User Manual for goTenna Mesh

Installation

1. Charge goTenna Mesh fully before initial operation via the micro-USB port found beneath the power button. The indicator light on the front of the device will light up during charging and will turn off, when fully charged.
2. Install the goTenna app from the App store or the Play store onto your respective iOS or Android device.
3. Follow the instructions within the app to setup your goTenna Mesh.
4. Turn ON goTenna Mesh by pressing and holding the power button for ~3 seconds. Release the button and watch for the indicator light to slowly pulse. goTenna Mesh is now ready to pair.

Operation

1. Follow instructions within the goTenna app to set up your goTenna contact number. Using your phone number as your goTenna contact number is recommended.
2. Proceed to text, share GPS location, or send other data over the app using regular text-messaging app conventions. For more help please visit our FAQ online at gotenna.com/pages/support.
3. We recommend placing goTenna Mesh in an unobstructed position, preferably as high up as possible on your body. For example, goTenna will work best when attached externally to the upper back of a backpack using the provided attachment strap.

- Note, you must keep the micro-USB port cap closed to ensure goTenna Mesh's limited water-resistance.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an output on a circuit different from that to which the receiver is connected.

Caution:

- IMPORTANT! Changes or modifications not expressly approved by goTenna could void the user's authority to operate the equipment.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
    1. This device may not cause harmful interference.
    2. This device must accept any interference received, including interference that may cause undesired operation.
- This device has been tested for RF emissions and has been deemed safe for human exposure as determined by the government's SAR testing standards.

Canada, Industry Canada (IC) Notices

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference. and (2) this device must accept any interference received, including interference that may cause undesired operation of the device.

Cet appareil est conforme à la norme RSS d'Industrie Canada exempte de licence. Son fonctionnement est soumis aux deux conditions suivantes: (1) Ce dispositif ne doit pas causer d'interférences nuisibles, et (2) cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant entraîner un fonctionnement indésirable.

CAN ICES-3 (B)/NMB-3(B) This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numériqué de la classe B est conformé à la norme NMB-003 du Canada.

This equipment complies with portable radiation exposure limits set forth for uncontrolled environment.
Cet équipement est conforme aux limites d'exposition aux rayonnements portables fixées pour un environnement non contrôlé.

Important Safety Information for Data Radios:

- Your goTenna Mesh device contains a RF transceiver.
- Your device has been tested for and passed the FCC's RF exposure guidelines for regular body-worn operation without any modification of the hardware.
- Any modification of the hardware or use of the device not in line with provided instructions may not ensure compliance with RF exposure guidelines.
- Unauthorized modifications or attachments could damage the device and also violate FCC regulations.
- **Recommended Position**: For best performance we recommend that the goTenna be attached in an unobstructed environment as high up as possible on your person. For example, clipping to the upper back of a backpack using the provided attachment strap is ideal.

FAQ

How it works

What do the indicator lights mean?

goTenna Mesh's LED light indicates multiple functions. It will flash a long, slow blink when the device is activated. It will blink repeatedly at one-second intervals while waiting to pair over Bluetooth (and will stop blinking once paired — a working and/or paired goTenna Mesh will NOT have any lights on to save battery). goTenna Mesh will also blink the instant a message is sent or received.

How do I turn OFF goTenna Mesh?

Press & hold the power button on the right side, until the indicator light turns off.

How do I turn ON goTenna Mesh?

Press & hold the power button on the right side until the indicator light starts flashing.

Will my goTenna Mesh work with goTenna v1 devices?

goTenna Mesh devices <u>are not</u> interoperable with our goTenna v1 devices (which are only available for sale in the U.S.) because they operate on different frequencies. Interoperability is physically and legally impossible due to regulatory restrictions that prohibit meshing on the first-gen product's frequencies. (e.g. It's sort of similar to why your TV doesn't "speak" to your microwave.)

What is goTenna Mesh?

