



# Managing Bluetooth<sup>®</sup> Density

EPOS





# How to Get the Best Sound In Today's Workplace

## **Clear sound supports clear communication**

That is true whether you're meeting with geographically dispersed teammates or on the phone with customers. Dropped sound, pops and distortion all get in the way of your ability to communicate.

If you are using Bluetooth® headsets and speakers, the cause of those issues may be related to the density of Bluetooth® devices in your workspace. Other electronics and radio signals such as WiFi can also create interference.

These problems can all be mitigated by following a few Bluetooth® best practices. To help you get the best performance from your Bluetooth® audio devices, we have put together this overview of how to manage Bluetooth® density in today's dynamic workplace.

# Why Bluetooth Density Matters

Bluetooth density refers to how many nearby devices can be active at the same time without interfering with each other's connections or degrading audio quality. The more live Bluetooth devices in any given area, the higher the density, and the higher the chance of radio interference.

Such interference results in audio distortions that have a detrimental effect on call quality and the resulting customer experience. Setting limits on how many Bluetooth audio devices should be used in a particular area will help you achieve the best performance and sound quality.

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# The Bluetooth Basics

Bluetooth technology is a global radio transmission standard which supports the application of a wide range of wireless electronic devices. The technology connects devices over a distance of up to 100 meters line of sight, or typically up to 25 m/82 ft in a normal office environment depending on the Bluetooth® class, device connectivity and environment.

Ericsson introduced Bluetooth to the market in 1994 to overcome the challenges of connecting devices with diverse types of technology and communication protocols. Since its introduction, the Bluetooth Special Interest Group (SIG) has collected more than 20,000 member companies (including EPOS) and the Bluetooth standard has become a popular method of connecting devices.

## Why Bluetooth Headsets and Speakers are So Popular

- Wireless Bluetooth audio devices provide users with the freedom to move around within the Bluetooth range
- Bluetooth is a standardized wireless specification, which assures a high-level of compatibility with other devices.
- Bluetooth devices are reliable, universal, and provide extremely low interference while consuming little energy.
- Implementing Bluetooth technology is relatively inexpensive and setup is automatic and user-friendly.
- Bluetooth devices can store multiple devices in its pairing list and can connect to up to seven devices at the same time.\*

\*EPOS Bluetooth devices can store 8 devices in the pairing list and connect to two devices simultaneously



# Setting Bluetooth Device Density Guidelines in Your Workplace

If you have multiple headsets and speakers operating in the same space, the distance between them and how many are in use will affect the sound quality. So, you will need to establish some best practices for distance between users to mitigate interference.

Determining how many devices can work effectively in your space is best done on a case-by-case basis. You may find in-depth information on density tests out there, but the truth is that your workspace should be approached with your specific performance criteria in mind.

## Bluetooth and WiFi

Bluetooth headsets and speakers can experience interference from other devices operating on the same open 2.4 GHz frequency, such as printers, TV sets, and WiFi routers. By removing such devices (when possible) and switching your router to 5 GHz frequency, you can help to mitigate interference.

## The New LE AUDIO Bluetooth Standard is On the Horizon

The Bluetooth Low Energy (LE) Audio standard is a new architecture for supporting Bluetooth audio applications. This standard supports new cases, longer battery life and increased bandwidth.

The LE Audio standard will exist alongside the current Bluetooth 5 and 5.1. standards. That means all your EPOS devices will keep working well into the future as LE Audio gradually gains wider use.

## User Tips for Avoiding Interference

- Try to limit the distance between your Bluetooth Audio device and the source it is connected to. Long distance means the transmit power must be higher, which will create more interference to other Bluetooth connections
- Stay near the source device to reduce signal loss and interference with other devices
- Turn off Bluetooth on your mobile phone and devices when not in use
- If you leave your headset in the office, be sure to turn it off before you go

## Bluetooth

Frequency	2.4 GHz
Range	Typical office environment: Up to 25 m/82 ft* Line of sight: Up to 100 m/328 ft
Connectivity	Mobile phone, tablet and/or PC (via dongle)

\* device dependent

# Experience the Quality of Freedom

EPOS offers an extensive range of completely wireless Bluetooth headsets and speakers, allowing hands-free communication and easy control of calls. Our versatile audio devices are designed to make it easy for your team to work across different situations and locations, in both office and remote work settings.

## Ready for the Remote Workforce

EPOS Bluetooth headsets and speakers are ideal solutions for hybrid workers or those who are often on the road. Our Bluetooth devices are portable. In a work from home setting, limited range is rarely an issue, the devices they are paired with tend to remain close to the owner during calls.

