# (III odeon omni

# User manual

A light-weight, wireless omni-directional sound source for room impulse response measurements.





## (modeon omni User manual

Updated in November 2023

Odeon A/S DTU Science Park Diplomvej, building 381 DK-2800 Kgs. Lyngby Denmark Tel: +45 8870 8845 Fax: +45 8870 8090 info@odeon.dk www.odeon.dk Thank you for purchasing **Odeon Omni**, a light-weight, wireless omni-directional sound source intended for room impulse response measurements. The source follows the ISO 3382 standard in terms of directivity and derivation of room acoustic parameters. It works on an aptX Bluetooth connection up to 30 m distance, which is sufficient for use in small to moderate venues (auditoria, small concert halls, classrooms, offices, restaurants, worship spaces etc.). The source can also be connected with an audio cable via a minijack 3.5 mm pin.

It has a built-in amplifier and lithium batteries that can be recharged directly on the device and provide about 1.5 hours of continuous measurement.

## Warranty and support

Every **Odeon Omni** is hand-assembled and tested thoroughly for normal operation before being packed and shipped. If **Odeon Omni** does not function as expected, please contact Odeon A/S at **support@odeon.dk**. **Odeon Omni** comes with 1 year warranty from the date of delivery. During this period, defective products will either be repaired or replaced free of charge.

## **Remarks and limitations**

The warranty does not cover damage caused by accidents, transportation, incorrect use, abuse, charging with inappropriate adaptor types or incorrectly inserted batteries.

Odeon A/S accepts no responsibility for subsequent damage of any kind. The warranty will be voided by carrying out repairs or services by third parties who are not part of an approved Odeon A/S service point.

- Always use the provided DC power supply or an equivalent with the same specifications. Damage caused by using an inappropriate external DC supply is not covered by warranty.
- Never insert batteries without consulting Odeon A/S first. Damage caused by inappropriate batteries or by inserting with the wrong polarity is not covered by warranty.
- Be gentle when you operate the button, plug in an audio cable or slide in **Odeon Omni** into the tripod pin. Damage caused by abuse is not covered by warranty.
- Damage caused by dropping **Odeon Omni** is not covered by warranty.
- Damage caused by using **Odeon Omni** in a damp environment is not covered by warranty.

# Keep your serial number safe

Your **Odeon Omni** comes with a card that contains the serial number of the device. Keep that card in a safe place or copy the number for any communication with Odeon A/S.

# \land Safety Warnings

- Always wear ear protection when operating **Odeon Omni** at high levels.
- Use only the supplied charger or another one with exactly the same specifications (consult the manual).
- In case Odeon Omni becomes hot or emits smoke during charging, remove the charger immediately.
- Do not take **Odeon Omni** apart without consulting **Odeon A/S**.
- In the rare case that you have to change the batteries, be extremely cautious with the polarity. Follow the + marks in the battery case. If the batteries are inserted with the wrong polarity, the electronics will be permanently damaged and there is a serious fire hazard.
- Odeon Omni is not waterproof. Do not expose to water.
- Do not leave **Odeon Omni** in direct sunlight for an extended time and pay attention to the working temperature in the specifications section in this manual.
- Do not drop **Odeon Omni**, as there is a risk of damaging the cabinet and the electronic components.
- To avoid excess heating of the loudspeaker driver, try to make intermittent measurements.

# **Packing list**

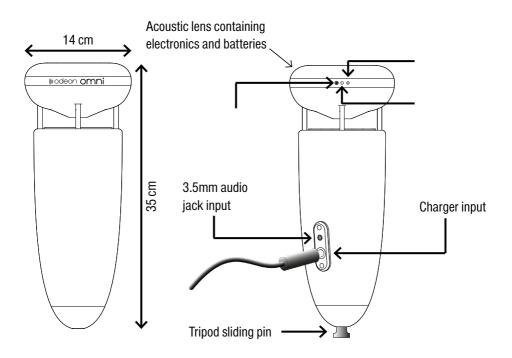
**Odeon Omni** is shipped inside a professional-grade backpack (rucksack) which includes the following items:

- One Odeon Omni source device.
- One DC charger with EU, UK or USA adaptor, depending on the destination country.
- One light-weight aluminium tripod with an **Odeon Omni** mounting pin pre-screwed and glued on it.
- O-rings to reduce vibrations from the source to the tripod (1 piece attached to the mounting pin and 2 spare pieces).
- Serial number card.
- Quick-start guide.