goTenna Mesh is the first 100% off-grid, mobile, long-range consumer-ready mesh network. The device pairs with smartphones to enable communication among users without any reliance on cell towers, wifi routers, or satellites. Additionally, goTenna Mesh intelligently enables automatic and private message relay, effectively doubling or tripling any device's effective range, creating a network which actually gets stronger the more people join it.
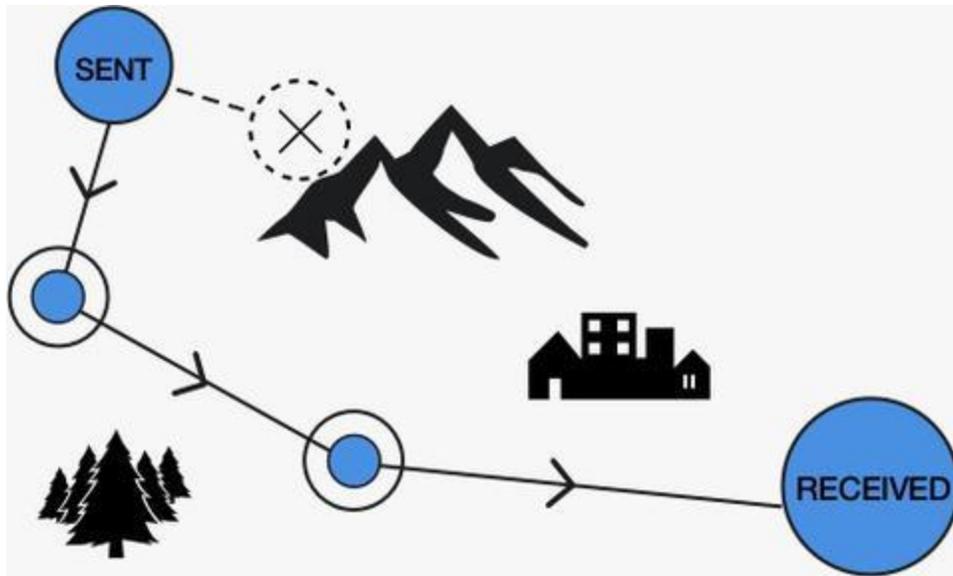
Will goTenna Mesh work with the first-generation goTenna?

goTenna Mesh devices will not be interoperable with our first-gen goTenna devices (which are only available for sale in the U.S.) because they operate on different frequencies. We would have loved to enable interoperability but that's physically and legally impossible due to regulatory restrictions which prohibit meshing on the first-gen product's frequencies. So it really comes down to both the laws of communications regulators, and the laws of physics!

On which frequencies does goTenna Mesh operate?

The first-gen goTenna works on the 151-154MHz band (MURS), whereas goTenna Mesh will transmit at 1 W on 902-928 MHz in the United States, and will vary throughout other countries. For example: goTenna Mesh will transmit at 0.5 W on 869.4-869.65 MHz in Europe and other CE countries, and the device will auto-tune itself to the appropriate frequency band and power output based on the location where it's being used.

What countries are supported?

goTenna Mesh will auto-tune to RF frequencies that are legal for use in the following countries:

United States, Canada, Albania, Andorra, Australia, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Greenland, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, San Marino, Serbia, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Where can I use goTenna Mesh?

goTenna Mesh works absolutely anywhere on earth, provided there is at least one other goTenna Mesh device in range. Whether you are traveling overseas, spending time outdoors, at a crowded event, or preparing for an emergency, goTenna Mesh provides incredible utility in any situation where cell service or wifi is not available by empowering you to create essential connectivity during any adventure.

Who can I communicate with using goTenna Mesh?

You can chat with any other goTenna Mesh user within range. The reason you can't chat with people who don't have goTenna Mesh is due to the physics of radio waves. You need a properly designed RF receiver to interpret a goTenna Mesh signal. We would love to have our signals get to devices that aren't goTenna-enabled, but phones are designed to work with towers and wifi — exactly what we are working around — and regular radios aren't able to operate at the level of our super-smart networking protocols. We should also point out that goTenna Mesh devices will not be interoperable with regular goTenna devices because they operate on different frequencies.

With that said, the goTenna Plus app upgrade enables an SMS network relay feature, so you can reach people beyond your off-grid network. If a goTenna Mesh user nearby has cell service, they can transmit your message via SMS to your intended recipient.

Can a goTenna Mesh act as a relay node when it is not paired with a smartphone?

The short answer is that, yes, it can!

The longer answer is that any powered-on goTenna Mesh device can receive and relay messages and location data. The information going through the relaying device can only be decrypted by the end recipient. In order to actually receive, interpret and view messages or location data, a user must have a smartphone paired with a goTenna Mesh.

This enables users to strategically place goTenna Meshes between members of their parties, which can function as stationary relay points to increase range. In other words, if two users have four goTenna Meshes, two of those devices can be used solely as relay points, effectively tripling overall range:

User A — User B
User A — Relay — Relay — User B

Because goTenna Mesh has a standard micro-USB, you could leave the device paired to a solar charger or some other power source on its own.

