

Cisco Wireless IP Phone 8821 Battery Performance

Overview

There are many conditions that can affect the expected performance of your Cisco® Wireless IP Phone 8821 battery. This paper is intended to help you understand and assess how the battery will perform under various configurations and usage patterns.

Types of work environments

Work environments that use the Cisco Wireless IP Phone 8821 fall into the following general types: Shift workers and Office workers.

Shift workers typically rotate on 8- to 12-hour shifts and do not have a dedicated device. Instead, they hand off the device when a shift change occurs. These users typically change the battery out with a fresh one during the shift change. Battery multichargers can be used to ensure a supply of fully charged batteries.

Office workers have a dedicated device. These users typically place their device in a charging stand or on a power cord during off hours.

Things to consider for shift workers

If you are a shift worker, it is important to replace the battery with a fully charged one at the start of your shift. This will give the best experience since there will not be a need to replace the battery mid-shift. It also allows for the spent battery to fully charge for the next shift.

Things to consider for office workers

Desk charging stands have a slot for a spare battery. It can be useful to have a spare battery charging in this slot. That way, if you inadvertently forget to place the phone on the charger, you will have a fully charged replacement battery on hand.

Things to consider for all users

The 8821 and 8821-EX support three different scan modes (Continuous, Auto, and Single). The **Cisco Wireless IP Phone 8821 and 8821-EX Wireless LAN Deployment Guide** identifies the appropriate use cases for the supported scanning modes. The scanning mode selected will have an impact on battery life. As noted in the deployment guide, Continuous Scan mode typically is the least efficient mode for battery life, but also provides the best performance when roaming. Devices that sit idle in Continuous Scan mode can have up to 75 percent less battery life than a device in Auto Scan mode.

As a user, you should be mindful of walking in and out of range of your Access Points (APs). Doing this will drain your battery due to the increased wireless scanning needed to reconnect and reregister with the Cisco Unified Communication Manager as you enter and leave the range of each AP. A good practice would be to set the phone in its charger if you are leaving the office or going out of range for an extended period of time.

Deployment in a wireless infrastructure that supports Proxy Address Resolution Protocol (ARP) is critical for maximum battery life. As indicated in the deployment guide, if your APs do not support Proxy ARP, then your battery life may be reduced by up to 50 percent. So a best-case battery time given as 10 hours may be reduced to 5 hours. This could be further reduced depending on other factors related to use.

Other factors related to work environment may impact how your battery charger performs. This is because battery charging can be affected by temperature. Chargers placed in cold areas may cause the battery to charge more slowly, while those placed in high-temperature areas may not allow the batteries to be fully charged. Chargers perform best when placed in an area that is moderate in temperature.

Things to consider for environments with a single AP

If your Wi-Fi network consists of a single AP, then you can configure your phone for a single AP scan mode. This will allow you to optimize your battery life based on your phone not requiring roaming functionality. Roaming allows your phone to seamlessly hand off as you move between APs.

Use cases

As indicated in the **Cisco Wireless IP Phone 8821 and 8821EX Wireless LAN Deployment Guide**, battery life will be affected by a variety of usage patterns.

The following use case examples assume that the network is configured per the deployment guidelines and that the phone's scan mode is configured for continuous scan.

Use case example 1

Devices that receive XML Schema Instance (XSI) messages every 10 minutes have been shown to have battery life reduced up to 60 percent. Optimizing settings such as display timeout and display brightness can help reduce the impact.

Use case example 2

Devices that receive numerous calls where the ringer is set either for vibration or at a maximum ring level can experience reduced battery life. This is due to these features having an increased power draw that can be 30 percent higher than a ringer set at a low volume.

Deployment considerations

Other features that may be available on your APs can help to conserve power on the phone. Work with your network administrator to ensure an optimized Wi-Fi network. Proxy ARP, Dynamic Transmit Power (DTPC), and Unscheduled Automatic Power Save Delivery (U-APSD) are all AP features that are covered in the **Cisco Wireless IP Phone 8821 and 8821-EX Wireless LAN Deployment Guide**. It is always best to follow the recommendations found in the deployment guide to insure optimized battery performance.

Configuration considerations

There are several configuration settings that can impact battery performance. Depending on your needs, you may consider opting for the settings that optimize the battery.

Display settings

Display settings, such as display timeout and display brightness, will impact the battery life. With software version 11.0 (4), the default display brightness for the 8821 is 5, and the default display timeout is 10 seconds. Changing the display timeout to 30 seconds can have up to a 10 percent impact on battery life. Increasing the display brightness can have up to a 15 percent impact on battery life. Changing both can have a cumulative effect on battery life.

If using XSI applications or waking up the display frequently, it is recommended to set the display sleep timer under Settings > Phone settings > Display > Sleep to 10 seconds and set the brightness level under Settings > Phone settings > Display > Brightness to level 5. This will ensure that the minimal amount of power will be used when the device receives phone calls and messages.

Ringer volume and vibrate

As indicated in the second use case above, the use of the vibrate function increases power consumption and will decrease your battery life. If you combine vibrate and ringer then you can see further reductions depending on the ring volume selected.

The cumulative effect

As detailed above, there are many factors that may influence battery life: scan mode, AP coverage, use of Proxy ARP, display settings, etc. All of these factors will be cumulative in their impact on battery life. So, a device that is deployed in an environment that has inadequate wireless coverage, is constantly being taken out of range and has the display brightness set to max and display timeout set to max will not have the same battery performance as a device that has very good wireless coverage, always stays within the range of the wireless infrastructure, and has the default display settings.

Battery life

The table below lists the maximum on-call and idle times per scan mode. These battery times are obtained under the following controlled conditions:

On call

- On a single call
- Display is off

- No call alerts
- No roaming, with good signal
- No XSI messaging or other application activity
- No key presses or user interface interaction
- No shared lines

Idle

- Display is off
- No call alerts or answered calls
- No roaming, with good signal
- No XSI messaging or other application activity
- No key presses or other user interface interaction
- No shared lines

Call state	Scan mode	Battery time
On call	Continuous	Up to 9.5 hours
	Auto	Up to 9.5 hours
Idle	Continuous	Up to 45 hours
	Auto	Up to 145 hours

The battery takes approximately 3 hours to recharge using the AC power adapter.

Battery replacement

After 500 charge cycles, the max voltage drops by 20 percent. This is important for you to know because the battery will need to be replaced at some point due to this drop in voltage.

Understanding charge cycles

A charge cycle occurs when you discharge a battery by 100 percent of its capacity. This can accumulate over several charges. As an example, you might use 80 percent of your battery's capacity one day, then charge it fully overnight. The next day you could then use 20 percent of its capacity and have reached a single charge cycle of 100 percent. Every charge does not equate to a charge cycle unless the battery is fully discharged every time that it is charged.

Summary

The Cisco Wireless IP Phone 8821 battery has been designed to give the best performance possible for a variety of use cases. By understanding the specifics of your individual use case, you will be able to take advantage of configurations and optimizations that will allow you to obtain the best battery life possible.