D positioning: Positioning is completed.

3D positioning: High-accuracy positioning is completed.

When positioning cannot be completed in a place with an unobstructed view, your vehicle may have glass that does not let radio waves through.

Distance and direction learning status

Status of distance and direction learning is displayed. “Learning completed” is displayed when learning is completed, and “learning not completed” is displayed when learning is not completed.

Initialization of sensor learning

Use a supporting application to operate.

1 Display the Sensor Setting menu.

2 Select “Sensor Learning Initialize.”

Software update

Software update of the Cradle can be done by connecting to a PC. Refer to the DoCoMo website for how to update and precautions.

- It is posted only when software update is needed.

What to do when you suspect a malfunction

If the symptom cannot be improved after checking the check-items for the symptoms, contact the “malfunction inquiries” noted on the manual or “product malfunction supporting contacts” authorized by DoCoMo.

Power source

[Symptoms] Power of the Sensor Unit cannot be turned on.

Check-items

- If this product is left in a place with a high temperature, wait until the temperature of the product goes down.
- Re-connect the Smartphone/Tablet Power Cable (a promotional sample).
- Check the accompanying Vehicle Charger to see whether the fuse is blown out or not. When the fuse is blown out, replace it with a new one (refer to the “how to change the fuse” section on page 19).

Bluetooth functions

[Symptoms] Cannot connect with a terminal/cannot find by a search.

Check-items

- Device registration has to be done from the terminal end. Before you delete the registered devices and re-register devices, reset the Cradle and delete registered devices from the terminal.

Charging

[Symptoms] Cannot charge the product.

Check-items

- Is the battery pack of your smartphone properly installed?
- When you make phone calls or use communication and other functions while charging the terminal, the temperature of the terminal goes up and the charging-light may blink. In that case, wait until the temperature of the terminal goes down before charging it again.
- When multiple applications are launched or the Wi-Fi connection setting is ON, they consume more power than the terminal can charge, and therefore, charging may not progress.

In that case, quit unnecessary applications, turn off the Wi-Fi setting, or adjust the screen brightness of the terminal.

- Is the Vehicle Power Charger connected to the cigarette-lighter socket properly?
- Are the Smartphone/Tablet Power Cable (a promotional sample) and the terminal set properly?

Navigation

[Symptoms] The mark showing the position of the vehicle is not aligned.

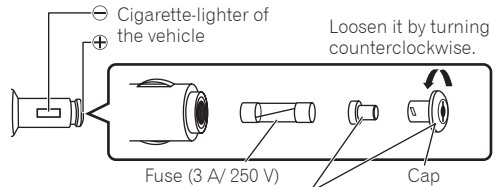
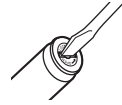
Check-items

- Check the position of the Sensor Unit installation. (Refer to the "Installation method [Sensor Unit]" section on page 9.)
- Initialize the sensor learning, and perform learning again. (→Refer to the "Initialization of sensor learning" section on page 14.)
- The mark showing the position of the vehicle can be misaligned, depending on driving conditions, when GPD positioning cannot be completed (→refer to the "accidental error" section on page 15).

1 Remove the cap of the Vehicle Power Charger while holding the groove of the cap.

Use a tool like tweezers to hold the groove of the cap. Turn the Vehicle Power Charger to remove the cap.

Terminals



Be careful not to lose it when it has been removed.

How to change the fuse

If the power of this product does not turn on, check whether the fuse of the accompanying Vehicle Power Charger is blown off.

- Fuse (3 A/250 V) is a consumable supply. Please purchase it from a nearby auto-supply shop when you need to replace the fuse.

! Precautions

- If the fuse is blown, replace it with a new fuse and tighten the tip. Replace it only with a fuse with specified capacity (3 A/250 V).

Trademark and copyright

- Wi-Fi® is a registered trademark of Wi-Fi Alliance®.
- The *Bluetooth*® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by PIONEER CORPORATION is under license. Other trademarks and trade names are those of their respective owners.