# System requirements

- **Odeon Omni** can be connected wirelessly to any device that includes a Bluetooth transmitter (Laptops, smartphones, tablets). However it is strongly recommended that your device supports **aptx** Bluetooth (5<sup>th</sup> generation), which ensures minimal signal distortion at long distances.
- PCs running Windows 10 or later are recommended for highest compatibility between the Bluetooth transmitter and **Odeon Omni**.
- If **Odeon Omni** is connected with an audio cable, a built-in sound card or an audio interface needs to be used along with the PC.
- **Odeon Omni** can be used with any audio software. However, ideally you should use ODEON to take advantage of the inverse filter and pre-calibration files supplied with the software. The inverse filter compensates for the frequency response of the source. The pre-calibration files can be used for performing Sound strength (G) and Speech Transmission Index (STI) measurements without the need of a calibration procedure in a reverberation or anechoic chamber.

# **Quick reference**



#### **Operation button**

The **Odeon Omni** has a single button for all three basic functions: Turning on, turning off and forcing to disconnect device.

#### **Power status LED**

The Power status LED provides five indications:

- Solid green: Odeon Omni is switched on.
- Momentary red: Odeon Omni is being turned off.
- Blinking red: Battery is low. **Odeon Omni** needs to be charged.
- Solid orange: Battery is charging.
- LED off while Odeon Omni is connected to the power supply: Battery is full.

#### **Bluetooth LED**

The Bluetooth LED provides three indications:

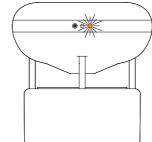
- Blinking blue: The device is in pairing mode or available for connection.
- Solid blue: The device is connected to a Bluetooth transmitter.
- Blinking purple: The device is playing back sound.

**Note:** The functions of the LED are solely for Bluetooth connection. For audio-cable connection, no indication is provided since Bluetooth is by-passed.

## 1. Charge Odeon Omni

Odeon Omni is shipped uncharged. You should let it charge for approx. 6 hours before the first use.

- 1. Connect the supplied charger to a 110 - 230 V power outlet.
- 2. The power status LED is lit solid orange while **Odeon Omni** is charging.
- 3. The power status LED turns off when the battery is fully charged.
- 4. Under normal use, the power status LED alternates between green and red when **Odeon Omni** needs to be recharged.





Power status LED turns off.

## 2. Mount Odeon Omni on the tripod

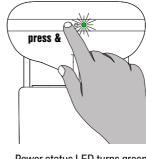
**Odeon Omni** comes with a lightweight tripod, with a sliding pin permanently mounted on it to reduce vibrations.

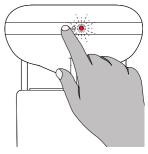
- To mount **Odeon Omni** on the tripod, 1 slide it gently on the pin through the hole at the bottom.
- 2. Make sure that the anti-vibration rubber o-ring stays attached at the bottom of the aluminium pin, and that the device rests on it

## 3. Switch Odeon Omni on/off

When Odeon Omni is switched on, it will automatically connect to the latest used PC or any other device (e.g. your smartphone).

- To switch Odeon Omni on, short press 1. the operation button.
- 2. Normally **Odeon Omni** will be connected to the latest used device. If not, try to connect Odeon Omni manually from vour Bluetooth device. See how to pair and connect in the next section

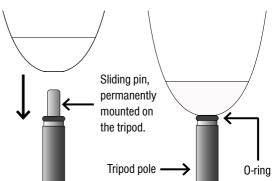




Power status LED turns green.

Power status LED turns red.

To switch **Odeon Omni** off press and hold the operation button for at least **2 sec**, until the power status 3. LED turns red. Release the button. The source is completely switched off after approx. 2 sec.



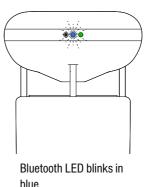
Power status LED turns orange.

## 4. Pair & connect Odeon Omni to a PC/device using Bluetooth

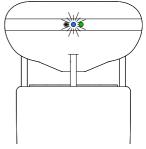
**Odeon Omni** connects to audio devices via Bluetooth. PCs running Windows 10 or later are recommended, but any device supporting an **Aptx** Bluetooth connection can be used. While **Odeon Omni** is switched on, it will be in pairing mode, as long as it is not already connected to a PC/device.

