

# SmartSense

## Frequently Asked Questions (FAQs)

### SmartSense FAQ

#### SmartSense Overview:

##### What is SmartSense?

SmartSense is a system of parts which can all communicate with each other as well as to a smartphone and share a single battery. By sharing the same battery and communication language, SmartSense components can be lighter and have more automatic smart features than if you added similar components by themselves to the bike.

**Is SmartSense exclusive to Cannondale?** Yes, SmartSense is an exclusive Cannondale technology.

#### What components make up SmartSense?

##### Base System (Required)

- [SmartSense Cradle](#) – The brains, the control center, and the mount for the battery. This is the communication hub between all the SmartSense components and out to your phone. Think of this as your computer and SmartSense is the operating system all the components work with.
- [SmartSense PowerPack](#) – Just one battery to charge it all. This is the power for the SmartSense system. As a side note, you can remove the battery and use it to charge your phone at the coffee shop by using the USB-C port on the top.
- [Cannondale Wheel Sensor](#) – Tells the SmartSense system when you are riding and automatically records your riding activity for you.
- [SmartSense Foresite E350 front light](#) – Features vary depending on region.
- [SmartSense Hindsite E85/25 rear light](#) – Features vary depending on region.
- [Cannondale App](#) – While the SmartSense system is fully functional without the app, the app allows you to customize light and display settings.

##### Additional Components (Optional)

- [SmartSense Garmin Varia Radar](#) – Provides visual and/or audible indication of cars or bikes coming up behind you. Upgrading and wiring is easy because you just plug it into the Hindsite rear light. Once plugged into SmartSense, both your Foresite and Hindsite lights flash patterns as vehicles approach and pass, giving both you and the other driver or rider greater awareness.
- [SmartSense Garmin Varia Radar Display](#) – This simple handlebar-mounted LED display plugs into your Foresite front light. The LEDs flash to indicate vehicle(s) approaching and change color if the vehicle is approaching quickly.
- Garmin Edge, Wahoo computer, smartphone – These can communicate with Varia radar and act as the display, eliminating the need for a separate display.

#### How much does SmartSense weigh?

SmartSense saves around 250 grams compared to adding each of these components as aftermarket devices with their own battery. Simply stating a weight is not that helpful in evaluating the system benefits. With additional features such as lights and radar comes additional weight – if you added those as separate units to a bike, you are still increasing the bike's weight but also losing a number of integration benefits.

SmartSense Device	Weight	Part Number
SmartSense Cradle	68g	CP1532U100S
SmartSense Battery	180g	CP1552U100S
Wheel Sensor	15g	CP1500U100S
Foresite E350 Headlight	80g	Standard: CP1662U100S STVZO: CP1642U100S
Hindsite E25/E85 Taillight	44g	Standard E85: CP1672U100S STVZO E25: CP1652U100S
Radar	42g	CP1512U100S
Radar Display	21g	CP1522U100S
Wire kit	15g	CP2502U100S
Handlebar mounts	Variable	
<b>Total</b>	<b>465g</b>	

#### What bikes can be upgraded to SmartSense, and how?

- SmartSense can only be added to a Cannondale frame that is SmartSense-compatible. A SmartSense-compatible frame allows for safe and secure mounting of the battery and cradle and for internal cable routing through and out the front of the bike, through the seat tube, and out the seat post head.
  - Compatible frames (as of May 2022)
    - 2022 Synapse
    - 2022 Topstone Carbon

#### Any questions related to future SmartSense features and products.

Is there a dynamo or solar recharging system planned?

Is there a plan to have a tracker module added?

Is there any video of the Radar system in action?

We have created the world's smartest bike with the SmartSense system. Over time, Cannondale will be adding features and products to the SmartSense eco system both as improved functionality on new bikes and as upgrades to existing SmartSense bikes.

## SmartSense Battery and Cradle

**What is the battery life of the system?** This is completely dependent on the light mode used. You should expect 3 hours in StVZO, 2:45 hours for non-StVZO lights/radar in their brightest settings, and up to 20 hours in the more-efficient modes.

