Court II	Frequencies/Bai	ids Syste	em regions	Spare groups	Coordinat	tion [18]	Allocation	Markers Log	messages
Scan		Channel na	Stationary devi	System frequen	Frequency	Portable dev	Selective antenna	boos Spare frequencies	1
E		20-2	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	-	0	
<b>_</b>	<b>*</b>	21-1	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	-	0	
Г		21-2	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000		0	
		22-1	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	-	0	
Г		22-2	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	<ul> <li></li> </ul>	0	
Г		23-1	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	-	0	
E	<b>*</b>	23-2	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	-	0	
E .	<b>*</b>	24-1	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	-	0	
Г	<b>*</b>	24-2	EM 6000 (RF	470,200 - 558,0	710,000 MHz	SK/SKM 6000	-	0	
	-	55-1	EM 9046	710,000 - 797,9	710,000 MHz	SK/SKM 9000	B1-B8 (#1)	0	
E .	-	55-2	EM 9046	710,000 - 797,9	710,000 MHz	SK/SKM 9000	B1-B8 (#1)	0	
<b>_</b>	<b>*</b>	55-3	EM 9046	710,000 - 797,9	710,000 MHz	SK/SKM 9000	B1-B8 (#1)	0	
	<b>*</b>	55-4	EM 9046	710,000 - 797,9	710,000 MHz	SK/SKM 9000	B1-B8 (#1)	0	
0		×							Device filters (all)
				d					FM mics
			ENG 1					ENG 2	🖬 IEM systems
dBm 💌									🗹 Others
dBm 💌 🚽									
dBm					1. 1. I.				System item filters (all
dBm ♥ -30									System item filters (all
-40 -50					M				System item filters (all
dBm ▼ -30 -40 -50									System item filters (all
dBm ▼ -30 -40 -50									System item filters (all Markers Thtermodulation Device ranges Spare groups
dBm ▼ -30						EM 9046 - 81.85	2 (620 - 708 MH)		System item filters (all Markers Intermodulation Device ranges Spare groups System regions
dBm  .30 .30 .50 .60 .70 .						EM 9046 - 81-88	8 (630 - 798 MHz)		System item filters (all Markers Intermodulation Device ranges Spare groups System regions Social data Sustem freeded

# **Wireless Systems Manager**

Software Help

PDF export of the original HTML instructions

# Contents

1. Preface	. 5
2. Product information	6
Important information	. 6
Compatible Sennheiser products	7
System requirements	. 9
3. Getting started/setting up	10
Putting the system in operation	10
Installing the WSM software	10
Configuring the network	12
Launching the WSM software	13
Setting the language	14
Allowing analytics	15
Using several WSM software in a network	.16
The operator interface of WSM	25
Main window	25
Overview of menus	30
Layout of the panel	36
Configuring the system in Offline mode	41
Creating a new configuration	42
Pre-configuring device parameters	45
Transferring the configuration to the devices	47
4. Working with the software	49
Claiming	49
Claiming single device	50
Bulk claiming	52
Authentication during operation	54
Changing the password	56
Updating the firmware of devices	58
Displaying the firmware versions of the devices	58
Downloading the latest firmware update from the Internet	60
Preparing the firmware update	.61
Factory reset for EW-DX	65
Frequency management	66
"Easy Setup" frequency management	67
Monitoring system	68

# 

Microphone system	70
Defining, adding and exporting new frequency ranges for stationary de	evices 72
"Professional Setup" frequency management	75
Launching the "Professional Setup" frequency management	75
Overview of the "Professional Setup" window	76
The tabs	79
Devices	81
Frequencies/bands	
System Regions	96
Spare Groups	100
Coordination	103
Allocation	105
Markers	109
Loading the regional frequency grid, performing a frequency scan and the frequency spectrum	analyzing 111
Working with scenes	117
Master Scene	117
Adding new scenes	118
Selecting a scene	119
Renaming a scene	120
Copying and pasting scenes	121
Deleting a scene	122
Scene commentary (label)	123
Working with panels	124
Creating panels	124
Enlarging/reducing panels	125
Selecting several panels	126
Changing the graphical representation of panels	127
Warning and error messages	133
Aligning and moving panels	136
Adding a panel to a different scene	137
Sorting panels for multi-channel systems	138
Identifying channels	139
Panel commentary (label)	140
Deleting panels	141
Configuring devices	142
Configuring streaming	142