- 1. Turn Odeon Omni on.
- 2. If connecting to a PC, search for Bluetooth & other devices in your Windows Settings app (Windows 10 and later).
- 3. Click the 'Add Bluetooth or other device' button. The list of detected devices will include **Odeon Omni**. Press 'Add device'.
- 4. If the connection is succesful, **Odeon Omni** will appear as connected in the list of devices. The Bluetooth LED should be lit solid blue.
- 5. If the connection is rejected, it is probably because **Odeon Omni** is already connected to another PC/ device. See next section for how to disconnect from other devices.





# Odeon omni connected

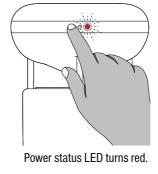


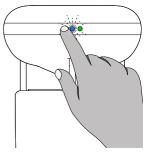
Bluetooth LED is lit solid blue.

### 5. Disconnect Odeon Omni from any PC/device

You can disconnect **Odeon Omni** either from the Bluetooth menu of your PC/device, or directly using the operation button:

- 1. Switch **Odeon Omni** off by pressing the operation button for at least **2 sec**.
- Press and hold the operation button for about **6 sec**, until the Bluetooth LED turns blue. Release the button immediately. During this process, the last connected device is forced to be disconnected.





Power status LED turns green. Bluetooth LED blinks in blue.

3. The source is now available for pairing and connecting with any PC/device.

### 6. Connect Odeon Omni to a PC using an audio cable

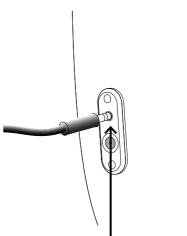
You may use a (mono/stereo) 3.5mm jack audio cable to connect **Odeon Omni** with either the built-in audio output of the PC or an external audio interface. The second option is often preferable for better audio quality. Regardless of the type of cable, the source will only play the left channel.

1. Switch Odeon Omni off.

4.

- 2. Connect the 3.5mm jack audio cable to the PC/audio interface and **Odeon Omni**.
- 3. Turn **Odeon Omni** on by short pressing the operation button. **Odeon Omni** should now be ready to receive audio from the cable connection.

In this mode, cable playback is prioritized over Bluetooth. This means that a Bluetooth device can still connect to **Odeon Omni**, but no audio will be transmitted.



To remove the audio cable, it is recommended to first switch **Odeon Omni** off.

Mono or stereo 3.5 mm jack.

## 7. Selecting Odeon Omni for measurements

Once **Odeon Omni** is connected with a PC, it will be shown in the list of output/playback devices on Windows. It should be possible to select the device in any software used for acoustic measurements.

- If **Odeon Omni** is connected via Bluetooth it will be shown as Speakers (OdeonOmni) in the list of output devices of your audio software. The following screenshot shows ODEON's Measuring interface with **Odeon Omni** in the list of output audio devices.
- If **Odeon Omni** is connected via an audio cable, it will be shown with the name of sound card/audio interface that is used for the connection.

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°	-6 dB	27 dB	Output Device
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-12		_	
-18	-10 d0	21 dB	Inverse filter
-24	-24 d8	18 dB	Ps [Hz] 44100
-30		15 dB	Input Device
-36			Device Microphone Array (Realtek(R) Audio
-42		12 dB	Inverse filter
10 10 10 10 10 10 10 10 10 10 10 10 10 1		9 dB	_
	-48 d8	6 d8	Type Individual channels Channels 1
-60 -		-	Calibration and measurement conditions
-66 -		3 d8	Calibration file (for SPL, G, G(early), G(late), LLG)
-72 -		0 dB	-
-78		-3 dB	
-84			Air conditions defined at measurement
-90		-6 dB	Temperature 20,00 + °C (68,00°F)
-96	-76 45	-9 dB	Relative humidity 50,00 + %
-96 In 1		-12 dB	
		-15 dB	Advanced settings (optimize sweep)
🔲 Hold 🔛 Max	96 dB	-13 db	

Device connected via Bluetooth, shown as **OdeonOmni**.

## **Typical connection diagram**

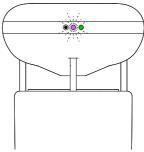
The diagram below shows a possible measurement setup with **Odeon Omni**, a microphone and a laptop with ODEON. The stronger feature of **Odeon Omni** is its capability to connect wirelessly via Bluetooth, and it is recommended to be used in this way. The measuring microphone has to be connected via cables to the laptop. There can be several variations to this setup. For example, a USB microphone can be used, which has its own sound card and can be connected directly to the laptop, without the need of a high-quality external audio interface.

