Rango Manual

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GoSense
38 rue de l'Université
69007 LYON
FRANCE
support@gosense.com

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Congratulations on your acquisition of a Rango!

We are pleased to welcome you as part of our user community, the Rangonautes.

Rango is proudly crafted in France and designed to provide you with auditory feedback to alert you to obstacles along your path. To fully experience Rango's auditory cues while remaining aware of your surroundings, we recommend using open-ear earphones, such as GoSense's Noor earphones.

To get started, Rango needs to be connected to your smartphone. Simply download the dedicated mobile application "Rango" from the App Store or Google Play Store. It is recommended to search for "Rango GoSense" in order to find the application more easily.

If you have an iPhone, you can directly navigate to the application's page by clicking on the following link from your phone: http://appstore.com/gosense/rango

If you have an Android phone, you can directly navigate to the application's page by clicking on the following link from your phone: https://play.google.com/store/apps/details?id=com.gosense.rango

INTENDED USE AND INTENDED USERS OF RANGO

RANGO is an obstacle detection device intended to be used by visually impaired persons who use a white cane. It is indeed intended to be fixed to the handle of a walking white cane and provides audio feedbacks to the user when detecting obstacles on the path.

Rango also indirectly provides orientation functionalities thanks to the GPS module and Internet connection of the smartphone it is connected to.

Are you tired of colliding with or constantly worrying about obstacles, whether they're at head or hip level? Despite your expertise in using a white cane and your best sweeping techniques, do you still occasionally miss obstacles? Are you concerned about head-level obstacles? Do you desire comprehensive protection without excessive feedback? Are you looking for a lightweight, user-friendly, and adaptable solution? If so, Rango is the answer!

Rango is not only highly adaptable and robust but also incredibly user-friendly. We've focused on two key objectives: first, providing users with complete body protection, from head to toe, spanning shoulder width; and second, ensuring that Rango is easy to use for everyone, with minimal sound feedback.

Currently, Rango can detect obstacles up to 2.5 meters in front of you, considerably increasing the detection range of your white cane. It detects obstacles at various heights that might be missed by your cane and sweeping motion. When combined with open earphones, Rango offers precise 3D audio alerts, allowing you to easily locate and navigate around obstacles. In practice, when you hear a sound, you can slow down and move away from it to navigate around the obstacle.

But that's not all. In addition to obstacle detection, Rango facilitates your journeys with additional orientation functions. It can tell you your exact position ("Where am I?"), announce intersections and inform you of upcoming public transport departures nearby.
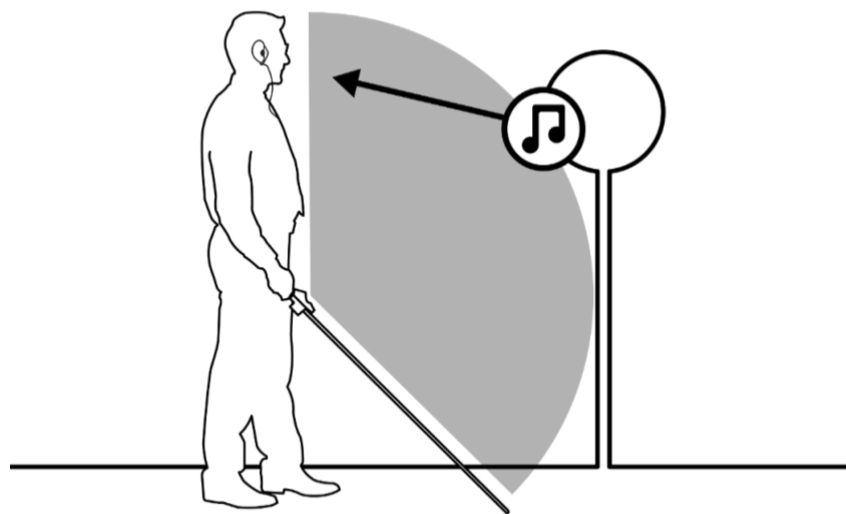
Your feedback is immensely valuable to us and plays a crucial role in shaping our software updates. This ongoing process allows us to continually enhance and refine your Rango experience. You can easily apply these updates through our dedicated 'Rango' mobile app, ensuring that you always have access to the latest technological advancements of our product.

Love your Rango? Become a GoSense Ambassador and earn a percentage on your sales. For more information, contact us at ambassador@gosense.com.

Chapter 1: Getting started

Content of the box

The box must contain the following items. If any of these items are missing or damaged, please contact your dealer.
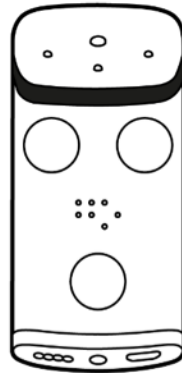
1.   Rango

2.   Micro-USB cable

3.   AC/USB Charger

Overview

Rango has four buttons, accessible to the thumb, and which form a cross, an LED to light your cane in the evening and a micro-USB charging connector. When handling Rango, you will also notice, on the top face of the product, the presence of three ultrasonic sensors (these are not buttons) and on the bottom of the product, a connector with four contacts next to the LED, which will serve for a future charging stand (not delivered with Rango).

four buttons

three ultrasonic sensors
(these are not buttons)

connector for future charging base
(not delivered with Rango)

charging connector
(micro USB)
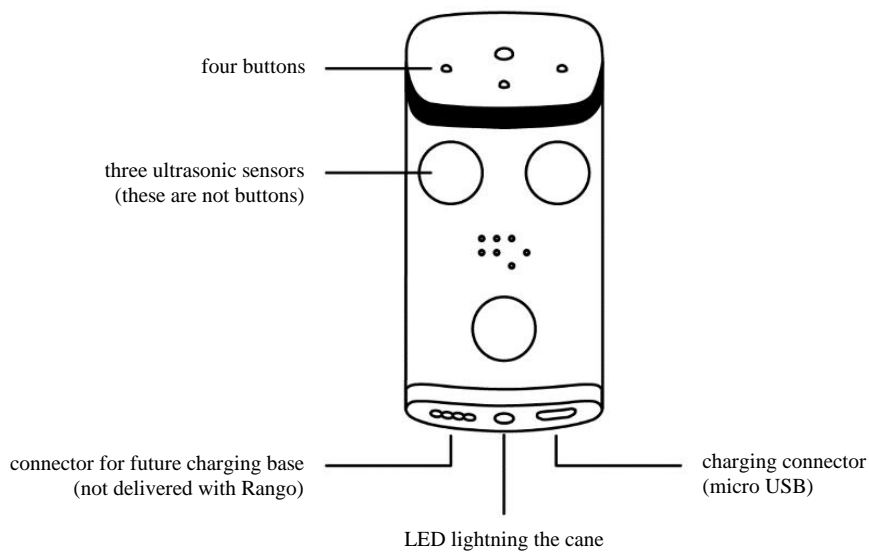
LED lightning the cane
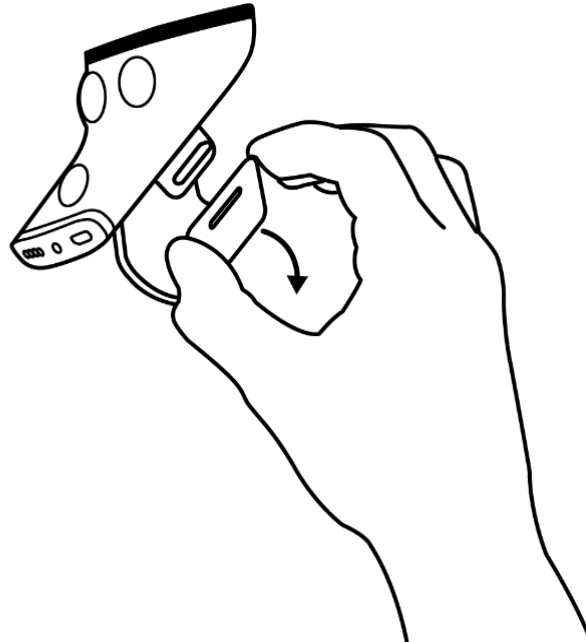
Take your Rango in one hand and then open the U-shaped clip behind your Rango. To open the clip, an outward force of the product must be exerted.
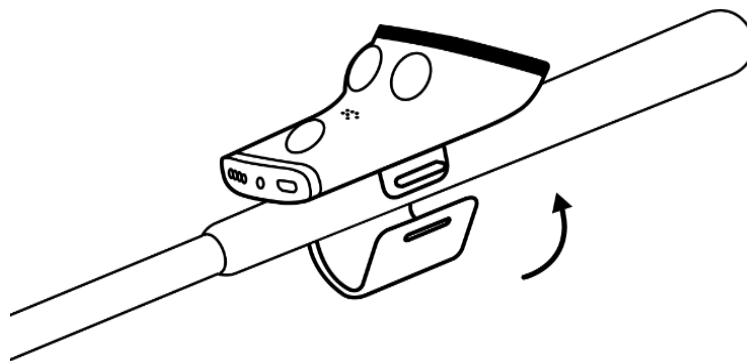
Then place your Rango on the handle of your white cane. Close the clip. If you find this challenging, ensure that the clamping screw is unscrewed as much as possible. You might also need to slide Rango further down the handle for a better fit. When it's properly closed, you should hear a click or feel a notch engaging.