**How do you charge the battery?** The SmartSense battery is charged with a USB-C cable. USB-A to USB-C cable included. Wall charger not included.

**Can I use my SmartSense battery to charge my phone?** Yes. You can remove the battery from the bicycle and use a USB-C cable to charge your phone from the SmartSense battery. You cannot use the battery to charge your phone while the battery is on the bike and powering the lights and radar.

**Can I charge my SmartSense battery while it is powering the light?** No. Currently you will need to turn off the battery in order to charge it.

**Can I use my SmartSense battery to charge a computer?** No. It does not have enough voltage.

**Can I charge my head unit (Garmin, Wahoo, etc.) from the SmartSense battery while riding?** Not currently but in the near future with the Garmin Edge Power Mount.

**What is the size (capacity) of the Battery?** 19.4 Watt\*hours (Wh) (The battery is made of two 18650 cells in 2S1P configuration. Nominal voltage of 7.2V and a capacity of 2810mAh.)

**Does the SmartSense battery power di2? Does di2 still have its own battery?** At this point, the SmartSense battery cannot power a Di2 system, thus requiring two batteries to run both on a bike. We are working on improving this.

**Does the SmartSense battery power Sram eTap? Does eTap still have its own battery?** At this point, the SmartSense battery cannot power a eTap system, thus requiring multiple batteries to run both on a bike. We are working on improving this.

**It's freezing outside, will SmartSense still work?** The SmartSense system will function from -20C to 60C. At very low temperatures, however, you may experience a shorter battery life. It is recommended to avoid leaving the battery in conditions outside of this range. For example, leaving the battery inside a hot car during the summer may result in permanent damage to the battery.

**How much time to fully charge a SmartSense battery?** Up to 3 hours with a 5V 2A USB supply. When the battery is fully charged, the green LEDs will turn off. A button press will confirm a full charge with all four LEDs lit.

**When I plug in my battery, it does not charge. How do I make it charge?** If your battery is not fully depleted and will not charge, please doublecheck the power of your charger. You will need a charger

providing at least 5V of voltage and 2.0A (or 2000mA) of current. For example, the charger in the pictures below will not work because it is only 1000mA (1A) of current – in this case a more-powerful charger would be required to charge the battery.



Please make sure the voltage of the charger is at least 5V



Please make sure the current of the charger is at least 2A (or 2000mA)

**Steps to try during debugging:**

1. Remove the battery from the cradle and return it. Power the system on by holding the power button for 3 seconds. (Did that solve your problem? If not, move to the next step.)

2. Power-cycle the system by holding the power button on the battery for more than 5 seconds to turn it completely off, then repeat that to turn it back on.
3. Charge the battery to full using a 5V 2A USB power supply, approx. 3 hours from empty, then repeat steps 1-2.
4. Remove SmartSense from the Bluetooth settings on all devices. Re-pair the device to your phone's Bluetooth.
5. If these do not work, factory reset the device using the Cannondale App.

## Battery LEDs

**If the battery is completely depleted**, the green battery level LEDs will stop working. To resolve this, plug in the battery to a 5V 2A USB supply for up to 3 hours. The LEDs will not show battery status while charging, but the battery will be charging. When the battery is returned to the cradle, it will reboot and resume the green battery status function. If the battery is still not fully charged, you can resume charging until it is.

**What do the flashing green LEDs mean?** If all four LEDs are flashing green, the battery is updating its firmware. Please wait until the flashing stops before using SmartSense. If just the bottom LED is flashing, it means your battery is almost depleted. Please charge the battery for up to 3 hours using a 5V 2A USB supply.

**My battery LEDs do not light up when I plug it in if the battery is fully dead, is it charging? How do I get LEDs to show again?** If the battery is completely depleted, the green battery level LEDs will stop working. To resolve this, plug in the battery to a 5V 2A USB supply for up to 3 hours. The LEDs will not show you battery status while charging, but the battery will be charging. When the battery is returned to the cradle, it will reboot and resume the green battery status function. If the battery is still not fully charged, you can resume charging until it is.

