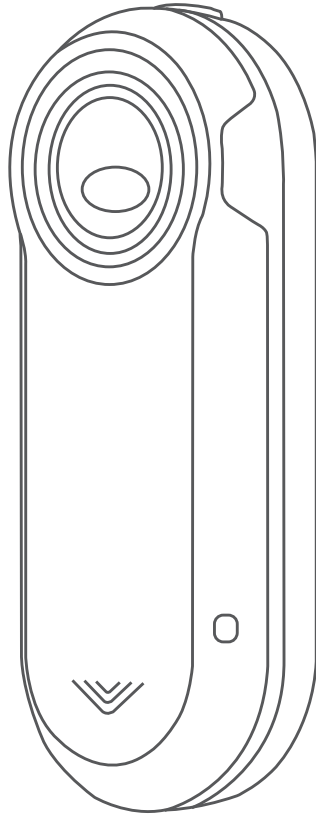


GARMIN®



VARIA™ REARVIEW RADAR RTL510/ RTL511

Owner's Manual

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Table of Contents

Introduction	1
Getting Started.....	1
Tips for Installing the Device.....	1
Installing the Universal Mount.....	1
Device Overview.....	1
Varia RTL Status LED.....	1
Turning Off the Taillight.....	1
Varia RDU Device Overview.....	2
Installing the Varia RDU Device.....	2
Turning On the Varia RDU Device.....	2
Turning Off the Varia RDU Device and Taillight.....	2
The Varia Taillight and Your Edge 1030	2
Pairing the Taillight with Your Edge 1030.....	2
Viewing Radar on Your Edge Device.....	3
Tone Alerts for Approaching Vehicles.....	3
Viewing Widgets.....	3
Customizing the Varia Device Settings with Your Edge 1030.....	3
Customizing the Radar Alert Settings with Your Edge 1030.....	3
Device Information	3
Specifications.....	3
Varia RTL Specifications.....	3
Varia RDU Specifications.....	4
Radar Detection.....	4
Taillight Modes and Intensity.....	4
Charging the Device.....	4
Tips for Charging the Device.....	4
Device Care.....	4
Cleaning the Device.....	4
Other Compatible Devices	4
Pairing the Taillight with a Compatible Edge.....	4
Pairing the Taillight with a Compatible Garmin Watch.....	5
Troubleshooting	5
Resetting the Device.....	5
Updating the Taillight Software With Your Edge Device.....	5
Taillight Status LED for Software Updates.....	5
Product Updates.....	5
Updating the Software Using the Garmin Express Application.....	5
The taillight disconnects from the Edge device.....	5
The taillight is not responding.....	5
Radar detection does not work indoors.....	5
The status LED turns red while charging.....	5
The taillight disconnects from the Varia RDU Device.....	6
Pairing the Taillight with the RDU Device.....	6
Replacement O-rings.....	6
Getting More Information.....	6
Index	7

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 use your best judgment, and operate the bicycle in a safe manner.

Getting Started

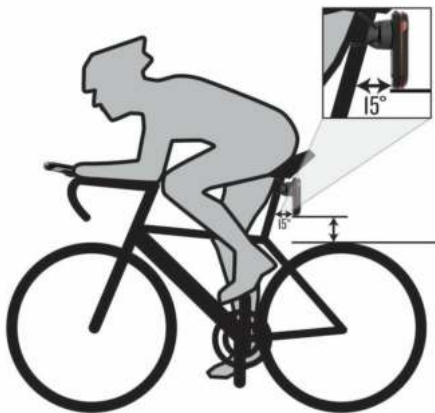
You can use the Varia RTL (radar taillight) with the Varia RDU (radar display unit) or with your compatible Garmin® device. This list provides an overview of the installation and setup tasks.

