

# Safariland TAC-MESH User Guide



## **IMPORTANT SAFETY WARNINGS**

### **FCC STATEMENT**

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Note: 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 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 outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **INDUSTRY CANADA NOTICE**

#### **CAN ICES-3 (B)/NMB-3(B)**

This device complies with Industry Canada's license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## **USE AND SAFETY CAUTIONS**

- Do not drop, disassemble, open, crush, bend, deform, puncture, shred, microwave, incinerate, paint, or insert foreign objects into the TAC-MESH. Such actions could result in electric shock.
- Do not expose the device to extremely high or low temperatures or leave in direct sunlight for extended periods of time.
- Do not leave your TAC-MESH near open flames such as cooking burners, candles, or fireplaces. Do not dispose in a fire. The battery could explode, causing injury or death.
- Do not block any ventilation openings, which could cause battery hazard.
- Do not attempt to repair, modify, or disassemble your TAC-MESH; it does not contain any user serviceable components.
- Dispose of the TAC-MESH and the battery in accordance with local regulations.

## **ELECTRIC SHOCK CAUTIONS**



- Only charge the battery in temperatures between 32°F - 113°F (0°C - 45°C).
- Do not attempt to disassemble the TAC-MESH or force open the built-in battery.
- Do not charge the unit in damp areas.
- Do not attempt to replace your TAC-MESH battery; it is built-in and is not changeable.
- Be sure the USB port is dry before plugging in the charging cable.

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## 1. Introduction

The Safariland wireless communications TAC-MESH provides a long-range high-quality voice intercom accessory which is used with a tactical headset to provide a local team comms capability for up to 32 headset users on a single network. The TAC-MESH uses a Mobile Ad Hoc Network (MANET) radio technology.

Team members simply plug their headset into properly provisioned TAC-MESHs, turn on the TAC-MESH's power and instantly begin communicating over ranges up to hundreds of meters in open field environments.

TAC-MESH includes mesh technology which augments communications in radio-challenged environments such as within buildings, connecting subterranean team members with those above ground and greatly extending range in large open spaces. The mesh technology also enhances LPI/LPD performance through maintaining required mission communication ranges while transmitting at lower power levels to minimize RF signatures.

In addition to the headset connection, the TAC-MESH contains an audio port for connection to a Push-to-Talk (PTT) control unit, or directly to a tactical radio for the purposes of providing both forms of communication capabilities to the end user (i.e., local intercom + tactical radio comms). To use this configuration, the TAC-MESH is inserted in between the headset and the control unit or the TAC radio. Audio received from both radios is combined within the TAC-MESH and MIC path audio from the headset is routed to both radios for outgoing transmissions.

The Safariland TAC-MESH is self-powered with a non-user serviceable rechargeable Li-Ion battery.

The TAC-MESH is available in two models based on connector type:

Model	Description	Part Number
TM-01	Single Comm	
TM-02	Dual Comm	
TM-03	Single comm PTT	

## 2. Getting Started

Getting started with the Safariland wireless TAC-MESH is a pretty simple process. The next few paragraphs help to familiarize you with the TAC-MESH.

### 2.1 Package Contents

- Safariland wireless TAC-MESH
- USB cable
- Quick Start Guide

### 2.2 Getting to Know Your TAC-MESH (NATO Connector model shown)



Figure 1 - TAC-MESH Buttons and Connectors

## **2.3 Charging the TAC-MESH**

To charge the TAC-MESH's battery, simply attach one end of the provided USB cable to the TAC-MESH's USB-C connector and the other end to a USB device capable of providing power over USB such as a laptop. It is recommended to charge the TAC-MESH overnight before first use to ensure that the battery has a full charge.

### 3. Button Control Functions & Voice/Audio Notifications

This section describes the functions of the 3 buttons on the TAC-MESH. Please refer to Figure 1 which illustrates the location of the buttons referenced by numbers in the sections that follow. Table 1 below provides a summary of the TAC-MESH button control functions.

