

GARMIN®

VARIA™ REARVUE 820

STVZO

Radar Tail Light



Owner's
Manual

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Introduction

WARNING

See the *Important Safety and Product Information* guide in the product box for product warnings and other important information.

The device can improve situational awareness. It is not a replacement for cyclist attentiveness and good judgement. Always maintain awareness of your surroundings, and operate the bicycle in a safe manner. Failure to do so could result in property damage, serious injury, or death.

Same-speed vehicle detection is limited or unavailable at slower speeds or when the device’s radar cannot detect the road due to factors such as snow, ice, heavy rain, other obstructions, or incorrect device mounting.

The Varia™ RearVue 820 radar tail light contains a micro radar that can detect vehicles behind your bike and estimate the vehicle size.

You must pair the device with the Varia app on your phone, or a compatible Garmin® watch or bike computer to use the radar features ([Pairing](#), [page 4](#)).

Device Overview



1 Device Button	Hold for 1 second to turn the device on. Hold for 2 seconds to turn the device off. When the device is off, hold for 2 seconds to enter pairing mode. When the device is on, press to turn the tail light on or off.
2 Status LED	Indicates device status and battery level (Status LED , page 16).

Pairing

Pairing with the Varia™ App

You can pair the Varia RearVue 820 radar tail light with the Varia app on your phone. The Varia app allows you to view the radar screen, change settings, and update the device software.

- 1 Go to garmin.com/VariaApp, or scan the QR code to download and install the Varia app on your phone.



- 2 Bring your phone within range (0.3 m) of the radar tail light.
NOTE: Stay 10 m away from other Bluetooth® sensors while pairing.
- 3 While the Varia RearVue 820 radar tail light is turned off, hold the device button for 2 seconds to enter pairing mode.
The device status LED flashes .
- 4 Open the Varia app on your phone.
- 5 Follow the on-screen instructions to pair the radar tail light.

If you already use the Varia app with another device, select **:** > **Devices** > **Add Device**.

While the Varia RearVue 820 radar tail light is connected to your phone, the Varia app displays the radar screen ([Varia™ App, page 8](#)).

Pairing with a Watch or Bike Computer

TIP: You can go to garmin.com/rearvue_820_stvzo/compatible to make sure your device is compatible with the Varia™ RearVue 820 radar tail light.

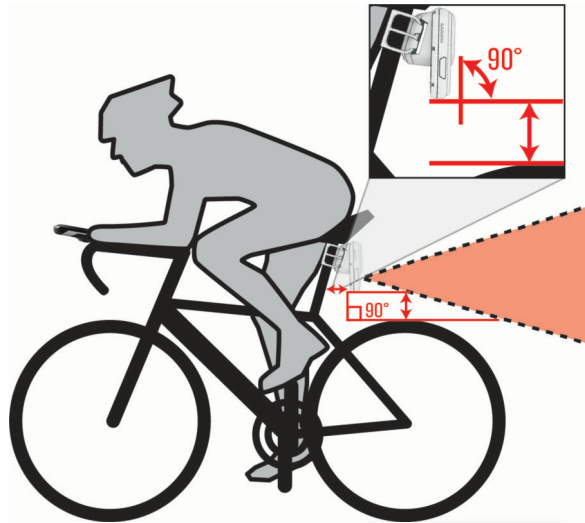
- 1 Make sure there are no other sensors within range that may interfere with pairing the Varia RearVue 820 device.
- 2 While the Varia RearVue 820 device is turned off, hold the device button for 2 seconds to enter pairing mode.
The status LED flashes .
- 3 Select an option:
 - On a Garmin® bike computer, select **≡** > **Sensors** > **Add Sensor** > **Search All**.
 - On a Garmin watch, from the menu, select **Sensors & Accessories** > **Add New** > **Search All**.
- 4 Select the Varia RearVue 820 device.

Your compatible Garmin device screen shows a sidebar and emits alert tones when it detects a vehicle approaching behind you. Additional options are available on compatible Edge® bike computers ([Edge® Bike Computer, page 10](#)).

