ıllıllı
CISCO

How to Deploy DECT at Work for the Cisco Headset 560 Series

DECT deployment options for the Cisco Headset 560 Series

Workplace transformation is happening everywhere, across all industries and countries. The way we work is rapidly changing in this globally connected environment with an expansion of devices utilized. New ways of collaborating are at the core of the transformation.

Audio, no matter where it happens, remains the most critical part of this new collaboration wave. While wired headsets provide a steady connection, wireless is usually preferred due to its flexibility and range. In some cases, it might be the only viable option because of physical constraints.

The Cisco® Headset 560 Series is a range of wireless DECT headsets that connect to your desk IP phones, softphones, or mobile devices. These headsets provide a stable connection, enabling workers to stay focused on the work at hand while offering an excellent audio experience. By combining with the market-leading Cisco Unified Communications architecture, the Cisco Headset 560 Series offers advanced, integrated manageability functions unlike any other in the market today.

While wireless headsets can help increase workplace productivity, incorrectly deploying wireless headsets can have the opposite affect and significantly increase the frustrations of staying connected. This white paper is intended to help you understand DECT technology and provide general guidance on how to deploy the Cisco Headset 560 Series.

Contents

Introduction to DECT

The Cisco Headsets 560 Series are wireless headsets with a DECT base. Users connect their source(s) to the base, and the base utilizes DECT radio technology to send and receive audio signals with the headset.

DECT stands for Digital Enhanced Cordless Telecommunications. It works close to the 1.9 GHz frequency band to avoid interference with traditional Wi-Fi, Bluetooth, and microwaves. It has several benefits compared to Bluetooth, another commonly used wireless technology for audio.

DECT has a far greater range than Bluetooth. DECT has a range of up to 100 meters while Bluetooth is limited to 1 to 30 meters. DECT helps to avoid interference and is suitable in situations where Bluetooth is not appropriate.

Like other radio technologies, DECT uses a combination of Frequency Division Multiplexing (channels), and Time Division Multiplexing (time slots) techniques. DECT devices share available channels on the radio spectrum and the active number of devices can be limited when in close range of each other.

The headset and base constantly scan and probe the available channels to establish and maintain communication. Following is a list of key factors that co-determines the channel capacity:

- The available radio channels
- Effective time slots per channel
- Audio payload type, such as narrowband, wideband, and music

The challenges

Since DECT headsets utilize radio channels, there may be situations where too many headsets in a confined space can generate radio interference, resulting in poor audio. Therefore, it is critical to plan your deployment of DECT headsets if working with limited space.

Facts about DECT density

DECT headsets share the radio spectrum when operating near each other. The key factor here–DECT density– defines the number of headsets that can be used at the same time in a given area. It is key to understand how many headsets can be used near each other without interference and how to maximize the number of headsets deployed.

DECT technology is based on shared open media and there are many environmental variables that play a part in determining its quality. Following are a few of the variables:

- Channel capacity
- Number of DECT headsets in use
- Average distance between bases
- Roaming range (mobility)
- Office size and layout
- Audio codec (e.g. music mode consumes a lot more RF resource than standard wideband mode)
- Office furnishings, including furniture, walls, dividers, carpets, curtains, metal objects, glass surfaces, etc.
- Call utilization (the amount of time in which the headsets are in use)

Table 1 outlines some examples of different materials and their radio attenuation.

Table 1.   Radio attenuation of different materials

Material	Attenuation	Example
Wood	Low	Door, floor
Plastic	Low	Partition
Glass	Low	Un-tinted windows, partition
Tinted glass	Medium	Tinted windows, partition
Living objects	Medium	Crowds, plants
Bricks	Medium	Walls
Ceramic	High	Tiles
Concrete	High	Walls, floors, pillars
Metal	Very high	Metal cabinet

Following are some general suggestions for positioning DECT headsets:

- Lower transmitting radio power can increase the deployment density but reduce the headset roaming range. This can be configured by parameter "DECT Radio Range" via the Cisco Unified Communications Manager (UCM) headset management page
- Set the headset to narrowband to improve deployment density (this may impact the headset audio quality)
- DECT technology seeks to maximize the number of available channels by reducing the likelihood of simultaneous transmission on the same channel. As a result, a channel reuse will automatically occur

- Distance the DECT headsets as evenly as possible in a given area for the least interference
- Call utilization plays a critical role in identifying the maximum number of DECT headsets that can be deployed in an area. We recommend planning at 100 percent headset utilization because lack of available channels will significantly impact audio quality
- Every deployment is unique. Reach out to your Cisco representative for additional guidance on the specifics of your deployment

DECT deployment planning

Thorough planning is key to a successful deployment. This section covers the steps to help plan your deployment.