- Charge the device ([Charging the Device, page 4](#)).
 - Install the universal mount ([Installing the Universal Mount, page 1](#)).
 - If you are using the Varia RDU, install it on your bike stem or handlebar ([Installing the Varia RDU Device, page 2](#)).
- NOTE:** When you purchase the Varia RTL and RDU devices together, they are already paired.
- If you are using an Edge® 1030 device, pair the devices ([Pairing the Taillight with Your Edge 1030, page 2](#)).
 - If you are using another Garmin device, pair the devices ([Other Compatible Devices, page 4](#)).

Tips for Installing the Device

The Varia RTL device includes a taillight and micro radar that can detect approaching vehicles up to 140 meters away.

- Select a secure location to mount the device where it does not interfere with the safe operation of your bike.
 - Mount the device as high on the seat post as possible for optimal light visibility and radar detection.
- NOTE:** The mount surface should be vertical. There is a 15-degree angle between vertical and a typical seat post.
- Mount the Varia RTL511 device on the seat post 250 mm to 1200 mm above the road.
 - Install the device correctly.
The device faces backward and is perpendicular to the road.
 - Go for a test ride during the day in a safe environment.



Installing the Universal Mount

- 1 Select a rubber pad ① based on your seat post shape, and place the rubber pad on the back of the universal mount.
- 2 Place the universal mount on the seat post.



- 3 Attach the universal mount securely using one band ②.
- 4 Align the tabs on the back of the device with the universal mount notches ③.
- 5 Press down slightly and turn the device clockwise until it locks into place.

Device Overview



① Device key	Press to change light modes. Hold for 1 second to turn the device on. Hold for 2 seconds to enter pairing mode when the device is turned off. Hold for 2 seconds to turn the device off.
② Status LED	Changes color based on the battery level, pairing status, and charging status.

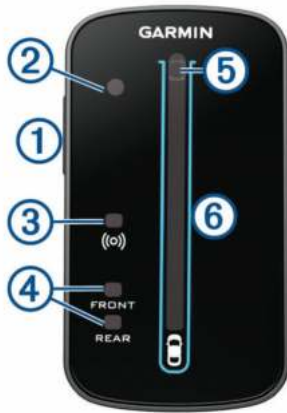
Varia RTL Status LED

LED Activity	Status
Flashing purple	The device is in pairing mode.
Flashing blue	The device is in smart mode and can be controlled by a paired Varia RDU or compatible Garmin device.
Flashing red	The battery is low.
Flashing green	The device is charging.
Solid green	Charging is complete.
Solid red	An error occurred while charging.
Alternating blue and green	The device is updating software.

Turning Off the Taillight

Hold the device key for 2 seconds.

Varia RDU Device Overview



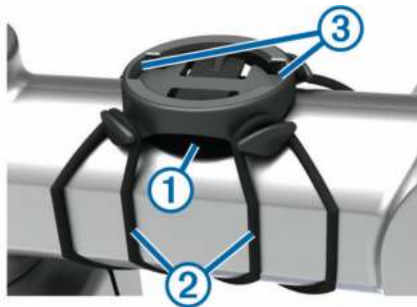
①	Device key	Turns the device on and off.
②	Ambient light sensor	Detects available light and automatically adjusts the brightness of the display.
③	Connection status LED	Appears solid blue when the device is paired with the taillight. Flashes blue when the device is searching for the taillight.
④	FRONT and REAR device status LEDs	Flashes red when the battery is low. Appears solid red when there is a device error.
⑤	Threat level LED Charging status LED (Charging the Device , page 4)	Changes color based on the potential level of threat. Green indicates no vehicle is detected. Amber indicates a vehicle is approaching. Red indicates a vehicle is advancing at a high rate of speed.
⑥	Vehicle position LEDs	Moves up the column as the vehicle gets closer to your bike.

Installing the Varia RDU Device

NOTE: If you do not have a Varia RDU device, you can skip this task and use a compatible Edge device ([Pairing the Taillight with Your Edge 1030](#), page 2).

You can install the device on the stem or the handlebars.

- 1 Select a secure location to mount the device where it does not interfere with the safe operation of your bike.
- 2 Place the rubber disk ① on the back of the bike mount.
The rubber tabs align with the back of the bike mount so it stays in place.