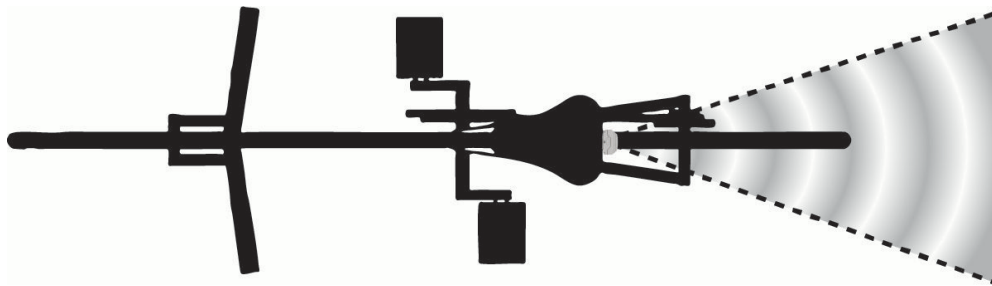
Installing the Device

To ensure maximum tail light visibility and radar detection range, you should install the mount according to these considerations.

- Make sure the device does not interfere with the safe operation of your bike.
- Install the mount as high as possible on the bike.
- Mount the device 250 to 1200 mm above the road.
- Mount the Varia™ RearVue 820 device parallel to the longitudinal axis of the vehicle.
- Make sure there are no obstructions in front of the light.
- Make sure the mount surface is perpendicular to the road.



- Make sure the device faces straight back, so that the radar beam covers the maximum range behind your bike.



You should go for a test ride during the day, in a safe environment, and adjust the mount, if necessary, before using the tail light at night.

Installing the Seat Post Mount

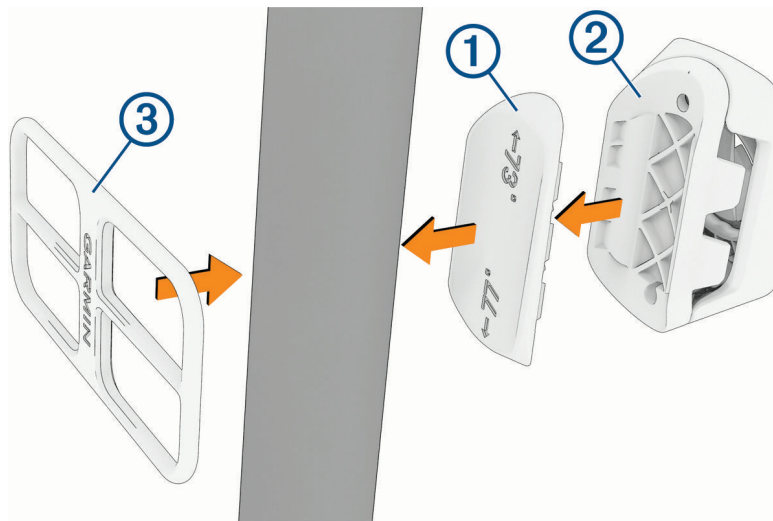
NOTICE

You must install the mount surface perpendicular to the ground, to make sure the radar beam is horizontal. If the seat post mount directs the radar beam up or down, the effective range of the radar is reduced.

NOTE: The mount is packaged with bands to fit round seat posts between 25.4 mm (1 in.) and 35 mm (1 ³/₈ in.) in diameter, and most D-shaped and aero seat posts. Seat post compatibility may vary depending on your bike model.

The mount is packaged with rubber pads to fit round, D-shaped, or aero seat posts.

- 1 Select the rubber pad ① that best fits the shape of your seat post.



2 Select an option to place the pad on the mount ②:

- If one of the numbers marked on the pad matches the angle of your seat post, place the pad on the mount with the correct angle number up.
- If neither of the numbers on the pad matches the angle of your seat post, or if you don't know the angle of your seat post, test both pad orientations, and select the best one.

The combined mount and pad must result in the device being perpendicular to the road surface, to maximize your radar range and tail light visibility.

3 Place the mount on the seat post.

4 Secure the mount to the seat post using one of the included bands ③.

NOTE: You can secure the mount using the included cable ties instead of the band.