Fixation on your cane
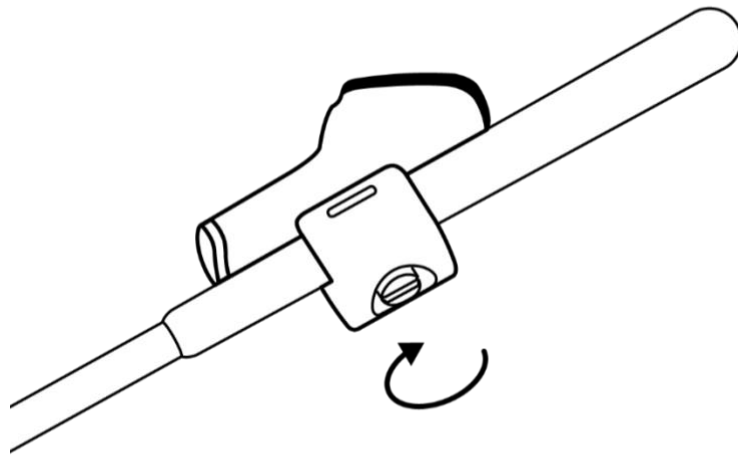
Then, so that your Rango is well attached to your cane, remember to tighten the clamping screw with the help of a coin. Check that Rango does not move. If so, Rango is in place.
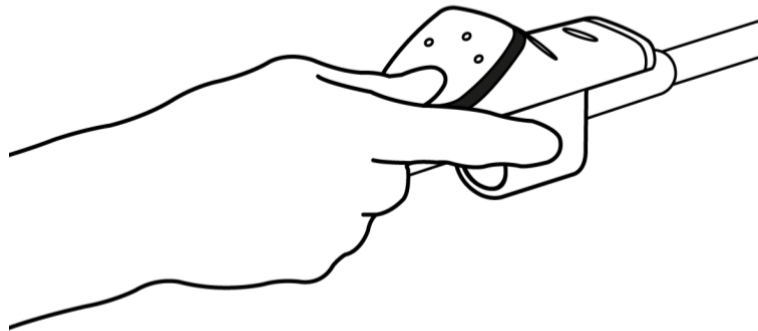
As you move, place your thumb on the button area of your Rango and your index finger on the side, on the U-shaped clip. It is recommended that you keep your fingers on these areas to ensure that Rango (and its sensors) are oriented correctly as you sweep your cane. These areas have been designed to be touched continuously (they are applied parts, in medical device terminology).

Proper orientation of Rango during travel is important for effective obstacle detection ahead of you. But don't worry, if the cane is not held in the correct position, Rango will alert you with an audio notification every 3 seconds. Once you have adjusted the cane to the correct orientation, you will hear a confirmation sound indicating that the orientation is now correct.

First connection of Rango to your phone

- Step 1: Download the Rango app to your phone from the App Store (on iPhone) or the Google Play Store (on Android).
- Step 2: Activate the Bluetooth of your phone and launch the Rango application.
- Step 3: Switch on Rango by pressing the bottom button (the biggest of the 4).
- Step 4: In the mobile app, press the "Start Pairing" button at the bottom of your screen.
- Step 5: The app tells you that Rango is paired with your phone.

Getting Started with Rango

- Step 1: Put on your earphones (it is recommended to use wired open earphones or to use the Noor earphones, in order not to be cut off from your surroundings and to limit the latency of the audio feedbacks).
- Step 2: Connect the earphones to your phone, check that your phone's volume is sufficiently high.
- Step 3: Turn on Rango.
- Step 4: Launch the Rango application and click on "Start pairing" if not already done and wait for Rango to be connected.
- Step 5: Lock your phone and put it in your pocket.
- Step 6: Test Rango in a secure environment <u>outdoors</u>. Place yourself in front of a wall, then move forward by sweeping with your cane. As soon as you get close to the wall, you hear a sound (faster and faster) alerting you of its immediate presence. Step back: the sound feedback should slow down and then stop; the wall is no longer a danger.

Using the buttons
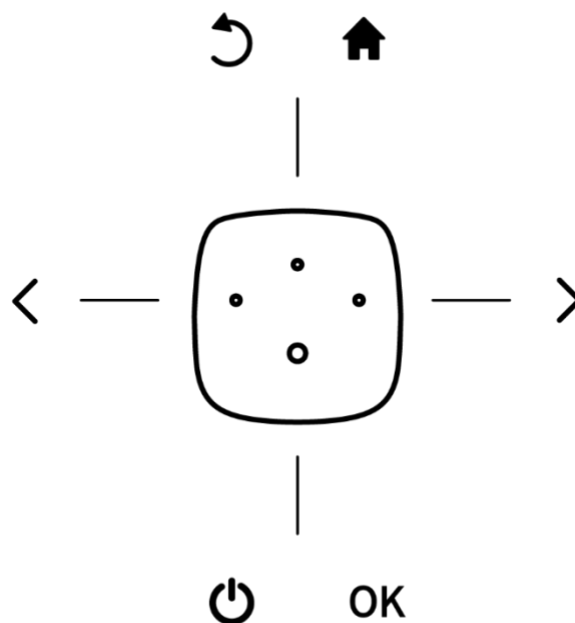
Rango's button area, located at the top, features four buttons arranged crosswise for intuitive use.

The main button is larger than the other three and is strategically placed closest to you, for easy thumb access. This button serves as both validation and on/off control. Pressing this button when Rango is switched on and connected to your phone tells you your position, time and battery status.

Opposite this main button is the back/home button. The left and right buttons allow you to navigate Rango's various functions.

Each button is embossed to permit easy tactile recognition by the user.

Extinction and standby mode of Rango

To turn off Rango, simply press and hold the main button for 2 seconds. You will hear a set of beeps from Rango and a voice message from your phone that says "Rango is shutting down". You then know that Rango is turned off.

A standby mode is also integrated with Rango. It automatically engages when you position your cane vertically. The standby mode is a mode that allows Rango to conserve his battery. During the standby mode Rango is not turned off but the detection is no longer active. Rango goes out of standby mode as soon as you start using your cane again.

If you forget to turn off your Rango, it will turn off automatically after 4 minutes of inactivity.

Charging & battery life
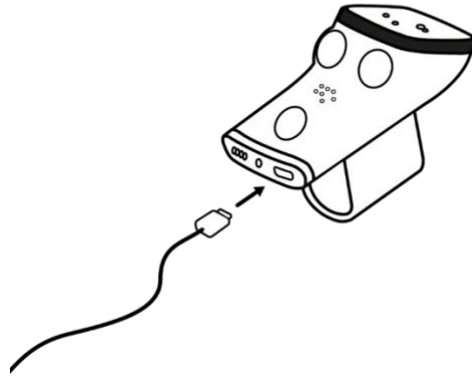
Rango boasts a battery life of up to 4 hours under typical usage conditions, including active movement with the cane. Generally, one to two charges per week suffice for regular usage.

When the battery dips below 20%, a 'low battery' alert is automatically announced and will repeat every 10 minutes until Rango is charged. Rango's standby mode activates in two scenarios: firstly, when you position your cane vertically, typically done when you're at a stop. This position deactivates obstacle detection, saving battery life and minimizing unnecessary alerts. Secondly, if you lay Rango horizontally, it also enters standby mode. Should Rango remain inactive for 4 minutes in this position, it will automatically shut off, assuming you have finished using it and may have forgotten to turn it off.

To recharge Rango, plug it into a USB cable using the port on the bottom. A full charge is achieved in approximately 2 hours. If you wish to check the battery level during charging, disconnect Rango, power it on, and access the Rango app. The app will verbally announce the current battery percentage.

For safety reasons, ensure easy access to the charger for convenient unplugging when necessary.

Understanding audios feedbacks

Sounds coming from Rango

Rango embarks a beeper that allows it to emit sounds.
On switching on and off, Rango emits a sound. If needed and to locate your Rango or your white cane, you can also ring Rango from your mobile application by going into your settings.
When you plug Rango to charge it, 2 short beeps confirm you that the device is charging.

Sounds coming from the phone

Rango is connected to your smartphone and has its own mobile app that controls the Rango sound interface. It's the Rango app that generates the obstacle alerts you hear in 3D in your earphones, as well as the vocalized information for the various other features.

Rango's obstacle alerts come in the form of spatialized beeps, indicating whether the obstacle is to the left or right. A low-pitched sound means that the obstacle is far away, and the sound becomes higher-pitched as the obstacle gets closer.

If Rango is not held correctly, an error sound is emitted. This sound is made up of two notes: a high-pitched one followed by a lower one, repeated every 3 seconds. This sound tells you that Rango is not in the right orientation. Moreover, the error sound is spatialized: to the left if Rango is too far to the left, and to the right if it is too far to the right. Once you've reoriented Rango correctly, a validation sound, consisting of two rising notes played rapidly one after the other, confirms the device's correct orientation.

Chapter 2: Functionalities of Rango

Obstacle detection

Rango incorporates advanced 3D ultrasonic sensors designed by GoSense, which permit to detect obstacles and alert users to potential collision risks. This detection feature is active by default, ensuring continuous safety during use.