- 3 Place the bike mount on the bike stem.
- 4 Attach the bike mount securely using the two bands ②.
- 5 Align the tabs on the back of the device with the bike mount notches ③.
- 6 Press down slightly and turn the device clockwise until it locks into place.



Turning On the Varia RDU Device

- Hold the device key for 1 second to turn on the device.
- The LEDs fill the column to indicate the battery level.
- The LED flashes blue while it is searching for the taillight.

Varia RDU Battery Status LED

When you turn on the device, the LED at the top of the column briefly indicates the battery status.

LED Activity	Status
Flashing green	The device is charging.
Solid green	Charging is complete.
Flashing yellow	The battery is low.
Flashing red	The battery is critically low.

Setting the Varia RDU Device Tones

- Press the device key to turn on tones.
- Press the device key again to turn off tones.

Turning Off the Varia RDU Device and Taillight

If the Varia RDU is paired with the taillight, you can turn off both devices at the same time.

- Hold the device key on the Varia RDU device for 1 second.

The Varia Taillight and Your Edge 1030

You can remotely control your taillight and customize settings using your compatible Edge device. This section contains instructions for the Edge 1030 device. Other compatible Edge devices contain similar settings and controls ([Other Compatible Devices](#), page 4).

Pairing the Taillight with Your Edge 1030

The first time you connect the taillight to your Edge device, you must pair the device and taillight. After the initial pairing, the device automatically connects to the taillight when you start your activity and the taillight is active and within range.

NOTE: The taillight is compatible with other Garmin devices ([Other Compatible Devices](#), page 4).

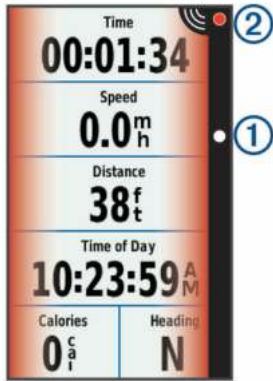
- 1 Bring the Edge device within range (3 m) of the sensor.
NOTE: Stay 10 m away from other ANT+® sensors while pairing.
- 2 Turn on the Edge device.
- 3 Select > **Sensors** > **Add Sensor** > **Search All**.
- 4 While the Varia device is turned off, hold the device key for 2 seconds to enter pairing mode.
The status LED flashes purple, and the taillight turns on. The device is in pairing mode for 5 minutes or until you press the device key.
- 5 Select your sensor, and select **Add**.

When the sensor is paired with your Edge device, the sensor status is Connected. The (radar) and (bike light) status icons appear solid on the top banner of the home screen.

Viewing Radar on Your Edge Device

Go for a ride.

The radar information appears on the active data screen.



The vehicle position LED ① moves up the column as a vehicle gets closer to your bike. The threat level LED ② changes color based on the potential level of threat. Green indicates no vehicle is detected. Amber indicates a vehicle is approaching. Red indicates a vehicle is advancing at a high rate of speed.

Tone Alerts for Approaching Vehicles

The Edge device beeps if audible tones are turned on in the settings. Your device has alert tones for several features. The alert tone for approaching vehicles has a unique sound. The device beeps one time when the first vehicle is detected. After the threat is cleared, the device beeps again when another vehicle is detected.

Viewing Widgets

Your device is preloaded with several widgets, and more are available when you pair your device with a smartphone or other compatible device.

- 1 From the home screen, swipe down from the top of the screen.



The settings widget appears. A flashing icon means the device is searching. You can select any icon to change the settings.

- 2 Swipe left or right to view more widgets.

The next time you swipe down to view the widgets, the last widget you viewed appears.

Customizing the Varia Device Settings with Your Edge 1030

Before you can customize Varia device settings with your Edge device, you must pair the devices.

- 1 Select **Settings** > **Sensors** > **Lights**.
- 2 Select an option:

- Select **Enable** to enable the light network.
- Select **Network Options** > **Test Lights** to verify that each light in your network is set up correctly ([Testing the Light Network](#), page 3).
- Select a light to view device information and customize each light in your network ([Light Network Settings](#), page 3).