How does offline location sharing work?

goTenna leverages the GPS on your phone, which works all the time even if you don't have service. goTenna then contextualizes that "blue dot" on detailed offline vector maps and allows you to share it with others who have goTenna.

All our maps are free for download, and you can share your location, request others' locations, and also share points of interest. The maps are detailed enough to show specific city blocks and even some trails in certain parks.

Is goTenna Mesh approved by the FCC?

Yes. goTenna Mesh is approved under Part 15.

Is goTenna Mesh patented?

goTenna's technology is patent pending.

Do I need to have my phone with me to use my goTenna Mesh?

You need your phone to send and see received messages, however goTenna Mesh can continue to receive messages without your phone being paired. In such a case goTenna Mesh would store your messages for upload to your phone the next time you connect.

This is also true if your phone battery dies. Your goTenna Mesh will continue to receive messages on your behalf and store them until you can recharge your phone and access the goTenna Mesh app again.

How far can my phone and goTenna Mesh be from each other?

goTenna Mesh uses Bluetooth Low-Energy to wirelessly pair to your smartphone. You'll probably want to have them within 20 ft (7 m) of each other, though you should aim to keep goTenna Mesh as close to your smartphone as possible, as Bluetooth can be unreliable at greater distances.

How many users can be in a private goTenna Mesh group chat?

Groups can be up to 10 users, though we plan to expand the group maximum soon.

Device specs

How long does goTenna Mesh take to charge?

It takes about 1-2 hours to fully charge depending on the amount of power supplied by the power source. The red charging light next to the USB port will turn off when the unit is fully charged.

What is goTenna Mesh's battery life?

The battery will last about 24 hours with typical use. If you use it to send lots of messages (and message retries), your goTenna Mesh's battery life can be much shorter. If you turn it off between uses, and only use it for a few hours at a time, your battery life can last for weeks or even months! When fully charged and unused, the battery can hold its power for about a year.

What are goTenna Mesh's key hardware specs?

- 1-watt UHF radio (tunes to frequencies & power permissible in your region)
- Flash memory good for 100's of messages
- Rechargeable Lithium-polymer battery (24+ hour battery life on standby)
- Micro-USB connector
- Bluetooth-LE data interface (BT 4.2)
- LED indicator light
- Thermoplastic elastomer attachment strap
- Weather-proof (fine in all kinds of rain & grime!)
- 4.2" x .9" x 1.3" (106.5 x 18 x 33 mm)
- Weight: 1.7 oz (48 g)

Why is goTenna Mesh better than a walkie-talkie?

goTenna Mesh enables you to intelligently relay your messages through other users to get to your recipient(s) when they are out of point-to-point range. This makes it more likely your messages will get through in difficult situations, and creates a network that gets stronger the more people join it. And not to worry: this all happens automatically and privately.

In addition, goTenna Mesh offers many features walkie-talkies cannot, including message delivery confirmation, the ability to create private groups and 1-to-1 chats, and the ability to share GPS locations on free, detailed offline maps. Plus: You never have to worry about channels or interference!

Is goTenna Mesh waterproof?

No, but it's definitely weatherproof and water-resistant. We've designed it to survive rainy excursions, and to stand a good chance of survival if briefly dropped in water, but it's definitely not designed to be submerged. Leave it with your smartphone when you go swimming!

Is goTenna Mesh dust-tight?

Yes

What kind of warranty do you provide?

goTenna comes with a 1-year limited warranty.

Privacy

What type of encryption does goTenna Mesh use?

Private 1-to-1 and group messages sent over goTenna Mesh are end-to-end encrypted with 384-bit elliptic curve public-private key ciphering. The only exceptions are messages sent using the

"shout" and "emergency" features which are by definition public conversations with others within range of you.

Why do I need to verify my phone number?

You will need to verify your phone number during account setup, and you need to be connected to a cell network (not wifi) to do so. Once you enter your phone number, you will be sent a 5-digit verification code via SMS text message. You will need this code to proceed with account setup. This step will occur only when first creating your account, and is done solely to verify the identity of the user. We do this so people know if a user on goTenna is using a phone number, you can trust it's really that person!

How secure is goTenna Mesh?

Very. Beyond the end-to-end encryption, because there is no central server there is no proverbial "back-door."

Can other people with goTenna Mesh devices gain access to messages I send?

No, everything is encrypted and our firmware doesn't allow downloading one goTenna account's messages to another smartphone anyway.

What information does my goTenna Mesh store?

Just the goTenna ID you've set to be your contact (i.e. either your phone number or a randomized string), and any messages your phone hasn't pulled yet. If you opt in to telemetry, we'll gather some basic statistics to help make goTenna better like battery life, device temperature, and so forth — absolutely zero actual messages or contact list information though!