How it works: As you approach an obstacle, the beeps in the earphones increase in pitch to indicate the proximity of the obstacle. The direction of the sound, left or right, tells you where the obstacle is. This 3D sound technology is designed to help you better understand your surroundings.

Essential equipment: To experience the full benefits of Rango's spatial sound alerts, it is essential to use earphones. We highly recommend the Noor open earphones included in the Rango kit. These open-design earphones allow you to stay connected to the environment and have low latency, crucial for timely alerts.

Selective alerting: A key feature of Rango is its selective alert system. It issues an alert only if there is a risk of collision. For example, if you're walking along a wall, Rango will detect but not alert you, as there is no risk of collision. However, if you walk directly towards a wall, Rango recognizes the risk and alerts you. This selective approach helps minimize unnecessary alerts, ensuring that alerts are relevant and provided at the right time.

Automatic detection range adjustment: To facilitate the use of Rango for everyone, the obstacle detection distance automatically adjusts based on your walking speed. This innovative mechanism eliminates the need for manual adjustments and ensures timely alerts without information overload. The detection distance varies smoothly: it is set at 1.5 meters at speeds of 2 km/h or less, and extends up to 2.5 meters when you walk at a speed of about 3.5 km/h or more. This adjustment is automatically calculated by Rango based on how quickly you sweep your white cane, providing a more intuitive and secure user experience.

Proper handling for optimal detection: To maximize the effectiveness of Rango's obstacle detection, it is important to hold the device properly. Ensure you maintain constant contact with Rango by placing your thumb on the button area or your index finger on the side of the device while holding the handle of your white cane. Proper positioning of Rango, with its sensors facing forward, directly affects its ability to accurately detect obstacles ahead. As described in Chapter 1, you should place your thumb on Rango's button area and your index finger on the side of the U-shaped clip to ensure proper orientation. Rango will alert you with a beep every 3 seconds if it is not held correctly. When held correctly again, Rango will play a confirmation sound to let you know it's in the best position to detect obstacles.

Always ready: The obstacle detection function is automatically active once Rango is paired and connected to your smartphone via the dedicated Rango app. Don't forget to connect your Noor earphones to your phone as well for the complete experience.

While we strive to provide complete protection, we cannot guarantee that Rango will detect every obstacle in every situation. For instance, Rango may sometimes be affected by the roughness of the ground.

In fact, we rely on your feedback to continue to improve Rango and offer you these improvements by free updates in the coming months and years.

Light

Rango features a small integrated LED light designed to illuminate the cane at night, enhancing its visibility. This feature is especially useful in low-light conditions, making sure that the user and the cane are more visible to others.

Using the light feature: Before using the LED light feature, ensure that Rango is powered on and connected to your smartphone. To control the LED light, navigate Rango's circular menu using the right or left buttons. When you hear "Light", you have selected the correct feature.

Activating or deactivating the light: Once on the 'Light' option, press the 'validate' button of Rango (the biggest one) to toggle the LED light. If the light is off, pressing 'validate' will turn it on, and you will hear a confirmation message, "Light is on". The LED will blink to draw attention to the cane, ensuring it is clearly visible. Conversely, if the light is already on, pressing 'validate' again will turn it off, confirmed by a message, "Light is off". This toggle functionality allows for easy and efficient control of the light, making it convenient to adapt to changing environmental conditions.

Additional orientation functionalities

Rango provides additional services that enhance urban navigation and localization by leveraging your smartphone's internet connection and GPS. These features are easily accessible through Rango's four buttons and its circular audio menu.

"Where am I?"

The 'Where am I?' feature can be accessed directly from the Home position, the default position in Rango's circular audio menu. While on home, pressing the 'validate' button enables Rango to announce your current address vocally. This announcement is then completed by the current time and Rango's battery level, offering three essential pieces of information in a single action.

Location accuracy depends on your smartphone, as Rango uses its GPS and Internet connection. Note that the precision of the location may be approximate indoors, where GPS signals are typically weaker.

If you've navigated to other features and wish to return to home, you can either press the 'back' button repeatedly until you get there or perform a long press on the 'back' button for a quick return.

Public transportation timetables

Accessing the feature: To use this feature, navigate to the "Public Transportation" option in Rango's audio menu and press the 'validate' button. Initially, you'll be presented with a list of up to six items. The first five items represent the nearest public transport options, while the sixth item offers access to a comprehensive list of all public transport services within a 500-meter radius, categorized by mode of transportation.

Navigating the Menu: If there are fewer than five nearby transport options, the list will be shorter. However, the option to access the complete list will always be available as the last item. When you select a specific transport option and press 'validate', Rango announces the time until the next service arrives in a particular direction. To view timetables for services going in the opposite direction, simply navigate to the next item using the left or right buttons.

The menu can be conceptualized as a series of items, which may represent actions (like activating or deactivating the Light feature), information (such as a timetable), or pathways to additional items (like the list of nearby transport options or subsequent departures for each direction).

Intersection announcement

Rango's Intersection Announcement feature is designed to provide users with valuable information as they approach intersections, ensuring enhanced safety and orientation during their journey. Here's how it works:

- Alert Sound: As you approach an intersection, typically at a distance of about 20 meters, Rango emits a distinctive alert sound to notify you of the upcoming intersection. This auditory cue serves as an initial warning, preparing you for the upcoming intersection.
- Street Name Announcement: Following the alert sound, Rango proceeds to announce the names of the streets at the intersection. The announcements start with the leftmost

street and progress clockwise. This sequential naming allows you to understand the layout of the intersection and identify each street's direction.

- Spatialized Sound: To further aid your orientation, Rango plays a spatialized sound toward the direction of each street as it announces its name. This feature helps you precisely locate each street, making it easier to make informed decisions.

The primary objective of this feature is twofold: it alerts the user when approaching an intersection, a potentially complex and dangerous area, and assists with orientation by providing street names and directions. However, it is important to note that this feature relies on GPS data, which may have limitations in terms of accuracy. While it provides valuable assistance, there is no guarantee that every intersection will be announced in time. Therefore, you should remain vigilant and not rely solely on this feature to locate crossings.

Enabling or disabling intersection announcement: Users have the flexibility to enable or disable the Intersection Announcement feature as needed. This can be done directly from Rango's circular audio menu. To toggle this functionality, select the "Intersection Announcement" option and click the 'validate' button. This action acts as a toggle switch, allowing you to activate or deactivate the feature. You can also control this setting through the Rango mobile application in the settings tab.

Chapter 3: Rango Mobile Application

Minimum requirements

Rango needs to be connected to an Android smartphone (Android 6 or newer) or an iPhone (iOS 11.0 or newer) to function properly. GoSense has developed a dedicated "Rango" mobile application, available for both platforms, to ensure seamless integration with the device. GoSense also strives to maintain compatibility with older versions of Android and iOS. You don't need a recent smartphone—if your device is less than 10 years old, it should work just fine!

We have also ensured that the app is compatible with smartphones designed specifically for visually impaired users, such as BlindShell or SmartVision.

Goal of the application

The Rango mobile application complements the operation of the Rango device. Rango detects obstacles, calculates potential collision risks, and automatically adjusts the alert range between 1.5 and 2.5 meters based on the user's walking speed. It then sends the position of the obstacles to be alerted to the app, which processes this data and provides 3D sound alerts (beeps). Additionally, the app manages features like "Where am I?", public transportation timetables, and intersection announcements, using the phone's GPS location and internet connection. The app also handles pairing with Rango, manages firmware updates, and provides access to useful documents. For the spatialized audio alerts to be heard, earphones must be connected to the smartphone, with Noor earphones recommended due to their open design and low latency.

Download the application

To download the dedicated "Rango" mobile application from the App Store or Google Play Store, it is recommended to search for "Rango GoSense" to easily find the app.

- For iPhone users, you can directly access the app page by clicking the following link on your phone: http://appstore.com/gosense/rango
- For Android users, you can access the app via this link: https://play.google.com/store/apps/details?id=com.gosense.rango

If you use a BlindShell device, as the Google Play Store is not available, the application is pre-installed on your phone by default.

Granting permissions at first launch

The Rango mobile application requires certain permissions to function correctly. When you first launch the app, some pop-up messages will appear asking for these permissions. Don't worry if you change your mind later—you can always adjust these permissions in your smartphone's settings under the section for Rango. For easier access, you can also navigate directly to the settings page by selecting "Permissions and system settings" in the Rango app's settings tab.