Installing the Device on the Mount

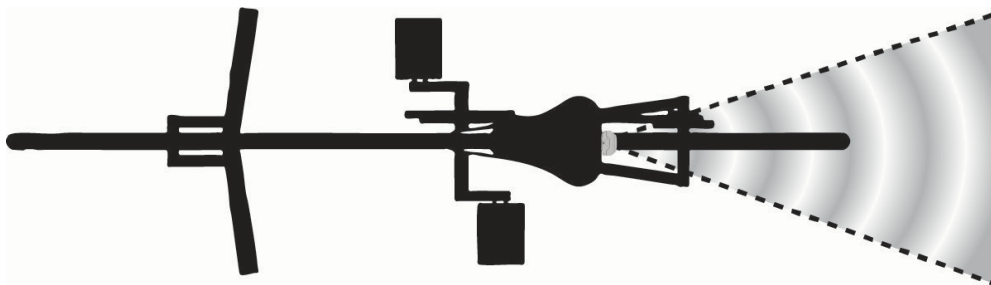
NOTE: You can install the device on the mount vertically in either orientation. The device automatically detects the mounting orientation.

1 Align the tabs on the back of the device with the seat post mount notches.



2 Press down slightly and turn the device clockwise until it locks into place.

3 Make sure the device faces straight back, so that the radar beam covers the maximum range behind your bike.



NOTE: If the device is mounted at an angle to the right or left, the radar does not track approaching vehicles correctly.

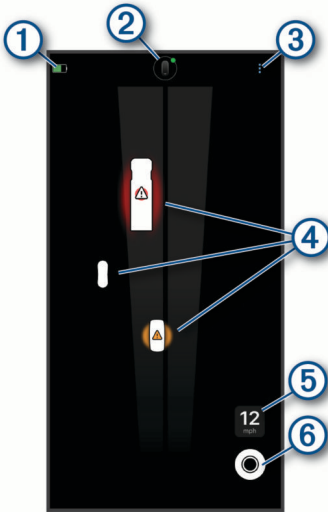
Varia™ App

⚠ WARNING

The device can improve situational awareness. It is not a replacement for cyclist attentiveness and good judgement. Always maintain awareness of your surroundings, and operate the bicycle in a safe manner. Failure to do so could result in property damage, serious injury, or death.

When connected to the Varia RearVue 820 radar tail light, the Varia app home screen shows a graphical representation of the road behind you, as you ride.

NOTE: You must pair the Varia RearVue 820 radar tail light with your phone using the Varia app ([Pairing with the Varia™ App](#), page 4).



1	Radar tail light battery level
2	Radar tail light settings
3	Varia app settings (Varia™ App Settings , page 9)
4	Vehicles
5	Bike speed
6	Select to turn the tail light on or off.
⚠	Mid-level threat
⚠	High-level threat

Vehicle icons reflect the estimated size of the vehicle, as detected by the radar, and move up and across the screen as they approach you. The radar continually reassesses and updates the icon to reflect the vehicle's approximate size. When the vehicle size can't be estimated, vehicles are shown as an indistinct shape. The radar calculates the threat level based on vehicle size, speed, and lateral distance from your path. The app emits audible tones when a threat is detected and when all threats are cleared ([Customizing the Varia™ App Sounds and Alerts Settings](#), page 9).

Device Settings

On the Varia™ app, select the device icon at the top of the home screen, and select Device Settings.

Speed Indicator: Shows or hides the speed indicator on the Varia app radar screen.

Location: Sets the placement of the speed indicator on the Varia app screen.

Measurement Units: Sets the measurement unit for the speed indicator on the Varia app screen.

Device Orientation: Sets the orientation in which the device is installed on the mount.

NOTE: By default, the device automatically detects its orientation. If you manually set the orientation, the device does not notify you of orientation errors, and you must make sure the setting matches the actual device orientation.

Varia™ App Settings

On the Varia app, select  at the top-right corner of the home screen ([Varia™ App, page 8](#)).

Devices: Allows you to add or remove Varia devices from the Varia app.

Sounds & Alerts: Allows you to configure the vehicle proximity alerts for the Varia app.

Location Permission: Allows you to manage your phone permissions to support geolocation and connectivity (applicable only to Varia devices equipped with a camera).

Help: Opens the product support page for the app with help topics, videos, and more.

Diagnostic Report: Allows you to enter a code from product support to view a diagnostic report for the Varia app.