Step 1. Cisco wireless headsets are a part of a larger Cisco UC and collaboration experience. To get the best experience possible, make sure the minimum system requirements are met (Table 2).

Table 2.   System requirements

Name	Version
Cisco Headset 560 Series	1.5(1)+
Cisco Unified Communications Manager	12.5(1)SU1+
Cisco IP Phone 7800 and 8800 Series	12.5(1)SR3+
Cisco Jabber® for Desktop	12.6(1)+

Step 2. Familiarize yourself with how to adjust the headsets' settings, which can impact your deployment (Table 3).

Table 3.   Headset management settings

Setting Name	Option	Description
DECT radio range	Medium range (available in November 2019)	Medium transmitting power
	Short range	Low transmitting power
	Auto range	High transmitting power
Audio bandwidth	Narrowband	Lower bit rate
	Wideband	Higher bit rate

Step 3. Survey the space where the wireless DECT headsets will be deployed.

- Identify the floor layout
- Find the size of the space, width, and length
- Mark any obstacles (e.g., metal object, large glass surfaces, etc.) and remove them if possible
- Locate any potential interference sources (e.g., other DECT systems being utilized on adjacent floors)
- Stage the deployment on the floor layout

ılıılı
CISCO

Step 4. Prepare headset training material for end users based on your deployment goals (e.g., prioritizing density over roaming or vice versa). For more information:

- Quick Reference Guide:
  - 560 with Multi-base
  - 560 with Standard Base
- User Guide: Cisco Headset 500 Series User Guide
- Admin Guide: Cisco Headset 500 Series Administration Guide

Typical deployment scenarios

Deployment recommendations vary based upon end-user requirements such as density versus mobility or audio quality in wideband versus narrowband. In this section, we provide recommendations based on three typical workspace scenarios: the standard-user density space, the high-user density space, and the sparse-user density space. The recommendations are based on mobility, size of the office, total number of active users, and the audio experience needed. We believe most deployments fit into one of these modes and further adjustments can be made to support variations.
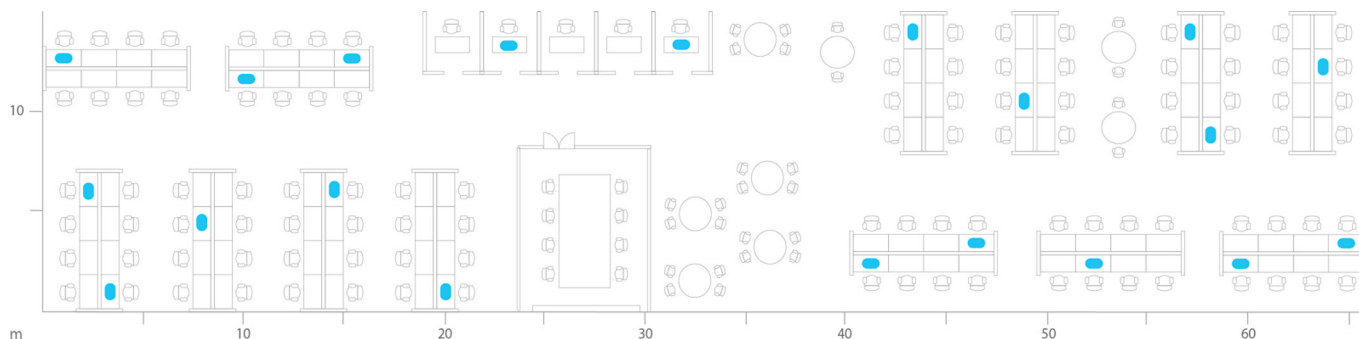
Standard mode – balanced mode between user density and mobility

Standard mode is recommended for standard offices that are smaller than 1500 square meters and the customer wishes to deploy as many DECT headsets as possible while maintaining mobility (Table 4).

Table 4.   Standard mode recommendation

Recommended radio range	Region	Max number of users in wideband	Max number of users in narrowband	Typical roaming range [meters]	Minimum base-to-base distance [meters]	Maximum range [m]
Medium range	U.S.	20	40	5	2	45
	E.U.	40	80	5	2	45

For example, a 1000 square-meter open-office space in the U.S. is deploying DECT headsets favoring both user density and mobility. Per the recommendation in Table 4, a maximum of 20 DECT headsets can be deployed running wideband audio. The bases should be at least 2 meters apart. Each user is able to enjoy wideband audio and a typical 5-meter roaming range, while the maximum roaming range in this mode is about 45 meters. As a user moves from 5 meters to 45 meters, they may become more and more susceptible to clicks and mutes resulting from interferences.