On iPhones:

- **Bluetooth Access**: Bluetooth access is required to discover and connect to your Rango device. The application does not scan, track, or connect to any other Bluetooth devices, except for the Noor earphones if you are using them with Rango.
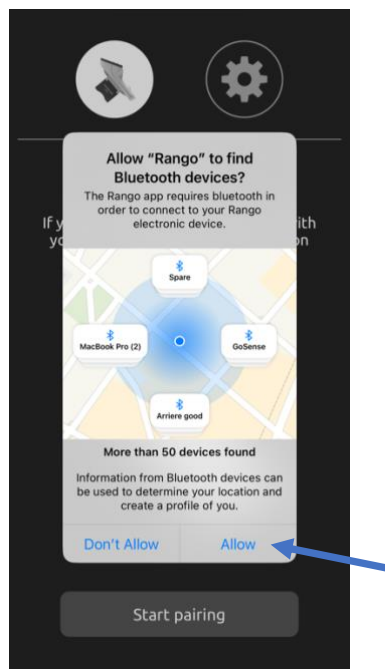
- **Location Access**: It is recommended to allow the application to access your location to enable features such as "Where am I?", "Intersection announcement", and "Public transportation." It is suggested to select "Allow while Using App" on the first pop-up,

followed by "Change to Always Allow" to ensure these features function even when Rango is connected, but the app is running in the background. This permission is not mandatory if you do not wish to use the orientation assistance features mentioned above.
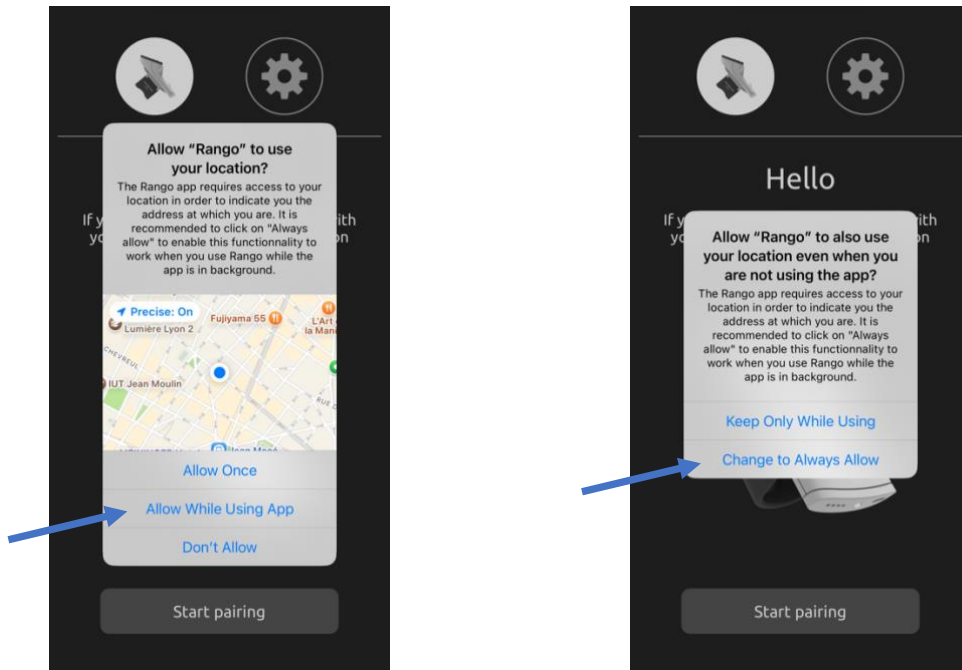
On Android Smartphones:

The permissions required by the Rango application on Android vary depending on the version of the operating system installed on your device. The app supports multiple Android versions, and the permissions process differs slightly based on the version:

- **Android versions 6 to 11**: The app requires **precise location access**, which is necessary for both Bluetooth device discovery and location-based services such as "Where am I?", intersection announcements, and nearby public transportation search. If location access is not granted, the app will not function. A pop-up will prompt you to grant this permission when you click "Start pairing" and on subsequent launches if the permission is missing.
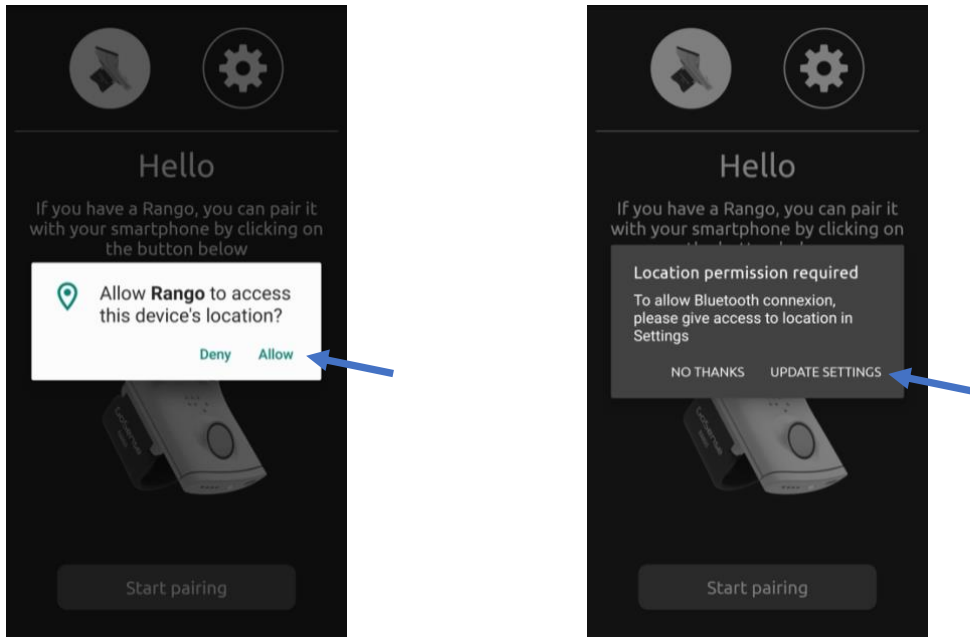
- **Android versions 12 and above**: You will need to grant permission for **Bluetooth device discovery** to pair and connect to Rango. While location access is also requested, the device will function without it, although location-based features won't be available. If the Bluetooth permission is not granted, the app will display a pop-up requesting it each time you launch or try to pair. If only Bluetooth permission is granted, the app will prompt you to grant location access for the first three launches before stopping. On these versions, you must also choose between **precise location** and **approximate location** permissions. Since approximate location is not precise enough for location-based services, the app will continue to ask you to upgrade to precise location until granted.
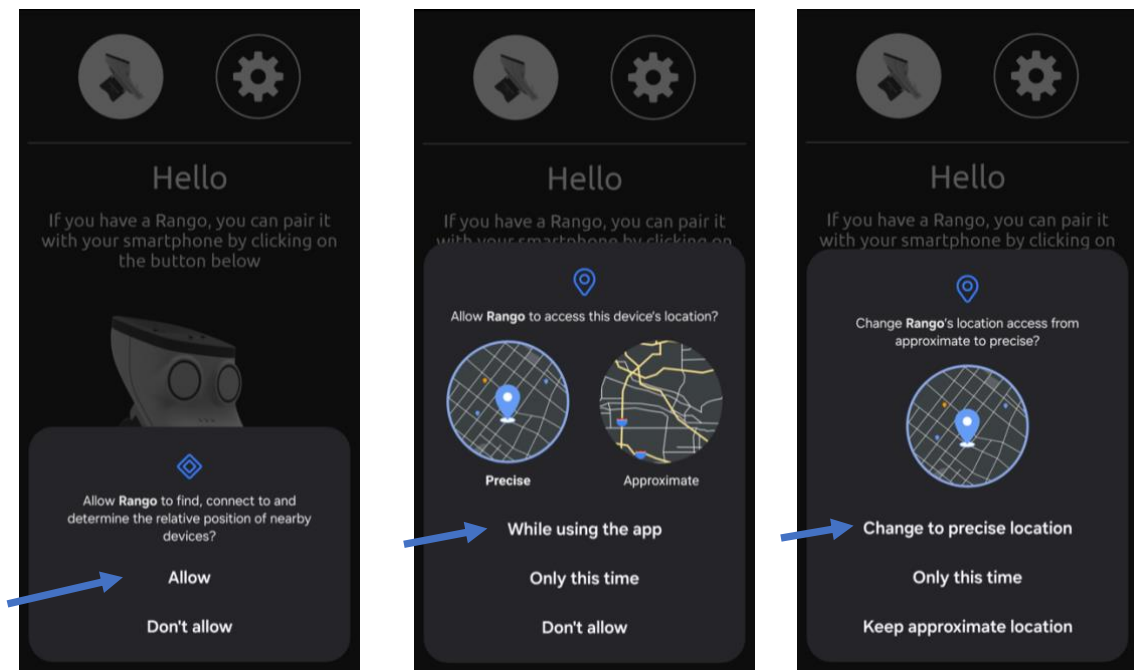
App structure

The Rango app is organized into two tabs, accessible from the top of the interface. The first and main tab, "Connection to Rango", shows whether Rango is properly connected and running. It also allows you to initiate the pairing process if Rango is not already paired. The second tab, "Settings", provides options to adjust a few preferences when a Rango is paired and access helpful documents. The settings tab also displays the current version of both the app and the paired Rango device.
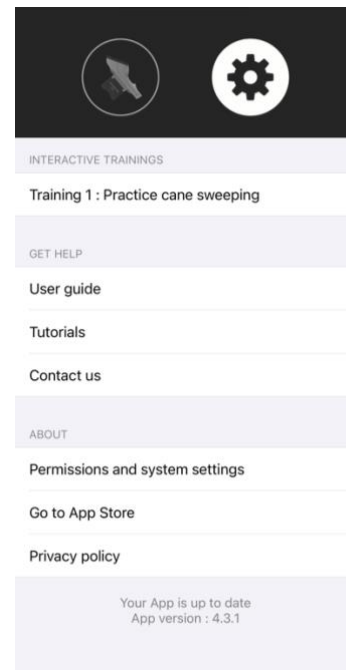
Pairing your Rango

To connect your Rango to your smartphone for the first time, you will need to pair the devices. Begin by clicking the "Start Pairing" button on the main tab of the app. The app will initiate the pairing process and display "Searching for nearby Rango." Next, turn on your Rango by pressing the main button (the largest of the four) once and wait a few seconds. Your Rango should then pair and connect to your smartphone. Once paired, Rango will automatically reconnect whenever you power it on, even if the app is running in the background.