Setting parameters in the "Properties" window	145
Enable Legacy Mode	149
Enable Third Party Access	151
Recording the field strength using the tools	154
The "RF Spectrum Analyzer" tool	154
The "RF Level Recorder" tool	158
Working with the tools	162
Setting the frequencies – "RF Spectrum Analyzer" only	164
Overview of the buttons of the tools	168
Starting the field strength recording	
Interrupting the field strength recording	
Canceling the field strength recording	172
Deleting the last field strength recording	
Zooming the "RF Level" window in/out	174
Temporarily saving recordings and comparing them	175
Marking measured values and commenting on them	177
Finding minimum and maximum values	179
Saving recording data	180
Loading previously saved recording data	181
Printing recording data	
5. Troubleshooting	
Frequently asked questions	183
If a problem occurs	185
Hardware	185
Software	
Glossar	
6. Contact	190

# 1. Preface

### PDF export of the original HTML instructions

This PDF document is an automated export of an interactive set of HTML instructions. It may be the case that not all contents and interactive elements are contained in the PDF as they cannot be presented in this format. Furthermore, automatically generated page breaks may cause coherent contents to be moved slightly. We can therefore only guarantee the completeness of the information in the HTML instructions, and recommend that you use these. You can find these in the download section of the website under www.sennheiser.com/download.

# 2. Product information

Information about supported devices and compatible Sennheiser products.

Important information Compatible Sennheiser products System requirements

# Important information

Additional information on the Wireless Systems Manager software can be found at sennheiser.com/wsm.

Additional information on the transmitters and receivers can be found in the individual instruction manuals on the product pages at sennheiser.com/download.

Always make backups when you create or edit configurations and store the backups in a safe location.

When you are using a firewall, please provide access via the corresponding ports for the WSM.

# Compatible Sennheiser products

The following Sennheiser systems can be configured using the WSM:

**i** Only transmitters and receivers that are equipped with the same compander system can be combined with each other.

## Digital 9000

• Required Firmware Version (or higher): 4.0.1

### Digital 6000

- EM 6000
  - Required Firmware Version (or higher): 3.2.1
- L6000
  - Required Firmware Version (or higher): 3.0.1

#### EW-DX

- EW-DX EM 2
  - Required Firmware Version (or higher): 2.0.1
- EW-DX EM 2 DANTE
  - Required Firmware Version (or higher): 2.0.1
- EW-DX EM 4 DANTE
  - Required Firmware Version (or higher): 2.0.1

### EM 373x (COM) + EM 373x-II (COM)

- Required Firmware Version (or higher): 2.2.0
- Required Firmware Version (or higher): 1.8.1
- Required Firmware Version (or higher): 1.8.1



#### ew 300 G4

• Required Firmware Version (or higher): 1.2.0.1

#### ew 500 G4

• Required Firmware Version (or higher): 1.2.0.1

#### ew IEM G4

• Required Firmware Version (or higher): 1.2.0.1

#### ew 300 G3

• Required Firmware Version (or higher): 1.8.0

#### ew 500 G3

• Required Firmware Version (or higher): 1.8.0

#### ew 300 G3 IEM

• Required Firmware Version (or higher): 1.8.0



# System requirements

The WSM software runs on the following operating systems:

### Windows

Windows 10 (32 Bit/64 Bit)

Windows 11 (32 Bit/64 Bit)

8 GB RAM

#### Mac

macOS 13 Ventura macOS 14 Sonoma 8 GB RAM

# 3. Getting started/setting up

First steps for starting the software, description of the interface and offline mode.