Table 1 - TAC-MESH Button Control Summary

Button 1	Button 2	Button 3	Dongle State	Button Function	Notes
P & R	X	X	OFF	POWER UP	<ul style="list-style-type: none"> <li>TAC-MESH powers up when held for several seconds and then released</li> </ul>
P & R	X	X	Normal Operation	INCREASE VOLUME	<ul style="list-style-type: none"> <li>If max volume has not been reached, increase volume adjustment by one step</li> <li>If max volume has been reached, no further increase of volume is made</li> </ul>
X	X	P & R	Normal Operation	DECREASE VOLUME	<ul style="list-style-type: none"> <li>If min volume has not been reached, decrease volume adjustment by one step</li> <li>If min volume has been reached, no further decrease of volume is made</li> </ul>
X	P & H	X	Normal Operation PTT Talk Mode	TRANSMIT	<ul style="list-style-type: none"> <li>This is the PTT button when TAC-MESH is in PTT talk mode</li> <li>Radio transmitter is activated to talk for as long as Button 2 is depressed</li> </ul>
X	P & R	X	Normal Operation AllTalk Mode	TOGGLE MUTE	<ul style="list-style-type: none"> <li>This is the MUTE/UNMUTE button when TAC-MESH is in AllTalk mode</li> <li>If UNMUTED, a press &amp; release of Button 2 will MUTE TAC-MESH</li> <li>If MUTED, a press &amp; release will UNMUTE</li> </ul>
X	P & H	P & H	Normal Operation	TOGGLE TALK MODE	<ul style="list-style-type: none"> <li>If dongle is in AllTalk MODE, then switch to PTT MODE</li> <li>If dongle IS in PTT MODE, then switch to AllTalk MODE operation</li> <li>NOTES:               <ul style="list-style-type: none"> <li>(1) Requires pressing &amp; holding for ≥ 3 sec. and until voice prompt heard</li> </ul> </li> </ul>
P & H	X	X	ANY	POWER DOWN	<ul style="list-style-type: none"> <li>Press and hold until “Radio Powering Down” voice prompt heard. Then release.</li> </ul>



## **3.1 Power ON / OFF**

### **3.1.1 Powering the TAC-MESH ON**

To turn on the TAC-MESH unit, press and hold Button 1 for several seconds. The red LED at the bottom of the unit should illuminate steadily once the unit is ON. If a headset is attached, you will hear an audio announcement of “Radio Powering ON.” If for some reason, the unit doesn’t power ON, simply repeat the process making sure to hold the button for a few seconds before releasing.

In addition to the “Radio Powering ON” voice prompt, you will also hear a voice indication of the talk mode setting (e.g., “AllTalk Activated” or “Push-to-Talk Activated”), whether the radio is muted or unmuted (e.g., “Radio Unmuted” or “Radio Muted”) if in AllTalk mode, and the current battery level when operating on battery power only.

### **3.1.2 Powering the TAC-MESH OFF**

To turn the TAC-MESH OFF, simply press and hold Button 1 until you hear the voice prompt, “Radio Powering Down.” Power OFF can be confirmed when the red LED flashes and then after is no longer illuminated.

## **3.2 Volume UP/DOWN**

With the TAC-MESH powered ON and headset connected, the user can change the volume into the headset by quickly pressing either Button 1 for volume DOWN or Button 2 for volume UP. With each press, the user will hear an audible blip in the headset. When the volume reaches its minimum level, then another press of Button 1 will trigger the “MIN VOLUME” voice prompt. When the volume reaches its maximum level, then another press of Button 3 will trigger the “MAX VOLUME” voice prompt.

## **3.3 Selecting Talk Mode**

The TAC-MESH talk mode can be toggled between either the AllTalk mode, or the Push-to-Talk mode using Buttons 2 and 3. When the radio is presently in AllTalk mode, then pressing and holding Buttons 2 and 3 will toggle to PTT mode. Once pressed, continue holding the buttons until the voice prompt, “Push-to-Talk Activated” is heard. Conversely, when the radio is presently in PTT mode, then pressing and holding Buttons 2 and 3 will toggle to AllTalk mode. Once pressed, continue holding the buttons until the voice prompt, “AllTalk Activated” is heard. Just afterwards another voice prompt indicating the MUTE or UNMUTE status in the AllTalk mode is played as well.