Step 1: click on "Start pairing"   **Step 2: searching for nearby Rango**
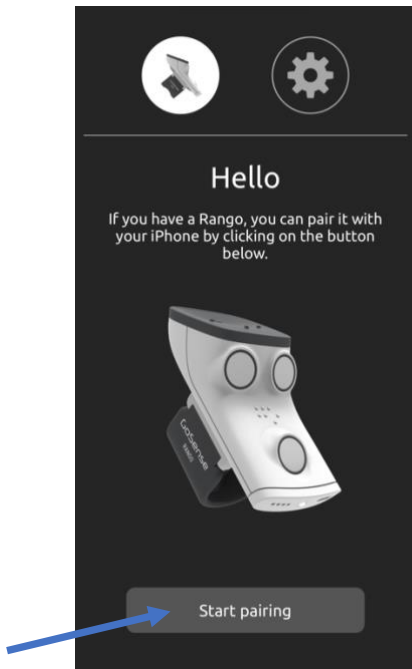
Step 3: power on Rango   **Step 4: Rango is connected**

Unpairing your Rango

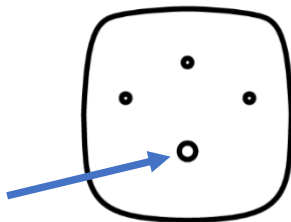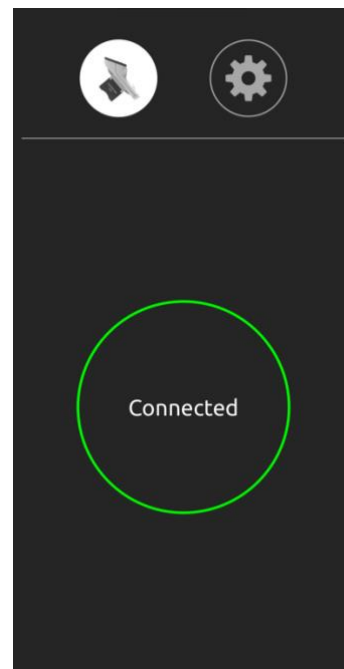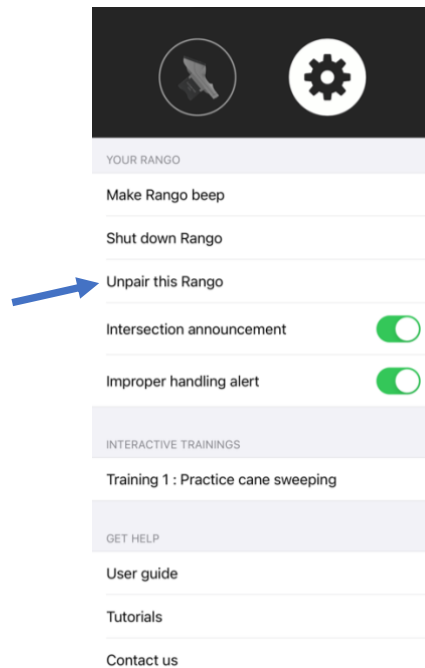If you want to unpair your Rango, for instance in order to pair it to a different smartphone, go to the "Settings" tab of the app and click on "Unpair this Rango".

Settings tab in detail

The settings tab is organized into four sections: **"Your Rango"** (visible only when paired to a Rango), **"Interactive Trainings"**, **"Get Help"**, and **"About"**. Below these sections, you will find the app version, the firmware version and the serial number of the paired Rango.

Here's what each section offers:

1. **Your Rango** (visible only when paired)
   - **Make Rango beep**: This option allows you to make your Rango emit a beep, which can help you locate your cane if it has fallen or verify that you are connected to the correct Rango when multiple devices are nearby.
   - **Shut down Rango**: This feature lets you turn off your Rango directly from the app. You can also shut it down by holding down the main button on Rango or via the audio menu.
   - **Unpair this Rango**: Use this option to unpair your Rango from the app.
   - **Intersection announcement**: This toggle switch enables or disables intersection announcements. You can also adjust this setting via the audio menu.
   - **Improper handling alert**: This switch turns the alert on or off, which notifies you when Rango is not being held correctly (sensors should be facing forward). It is recommended to leave this enabled, as holding Rango improperly can affect obstacle detection performance.

2. **Interactive Trainings**
   - This section offers interactive training modules to help you get the most out of Rango. Currently, one training is available on Android (in beta), with more planned for future updates.

3. **Get Help**
   - o This section provides links to contact support (support@gosense.com), access the user manual, and access YouTube tutorials.

4. **About**
   - o In this section, you can access the Rango settings page on your smartphone to adjust permissions, find links to the Rango page on the Google Play Store or App Store (depending on your device), and access the privacy policy.

Access features via the audio menu

Once connected to your smartphone, all Rango features can be accessed through an audio menu, navigable using Rango's four buttons. The system is designed so that you don't need to take out your smartphone, except for the initial pairing process. After the first connection, Rango will automatically reconnect to your smartphone when powered on, allowing you to access all features directly through the audio menu, in addition to obstacle detection.

The audio menu includes a home element and a circular menu, which you can navigate by pressing the right or left buttons on Rango. Some menu items lead to additional circular sub-menus, similar to a file and folder hierarchy. You can move through the menu items and select one by pressing the main button. To exit a sub-menu and return to the home, press the back button multiple times to move up through the hierarchy, or press and hold the back button to jump directly to the home.

From the home, pressing the main button will announce your current address ("Where am I?" feature), the time, and Rango's battery level.

To enter the circular menu, press the left or right button from the home. Here is a list of the circular menu items:

- **Public Transportation**: This option provides access to nearby public transportation schedules (within a 500-meter radius). When selected, it presents a circular list of up to six items. The first five are the names of the nearest public transport services, ranked by proximity. If two are equally distant, the one with the closest departure time will be listed first. The last item in the list gives access to a full list of nearby transportation options, categorized by type (bus, metro, tram, etc.). You can select a transport service to get its next departure time. In the sub-menu, each item provides the different directions, along with the next departure times. For example: "Bus 14, direction Central station, next departure in 2 minutes from Oakwood Stop, at 10 meters."

- **Light**: This option allows you to turn Rango's LED on or off. The LED, located at the base of the device, blinks when turned on to make your cane more visible in low-light conditions. Selecting this option will indicate the current LED status, and pressing the main button will toggle the LED ("LED is on" or "LED is off").

- **Obstacle Detection**: This option allows you to temporarily disable obstacle detection, which can be useful in crowded environments where frequent alerts may not be helpful. Pressing the main button while on this menu item will deactivate or reactivate obstacle detection. Detection will also automatically reactivate the next time you power on Rango, ensuring your safety.

- **Intersection Announcement**: This option allows you to enable or disable intersection announcements, which can also be toggled from the app's settings tab. When enabled, you'll receive a notification when approaching an intersection (about 15 meters away). The names of the streets are announced from left to right, accompanied by a spatialized sound in the direction of each street. Keep in mind, this feature relies on the phone's GPS, which may not always be perfectly accurate, and maps that can sometimes be incomplete or contain errors. It's important not to rely solely on this feature for crossing streets, but rather to use it as a tool to help you navigate and build a mental map of the area.

- **Shut down Rango**: This option allows you to power off your Rango. You can also turn off Rango by holding down the main button or by selecting "Shut down Rango" from the app's settings tab.

Adjust volume

The audio alerts and the audio menu are managed by the mobile application. To adjust the volume, you can use the volume buttons on your smartphone, just as you normally would. Additionally, if you're using Noor earphones or any other earphones, you can adjust the volume directly from the earphones' controls.

Mobile application updates

Updating the Rango mobile application is done the same way as with any other app—via the Google Play Store on Android or the App Store on iPhone. If you have automatic app updates enabled on your phone, the update will happen automatically.

Additionally, the application regularly checks for available updates. If a new version is detected, you will be notified via a pop-up and, if the app is running in the background, through an audio message. On iPhone, the pop-up will give you the option to directly access the Rango App Store page to install the update. On Android, you'll have the option to start the update directly from the pop-up, without needing to go to the Google Play Store.

You can also verify if your application is up to date by checking the information at the bottom of the Settings tab. If the app is up to date, you will see the message "Your app is up to date" just before the app version, firmware version, and serial number. On iPhone, if an update is available, the "Go to App Store" button will be renamed "Go to App Store (update)" to indicate that an update is ready. On Android, a new item labeled "Update your App" will appear in the About section.