Putting the system in operation The operator interface of WSM Configuring the system in Offline mode

# Putting the system in operation

Related information Installing the WSM software Configuring the network Launching the WSM software Setting the language Allowing analytics Using several WSM software in a network

# Installing the WSM software

#### To install the WSM software on your computer:

- Download the current version of the WSM software from the product page at sennheiser.com/wsm.
- Close all currently running programs, including those running in the background (e.g. anti-virus programs).
- Start the installation by double-clicking on "x.x.x-xx.exe" (Windows) or "x.x.xxx.dmg" (Mac).
  - **i** Automatic installation of Rosetta to use WSM for Macs with Apple silicon. Learn more about Rosetta from Apple: Installing Rosetta.

Follow the wizard's instructions.



**i** You can install the WSM software on several computers in a network (see Using several WSM software in a network).

# Configuring the network

All devices are factory presetto automatic IP address assignment.

To enable communication between the WSM software and the connected devices, configure the network (LAN connections) as follows:

#### Automatically obtaining an IP address

- Go to the Network Settings in your operating system.
- In the Internet Protocol (TCP/IP) properties window select the "Obtain an IP address automatically" option button for PCs or the "Configuration DHCP" option button for Macs.

The assignment of an IP address may take some minutes. With this, the configuration of the network is terminated.

**i** Only launch the WSM software after having configured the network. For information on how to connect the transmitters and receivers to the computer, please refer to the individual instruction manuals.

If you want to use several WSMs in a network, please follow the instructions in chapter Using several WSM software in a network.



# Launching the WSM software

#### When you have connected the devices:

Switch on all connected devices.

#### To launch the WSM software:

- Double-click on the program icon on the desktop. Or
- Click on Start > Programs > Wireless Systems Manager.



# Setting the language

- Click on "Language" and select the desired language.
  - ✓ A tick appears in front of the selected language.



 $\checkmark$ 

English (English)
 Deutsch (German)
 Français (French)

The language of the software interface is changed.



# Allowing analytics

WSM uses anonymous data analytics to unterstand app usage and improve your experience.

No personal or identifiable information are collected.

#### To allow anonymous analytics:

- Click on "System" > "Preferences".
- ▶ Go to the "Usage Analytics" tab.
- Activate the checkbox.

Remote Access	Usage Analytics				
WSM uses anon personal or iden	iymous data analytics itifiable information is ymous analytics to im	to understand app usage and collected. You can update you prove the app	l improve your experience. We re ir preferences anytime.	spect your privacy—no	

The analytics has been allowed.



# Using several WSM software in a network

#### Multi access function

The multi access function allows you to simultaneously network up to 6 computers with the Sennheiser devices. Configurable access rights establish clear procedures and hierarchies for your production.



You can install the WSM software on several computers in a network. For the individual application scenarios you can assign different rights for accessing the devices in the network (e.g. for the parameters):

- "Exklusive":
  - All access rights are assigned to only one WSM (see Have you selected "Exclusive" for the first WSM?).
  - The access rights cannot be shared with other WSMs.



- "Shared":
  - All WSMs have the same access rights (see Have you selected "Shared" for the first WSM?).
  - While one WSM is accessing a device (remotely), this device is locked for all other WSMs until this action is terminated.



- "Remote disable" (no access rights):
  - The WSM has no access rights.
  - The WSM is solely used for monitoring.





#### Proceed as follows:

- First define the access rights for only one WSM software (see Assigning access rights to a WSM).
- Adapt the access rights of all other WSMs to the settings of the first one (see Assigning access rights to additional WSMs). Or
- Deny access for all other WSMs (see Withdrawing access rights from a WSM).