Specifications

Vehicle Power Charger

External dimensions:
approx. 39 mm (W) × 29 mm (H) × 111 mm (D)

Weight: approx. 54 g

Range of operating temperature:
0 – 45 degrees Celsius

Input voltage: DC 12 V

Output voltage: DC 5 V

Maximum output current: 2.1 A (Smartphone/Tablet
Power Cable connecting terminals)

Sensor Unit

External dimension:
approx. 76 mm (W) × 14 mm (H) × 50 mm (D)

Weight: approx. 38 g

Range of operating temperature: 0 – 45 degrees
Celsius

GPS Part

50-channel receiving system

Antenna: built-in Sensor Unit

Bluetooth

Version: Bluetooth standard Ver.2.1 compliant

Output: Bluetooth standard Power Class 2

Navigation mechanism

GPS positioning

- GPS (Global Positioning System) is a system that receives positioning signals from GPS satellites to position the current location.
- GPS is launched to an altitude of 21,000 km from Earth. The positioning can be done when receiving signals from more than three satellites. There are 3D positioning and 2D positioning for GPS positioning.

Types	Description
3D positioning	When you receive strong signals from GPS satellites, 3D (latitude, longitude and altitude) positioning can be done.
2D positioning	When you are able to receive but the reception status is not good, positioning is done in 2D (latitude and longitude). Because altitude cannot be detected, the incidental positioning error is slightly bigger than in 3D.

Positioning by autonomous navigation

- The built-in hybrid sensor determines the current location by detecting travel distance from the acceleration sensor and turned directions from the gyro sensor.

The characteristics of the positioning that combined GPS and autonomous navigation

- The combination of current location data from GPS and current location data from autonomous navigation enables it to perform positioning with higher accuracy.
- Even signals from GPS satellites cannot be received, autonomous navigation can continue performing positioning.
- Positioning just by autonomous navigation can cause misalignment of the current location display. By combining GPS and autonomous navigation, GPS positioning can correct the misalignment of autonomous navigation, and therefore, the accuracy of positioning will be higher.

Built-in sensor learning

- The Cradle is equipped with a gyro sensor and an acceleration sensor in order to achieve higher accuracy in positioning. To enable this function, these sensors have to learn. Learning can take approximately 5 – 15 minutes after starting driving. (It varies depends on driving conditions.)
- If the learning is not completed, the mark which shows the current location on the screen map will stop when it cannot receive GPS information in tunnels. (The current location of the vehicle will be updated when GPS becomes available again.)
- This function requires re-learning when the installation angle changes significantly or previous learning is cleared.
- The current location of the vehicle can be misaligned even when learning of the built-in sensors is completed.

Map matching

- The supporting application has to be used together to operate the map matching function.
- Incidental errors can occur with the positioning by GPS or autonomous navigation, and the current location can be shown as off road. In this case, it thinks that vehicles should drive on the road, and the GPS corrects the current location of the vehicle on to the nearby road. This is the map matching function.
- A more accurate display of the current location is possible by using the Cradle because GPS and autonomous navigation can perform highly accurate positioning and the map matching function supports it at the same time.

Incidental errors

Incidental errors may become significant in the following cases.

Incidental errors due to non-performing GPS positioning

- GPS positioning cannot be performed when your vehicle is in places such as the following because the signals from GPS satellites are interrupted and not received:
 - inside of a tunnel or indoor parking lot
 - under a two-layer structure highway
 - an area crowded with high-rises
 - an area surrounded by thick tree growth
- When GPS positioning is not working for a long time, the current location of the vehicle can be misaligned or stopped. Even in these cases, once GPS signals become available again and you continue driving for a while, the current location of the vehicle will be corrected to the right location.
- Do not apply paint or wax to the Cradle. It may

reduce the sensitivity of the sensors or may not be able to receive signals.

Incidental errors caused by GPS satellites themselves

- GPS satellites are controlled by the U.S. Defense Department and satellites themselves sometimes deliberately send misaligned positioning data. In this case, incidental errors of positioning may become significant.
- When signals from fewer satellites are captured (received), the positioning will be 2D positioning and the incidental errors may become significant.