### **What do the blue lights indicate on the SmartSense battery pack?**

One blue flash every 15 seconds = System is in SmartSleep mode, meaning BLE and ANT+ are awake and communicating, but everything else is off

Two blue flashes every 5 seconds = System is Active, meaning BLE and ANT+ are communicating and radar/RDU/lights are active.

NO blue flashing = off or deep sleep, meaning no BLE nor ANT+. To get out of this, hold for another 5 seconds or remove and replace the battery on the cradle, which makes the battery go directly to SmartSleep.

**How is the rider notified of a low SmartSense battery? How soon in advance will it notify you, and does it provide feedback on how long you have left with power?** When the blue LED flashing turns to red LED flashing.

### **What is the most efficient way to manage SmartSense battery life? What indicators are there that the SmartSense battery life needs management?**

Don't worry about putting the system to sleep yourself. With the wheel sensor connected and Auto-wake enabled, the bike will go to sleep on its own. Just press the button once after your ride to check

battery level. Green LEDs will indicate how much life is left. Charge the battery when it seems low and not likely to last for your next ride.

s be sleeping but the battery level would read accurately down to the percent.

## Radar and Radar Display

**Can I use my Garmin Edge instead of the Varia Radar Display?** Yes. You can remove the radar display and its mount and pair your Edge to the Varia system and use it as the display. If you have a Garmin out-front head unit mount you can also mount your Lezyne SmartSense light to that by using Garmin's Quarter-turn to Friction Flange Mount Adapter 010-12494-00. The SmartSense radar should also be compatible with other cycling computer manufacturers such as Wahoo and Hammerhead.

**How is the rider informed that a car is coming?** The bikes come with the Garmin Radar Display Unit. This display unit is smaller than the aftermarket one because it doesn't have a battery. See this video to understand how the system works: <https://www.clevertraining.com/garmin-varia-radar-bundle>. The display has a series of LEDs that have orange at the bottom and red at the top. When a target (car or bike) is sensed, the bottom LED will go orange and the display will beep (which can be turned off). As the target gets closer, the orange LEDs progress up the display until it turns red at the top when the target is passing you.

**What does the driver see when approaching and passing a rider with a SmartSense-equipped bike?** Depends on the region. Most will see a change in the blink pattern and increased brightness. In Europe, the system simply increases brightness due to StVZO regulations not permitting a blink pattern.

**How does the SmartSense rear radar perform on tighter winding roads or when making turns on city streets – what happens to vehicle tracking in these situations?** Radar requires line of sight to vehicle, just like a set of eyes on the back of your head. The radar beam width is 40 degrees, providing radar coverage for typical bends in the road. It alerts to approaching vehicles with speeds from 10 to 160 km/h (from 6 to 99 mph).

**Are there any other audible and visual LED functions/meanings to be aware of on the SmartSense display unit?** The audible cues from radar contacts are louder for high-threat contacts. The lights will pulse when the system powers up to let you know it's on and ready.

## SmartSense Lights

**What is the maximum lumen output the Foresite and Hindsite lights?** The Foresite and Hindsite lights on the SmartSense system are designed for be-seen visibility. At 350 lumens, the Foresite is extremely bright for a daytime light (most urban bike lights are between 120 and 200 lumens). While not a 600-1000 lumen off-road nightriding light or designed for commuting year-round, the Foresite will get you home in a pinch if it gets dark.

- Foresite E350 – 350 lumens
- Hindsite E85 – 85 lumens (not available for EU)

- Hindsite E25 STVzO – 25 lumens (available on EU bikes)

**Are these lights waterproof?** Yes. They are rated to IPX7, meaning they can be totally submerged in up to 1 meter of water. When exposed to water, the charging port should remain covered to avoid having water stuck in the USB connector which can prevent charging.

**What model of Lezyne lights are these?** The Foresite E350 uses the aluminum case and optics of the Lezyne Classic STVZO E500. The board, programming, and accessory ports are all custom to Cannondale. The Hindsite E85 and E25 lights are fully custom designed by Lezyne for Cannondale.