What information does my goTenna Mesh device share with goTenna, the company?

None, though you can opt-in to share completely anonymized telemetry when you have a data connection, so that we can improve our service. Again, this is limited to basic data regarding battery life, device temperature, and so forth. No messages or contact list info are included.

Why should I believe goTenna Mesh cares about my privacy?

We feel you. It's hard to sort out who pays lip service to privacy and who really means it these days. The sad reality is both the government and tech companies have disrespected our privacy, time and time again. Well, we have this to say about goTenna: we set out to build a consumer-ready, completely decentralized, end-to-end encrypted communication technology, without a "back-door" for anyone, because it didn't exist yet, and we thought it should. We'll leave it at that.

Messaging

Which message types support meshing/relay?

Message relay (meshing) is available for 1-to-1 messages, group messages & emergency messages. Shouts do not mesh.

How can I tell if the messages I send are being relayed through other goTenna Mesh users?

Relayed messages will show a "hopping" animation next to the green check mark. The number of hops represent the number of nodes your message was relayed through.

How many users can be in a private group chat?

Groups can contain up to 10 users.

How do I know if a message I sent was received?

When sending a 1-to-1 message, goTenna Mesh will try to determine whether the intended recipient received it. If goTenna Mesh receives an acknowledgment of receipt at the other end, you'll see a delivery confirmation check mark in the chat window. If the message wasn't delivered successfully OR if the acknowledgment receipt is not received, you'll see "Delivery Unconfirmed".

You can manually try to send the message again (usually moving to higher ground or just trying from a different location can help a lot).

(Note: Delivery receipts are only available in 1-to-1 chats in the standard app.)

How do I broadcast publicly to anyone around?

Step 1: Click the blue Compose icon in the lower right corner of your main chat screen

Step 2: Select "Shout Chat"

Step 3: Type your message

Step 4: Tap "Send"

How do I start a group chat?

Step 1: Click the blue Compose icon in the lower right corner of your main chat screen

Step 2: Select "Group Chat"

Step 3: Select group members from your contact list

Step 4: Tap "Create"

Step 5: Type your message

Step 6: Tap "Send"

How do I start a chat with someone?

Step 1: Click the blue Compose icon in the lower right corner of your main chat screen

Step 2: Select "1-to-1 Chat"

Step 3: Choose your contact or type in the goTenna ID (GID) they used during account creation. (Note: This is likely to be their phone number — if they're in your contact list, you'll see that clearly — but it can also be a GID they need to share with you.)

Step 4: Type your message

Step 5: Tap "Send"

How do I manage my contact list? How do I add or edit a contact?

You can access and manage your contacts in the Contacts section in the Side Menu.

To add contacts from your phone to goTenna, click on Contact Name > Add Contact.

The "add new" button on the top right-hand side of the Contacts screen allows you to add new goTenna Mesh contacts. You can edit your goTenna contacts by clicking on the contact name > Edit Contact.

How do people find me on goTenna Mesh?

Other goTenna Mesh users can find you using your phone number.

If you did not use your phone number to set up your account, you can share your goTenna ID (GID) with other users. You can find your GID at the bottom of the Side Menu.

Maps & Location

How can I share automatic location updates with other goTenna Mesh users?

To automatically share your location with other goTenna Mesh users, take advantage of **Auto Accept Location Requests**. This feature allows trusted contacts to query and receive your location without any action on your part.

(Please note this feature is enabled one-way. For example, you accept a friend's invitation to automatically share your location when he requests it, but he manually accepts or declines yours.

If you want to have it be two-way, you have to send your friend an invitation to auto accept your location requests.)

If you upgrade to goTenna Plus, you can also use **Location Tethering** to send automatic location updates to trusted contacts at regular intervals — choose between every 1 to 10 minutes — for up to 4 hours! Think of this as completely "hands-free" tracking so others can keep tabs on where you are even if you're not looking at your phone or have your hands busy.

Follow these steps to get started:

Step 1: Select "Chat" on the Side Menu

Step 2: Choose an existing chat, or start a new one by clicking the blue Chat icon

Step 3: Click the Location icon to the left of the text field

Step 4: Choose "Auto Accept Location Requests" or "Location Tethering"

How do I create and share a specific location (pin) on the map?

Step 1: Select "Location" in the Side Menu

Step 2: Find location where you would like to create a pin on the map

Step 3: Hold your finger on your desired location until the dialog appears

Step 4: Select "Create Pin"

Step 5: Name the pin and select "Save"

Step 6: To share, select "Share Pin"

How do I share my current location?