Other incidental errors

- When driving through Y-intersection with small angles.
- Right after driving on a straight line or gentle curves for a long distance.
- When tires slip on a gravel road or snowy road.
- When weaving on the road.
- When turning on a rotating platform in a parking garage, etc.
- When a series of hairpin-curves continues.
- When roads are adjacent to each other (such as toll way and side road)
- When repeatedly turning or changing directions in a multistory parking garage, etc.
- When GPS positioning is not working for a long time.
- When crossing a loop bridge.
- When driving on a newly constructed road which is not yet reflected on the map information.
- When the vehicle is transported by ferry or car-transporter vehicle.
- When there are repeated starts and stops at low speed in a traffic jam.
- When driving on a street in a grid.
- When driving on a road in a facility such as a plant and getting close to a road adjacent to that facility.
- When starting to drive right after starting the engine.
- When the Cradle is performing at its best capacity due to incorrect installation or impact from vibrations.
- When the Sensor Unit is installed while driving.
- When the installation site of the Cradle has been changed.

Main Features

- 1 Eco driving support function
- 2 GPS antenna and Receiver
- 3 Gyro sensor and accelerometer built-in
- 4 Bluetooth® technology for data communication between this unit and smartphone
- 5 Charging for smartphones

1 Eco-Driving Support

This unit is equipped with an Eco-driving Support function that can be used to estimate whether you are driving in an environmentally friendly way.

This function estimates approximate fuel mileage based on your driving, compares with your estimated average fuel mileage in the previous trip, and indicates the results by LED.

If your current driving has better estimated fuel mileage compared with the previous trip, the Green LED turns on.

If your driving has a lower estimated fuel mileage compared with the previous trip, the Red LED turns on.

The fuel mileage comparison is calculated while the unit turned off.

Green LED will turn on when i) this unit is used for the first time, or ii) the unit fails to store the previous fuel mileage.

This function is an estimate only and may not reflect actual driving fuel mileage.

CAUTION

Pioneer accepts no responsibility for data lost on the smartphone even if that data is lost while using this unit. Do not forget to back up smartphone data regularly.

(The notes below shall mentioned in appropriate location in the manual)

Specification

Note: Specifications and design are subject to modification without notice.

Connection Diagram

Vehicle Power Charger

– To protect your unit against sudden surges in current, connect the vehicle power charger only while the ignition switch is turned off.

Note: Be sure not to misplace detached parts. Keep parts out of the reach of small children to prevent accidental swallowing.

Avoid exposure to moisture.

Precaution

Information to User

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment has very low levels of RF energy that are deemed to comply without testing of specific absorption ratio (SAR).

Alteration or modifications carried out without appropriate authorization may invalidate the user's right to operate the equipment.

NOTE:

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 into 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.

FEDERAL COMMUNICATIONS COMMISSION DECLARATION OF CONFORMITY

Product Name: Sensor Unit

Responsible Party Name:

PIONEER ELECTRONICS (USA), INC.

SERVICE SUPPORT DIVISION

Address: 1925 E. DOMINGUEZ ST. LONG BEACH, CA 90810-1003, U.S.A.

Phone: 1-800-421-1404

URL: <http://www.pioneerelectronics.com>

! WARNING (This specific letter requires in Capital)

Handling the cord on this unit or cords associated with accessories sold with the unit may expose you to chemicals listed on proposition 65 known to the State of California and other governmental entities to cause cancer and birth defects or other reproductive harm. **Wash hands after handling.** (this specific statement requires in italic and bold)

This unit contains mercury. Disposal of this material may be regulated due to environmental considerations. For disposal or recycling information, please contact your local authorities or the Electronics Industries Alliance: www.eiae.org

Important Safety Information

The Safety of Your Ears is in Your Hands

Get the most out of your equipment by playing it at a safe level—a level that lets the sound come through clearly without annoying blaring or distortion and, most importantly, without affecting your sensitive hearing. Sound can be deceiving. Over time, your hearing “comfort level” adapts to higher volumes of sound, so what sounds “normal” can actually be loud and harmful to your hearing. Guard against this by setting your equipment at a safe level BEFORE your hearing adapts.