Vault Settings: Allows you to access the saved videos in your vault, update your vault settings, review your vault subscription information, and update your Wi-Fi® connections (applicable only to Varia devices equipped with a camera).

Version: Displays the software version number.

User Warnings: Displays safety warnings and information.

Privacy Policy: Displays the full privacy policy and how Garmin® protects your data.

Copyright: Displays the license agreement information.

Customizing the Varia™ App Sounds and Alerts Settings

- 1 From the Varia app, select  > **Sounds & Alerts**.
- 2 Select an option.

Edge® Bike Computer

⚠ WARNING

The device can improve situational awareness. It is not a replacement for cyclist attentiveness and good judgement. Always maintain awareness of your surroundings, and operate the bicycle in a safe manner. Failure to do so could result in property damage, serious injury, or death.

When connected to the Varia™ RearVue 820 radar tail light, your compatible Edge bike computer shows the vehicle column on the side of the screen when a vehicle is approaching you from behind.

An icon ① along the side of the screen represents a vehicle behind you. The size of the icon represents the size of the vehicle, as detected by the radar.



The vehicle icon moves up the screen as the vehicle approaches you, representing the vehicle's position relative to you.

The radar calculates a threat level based on vehicle size, speed, and lateral distance from your path. A ⚠ icon over the vehicle icon indicates that the vehicle is a mid-level threat. A ⚠ icon over the vehicle icon indicates that the vehicle is a high-level threat.

When the radar detects a threat, the bike computer emits an audible tone and the screen shows a red or orange overlay on the sides of the screen, depending on the calculated threat level. When all threats are cleared, the bike computer emits another tone and the screen shows a green overlay on the sides of the screen.

You can configure the threat alerts within the Sensors menu on your Edge bike computer ([Alert Settings](#), page 11).

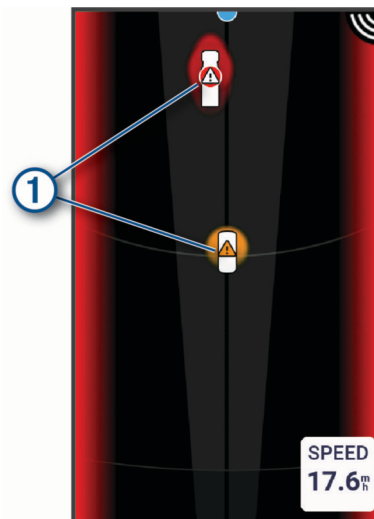
Radar Data Screen

⚠ WARNING

The device can improve situational awareness. It is not a replacement for cyclist attentiveness and good judgement. Always maintain awareness of your surroundings, and operate the bicycle in a safe manner. Failure to do so could result in property damage, serious injury, or death.

NOTE: The radar data screen is supported by Edge® bike computer models 540/840/1040 or newer. Some devices may need a software update to enable the radar data screen.

The radar data screen shows a graphical representation of the road behind you, as you are riding. An icon ① represents an approaching vehicle. The size of the icon represents the size of the vehicle, as detected by the radar.



The vehicle icon moves up and across the screen as the vehicle approaches you, representing the vehicle's position relative to you.

The radar calculates a threat level based on vehicle size, speed, and lateral distance from your path. A  icon over the vehicle icon indicates that the vehicle is a mid-level threat. A  icon over the vehicle icon indicates that the vehicle is a high-level threat.

TIP: You can add five data fields to this screen. For more information on customizing data fields, see the owner's manual for the bike computer.

Alert Settings

From the **Sensors** menu, select the Varia™ RearVue 820 device, and select **Alert Settings**.

Color Overlay: Enables the orange, red, and green overlays shown on the sides of the bike computer screen when a threat is detected or cleared.

Vehicle Column: Sets the placement and size of the vehicle column sidebar shown on the bike computer screen ([Edge® Bike Computer, page 10](#)).

Tones: Allows you to customize the audible tones emitted by the bike computer when a threat is detected.

Green Threat Level Tone: Enables the audible tone emitted by the bike computer when all threats are cleared.

Light Network

The Edge® bike computer can control your connected bike lights while you ride.

Viewing the Light Widget

You can control your connected lights from the Light widget.