#### **Related information**

Assigning access rights to a WSM Assigning access rights to additional WSMs Withdrawing access rights from a WSM Protecting the WSM with a password Registering a device with a static IP address

### Assigning access rights to a WSM

- Click on "System" > "Preferences".
- Under "Multiple machines" select one of the options "Exclusive", "Shared" or "Hands Over".

ingle remote machine	Password	
Single remote machine	No password	<ul> <li>Use password</li> </ul>
fultiple machines	Change password	
	Old password:	
<ul> <li>Exclusive (only this WSM instance has permanent access)</li> </ul>	New password:	
Shared (access as necessary)	Confirmation:	

#### To be able to access the devices:

Click on "System" and check if the "Remote Access" command is ticked.



#### If "Remote Access" is not ticked:

- Click on "Remote Access".
  - You may be requested to enter a password (see Protecting the WSM with a password). Enter the password.

A tick appears to the left of the item.

**i** If you have selected "Exclusive" or "Hands Over", red dots appear in the panels. These dots indicate that you have access to these devices.





# Assigning access rights to additional WSMs

When using additional WSMs in a network, adapt their settings according to the previously selected access rights. If you do not want to assign any access right to a WSM software, just deactivate it (see Withdrawing access rights from a WSM).

#### Have you selected "Exclusive" for the first WSM?

In this case, the first WSM being registered in the network owns all access rights. In order to avoid any collisions, you should deactivate access to the devices for all other WSMs (see Withdrawing access rights from a WSM).

**i** If you should assign "Exclusive" access right to several WSMs, then access is random. The WSM which registers quicker with the device owns all access rights. This can, under certain circumstances, lead to confusion during operation.

#### Have you selected "Shared" for the first WSM?

All WSMs with this access right are equal. While one WSM is accessing a device (remotely), this device is locked for all other WSMs until this action is terminated.

- Select "Shared" for all other WSMs in the network that shall obtain access rights.
- Proceed as described in chapter Assigning access rights to a WSM.

#### To request the access rights:

- Make the desired settings (e.g. parameters).
  - WSM transmits a message to the user of the WSM with the access rights. The user confirms the assignment of access rights.

The parameter is transferred to the device.



# Withdrawing access rights from a WSM

If you want to use a WSM exclusively for monitoring the system, you can withdraw the right to access the devices as follows:

Click on "System" and check if the "Remote Access" command is ticked.

#### If "Remote Access" is ticked:

- Click on "Remote Access".
  - ✓ The tick disappears.

The rights to access the devices are, thus, withdrawn.



# Protecting the WSM with a password

To protect this WSM and its devices against manipulation, you can enter a password; proceed as follows:

- Click on "System" > "Preferences".
- Select the "Use Password" radio button.

#### To set up a password:

- Enter your password in the "New Password" and "Confirmation" fields.
  - The "Old Password" field remains empty.

#### To change your password:

- Enter your old password in the "Old Password" field.
- Enter your new password in the "New Password" and "Confirmation" fields.
- If you want to disable the password protection, click on the "No Password" radio button.
- i If you should have forgotten your password, please contact your local Sennheiser partner.



# Registering a device with a static IP address

If you have assigned a device a static IP address, this device is not automatically detected by the WSM. You must manually register these devices with each WSM.

- In the system window, click on the "Devices" tab.
  - If the system window is not shown, click on "View" > "System window".

#### To register the device with a WSM:

- Right-click a free area in the system window.
- Click on "Add device".

Syste	m
Ī	Add device

- Click on the desired device.
- In the "IP Address:" field, enter the static IP address.

Z Add device									
To find your define the de	device, WSM needs the target IP a vice type and IP address and click '	ddres OK'.	ss. Please						
	EM2050	^							
	SR300 IEM G3								
	SR2000 IEM								
	SR2050 IEM								
	EM 300-500 G4								
	SR IEM G4								
	L6000	~							
	IP address:								
	Cancel OK								

- Registration of the device is now complete. The device is marked by a red cross in the system window. The device list is updated after a short time. A green tick appears in front of all detected devices.
  - **i** If the WSM cannot detect the device with the static IP address, check the settings of the device and of your network.



#### To save the registered device with the static IP address:

- Click on "File" > "Save Configuration" or "File" > "Save Configuration As...".
  - **i** If you close the WSM without saving the configuration, you must register the devices with a static IP address again. These devices are not detected automatically.