ESTABLISH A SAFE LEVEL:

Set your volume control at a low setting.

Slowly increase the sound until you can hear it comfortably and clearly, without distortion.

Once you have established a comfortable sound level, set the dial and leave it there.

BE SURE TO OBSERVE THE FOLLOWING GUIDELINES.

Do not turn up the volume so high that you can't hear what's around you.

Use caution or temporarily discontinue use in potentially hazardous situations.

Do not use headphones while operating a motorized vehicle; the use of headphones may create a traffic hazard and is illegal in many areas.

NOTICE TO ALL DRIVERS: Certain states and European countries prohibit the installation of product on vehicle's windshield. Those that are known as of the release date of this product are listed below; however, please make sure that you are in compliance with your state's most recent law before installing this product. Pioneer is not responsible for any damages, penalties, or fines that may occur as a result of illegal installation.

! WARNING (need to be bold)

- Do not attempt to install or service your unit by yourself. Installation or servicing of the unit by persons without training and experience in electronic equipment and automotive accessories may be dangerous and could expose you to the risk of electric shock or other hazards. If liquid or foreign matter should get inside this unit, park your vehicle to safe place and turn the ignition switch off (ACC OFF) immediately and consult your dealer. Do not use the unit in this condition because doing so may result in a fire, electric shock, or other failure
- If you notice smoke, a strange noise or odor from the unit, turn off the power immediately and consult your dealer. Using this unit in this condition may result in permanent damage to the system.
- Do not disassemble or modify this unit, as there are high-voltage components inside which may cause an electric shock.
- Do not allow this unit to come into contact with liquids. Electrical shock could result. Also, damage to the unit, smoke, and overheating could result from contact with liquids.

CAUTION

Before using your unit, be sure to read and fully understand the following safety information:

- Read the entire manual before operating this unit, and keep the manual handy as a reference for operating procedures and safety information.
- Do not operate this unit (or smartphone if used with) during driving. Doing so will divert your attention in any way from the safe operation of your vehicle. Always observe safe driving rules and follow all existing traffic regulations. If you experience difficulty in operating the system or reading the display on the phone, park your vehicle in a safe location and apply the parking brake before making the necessary adjustments.
- Never allow others to use the system unless they have read and understood the operating instructions.
- Pay close attention to all warnings in this manual and follow the instructions carefully.
- Do not install this unit where it may (i) obstruct the driver's vision, (ii) impair the performance of any of the vehicle's operating systems or safety features, including air bags or hazard lamp buttons, (iii) impair the driver's ability to safely operate the vehicle, or (iv) where it is illegal to do so by applicable law. Check with your state's motor vehicle agency for any changes to the law that may affect acceptable placement of this unit.
- Please remember to fasten your seat belt at all times while operating your vehicle. If you are ever in an accident, your injuries can be considerably more severe if your seat belt is not properly buckled.
- Never use headphones while driving.
- Do not leave the smartphone in direct sunlight for extended amounts of time or in any place with high temperatures. Doing so may cause the smartphone to malfunction from the extreme rise in temperature. For details, refer to the manuals for the smartphone.

Cautions for the power cable usage

WARNING

- Be sure to use only the supplied power cable with this unit. Use of another power cable is dangerous and could result in malfunction.
- Never touch the adapter when your hands or feet are wet. Also, do not use the adapter in a high moisture environment.
- Do not use the power cable if damaged.
- Unplug the power cable from the outlet when not in use.
- Never attempt to disassemble the power cable.
- When disconnecting the power cable, pull the plug itself. Do not disconnect by pulling on the cable.

Notes Before Using the System

Important (Serial Number:)

The serial number of this device is located on the package of this unit. For your own security and convenience, be sure to record this number.

In case of trouble

Should the unit fail to operate properly, please contact your dealer.

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