Testing the Light Network

- 1 From your Edge device, select **Settings** > **Sensors** > **Lights** > **Network Options** > **Test Lights**.

- 2 Select a light to test.

The light blinks when it is connected.

Light Network Settings

From your Edge device, select **Settings** > **Sensors** > **Lights**, and select a paired light.

Enable: Turns on the light and allows you to control the light remotely with your Edge device. You can disable a light to disconnect it from the light network.

Light Mode: Sets the light intensity and pattern mode, or turns off the light.

NOTE: This setting is available when you select the Individual light mode setting ([Light Mode Settings](#), page 3).

Software Update: Checks for software updates.

About: Displays device, software, and battery information.

Remove: Allows you to delete a paired light from the network.

Light Mode Settings

From your Edge device, select **Settings** > **Sensors** > **Lights** > **Network Options** > **Light Mode**.

Auto: Automatically adjusts the light intensity and light mode based on the ambient light and time of day. This mode is recommended for commuting or road rides.

High Visibility: Sets the light intensity to flash mode or the brightest setting available.

Trail: Automatically adjusts the light intensity and light mode based on the ambient light and time of day. This mode is recommended for mountain biking.

Individual: Allows you to customize the light intensity and pattern mode for each light in your network ([Light Network Settings](#), page 3).

Customizing the Radar Alert Settings with Your Edge 1030

Before you can customize the radar alert settings with your Edge device, you must pair the devices.

You can customize how the radar alerts sound and display on your Edge device.

- 1 From your Edge device, select **Settings** > **Sensors**.
- 2 Select your taillight.
- 3 Select **Sensor Details** > **Alert Settings**.
- 4 Select an option.

Device Information

Specifications

Varia RTL Specifications

Battery type	Rechargeable, built-in lithium-ion battery
RTL510 Battery life	Up to 6 hr. in solid mode Up to 6 hr. in night flash mode Up to 15 hr. in day flash mode Up to 5 mo. in standby mode

RTL511 Battery life	Up to 10 hr. in solid mode Up to 5 mo. in standby mode
Operating temperature range	From -20° to 50°C (from -4° to 122°F)
Charging temperature range	From 0° to 45°C (from 32° to 113°F)
Radio frequency/protocol	2.4 GHz @ 4 dBm nominal; 24 GHz @ 12 dBm nominal
Water rating	IEC 60529 IPX7*
RTL510 LED luminous flux	20 lm (solid mode) 29 lm (night flash mode) 65 lm (day flash mode)
RTL511 LED luminous flux	7 lm (solid mode only)

*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.

Varia RDU Specifications

Battery type	Rechargeable, built-in lithium-ion battery
Battery life	Up to 10 hr., typical usage
Operating temperature range	From -20° to 60°C (from -4° to 140°F)
Charging temperature range	From 0° to 45°C (from 32° to 113°F)
Wireless frequency/protocol	2.4 GHz ANT+ @ 0 dBm nominal
Water rating	IEC 60529 IPX7*

*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

- The radar detects approaching vehicles up to 140 m away.
- The approaching vehicle speed must be from 10 to 160 km/h (from 6 to 99 mph).

NOTE: The radar does not detect vehicles traveling at the same speed as your bike.

- The radar beam width is 40 degrees. It provides radar coverage for typical bends in the road.
- The radar can detect up to eight approaching vehicles.

Taillight Modes and Intensity

The Varia RTL510 default light mode is solid. You can switch the device to night flash and day flash modes by pressing the device key. You can switch the device to standby mode by pressing the device key. The device does not detect vehicles in standby mode.

The Varia RTL511 has the solid mode only. You can switch the device to standby mode by pressing the device key. The device does not detect vehicles in standby 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 is powered by a built-in lithium-ion battery that you can charge using a standard wall outlet or a USB port on your computer.


NOTE: The device does not charge when outside the approved temperature range (*Varia RTL Specifications, page 3*).

- 1 Pull up the weather cap ① from the USB port ②.