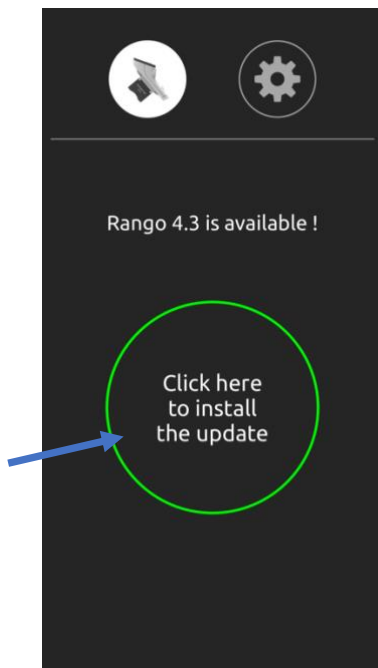If you are using BlindShell, the application will update automatically.

Firmware updates

Firmware updates for Rango are available in addition to app updates. These updates are designed to continuously improve the product, introduce new features, or enhance existing ones. Firmware updates often enhance obstacle detection, so it's highly recommended to install them. The update process is done via Bluetooth and typically takes around 10 minutes.

When Rango connects to your smartphone, the app checks for available firmware updates. If an update is found, a message will appear on the main tab, and the central circle—normally showing the connection status—will display **"Click here to install the update"**. If the app is running in the background, an audio message will inform you that a firmware update is available and prompt you to open the app to install it.

Once the update begins, the progress is displayed as a percentage. When the update reaches 100%, Rango will restart automatically, and a pop-up will notify you that the update is complete.

Step 1: click on the circle to start update

Rango 4.3 is available !

Click here
to install
the update

Step 2: click on "Install now"

Rango 4.3 is available !

Upgrade to Rango 4.3
Rango 4.3 detects and alerts you when
Rango is not orientated correctly.
The upgrade process takes 5 to
10 minutes.

Install now   Later
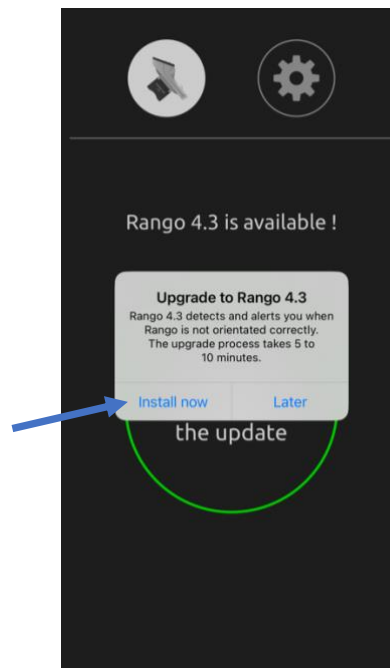
the update

Step 3: upgrading takes around 10 min   **Step 4: "Upgrade is finished" pop-up**
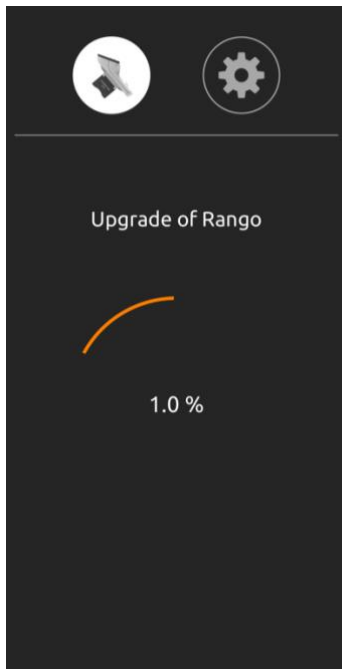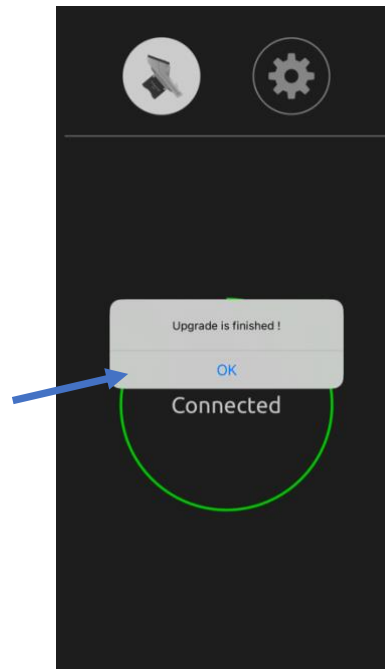
You can stop the update at any point by clicking the central circle and confirming your choice in the pop-up that asks **"Do you want to stop the upgrade of Rango?"**. Stopping the update partway through is safe, and there's no risk of damaging the device or rendering it unusable.

Chapter 4: Technical Details & Maintenance

Technical specifications

Charger
- Input: 100-240 Vac, 50-60 Hz, < 0.3 A
- Output: 5Vdc, 2A
- Trade mark : CUI INC
- References: SWI10B-5-E-I38 (EUROPE), SWI10B-5-N-I38 (NORTH AMERICA)
- class II

Battery
- Type: Lithium-ion
- Capacity: 750 mAh
- Voltage: 3.7V

Radio
- Type: Bluetooth Low Energy
- Frequency range: 2400 to 2483.5 MHz

- Power: < 20dBm

USB Cable
- Type: USB A to micro-USB B
- Length: 1 m
- Trade mark : Teleqare
- Reference: GNG-122

Rango
Temperatures ranges
Operating*: -20°C to 35°C
Charging: 10°C to 45°C
Storage: -20°C to 30°C

*Note: If you use Rango in a very cold environment, you may notice a decrease in battery life, but this situation is temporary. Once the battery temperature is back to normal, performance returns to normal.

Relative Humidity Range
20% to 75%

Atmospheric Pressure Range
70 kPa to 106 kPa

Material information

- Button area: Made from Thermoplastic Elastomer, TPE (Thermolast K), with a V-0 flame rating at 3.0 mm.
- Main shell: Constructed using flame retardant ABS grade without PBDE, specifically POLYFLAM® RABS 90000 UV5.
- Rings (for reinforcement): Composed of flame retardant polyamide 66, reinforced with 25% glass fiber, using TECHNYL® A 20 V25 NATURAL.

Software
- The version of the installed software (embedded software and application software) is displayed in the settings tab of the RANGO application

Smartphone & earphones requirements

Smartphone requirements:

- Android 6 or iOS 11.0 or newer
- Bluetooth 4 Low Energy or newer

Earphones requirements

Minimum:
- Extra-auricular (without obstruction or alteration of the sound environment)

- Low latency (<150 ms)
- Volume control

Recommended:
- 9-axis inertial unit for body tracking
- 9-axis inertial unit for head tracking

The Noor earphones are recommended as they fulfill all minimum requirements and also include two 9-axis inertial units for body and head tracking. This information will be used in future updates to enhance user direction estimation (improving collision risk assessment) and to improve 3D audio spatialization by considering head orientation.

Cleaning & Reuse

Rango can be cleaned or disinfected by user. To clean your Rango, gently wipe its surface with a soft cloth or sponge with soap and water. Avoid solvents. For disinfection, gently wipe its surface with a soft cloth or sponge dampened with isopropyl alcohol (70-90%). Avoid using excessive liquid to prevent damage to the internal components.

⚠️ Neither cleaning nor disinfection should be performed when RANGO is being charged or in use.

Rango is suitable for reuse after proper hygienic cleaning, making it ready for use by another person.

Repair

Rango is protected against impact by two plastic parts loaded with fiberglass. These two rings, placed at the ends of Rango, are the first points of contact in case of fall of your product. Although designed to be the most robust possible, please be informed that if they come to break, it is possible to have them changed. Should these parts or any other component of Rango become damaged or broken, please contact your seller for repair or replacement options.

⚠️ Do not attempt to replace the battery of your Rango yourself, as it may damage the battery and cause overheating, fire and injury. The lithium-ion battery in your Rango must be replaced by GoSense or a GoSense-approved service center. It must be recycled or disposed of separately from household waste. Dispose of batteries in accordance with local laws and regulations.

⚠️ No modification of this equipment is allowed.

Chapter 5: Frequently asked questions

Is it possible to fold my cane with Rango attached?

Absolutely. Rango is designed to allow normal folding of your cane even when it's attached. Additionally, Rango features a convenient U-shaped clip, making it easy to quickly remove and reattach as needed.

Does Rango work on Android?

Rango works well with Android. Nevertheless, some prerequisites are necessary to pair Rango with your smartphone. Make sure that your smartphone has Bluetooth 4.0 or higher and a version of Android 6.0 or higher.

Does Rango work with specialized smartphones ?

Rango is compatible with a range of smartphones, including specialized devices designed for the visually impaired. It works seamlessly with Blindshell 2 phones and any other smartphone that allows app installation via the Play Store, such as the Smartvision 2 or 3 from Kapsys.

My Rango has no longer sound feedback, or no longer reports my location, time or battery level; is this normal?

If there is a problem with your Rango, remember to restart your phone; once your phone is on, check that Bluetooth is enabled, turn on your Rango mobile app, then your Rango. Once Rango connected everything should work again. If the problem persists, contact us at support@gosense.com

Is Rango resistant to shocks?

Rango is designed to be shock-resistant, featuring two end parts made from fiber-filled plastic. It has undergone multiple 'crash tests' with very positive results. However, in the event of a violent shock leading to damage, don't try to repair Rango yourself. Instead, please contact your reseller for repair options and further assistance.