- 1 On the Edge® bike computer, swipe down from the top of the screen.
- 2 Swipe left or right until you see the **Light** widget.

Configuring the Light Network

- 1 Select  > **Sensors** > **Lights**.
- 2 Select an option:
 - Select **Enable** to enable the light network.
 - Select **Network Options** to configure your light network ([Light Network Options, page 11](#)).
 - Select a bike light to configure it individually ([Bike Light Settings, page 12](#)).

Light Network Options

From the **Sensors** menu, select **Lights** > **Network Options**.

Light Mode: Sets the light mode for your light network.

NOTE: Light modes apply only if a headlight is connected. Tail lights operate the same way under all light modes.

Light Beam Activated: Sets whether your bike lights activate when you turn on the bike computer or when you start an activity timer.

Test Lights: Allows you to test each connected bike light.

Auto Beam Adjustment: Allows a connected headlight to increase its brightness level when you increase your speed (applicable only with a compatible headlight).

Bike Light Settings

From the **Sensors** menu, select **Lights**, and select a paired light.

Not all settings are available for all Edge® bike computers.

Sensor ID: Displays the sensor's identification number.

Connection Type: Displays the technology that is used to connect to the sensor.

About: Displays device and software information.

Alert Settings: Allows you to configure how the bike computer alerts you about approaching vehicles ([Alert Settings, page 11](#)).

Light Mode: Turns the light on or off.

NOTE: This setting is available only when you select the **Individual** light network mode.

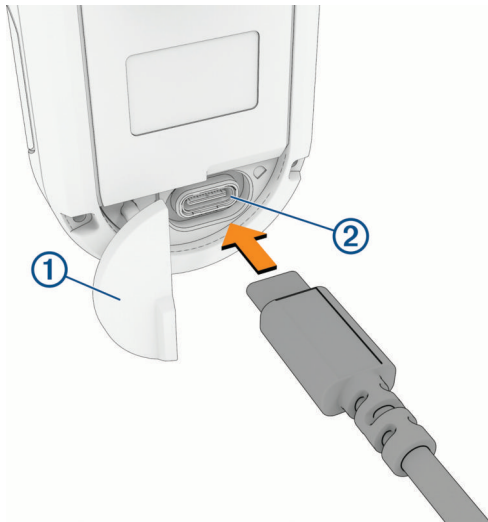
Charging the Device

NOTICE

To prevent corrosion, thoroughly dry the USB port, the weather cap, and the surrounding area before charging or connecting to a computer.

The device can operate normally while charging. If you use the device while charging, Garmin® recommends using a cable with a right-angle connector (not included) to avoid strain on the device charging port.

- 1 Pull up the weather cap ①, and plug the USB cable into the charging port ② on the device.



- 2 Connect the other end of the USB-C® cable to a power supply, such as a charging port or AC adapter (not included).

After charging for 15 minutes, the device has at least 3 hours of battery life. It takes up to 2.5 hours to complete a full charge.

The status LED flashes ■ to indicate the charging status.

Charging Status LED

NOTE: The status LED ① flashes to indicate the current charge status when the device is charging and turned off. If the device is charging and turned on, the normal operating status LED patterns apply ([Status LED](#), [page 16](#)).



Flashing ■ rapidly	The device is less than 15% charged.
Flashing ■	The device is between 15% and 99% charged.
Solid ■	The device is fully charged.

Software Updates

Checking for Software Updates Using the Varia™ App

Before you can check for software updates using the Varia app, you must pair the device with the Varia app ([Pairing with the Varia™ App, page 4](#)).

The Varia app alerts you automatically when a software update is available. You can manually check for updates to make sure you have the latest version.

- 1 In the Varia app, select the device icon at the top of the home screen.
- 2 Select **Software Updates**.
- 3 If a software update is available, follow the on-screen instructions to install it.

The radar LED flashes   while the device is updating.

When the update is complete, the LED flashes  20 times.

If the update fails, the LED flashes  20 times. You should repeat the steps to try again.

Updating the Software Using the Garmin Express™ Application

Before you can update your device software, you must download the Garmin Express application (garmin.com/software/express).