- 2 Plug the small end of the USB cable into the USB port on the device.
- 3 Plug the large end of the USB cable into an AC adapter or a computer USB port.
- 4 Plug the AC adapter into a standard wall outlet.
- 5 Charge the device completely.
The status LED flashes green while charging. The status LED is solid green when charging is complete.
- 6 Remove the USB cable, and close the weather cap.

Tips for Charging the Device

- Connect the charger securely to the device.
You can charge the device by plugging the USB cable into a Garmin approved AC adapter with a standard wall outlet or a USB port on your computer. Charging a fully depleted battery takes about 5 hours using a computer and 3 hours using an AC power source.
- Remove the charger from the device when the status LED is solid green.
- View the remaining battery life  on your Edge 1030 settings widget (*Viewing Widgets, page 3*).

Device Care

NOTICE

Do not store the device where prolonged exposure to extreme temperatures can occur, because it can cause permanent damage.

Avoid chemical cleaners, solvents, and insect repellents that can damage plastic components and finishes.

Secure the weather cap tightly to prevent damage to the USB port.

Cleaning the Device

NOTICE

Do not use a cloth or any material that can scratch the optical lens on the front of the device. Scratching the optical lens may cause poor radar performance.

- Clear mud and dirt from the weather cap area.
- While the weather cap is closed, hold the device under running water.

After cleaning, allow the device to dry completely.

Other Compatible Devices

Pairing the Taillight with a Compatible Edge

This task is for the Edge 1000, 820, 520, and 130 devices. If your device is not listed, go to buy.garmin.com.

- 1 Bring the Edge device within range (3 m) of the sensor.

NOTE: Stay 10 m away from other ANT+ sensors while pairing.

- 2 Turn on the Edge device.
- 3 From the **Sensors** menu, select **Add Sensor > Search All**.
- 4 While the Varia device is turned off, hold the device key for 2 seconds to enter pairing mode.

The status LED flashes purple, and the taillight turns on. The device is in pairing mode for 5 minutes or until you press the device key.

- 5 Select your sensor.

When the sensor is paired with your Edge device, the radar and bike light status icons appear solid.

Pairing the Taillight with a Compatible Garmin Watch

This task is for the Forerunner® 935, fēnix® 5 series, and vívoactive® 3 watches. If your device is not listed, go to buy.garmin.com.

- 1 Bring the watch within range (3 m) of the sensor.

NOTE: Stay 10 m away from other ANT+ sensors while pairing.

- 2 Turn on the Garmin watch.
- 3 From the **Settings** menu, select **Sensors & Accessories > Add New > Search All**.
- 4 While the Varia device is turned off, hold the device key for 2 seconds to enter pairing mode.

The status LED flashes purple, and the taillight turns on. The device is in pairing mode for 5 minutes or until you press the device key.

- 5 Select your sensor.

When the sensor is paired with your Garmin watch, the radar and bike light status icons appear solid.

Troubleshooting

Resetting the Device

You can reset the device if it stops responding.

Hold the device key for 8 seconds until all the LEDs turn off.

Resetting deletes the pairing connections from the device.

Updating the Taillight Software With Your Edge Device

Before you can update the taillight software, you must pair the taillight with your Edge device, you must have a Garmin Connect™ account, and you must pair the Edge device with a compatible smartphone.

- 1 Bring the Edge device within 3 m (10 ft.) of the taillight.
- 2 Sync your Edge device with the Garmin Connect Mobile app.
When new software is available, your device alerts you to update the software.
- 3 Follow the on-screen instructions.

The taillight LED flashes blue and green to indicate the device is updating. When the update is complete, the LED flashes green ten times.

Taillight Status LED for Software Updates

LED Activity	Status
Flashing blue and green	The device is uploading software.
Flashing green	The software update is complete and successful.
Flashing red	The software update failed.

Product Updates

On your computer, install Garmin Express™ (www.garmin.com/express).

This provides easy access to these services for Garmin devices:

- Software updates
- Product registration

Updating the Software Using the Garmin Express Application

Before you can update your device software, you must download the Garmin Express application.