Is Rango waterproof? Is it resistant to rain?

Rango complies with the protection rating IP 64, which is fully protected against dust and splashing water from all directions. However, the charger must never be exposed to water drops or immersion.

Can Rango be hung on a cane without a handle, with a curved handle or with a flat face?

With its U-shaped clip and clamping screw, Rango can be attached to any type of white cane. If you have a round handle with a flat face, for better adjustment of your Rango's position, and in case of difficulties, remember to ensure that your clamping screw is fully loosened. If necessary, slide Rango further down until you can close the clip. Finally, tighten the clamping screw using a simple coin.

In the case of a Czech cane, Rango should be directly positioned on the tube of the cane just below the handle.

Can Rango be attached to a guide dog harness?

Rango is used on a white cane, it was designed like that. It is important to sweep so that Rango can correctly detect the dangers. In addition, the dog could be considered by Rango as an obstacle.

How long can I keep my Rango until I have to buy another one?

Rango is designed to be extremely robust and durable. Our goal is for the product to be used as long as possible. That's why we offer after-sales service to replace the battery when it gets too old or no longer holds a charge, or to replace the plastic shell if it is damaged. You can contact your reseller for more information and to arrange a repair.

Regular software updates are also provided to continue improving the performance of your Rango.

Why use audio feedbacks rather than vibration?

Vibrations can be difficult to feel, especially when wearing gloves, and their interpretation often requires a more complex training process. Besides, the information conveyed by vibrations is limited.

At GoSense, we've opted to exploit our natural sense of locating sounds in space. This innate ability to determine where sounds come from makes Rango intuitive and easy to use. With a little practice and a short period of adaptation, you'll soon be able to locate obstacles in three dimensions with Rango.

Can I put only one earbud instead of both when using my Rango?

In order to benefit from the 3D audio feedbacks, it is essential to put your earbuds in both ears.

Can I use my Rango without a white cane?

No, it is essential to use Rango in conjunction with a white cane. While Rango provides additional assistance, it is not designed to replace the white cane. Rango and the white cane work together to offer the best obstacle detection and navigation experience.

Chapter 6: How to get help?

Engaging with the community on Facebook

If you have questions, feedback, or ideas to share about using Rango, we invite you to join our French-speaking Facebook group, "Le Coin des Rangonautes". This group is a dedicated space for our users where you can freely interact with other Rango users and the GoSense team.

Group Link: https://www.facebook.com/groups/153191826673104

This group is an excellent resource for getting advice, sharing your experiences, and learning from the community.

Contacting GoSense

For any assistance, inquiries, or suggestions, please feel free to contact us directly. You can reach us in two ways:

1. **Via Email:** Send us a message at support@gosense.com. We strive to respond to all emails as promptly as possible.
2. **Through the Rango App:** In the settings tab of your Rango app, you'll find a "Contact Us" button. By clicking this, you can easily send an email to our support team.

We are always eager to receive your feedback and provide you with the necessary support to ensure your experience with Rango is the best it can be.

Online tutorials

Online tutorials are available on youtube to help you better understand the features of Rango : https://youtube.com/playlist?list=PLk5FPGyKFCr-9Jla5GuM3UxGraw4MRBwo

Trainings

In France, we offer an initial telephone training session to help you get started with Rango. This session includes an introduction to Rango and its functionalities. We also follow up within a week to ensure everything is going smoothly. To schedule this training, please contact us at training@gosense.com.

For international users, and in France after the initial training, we highly encourage users to seek training from certified orientation and mobility instructors. If you need assistance in finding an instructor, please ask your reseller or contact us at contact@gosense.com for guidance.

Please note that in Germany, the use of an electronic mobility aid like Rango must be verified and approved by an orientation and mobility teacher or trainer. This is a requirement for reimbursement by health insurance companies. The costs of the testing and training are also covered by the insurance.

Chapter 7: Warranty, Safety & Regulation

Two-year Limited Warranty Summary

GoSense warrants Rango and its accessories against any material and manufacturing defects for two years from the date of original purchase. GoSense does not guarantee Rango against normal wear and tear, damage caused by accident or misuse. To have your device repaired, it is recommended to contact GoSense by email at support@gosense.com

Safety information

Terms of use, warnings

<u>General terms</u>

Your RANGO must be used in accordance with these terms of use. GOSENSE cannot be held responsible for any use that does not comply with these terms of use.

RANGO BEING ONLY A DISPLACEMENT ASSISTANCE SYSTEM, GOSENSE DISCLAIMS ALL RESPONSIBILITY IN THE EVENT OF DOMAINS TO PERSONS OR PROPERTY OCCURRING DURING ITS USE, IN PARTICULAR IN CASE OF NON-RESERVE OF THESE TERMS OF USE.

In case of damage, do not attempt to repair your RANGO yourself. Instead, contact GOSENSE for support at support@gosense.com

⚠️ RANGO system is not intended for use in a home environment

⚠️ RANGO system is not intended for use in the vicinity of oxygen-rich environments or flammable gases.

⚠️ Some accessories in your RANGO may be a choking hazard for young children. Keep these accessories away from young children.

⚠️ The use of RANGO by a person under the age of 10 without the help of a valid adult person is not recommended.

In case of doubt about the suitability of RANGO for your situation, you are invited to consult a health professional or to ask any question to your dealer or to GOSENSE on the site http://www.gosense.com.

Your RANGO and charger are compliant with applicable standards and limits for surface temperature. However, even within these limits, prolonged contact with hot surfaces can cause discomfort or injury. Use common sense to prevent your skin from being in prolonged contact with a device, its AC adapter, or a wireless charger while it is in use or connected to a power source. For example, do not sleep on a device, AC adapter, or wireless charger. Also, do not place them under a blanket, pillow, or your body when they are connected to a power source. It is important to keep your RANGO charger in a well-ventilated area when using or recharging. Be particularly careful if your physical condition prevents you from normally feeling the heat on your skin.

Your RANGO is protected against rain and water splashes. If liquid splashes on your RANGO, wipe it with a cloth. However, the exposure of your RANGO to a high dose of liquid (including total immersion) or to liquids other than clear water (acids in particular) may cause irreparable damage to the device. In order to limit the exposure of your RANGO to these risks, do not immerse your RANGO in the water, do not put it in the dishwasher or in the washing machine, do not expose it to water sports, saunas or steam rooms or in environments

RANGO has been designed to operate at ambient temperatures between -20 and 35 °C and stored at temperatures between -20 and 30 °C. Your RANGO may be damaged and the battery life may be shortened if stored or used outside these temperature ranges. Avoid exposing your RANGO to sudden changes in temperature or humidity.

Medical contraindications

Medical contraindications for the use of Rango include:

- Individuals with severe auditory impairments, as Rango relies on auditory signals for navigation.
- Persons with cognitive impairments that might limit their ability to interpret auditory signals and react accordingly.
- Individuals with mobility impairments that prevent the effective use of a traditional white cane.

Before use

Your RANGO is an electronic device for walking assistance for people with disabilities. For a proper use, RANGO must first be tested and controlled in a closed and familiar environment before being used in an unknown environment. GOSENSE recommends 2 hours of practice in a known environment, safe and closed before testing in an unknown environment. GOSENSE recommends that you can be accompanied by a sighted person for your first use in an unfamiliar environment, until you have complete control of your RANGO which can take up to 3 days in daily use.

Before using RANGO you must ensure that its battery is sufficiently charged to accompany you for the planned journey.

RANGO is a walking aid that cannot be used as a substitute for the caution of the user adapted to his personal situation.

⚠️ Charger must never be exposed to water drops or immersion. Otherwise, electrical risk could result.

Use

Your RANGO will warn you of the main objects present in the immediate environment of your cane, from 0 meter to 2.50 meters in front of you. RANGO is not able to detect the holes or small obstacles as well as soft obstacles. GOSENSE cannot guarantee that RANGO will detect all types of obstacles in all situations. You must therefore remain fully aware of your environment and adopt the same caution as when you travel without RANGO. An attention and note will have to be given to the traffic of surrounding vehicles and the roadworks.

⚠️ At full sound power, prolonged use of RANGO can damage the user's ear. The sound level should be set reasonably and in consideration of your personal situation.

RANGO may only be used as a walking aid to the exclusion of any other mode of transport (public transport, bicycle, car, motorized two-wheeled vehicles in particular) or other activity (sports, manual labor in particular).

Your RANGO has been designed for outdoor use. Indoor use may work but is not yet suitable, moreover use in specific and risky situations such as beachfront, riverbank or lake, mountain or hostile environment may lead to additional unsuitable risks.

⚠️ Every user should not only rely on RANGO but also on his white cane.

⚠️ In a noisy environment, the user may not hear the audible alerts. Please pay extra attention and stop or leave the noisy area depending on the situation.

⚠️ Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established;

⚠️ RANGO must be handled with care: it contains sensitive electronic components that can be damaged if dropped, burned, pierced, crushed or comes in contact with liquid. If you suspect that your RANGO or battery may be damaged, stop using your RANGO.

The presence of waves or radiofrequency may temporarily affect the operation of your RANGO, so you must be careful in all circumstances.