Good audio is an important part of remote collaboration and online meetings. EPOS has teamed with the world's leading online meeting platforms to develop, test, and certify solutions that bring high-quality video and audio conferencing to every type of meeting space.\*

## Make Bluetooth Work in Your Office

Today, offices are dynamic spaces that require the flexibility for quick changes. Especially in

these days of hybrid work, the amount of headset users onsite can vary from day to day. EPOS devices give you the flexibility to easily scale up and continually optimize your office space.

Your office layout and the devices within it have a direct impact on the performance of your Bluetooth devices. The EPOS team can help you examine your floorplan or walk through your offices to help you create the best set up.

## Repairing Lost Packets – Managing RF interference

A lost packet occurs when the data being transmitted over the Bluetooth signal is disrupted. Solutions for dealing with this vary from vendor to vendor. At EPOS, we apply proprietary algorithms to repair lost packages and assure high-quality audio.

## Don't Let Dual Connectivity Get in Your Way

Dual connectivity refers to connecting your Bluetooth audio device to multiple sources (such as your phone and your laptop) at the same time. This needs to be balanced so that a call is never lost and that channels are not polluted.



## Set and Forget with the Power to Optimize

EPOS Bluetooth devices automatically manage technical parameters such as operational range setting. The free-to-use EPOS Manager allows you to analyze devices across locations and provides insights on how to work smarter.

WiFi frequency interference is a common issue with Bluetooth, resulting in clicks and pops on calls. This issue can be managed by using a dedicated base station or a dongle attached to the phone, computer, or other device. This creates a "closed circuit" which ensures consistent audio quality.

\* For more information, please visit: <https://www.eposaudio.com/en/dk/enterprise/partnerships/technology-partners/uc-partners>



# Setting Bluetooth Device Density Guidelines in Your Workplace

## **Gain Flexibility with A DECT Mesh Combined Solution**

To achieve the strongest and most stable connectivity possible, you can utilize multiple wireless frequencies. EPOS offers a mesh solution combining Bluetooth and Digital European Cordless Telecommunications (DECT), which are the two main wireless protocols used to connect wireless audio devices.

DECT headsets can support much higher user densities compared to Bluetooth. DECT devices are also more resilient to interference from WiFi and connected electronics.

Both wireless standards offer a secure, reliable way to connect telecommunications devices with each other. Our mesh combined solution gives you the power to choose between the two, based on your specific situation.

## **Stay Secure with Bluetooth and DECT**

For everyday use, Bluetooth provides a high level of security, making calls virtually impossible to intercept. For those especially concerned with the privacy of their calls, including healthcare professionals, legal consultants, or similar, DECT offers an extra level of security.

## **Make Work Sound Better, Wherever You Are**

Providing you with excellent sound clarity even in high density environments is a top priority for EPOS. If you would like to learn more about optimizing Bluetooth performance for your work force, we're here to help.



# EPOS legal disclaimer

At EPOS we strive for ensuring the best security measures in our Bluetooth® products. However, we cannot be held responsible with regard to compensation for damages or expenses due to any security breaches taking place on the part of the customer by using our Bluetooth® products.

Although EPOS has implemented precautionary measures to ensure a high security level, it is the customer's responsibility to check and configure appropriate settings of his Bluetooth® device to maintain security. Security measures implemented in the EPOS device may not be supported by the customer's device which may reduce the security level of a Bluetooth® connection.

The customer acknowledges that encryption of the Bluetooth® connection only applies to the wireless connection between paired devices. Communication links and contents transferred by an encrypted Bluetooth® connection (i.e. telephone calls) are not encrypted by the EPOS Bluetooth® device. The customer further acknowledges that no technology provides complete security. For higher security require-

ments than provided by the Bluetooth® standard, additional measures must be implemented by the customer.

Nevertheless, EPOS will be liable for damages from injury to life, body or health due to negligent breach of duty by EPOS or damages arising from a breach caused by gross negligence or willful intent by EPOS.

EPOS is also liable for negligent breaches of essential contractual obligations. Essential contractual obligations means obligations whose performance is a fundamental prerequisite for the proper execution of the contract and on which a contracting party may rely upon. In this case, compensation is limited to foreseeable, typical damages.

The above provisions also apply to damages caused by a legal representative or a person used to perform an obligation of EPOS.

EPOS' liability according to the Danish/ European Product Liability Act unaffected.