**What lights are SmartSense compatible, i.e., could I use my own light?** Cannondale partnered with Lezyne to create the SmartSense-compatible Hindsite and Foresite lights. These lights have specific programming allowing them to communicate and to function with other SmartSense products. They also serve as junction boxes for the front and rear of the bikes by having two open power/data ports into which other SmartSense devices can plug. Other lights will not have the ability to be adjusted through our app or to be powered by the SmartSense battery; however, aftermarket lights can still be bolted onto the bike and powered on their own.

**How do I get my saddle bag or tool roll to fit with my light and radar?** If your under-saddle storage doesn't fit with your light and radar, a friction flange (GoPro®) extension can be used to move the light further back. These can be found on Amazon or on eBay for a very affordable price.



**How does the Auto-Adjust Mode work?** On the back of the light at the center of the button, accessory ports, and cable is a small dot – this is the ambient light sensor which measures the amount of light around the sensor. If the amount of light measured falls below the programmed threshold value, the lights will turn to Auto Adjust mode (or Auto-On mode for StVZO). If you want to override this, you can simply hit the front light button to return to the previous mode or choose a different mode from the Cannondale App. When the measured light returns to above the threshold (e.g., when coming out of a tunnel), the lights will automatically return to the previous mode. If the sensor is blocked by the rubber accessory port covers, cables, or other objects, the sensor may think it is darker around you than it really is - try clearing any obstructions for better sensing. This feature kicks in 1 minute after turning on SmartSense. If you override the Auto-Adjust mode, it will not trigger again until the next transition across the threshold value or until the system power is cycled.

**Can the SmartSense lights run independently of the SmartSense radar?** Yes. You can select whether the radar and lights interact. In Europe, only the rear light interacts with radar.

**Will the SmartSense front light brighten to alert the rider of an approaching vehicle detected by the rear radar?** No. The front light will flash four quick pulses when a vehicle is detected then return to the previous mode. This only happens when the first vehicle is detected by the radar and not when a

second, third, etc. vehicle is detected in range. This feature is called “React to Radar Targets” and can be turned on or off in the app. This feature requires the radar to be equipped.

EU front lights do not change when vehicles are detected.

## Cannondale App

**Can you power on SmartSense using the Cannondale App?** Yes. Other methods include pressing the button on the battery, enabling proximity wake in the app, or using Auto Wake in the app (which detects wheel motion).

**Will SmartSense auto-activate when you walk towards the bike if you have the Cannondale App?** Yes, if you’ve enabled Proximity Wake. When you open the Cannondale app, the bike will sense you and turn on. The app must be in the foreground – just having the app on your phone will not enable this.

**Does the Cannondale App allow viewing SmartSense light and radar status directly on the ride screen?** Yes.

**Does the Cannondale App allow you to cycle through light modes?** Yes. More options for Global than for EU.

**Does the Cannondale App allow you to customize SmartSense and light configurations?** Yes.

**Does the Cannondale App have SmartSense functionality as a display mode?** Again, yes. The Cannondale App has redesigned the Ride Screen to put SmartSense features within easy reach during your ride. Easy, quick taps can control your bike while on the move.

**Can I use SmartSense without the App?** Yes, SmartSense will function without the app; but functionality and usability are greatly enhanced with it. Plus, the App is getting a major overhaul to make it even better, regardless of SmartSense.

**Does the wheel sensor auto-notify your phone when it begins to move without having opened the app yet?** The Wheel Sensor works regardless of the app being on or off. If you have the Auto Start feature enabled, the system will start up regardless of if the app is on or if you have a phone with you. A moving wheel sensor will not launch the app.

**What does the Cannondale app let you do that you wouldn’t otherwise be able to do with SmartSense?** Customize settings; enable features like Auto Wake, Proximity Wake, efficiency and visibility settings (as allowed by law) etc.; display ride tracking; act as a Radar display; allow all the usual App functions like speed, distance, ride tracking, Co2 reductions, etc.

**By spinning the wheel, does the SmartSense system come to life and be 100% operational?** Yes, if you have that feature enabled.