

DECT™

Wireless Technology
and DECT Density

EPOS | SENNHEISER



Introduction to DECT

DECT technology has become a popular standard for wireless voice communication. DECT devices are not likely to be affected by other electronic devices and signals because they operate in a separate frequency band.

In an office environment, DECT devices can be used alongside Bluetooth® devices and WiFi due to the different frequency. Furthermore, DECT technology provides the user with good voice quality and superior mobility.

DECT phones and headsets can be used with traditional PBX telephone systems and VoIP systems to achieve a clear voice quality and ease of use for employees.

Various factors influence the range and density of the devices, including the number of simultaneous users, the layout and design of the building, the type of technology in use and the number of devices using the same technology.



Facts about DECT technology¹

Digital Enhanced Cordless Telecommunications (DECT™) is the ETSI (European Telecommunications Standards Institute) standard for short-range cordless communications, which can be adapted for many applications, including voice, data and networking applications and can be used over unlicensed frequency allocations worldwide.

The most common spectrum allocation is 1880 MHz to 1900 MHz, which is used in Europe. This spectrum is unlicensed and exclusively for technology, which ensures an interference-free operation.

In the United States, the FCC (Federal Communications Commission) changed channelization and licensing costs in 1920 MHz–1930 MHz, or 1.9 GHz, known as Unlicensed Personal Communications Services (UPCS), allowing DECT devices to be sold in the U.S. with only minimal changes².



1. Please refer to www.etsi.org and www.dect.org for more information.

2. The US DECT standard is also known as DECT 6.0 (created by DECT Forum).

Advantages of DECT solutions

Mobility, comfort and communication are major advantages of DECT solutions that lead to improved staff efficiency and productivity. The ability to answer calls when away from a desk as well as being able to use both hands for other tasks can boost job satisfaction and help to create a pleasant working environment.

Additionally, a DECT solution does not interfere with 2.4 GHz WiFi, whereas a Bluetooth® solution does. This means that it is possible to have more users in the same area when a DECT solution is used.

Density – communication without interference

Density is a keyword when you are planning the deployment and use of wireless communication technology. It refers to the number of DECT devices in use in a specific area.

DECT devices share the number of channels available on the radio spectrum when they are within close range of each other, which therefore puts a limit on the number of DECT devices that can be in use at once. When this limit is exceeded, it can result in break-ups in the audio quality or delays when creating a link to the DECT headset.

Many factors influence the transmission power or the number of channels on the radio spectrum that a product is using. One factor, for example, is roaming range. The further away from its respective base a headset is being used, the more transmission power it takes, leaving less radio spectrum remaining for other devices. Therefore, as roaming range increases. Density doesn't decrease, it increases as well. The more transmission power is used, the more dense the environment.

Considerations – quantity of DECT units

There is a fixed number of channels available for DECT devices. The number of channels is not equivalent to the number of units you can deploy in your business. Various factors influence whether you can deploy more or fewer DECT devices. The most important factors are:

- DECT standard (frequency band)
- Office working styles
- Simultaneous users
- Office layout and location
- Products deployed



IMPACT DECT

wireless headsets

- D 10 Series, SD/DW Series, SDW 5000 Series



Experience the quality of freedom

EPOS wireless DECT headsets -from the call-centric IMPACT product line- are the ultimate communication tools. With a focus on wearing comfort and user well-being, the D 10, SD/DW and SDW 5000 Series are specifically designed to meet the needs of all-day users - where the benefits of switching from wired to wireless solutions are significant.

The wireless range for EPOS DECT headsets is up to 55 meters/180 feet in typical office buildings and up to 180 meters/590 feet in line of sight. Users can choose from a wide range of variants based on their preference for wearing style and communication devices. The performance of wireless communication systems is affected by working styles, office layout and the type of products deployed. EPOS wireless DECT solutions successfully address all these concerns, making them an excellent choice for efficient communication that boosts company productivity.

Office working styles

EPOS DECT headsets are 'intelligent' because they adapt to your surroundings by utilizing different channels and increasing the transmission power the further away they are from their base units. Different office working styles have an effect on the density of DECT devices. The more that workers stay at their desks, the more devices can be used simultaneously.

Simultaneous users

There is a huge difference from company to company when it comes to call utilization. In some companies only a few employees use the phone at the same time whereas the staff of busy contact centers are constantly on the phone. The number of simultaneous users plays a large role in determining the number of possible DECT units in one location.

The figures illustrate that office layout, location and number of users has a major impact on DECT density and therefore influence how many headset users can be on calls simultaneously.

Office layout and location

Walls, hallways, conference rooms and other obstacles affect the range of DECT units. The materials used in a building can also affect the range. For instance, a solid concrete wall limits the range of the radio signal more than a window, but can lower interference from radio signals from neighboring offices.