#### Laptop with Bluetooth transmitter



### 8. Playing back audio

- If **Odeon Omni** is connected via Bluetooth, the Bluetooth LED will blink in purple during playback.
- If **Odeon Omni** is connected via an audio cable, no special indication is provided from the Bluetooth LED.
- There is significant consumption of power only during playback.
- When not playing back, the source remains on standby state automatically, consuming minimal energy.



Buetooth LED blinks in purple.

# Troubleshooting

Below you will find a list of common issues that you can experience with **Odeon Omni**. Please ensure your question is not answered below, before you contact Odeon A/S at support@odeon.dk.

### **Problems connecting Odeon Omni via Bluetooth**

#### 1. I cannot see Odeon Omni in the list of available devices

Possible solutions:

- Make sure Bluetooth is tuned on in your device.
- Move Odeon Omni closer to the device you are trying to connect with.

#### 2. My device is rejected by Odeon Omni when I try to pair/connect

It is likely that **Odeon Omni** has been connected to the most recently used device. This does not allow other devices to connect. Possible solutions:

- On the most recent transmitter device, manually disconnect **Odeon Omni** or simply turn Bluetooth off.
- Force any previously connected device to be disconnected, by following the procedure in section 5.

# **3. I followed section 5 for disconnecting another device, but the device remains connected.**

Repeat the process of section 5 and apply the following recommendations:

- Try to press the operation button for a longer time.
- You may also move **Odeon Omni** far from the present location. When it is out of range from the connected device, it will be possible to pair and connect with your new device.

#### 4. How can I find out what Bluetooth version does my PC run?

**Odeon Omni** works best with Bluetooth 5.1 and later, which supports Aptx technology for low latency and high sound quality.

- PCs that operate on **Windows 10** and later will be by default equipped with Bluetooth 5.1 or later, which should work smoothly with **Odeon Omni**.
- For PCs that run older versions of Windows, you need to check what driver the pre-installed Bluetooth transmitter runs:
  - Go to the Device Manager on your PC and expand the list of Bluetooth devices.

- Normally this list contains many entries, but you should be able to see a device listed with the word 'Adapter' next to it. The rest of the name can vary. This should be the Bluetooth transmitter on your PC. See the example in the screenshot on the next page.

- Double-click to get the Device Properties.
- Go to Advanced. There you should be able to see the exact driver's version as LMP XX...

- If the name of the driver is LMP 10 or LMP 11 (any increment of them) then it runs Bluetooth 5.1 or later, which is compatible with **Odeon Omni**. You can visit <u>this link</u> for more information about drivers.

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8 Bluetooth LE Generic Attribute Service	
8 Bluetooth LE Generic Attribute Service	General Advanced Driver Details Events Power Management
8 Bluetooth LE Generic Attribute Service	Bluetooth Radio Information
8 Bluetooth LE Generic Attribute Service	Name LAPTOP-1JIV8RDN
Bluetooth LE Generic Attribute Service	
Bluetooth LE Generic Attribute Service	Address: (90:e8:68:f9:3b:9a)
Bluetooth LE Generic Attribute Service	Manufacturer Id: 70
8 BW-BR4	
BW-BR4 Avrcp Transport	Firmware HCI 11.2336 / LMP 11.8712
3 JBL GO 2	
3 JBL GO 2 Avrcp Transport	Default
BL TUNE710BT	Dorda
BL TUNE710BT Avrcp Transport	
8 LE_WH-1000XM2	
8 LE_WH-1000XM2	
8 LE_WH-1000XM2 Avrcp Transport	
8 LE-Antoinephones	
8 LE-Antoinephones	
8 LE-Jasper Bose	
🚯 MediaTek Bluetooth Adapter	
Microsoft Bluetooth Enumerator	
8 Microsoft Bluetooth LE Enumerator	
8 Odeon Omni	OK Cancel
<ul> <li>8 Odeon Omni Avrcp Transport</li> <li>8 Smart Tank Plus 550 series</li> </ul>	

#### **Playback issues**

#### 1. Odeon Omni turns off when I increase the playback level

Possible solutions:

- Charge Odeon Omni. Remember to let your Odeon Omni fully charge for approx. 6 hours before the first use.
- Let Odeon Omni cool without performing measurements, as it might have overheated.