## **3.4 PTT Button**

When the TAC-MESH is in the PTT talk mode, Button 2 becomes the Push-to-Talk button. As with a traditional PTT radio, the button must be pressed for the entire time that the user is speaking.

### **3.5 MUTE/UNMUTE in AllTalk Mode**

When the TAC-MESH is in the AllTalk talk mode, Button 2 functions as the MUTE / UNMUTE button. Pressing and releasing Button 2 will toggle the MIC MUTE or UNMUTE to the opposite state. When MUTED, the MIC is disabled and no transmissions of the user's voice will occur over the network. Note that the MIC must be UNMUTED when the Voice Activity Detection (VAD) feature is being used.

## **4. Additional Voice Notifications & Alerts**

In addition to the voice and audio notifications mentioned in section 3, this section includes a few other voice notifications that are triggered when certain TAC-MESH conditions occur that are not the result of button presses.

### **4.1 Battery Level Status**

When operating on battery power, a power level voice notification such as “BATTERY LEVEL HIGH” occurs just after power up and device initialization. Level notifications for “BATTERY LEVEL LOW,” “BATTERY LEVEL MEDIUM,” and “BATTERY NO LEVEL” are the other possibilities when the level is reported at power on. Also, when the battery level discharges to a critically low state, the “BATTERY NO LEVEL” alert occurs.

### **4.2 Power-Down Approaching Alert**

When the auto power-OFF feature is enabled, the “POWER DOWN APPROACHING” alert will begin playing as the TAC-MESH approaches the time to power-OFF.

### **4.3 No Network / Out-of-Range Alert**

When the TAC-MESH is powered ON and no network is found, it will begin periodically sounding a “NO NETWORK” alert in the headset. The other scenario where this alert is triggered (if enabled) is when the user moves beyond the range of the next closest TAC-MESH unit that is in range of the other users in the network.

## **5. TAC-MESH Configuration Reference**

This section describes the TAC-MESH special features that are user configurable:

### **5.1 Auto Power-OFF**

TAC-MESH is equipped with an auto power-OFF feature. This feature will power off the device after a set number of hours has passed.

Note that pushing a button, transmitting voice over the air or receiving from other TAC-MESH units will reset this power OFF feature to begin counting down again.

When 1 minute before the auto power-OFF event is about to occur, the voice prompt “Power Down Approaching” will be heard in the headset.

### **5.2 Transmitter Cut-off**

For safety and security purposes, the TAC-MESH is equipped with a cut-off feature for ceasing continuous transmission after a period of constant transmission has elapsed. An example use case for this feature would be a firefighter fighting a fire in a high noise environment with the TAC-MESH in AllTalk mode with the MIC UNMUTED who suddenly becomes injured. The loud background noise will be transmitted over the network continuously since the injured firefighter is not able to MUTE their MIC. This cut-off feature will limit the amount of time that this unwanted transmission occurs and that will prevent others from understanding each other over the network due to the noise being transmitted.

### **5.3 No Network / Out-of-Range Alert**

The “No Network” / “Out-of-Range” Alert is similar to your cell phone when no bars are present on the signal strength icon. In the case of the TAC-MESH, when no network can be found, a voice alert notification is announced in the headset indicating “NO NETWORK.” This situation can simply be after power ON when no other TAC-MESH units have been powered up, or the more important case when a user wanders out-of-range with the network and becomes disconnected.

## **5.4 Voice Activity Detection (VAD)**

TAC-MESH has an advanced voice activity detection algorithm that when enabled will activate transmission only when voice is detected. This feature is only present when using the AllTalk mode. TAC-MESH must be unmuted in the AllTalk mode in order for voice activity detection transmission to occur.

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