DECT density can also be influenced by the same technology being utilized in the vicinity. In Figure 2, the number of units and the range for each unit will decrease if companies in the vicinity also use DECT technology. How much, is determined by the size of the DECT solution and factors like building materials.

Products deployed

DECT is an industry standard and all DECT products must comply with the relevant regulations and standards. However, there are major differences in the quality of different headset models and manufacturers, which also has an impact on the maximum number of units deployed and their range.

Our recommendation

At EPOS, we recommend an estimated maximum number of DECT units that can be deployed in one location as seen in Figure 3. However, the above mentioned factors must be considered when planning the deployment of DECT technology.

Figure 1. The device range is proportional to the number of users. Fewer users means range increases, more users means range decreases.

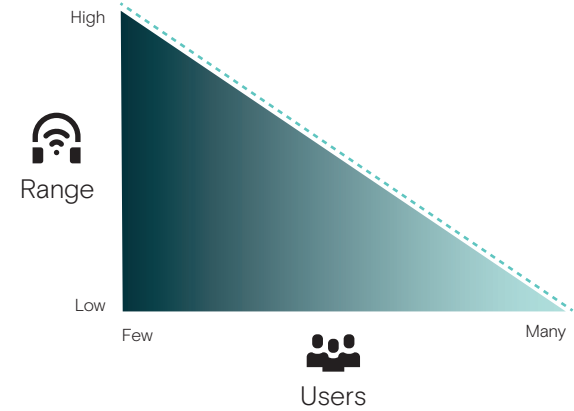


Figure 2. The DECT density can also be affected from Office A to Office B and vice versa.

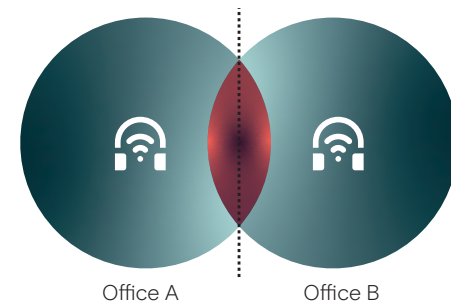


Figure 3.

ESTIMATED MAX. NUMBER OF UNITS PER LOCATION*		
Large office environment	Europe/APAC** D 10, DW and SDW 5000 Series	US D 10, SD and SDW 5000 Series
Contact Centers – When 90 % of users spend most of the time on calls	200 units	100 units
Offices – When up to 40 % of users call at the same time	360 units	180 units

* Location is defined as an open office environment which is not interfering with another area using a DECT system. The estimated max. number of units per location is based on the maximum optimization of DECT units (combination of narrowband or high-density wideband mode in the SDW 5000 Series and short-range mode), which is described on page 8 of this white paper.
 ** With exception of Japan which has another DECT standard.

How to increase the number of EPOS DECT headsets in use



Typically, the number of employees increases when a company expands. This will often lead to the use of more headsets in the office and thereby increase the density. In many cases, this is not a problem but if the number of simultaneous users increases dramatically it may be necessary to address the issue.

Today, it is possible to deploy a larger number of DECT units in one area by making a few smart choices regarding your DECT devices.

Choose short-range mode

This means that you choose a shorter range (approximately 5–10 meters / 16–32 feet in high density) for each device. The employee will not be able to use the full range, but in reality this is often not a problem.

Choose narrowband mode or high density wideband mode

Wideband mode (150–6.800 Hz) delivers better voice quality but also occupies two of the available DECT channels on the radio spectrum. In narrowband mode (300–3.500 Hz), the number of channels cannot be increased, which makes it a good option for the majority of landline calls. The voice quality is still good and each device only occupies one DECT channel. This is possible to adjust on all EPOS DECT headset series. A unique feature of our DECT headsets is that they can operate in narrowband even in PC mode. With the introduction of the SDW 5000 Series including a new high density wideband mode, the same

number of users can benefit from warm, natural audio in wideband sound as if narrowband mode was selected. This high density wideband mode provides users with better audio quality and an improved conversation experience.

Close the audio connection when you are not on a call

The auto link function of EPOS DECT headsets automatically links the headset with the base station when it is taken out of the charger. To secure maximum DECT capacity, headsets need to be put back into the cradle when not on a call. This closes the link to the base station and thereby frees up DECT channels, making it possible to deploy more units in the same office environment.

Enjoy music while working via headphones and not your DECT headset

It is very convenient for users to use a DECT headset when listening to music while working, especially with the SDW 5000 double-sided headsets, as users can benefit from stereo sound. However it makes a lot of sense to switch to wired headphones instead. This is because listening to music in this way takes up two DECT channels and limits the total number of devices which can be used in the office space. If a company has device density issues, this is important to be aware of so that users can be encouraged to only use headsets for communication and enjoy music instead with their wired headphones.