- 1 Connect the radar device to your computer using the included cable.
The Garmin Express application looks for software updates automatically and sends them to your device.
- 2 If necessary, allow the device battery to charge to at least 15% ([Charging Status LED, page 13](#)).
- 3 Follow the on-screen instructions.
- 4 Disconnect the device, and turn it on.

The radar LED flashes   while the device is updating.

When the update is complete, the LED flashes  20 times.

If the update fails, the LED flashes  20 times ([The status LED turns red while updating the software, page 19](#)).

Getting More Information

- Go to support.garmin.com for additional manuals, articles, and software updates.
- Go to buy.garmin.com, or contact your Garmin® dealer for information about optional accessories and replacement parts.

Specifications

Battery type	Rechargeable, built-in, lithium-ion polymer battery
Battery life	Up to 16 hr. with tail light on Up to 30 hr. with tail light off
Operating temperature range	-15° to 50° C (5° to 122° F)
Charging temperature range	0° to 45° C (32° to 113° F) ¹
Wireless frequency and transmit power	2400 – 2483,5 MHz: < 10 dBm 57 – 59,4 GHz: < 20 dBm
Water rating	IEC 60529 IPX7 ²

Status LED

The status LED ① is located next to the device button.



Slowly flashing ■	The battery level is good, and the device is in active mode.
Slowly flashing ■	The battery level is critical. Approximately 60 minutes of battery use remains. NOTE: You must charge the device as soon as possible.
Flashing ■	The device is in standby mode. The device automatically goes into standby mode after you turn off your connected bike computer. You can press the device button to reactivate the device.
Flashing ■	The device is in pairing mode.
Flashing ■	The device is in demo mode (<i>The status LED flashes yellow, page 19</i>).
Flashing ■ continuously	An error has occurred. NOTE: Most errors, such as radar interference, are temporary. If an error persists, contact Product Support at support.garmin.com .
Flashing ■ ■	The device is updating the software.
Flashing ■ 20 times rapidly	The software update is complete.
Flashing ■ 20 times rapidly	The software update failed.

¹ Charging speed is reduced when the ambient temperature is below 20° C (68° F).

² The device withstands incidental exposure to water of up to 1 m for up to 30 min. For more information, go to www.garmin.com/waterrating.

Radar Detection

WARNING

The device can improve situational awareness. It is not a replacement for cyclist attentiveness and good judgement. Always maintain awareness of your surroundings, and operate the bicycle in a safe manner. Failure to do so could result in property damage, serious injury, or death.

Same-speed vehicle detection is limited or unavailable at slower speeds or when the device's radar cannot detect the road due to factors such as snow, ice, heavy rain, other obstructions, or incorrect device mounting.

- The radar detects approaching vehicles up to 170 m (558 ft.) away.
 - The radar detects approaching vehicles traveling up to 170 km/h (106 mph).
- NOTE:** The radar may fail to detect vehicles traveling at exactly the same speed as you.
- The radar beam width is 60 degrees. It provides radar coverage for typical bends in the road.
 - The radar is optimized to work outdoors. When used in an enclosed area, such as a parking garage or a tunnel, the radar may report interference and temporarily stop functioning. After leaving the enclosed area, the radar automatically resumes normal operation.
 - The radar can detect up to eight approaching vehicles.

Troubleshooting

Resetting the Device

You can reset the device if it stops responding.

Resetting deletes the pairing connections from the device.

Hold the device button for 10 seconds.

The LED flashes    continuously, until the reset is complete.

Restoring All Device Settings to Factory Defaults

You can use the Varia™ app to clear all pairing connections and device settings.

1 From the Varia app, select the device icon.

2 Select  > **Restore Default Settings**

The LED flashes    continuously, until the reset is complete.

The radar device disconnects from the Edge® bike computer

WARNING

If the radar device is not connected or sending radar data, Garmin® recommends that you stop riding and check the devices in a safe location. Failure to do so could result in serious injury or death.

- Turn both devices off, and turn them back on.
- Pair the devices ([Pairing with a Watch or Bike Computer, page 4](#)).

The Varia™ RearVue 820 sends light and radar data to the Edge bike computer. The Edge bike computer displays  and  when connected.

The radar device disconnects from the Varia™ app

WARNING

If the radar device is not connected or sending radar data, Garmin® recommends that you stop riding and check the devices in a safe location. Failure to do so could result in serious injury or death.