You can double the number to 40 by simply changing the audio bandwidth setting to narrowband.

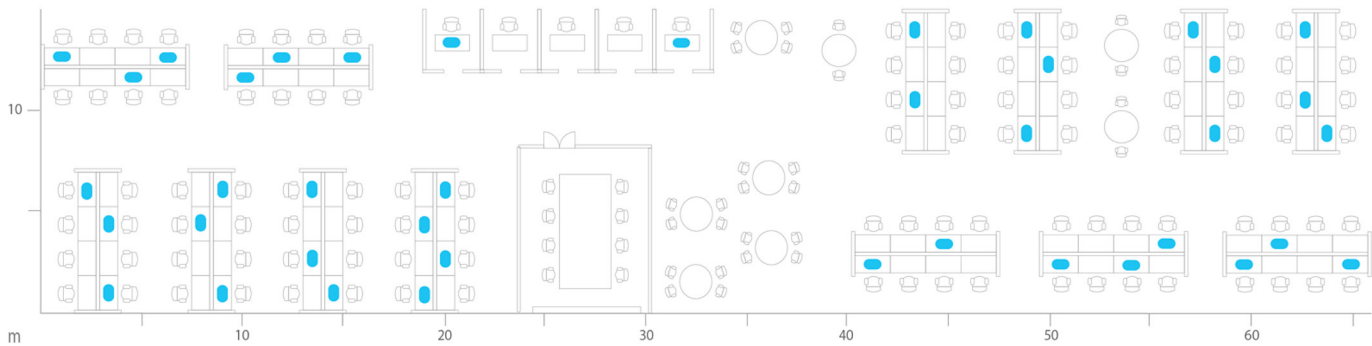## Density mode – a densely populated space favoring user density over roaming

Density mode is recommended for densely populated offices that are smaller than 400 square meters and the customer wishes to deploy as many DECT headsets as possible (Table 5).

Table 5.   Density mode recommendation

Recommended radio range	Region	Max number of users in wideband	Max number of users in narrowband	Typical roaming range [meters]	Minimum base-to-base distance [meters]	Maximum range [meters]
Short range	U.S.	20	40	2	2	12
	E.U.	40	80	2	2	12

For offices larger than 400 square meters, you can split the space to multiple 400 square-meter areas with a minimum 10-meter wide buffer zone and follow the same recommendation for deployment.

For example, in the same 1000-square-meter office, if most headset users don't require mobility and you wish to deploy more DECT headsets, set the DECT radio range to short range per the recommendation in Table 5. Two 400-square-meter areas can be identified with sufficient buffer zone in between, and a maximum of 40 DECT users can be deployed while still running wideband audio. The bases should be at least 2 meters apart. Each user is able to enjoy wideband audio and a typical 2-meter roaming range, while the maximum roaming range in this mode is about 12 meters. As a user moves from 2 meters to 12 meters, they may become more susceptible to clicks and mutes resulting from interferences.

To further scale the number of deployable users, set the audio bandwidth to Narrowband. This will effectively double the DECT headset capacity or alternatively, utilize a mixed deployment with the wired Cisco Headset 520 and 530 Series.

Mobility mode - sparse workspace favoring roaming over user density

Mobility mode is recommended for those sparse workspaces where maximum mobility is needed (Table 6).

Table 6.   Mobility mode recommendation

Recommended radio range	Region	Max number of users in wideband	Max number of users in narrowband	Typical roaming range [meters]	Minimum base-to-base distance [meters]	Maximum range [meters]
Auto range	U.S.	20	40	20	5	100
	E.U.	40	80	20	5	100

Why Cisco

Cisco has extended the collaboration platform with a range of professional headsets that create intuitive user experiences and offer a single, integrated tool to manage Cisco headsets, endpoints, and applications, both on premises or in the cloud.

On the front end, Cisco headsets are integrated with Cisco devices, such as IP phones, desktop video devices, and Cisco soft clients such as Cisco Jabber, Cisco Webex Teams™ and Cisco Webex® Meetings. On the back end, Cisco headsets are provisioned, configured, managed, and serviced by Cisco Unified Communications Manager. For more details, visit the Cisco Headset 500 Series Administration Guide here.