#### 2. There are dropouts during Bluetooth connection

Possible solutions:

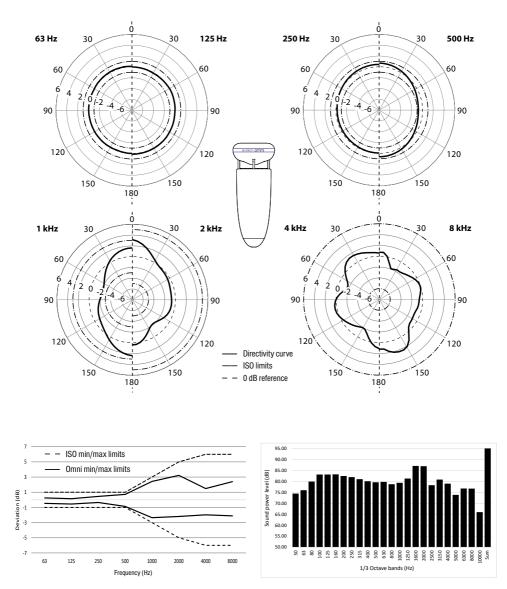
- Charge **Odeon Omni**. If the batteries are very low in charge, the Bluetooth antenna will not have enough power to maintain a stable connection.
- Try to keep Odeon Omni within the allowable Bluetooth range (up to 35 m without obstacles, as listed in the Specifications section). Note that this range is reduced significantly when there are obstacles involved (e.g. walls, doors).

# **Specifications**

Weight	1.5 kg
Frequency range(±6 dB)	63 - 8000 Hz octave bands
Number of speaker drivers	1 full-range driver (3.5 inches)
ISO standards supported	ISO 3382, ISO 14257
Sound power level (max)	96 dB, broadband
Electric power	30 W rms, 4 Ohm
Capacity of batteries (pre-installed)	4 x 3000 mAh, 3.6 V
Battery life	1.5 hour continuous playback at max. level
Wireless connectivity	Bluetooth 5 <sup>th</sup> gen. with aptX*
Wireless distance	Up to 35 m without obstacles, up to 10 m with obstacles
Cable connectivity	3.5 mm audio jack input
Mounting	Sliding aluminium pin with 1/4 inch thread (camera standard)
Temperature range	10° to 45° Celsius
Dimensions	35 cm length x 14 cm diametre
Material	Gel-coated fiberglas, aluminium
Charger	Includes EU, UK or USA interchangeable adaptors. Input: 100 - 240 V (AC), 1.0 A Max, 50-60 Hz. Output:12V DC, 2.0 A DC
Tripod mounting	Sliding pin, permanently mounted on the tripod

\*This depends on the Bluetooth transmitter available on the laptop. Typically laptops with Windows 10 and 11 support Bluetooth 5th generation. Otherwise, use an extarnal USB Bluetooth adaptor.

## **Directivity patterns**



Simplified directivity plot showing the largest deviation from the reference level (0 dB). The plot uses the min and max values from each polar plot in the figure above.

Max sound power of OdeonOmni per 1/3 octave. Last column: broadband sum.

# EU Declaration of Conformity

Declaration No:					
Supplier:					
	DTU Science Park, Diplomvej Bldg. 381, 2800 Lyngby, Denmark				
Product:					
FTUUUGI.	A light-weight, wireless omni-directional sound source intended for room impulse response measurements. The source follows the ISO 3382 standard in terms of directivity and derivation of room acoustic parameters. The device has a size of approximately 35 cm x $Ø14$ cm, it is powered by rechargable batteries and connects via Bluetooth to a computer. The main body is made out of black, gel-coated fiberglass and includes a few blue aluminium components.				
Directives and Standards:	The product above is in conformity with the following directives and standards:				
	(	EN 50663: 2017 EN 62368-1:2014+A11: 2017			
Testing body:	The declaration was issued based on the test results provided by: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabi- anxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China. Attestation No.: LCS211105091AE.				
Declaration:	This declaration of conformity is issued under the sole responsibility of the sup- plier:				
	Lyngby, Denmark, 20 June 2022	<b>Odeon A/S</b> Claus Lynge Christensen, Managing Director			