Step 1: Select "Chat" on the Side Menu

Step 2: Choose an existing chat, or start a new one by clicking the blue Compose icon

Step 3: Click the Location icon to the left of the text field

Step 4: Choose "Attach My Location"

Step 5: If you wish to include a message, type your message in the text field and you can send the text with your location in one go

Step 6: Tap "Send"

Where do I download goTenna Mesh's free offline maps?

Choose "Location" from the Side Menu, then click the gear icon in the upper right corner of the map screen. Select "Downloaded Maps", then select "Available" on the "Map Downloads" screen. Choose either by Country (e.g. France) or by Country > Region (e.g. United States of America > California).

All standard maps are free and available for the whole world. You will need a data connection to download the maps, so plan to do so before you go off-grid! And because some of these maps can be big, wifi is recommended.

(Note: By upgrading to goTenna Plus you can access offline topographic maps to get richer detail of your surroundings, which is particularly useful when enjoying the outdoors.)

Range & Performance

How does a goTenna Mesh in relay mode work?

A powered goTenna Mesh device can receive and relay messages and location data. goTenna Mesh does NOT need to be actively paired to a smartphone to serve as a relay node, but it does have to be powered on.

This enables users to use goTenna Mesh devices as stationary relay points in strategic locations to increase range. As an example, image two users have four goTenna Mesh devices. Two of those devices can be used solely as relay nodes, increasing potential reach of the mesh network:

User A — User B

User A — Relay Unit 1 — Relay Unit 2 — User B

Because goTenna Mesh has a standard micro-USB port, you can leave the device paired to a power source if you plan to use it as a relay node for an extended period of time.

How can I use goTenna Mesh as a dedicated relay node to increase range?

Step 1: Turn ON your goTenna Mesh

Step 2: Triple-press the Power button and watch for the LED status indicator to turn on. Quickly triple-press the Power button once again to confirm relay mode. The light will pulse 3 times then turn off.

To confirm Relay Mode is on at any point, press the Power button and the light will pulse 3 times.

While in Relay Mode, your Mesh device automatically unpairs from any phone. To repair, open Settings, tap 'Unpair goTena Mesh' and follow instructions.

Why are my messages showing as "Delivery Unconfirmed" and what can I do about it?

The "Delivery Unconfirmed" status indicates that your message was not received, or the recipient device did not send a delivery receipt. This typically happens when the recipient is not in range or is at the very edge. It's also possible the message reached your recipient but conditions changed before a delivery receipt could make it back to you — especially if you're meshing and/or moving around a lot.

You can try sending the message again by clicking on "Delivery Unconfirmed". Changing locations may result in a better chance for success. For example, if you're in a ravine, behind a big boulder, or blocked by a large building, try elevating the device (or standing on a higher surface) or getting around the obstacle. Also, remember to wear your goTenna Mesh as high as possible.

What kind of range should I expect?

Point-to-point range depends on your environment, and no situation is exactly the same. That being said, more open terrain often allows for greater range; line-of-sight can also help but is not required. Plus: you may be able to extend your range through other goTenna Mesh devices by relaying!

In general, you can expect up to 4 mi (6.4 km) point-to-point range in open environments such as plains, desert, beach-side, etc. Expect up to 0.5 mi (0.8 km) point-to-point range in congested areas such as cities, mountains, ravines, thick forests, etc.

Don't be surprised if you get a lot less or a lot more than this — it's quite common to get only a few blocks in very dense urban areas and the current ground-to-peak point-to-point range record for goTenna Mesh is 10 miles. (A skydiver set the open-air range point-to-point record: 26 miles!)

Where should I have my goTenna Mesh while I'm using it?

For best performance, you should try to attach goTenna Mesh externally to gear and elevate it as much as possible. For instance, attaching goTenna Mesh externally to your backpack is better than placing it anywhere inside your backpack.

Also note that goTenna Mesh is not designed to be used when directly in contact with your body. The reason being that the human body can interfere with radio transmissions, including goTenna Mesh's signal. Holding goTenna Mesh in your hand or putting in the chest pocket of a thin item of clothing could noticeably decrease your range.

That said, if you want to hold it up for more height, hold it from the strap, avoiding touching the metal and plastic casing. If you put it in your pocket, try to pick a thick clothing material so the

device doesn't make contact with your skin. (P.S. If you don't care about range in a certain situation, there's less need to worry about all these tips.)