You can update the taillight software using the Garmin Express application.

- 1 Connect the taillight to your computer using the USB cable.
Garmin Express looks for software updates automatically and sends them to your device.
- 2 Follow the on-screen instructions.
- 3 Disconnect the device, and turn it on.
The taillight LED flashes blue and green to indicate the device is updating. When the update is complete, the LED flashes green ten times.

The taillight disconnects from the Edge device

WARNING

If the taillight is not connected or sending light and radar data to the Edge device, Garmin recommends that you stop riding and check the devices in a safe location.

- Turn both devices off, and turn them back on.
- Pair the devices (*Pairing the Taillight with Your Edge 1030, page 2*).
The Varia RTL device sends light and radar data to the Edge device. The Edge device displays  and  when connected.

The taillight is not responding

During a ride, if the taillight status LED is solid red, the device is in an error state.

- Make sure the device is within the approved operating temperature range (*Varia RTL Specifications, page 3*).
- Turn the device off, and turn it back on.
You can check the battery level on the Sensors menu of your Edge device.
- Avoid multiple sources of radar interference.

Radar detection does not work indoors

The Varia RTL device is tuned to detect vehicles in an outdoor setting. If you turn on the device indoors, a saturation alert can occur. When you take the device outdoors, the device resumes normal operation.

The status LED turns red while charging

- Check the USB cable, connectors, and ports for damage.
- Make sure the power source is generating power.
You can check this several ways. For example, you can check whether other devices powered by the source are functioning.
- Make sure the device is within the approved charging temperature range (*Varia RTL Specifications, page 3*).

The taillight disconnects from the Varia RDU Device

WARNING

If the taillight is not connected or sending data to the Varia RDU device, Garmin recommends that you stop riding and check the devices in a safe location.

If the threat level LED is solid red and the REAR LED is off, the taillight is not connected to the Varia RDU device.

- Turn both devices off, and turn them back on.
You can check the battery level when you turn the devices back on. The taillight LEDs fill horizontally to indicate the battery level.
- Pair the devices (*Pairing the Taillight with the RDU Device*, page 6).

Pairing the Taillight with the RDU Device

The Varia RDU device can be paired with one taillight at a time.

NOTE: If your taillight was packaged with an RDU device, they are already paired.

- 1 Hold the Varia RDU device key for 5 seconds.
The threat level LED flashes purple.
- 2 Turn on the taillight.
- 3 Bring the devices within 1 cm of each other, and wait while the devices connect.
The Varia RDU (●●) LED turns solid blue and the threat level LED turns solid green. The Varia RTL status LED flashes blue.

Replacement O-rings

Replacement bands (O-rings) are available for the mounts.

NOTE: Use Ethylene Propylene Diene Monomer (EPDM) replacement bands only. Go to <http://buy.garmin.com>, or contact your Garmin dealer.

Getting More Information

- Go to www.support.garmin.com for additional manuals, articles, and software updates.
- Go to www.garmin.com/intosports.
- Go to www.garmin.com/learningcenter.
- Go to <http://buy.garmin.com>, or contact your Garmin dealer for information about optional accessories and replacement parts.

Index

A

accessories 6
ANT+ sensors 3

B

bands 6
battery 1, 2
 charging 4, 5
brightness 3

C

charging 4
cleaning the device 4
customizing the device 2

D

device, care 4

E

Edge 2–4

F

fēnix 5
Forerunner 5

G

Garmin Express 5
 updating software 5
GPS, signal 3

I

indoor training 5
installing 1, 2

K

keys 1, 2

L

light modes 4

M

mounting the device 1, 2

O

O-rings. *See* bands

P

pairing 2–6
power key 1

R

resetting, device 5

S

satellite signals 3
settings 3
smartphone 3
software, updating 5
specifications 3, 4
status LED 1, 2

T

tones 2, 3
troubleshooting 4–6

U

updates, software 5
USB 5

V

vívoactive 5

W

Wi-Fi 3