- Turn off Bluetooth® technology from your phone settings, and turn it back on.
- Turn off both devices, and turn them back on.

The radar device is reporting an error

WARNING

If the radar device status LED is flashing red continuously, an error has occurred. Errors are also reported on the Varia™ app or your Garmin® watch or bike computer. While there is a radar error, the device cannot alert you to vehicles behind you.

- Make sure the device is within the approved operating temperature range ([Specifications, page 16](#)).
- Turn the device off, and turn it back on.
You can check the battery level on the **Sensors** menu of your Edge® device or on the Varia app.
- Move away from potential sources of radar interference, such as other radar devices or radar antennas.

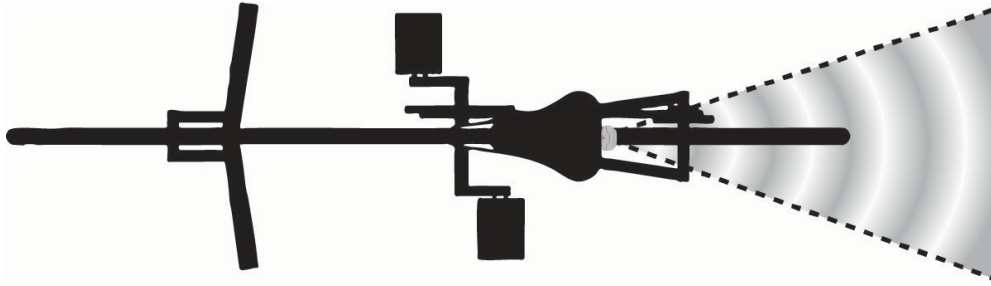
My bike computer does not show the lateral position of vehicles

NOTE: The radar screen showing the lateral position of vehicles is supported only by the Varia™ app and Edge® bike computer models 540/840/1040 or newer.

- 1 Update your compatible bike computer to the latest software version.
For more information on updating the device software, see the owner's manual for the bike computer.
- 2 On the bike computer, select  > **Sensors**.
- 3 Select the Varia RearVue 820 radar device.
- 4 Select **Sensor Details**.
- 5 If **Connection Type** is not set to **Secure (BLE)**, unpair the radar device, and pair it with your bike computer again ([Pairing with a Watch or Bike Computer, page 4](#)).

The lateral position of vehicles appears to be wrong

- Make sure the device faces straight back, so that the radar beam covers the maximum range behind your bike.



The device does not turn on

- Make sure the device is within the operating or charging temperature range ([Specifications, page 16](#)).
 - Charge the device for 4 hours ([Charging the Device, page 13](#)).
- If the device still does not turn on, reconnect it to the charger, and hold the device power button for at least 12 seconds.

The device turns on but the tail light does not turn on

WARNING

Before you start an activity, always check to make sure the tail light is functioning properly.

If one of the tail light LEDs fails, the tail light automatically turns off and Varia™ app reports an error. You must replace your tail light immediately. The radar operates normally when the tail light is disabled due to an LED failure.

- Turn the device off, and turn it back on.
- If the device is connected to an Edge® bike computer, start a ride on the bike computer.

TIP: By default, the Edge bike computer turns on the tail light when you start an activity timer ([Light Network Options, page 11](#)).

The status LED flashes red while charging

- If the device has been exposed to moisture, disconnect the charging cable, leave the weather cap open, and allow the charging port to dry completely.
 - Check the USB cable, connectors, and ports for damage.
 - Make sure the AC adapter or computer USB port is generating power.
- You can check this several ways. For example, you can check whether other devices powered by the source are functioning.
- Charge the device within the approved charging temperature range ([Specifications, page 16](#)).

The status LED turns red while updating the software

- Charge the device, and try again ([Charging the Device, page 13](#)).
- Check the USB cable, connectors, and ports for damage.
- Turn off both devices, and turn them back on.
- Make sure the device is within the operating temperature range ([Specifications, page 16](#)).

The status LED flashes yellow

If the device status LED flashes  in a fast, continuous pattern while the device is on, the radar is in demo mode. When in demo mode, the radar generates artificial data.

Press the device button twice to exit demo mode.

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