Symbols used on labeling (RANGO or charger) or inside this manual

	Refer to instructions for use		General warning sign
	Manufacturer name and address	**MD**	Indicates that the device complies with regulation UE 2017/745 on medical devices
CE	CE Marking indicates that the device complies with UE applicable UE regulations	**SN**	Serial number
⚠	Caution : To indicate that caution is necessary when operating the device or control close to where the symbol is placed, or to indicate that the current situation needs operator awareness or operator action in order to avoid undesirable consequences		Means that, in accordance with local laws and regulations, you must dispose of your product and/or battery separately from household waste. When this product is no longer usable, take it to a waste collection center approved by the local authorities. The separate collection and recycling of your product and/or battery during disposal helps conserve natural resources and protect the environment and human health
	Device includes type B applied parts		Date of manufacturing

EU Statement of Compliance
GoSense states that Rango complies with the GENERAL SAFETY AND PERFORMANCE REQUIREMENTS of the Medical device regulation EU 2017/745.

Electromagnetic compatibility

Electromagnetic environments

The RANGO system meets the NF EN 60601-1-2: 2014 + A1: 2020 standard for electromedical systems and relating to the safety requirements for electromagnetic compatibility for a residential environment; It is specified for use in the following electromagnetic environments:

ELECTROMAGNETIC ENVIRONMENTS		
Environment	**Location**	**General characteristics**
Residential	Outdoor	Uncontrolled

Directives and manufacturer's declarations – Electromagnetic emissions

EMISSION	
RF emissions	CISPR 11 Group 1 Class A
Harmonic emission IEC 61000-3-2	Class A
Voltage fluctuation / flicker emissions IEC 61000-3-2	Compliance

Directives and manufacturer's declarations – Electromagnetic immunity

IMMUNITY		
Test	**Requirements**	**Conformity Level**
Electrostatic discharges (ESD) IEC 61000-4-2	± 8 kV contact discharges ± 2/4/8/15 kV air discharges	± 8 kV contact discharges ± 2/4/8/15 kV air discharges
Radiated RF EM fields IEC 61000-4-3	10V/m 80MHz-2.7GHz 80% AM à 1kHz	10V/m 80MHz-6GHz 80% AM à 1kHz

Proximity fields from RF wireless Communications equipment IEC 61000-4-3	Frequency (MHz)	Modulation	Level (V/m)	CONFORMITY LEVEL (V/m)
	385	Pulse Modulation: 18 Hz	27	27
	450	Pulse Modulation: 18 Hz	28	28
	710 – 745 - 780	Pulse Modulation 217 Hz	9	9
	810 – 870 - 930	Pulse Modulation: 18 Hz	28	28
	1720 – 1845 - 1970	Pulse Modulation 217 Hz	28	28
	2450	Pulse Modulation 217 Hz	28	28
	5240 – 5500 - 5785	Pulse Modulation 217 Hz	9	9

Proximity magnetic fields IEC 61000-4-39	Frequency	Modulation	Level (A/m)	CONFORMITY LEVEL (A/m)
	30 kHz	CW	8	8
	134.2 kHz	Pulse Modulation: 2.1 kHz	65	65
	13.56 MHz	Pulse Modulation: 50 kHz	7.5	7.5

IMMUNITY		
Test	**Requirements**	**Conformity Level**
Electrical fast transients / bursts IEC 61000-4-4	*Supply: ± 2 kV* *I/O lines : ± 1 kV* *Repetition rate : 100 kHz*	*NA*
Surges IEC 61000-4-5	*Line-to-line: ± 0,5 kV, ± 1 kV* *Line-to-ground ± 0,5 kV, ± 1 kV, ± 2 kV*	*NA*
Conducted disturbances induced by RF fields IEC 61000-4-6	*3 V 0,15 MHz – 80 MHz* *6 V in ISM and radio-amateur band between 0,15 MHz and 80 MHz* *80 % AM à 1 kHz*	*NA*
RATED power frequency magnetic fields IEC 61000-4-8	*30A/m*	*30A/m*
Voltage Dips and Interruptions: IEC 61000-4-11	*0 % UT; 0,5 cycle* *At 0°, 45°, 90°, 135°, 180°, 225°, 270° et 315°* *0 % UT; 1 cycle at 0°* *70 % UT; 25/30 cycles at 0°* *0 % UT; 250/300 cycles*	*NA*

Essential performance

The RANGO system emits and receives ultrasounds in order to detect obstacles. Rango also analyzes its orientation and movements to estimate the user's walking direction. It then computes the risks of collisions with the obstacles and transmits information about the detected obstacles to the smartphone. The smartphone then generate 3D audio feedbacks for the corresponding detected obstacles, so that the user can locate and avoid them. Rango may possibly shut down in the event of electromagnetic disturbances beyond the intended limits, but no untimely shutdown of operation should occur without the user being informed by an audio notification.

Interference with adjacent devices

Use of the system alongside devices should be avoided as it can lead to improper operation. If this cannot be avoided, then observations should be made to verify that everything is functioning normally.

Your RANGO contains components and radios that emit electromagnetic fields. These electromagnetic fields and magnets can interfere with pacemakers, defibrillators or other medical devices. Keep a safe distance between your medical devices and your RANGO and earphones. Consult your doctor and the manufacturer of the medical device for information

specific to your medical device. If you think your RANGO is interfering with your pacemaker, defibrillator, or other medical device, stop using your RANGO.

Accessories

The system is supplied with all accessories, especially cables, validated to meet electromagnetic compatibility requirements. Any replacement of these accessories must only be done with GoSense equipment.
If replaced by accessories not supplied by GoSense, it could result in an increase in electromagnetic emissions and a decrease in the electromagnetic immunity of the system.

Note: Concerning the smartphone, not provided by GoSense, please make sure that it complies with all regulations that apply to it.

Coexistence with RF transmitters

Portable RF communications equipment (including peripherals such as antennas or antenna cables or external antennas) should not be used within 30cm of any part of the system, including cables supplied by GoSense . Otherwise, a deterioration of the functioning of the system could result.

Intellectual property

The GoSense company holds trademark "Rango" and "GoSense". Any unauthorized use may be sanctioned.

The technology used by your RANGO is the property of GOSENSE, any unauthorized use may be sanctioned.

Warranties - Liability

Your RANGO is covered by the following guarantees:
- legal guarantee of conformity, for Products apparently defective, spoiled or damaged or not corresponding to the order,
- legal warranty against hidden defects resulting from a defect in material, design or manufacture affecting the delivered products and rendering them unfit for use, under the conditions and in the manner described below.
RANGO is not covered by any other warranty.

This warranty only applies to the RANGO product itself and does not extend to consumable parts that may be supplied (such as batteries, protective coating). This Warranty shall not extend to any use of your RANGO that does not comply with these terms of use.

Provisions relating to legal warranties

French decree of December 18, 2014 relating to the information contained in the general conditions of sale regarding legal guarantee - Articles 2 and 3

The seller is held to the defects of conformity of the good to the contract in the conditions of the article L. 211-4 and following of the code of the consumption and the hidden defects of the thing sold under the expected conditions in articles 1641 and following of the French civil code.

The customer:

- benefits from a period of two years from delivery of the property to act;
- may choose between the repair or replacement of the property, subject to the cost conditions provided for in Article L. 211-9 of the French Consumer Code;
-is exempted from reporting the proof of the lack of conformity of the property during the six months following the delivery of the property. This period is extended to twenty-four months from March 18, 2016, except for second-hand goods.

The legal guarantee of conformity applies regardless of the commercial guarantee that may be granted.

The consumer can decide to implement the guarantee against hidden defects of the thing sold within the meaning of Article 1641 of the French Civil Code and that in this case, he can choose between the resolution of the sale or a reduction of the selling price in accordance with Article 1644 of the French Civil Code.

Article L211-4 of the French Consumer Code
The seller is required to deliver a good in accordance with the contract and is liable for any lack of conformity existing at the time of delivery. He also responds to any lack of conformity resulting from the packaging, the assembly instructions or the installation when it has been charged to him by the contract or has been carried out under his responsibility.

Article L211-5 of the French Consumer Code
To be in conformity with the contract, the property must:
- Be fit for the usual expected use of a similar good and, where appropriate:
- correspond to the description given by the seller and possess the qualities that he has presented to the buyer in the form of a sample or a model
- present the qualities that a buyer can legitimately expect given the public statements made by the seller, the producer or his representative, in advertising or labeling

- Or have the characteristics defined by mutual agreement by the parties or be fit for any special purpose sought by the buyer, made known to the seller and that the latter has accepted.
Article L211-12 of the French Consumer Code
The action resulting from the lack of conformity is prescribed by two years from the delivery of the goods.

Article 1641 of the French Civil Code
The seller is bound by the guarantee by reason of the hidden defects of the thing sold which render it unsuitable for the use for which it is intended, or which diminish the use so much, that the buyer would not have acquired it, or not would have given a lower price, had he known them.

Article 1648 paragraph 1 of the French Civil Code
The action resulting from the latent defects must be brought by the purchaser within two years from the discovery of the defect.

General provisions
No RANGO reseller or any other person other than GOSENSE is authorized to modify these.
If a stipulation herein is considered invalid or unwritten, the remainder of the stipulations will remain in effect.