# The operator interface of WSM

This chapter describes the operator interface of the WSM software. You will become acquainted with the system setup and the individual menus.

Main window Overview of menus Layout of the panel

# Main window

Z Sennheiser-	Wireless Systems	Manager - Offi	ne mode			_											- 8 ×
File View S	cenes System	Lingsage C	annet hiegoer	ky Minager A	ppications He	, 											24
		0		R	0	<u> </u>		ß	R	R	R	ß	R	R	R	iystem	8 ×
CH1	012	ons P	074	una 👫	c==	c=7	CHE NO	СН1	042	00	DH4	CHS	016	CH7 CH8		Add Device	Expand All
ESG 2004Hrz	CSD, SYSCENE U U CRIMA B TA TA TA TA TA TA TA TA TA TA TA TA TA	CSS - LECOMPCC U COMP A - C CSS - C CS	SS2.0004H2 U dBr A B Ta Ta Ta Ta Ta Ta Ta Ta Ta Ta Ta Ta Ta	dire A B	U CBRA B R R R R R R R R R R R R R R R R R R R	ESS 2000 Held U U U U U U U U U U U U U U U U U U U	EXA ADDURINE U U U U U U U U U U U U U U U U U U U	400,000,00,000,000,000,000,000,000,000,	400.0000H12 U Com A B T T T T T T T T T T T T T T T T T T T	479,500,800 000 700 700 700 700 700 700 700 700	430,54000000 U dbm A 6 T T T T T T T T T T T T T T T T T T T	419,0000000 dbm A - 6 38 39 39 89 72 89 72 89 72 89 73 89 74 9 89 74 9 89 74 9 89 74 9 89 74 80 74 80 74 80 74 80 74 80 74 80 74 80 74 80 74 74 74 74 74 74 74 74 74 74	400,000412 0 0007A 8 74 74 74 75 74 74 74 74 74 74 74 74 74 74 74 74 74		SUM12 S	Induce (Media) (2 - 1 Construction (2 - 1) Construction	
O10	AF Bett	AF Batt	SRC000 EM	EM2050	O15	Butt	CO4	AF Bett	EM2050	AF Batt	AF Bett	O26	AF But	AF Balt AF		INVESTIGATES           VIE         RCI, 027, 678,000 MHz           VIE         RCI, 028, 679,675 MHz	
604,225MHz B CH U1 00	0,000MHz B.CH 1.00	632,40048Hz B.CH U1.00	0,8008842 B.CH 1.00	0,000WHz 8.CH 1.00	8.CH U1.00	834,500MHz B.CH U1.00	782,300MHz B.CH U1.00	791,035MHz B.CH U1.00		592,000MHz B.CH U1.00	678,000MHz B CH U 60	679,675MHz B.CH U.60	710,250MHz B.CH U.60			<ul> <li>EM2050-Gw-5</li> </ul>	
					8 											201, 54/2010, 0,000 MHz           201 002, 000 State           201 A02(55-0)=-6           201 A02(55-0)=-6           201 A02(55-0)=-6           201 002, 013, 752(47) MHz           201 A02(55-0)=-7           201 001, 013, 79(75) MHz           201 201, 013, 79(75) MHz           201 201, 014, 014, 014, 014           201 201, 014, 014, 014, 014, 014, 014, 014, 0	
Master Scene	+															SR2050 IEM-Bar-9     TR1, 002, 612,400 MHz     TR2, SR2050 IEM, 0,000 MHz     TR2, SR2050 IEM, 0,000 MHz	
					- 4												13/09/2023 14:22

The main window contains the following regions:

#### 1 Menu bar



The menu bar 1 is always visible.

You can select from the following menus (see Overview of menus and the following): "File", "View", "Scenes", "System", "Language", "Channel", "Frequency Manager", "Applications", "Help".



# 2 Symbol bar (tool bar)



You can operate the WSM via the menu bar 1 and via the buttons in the symbol bar 2. The symbol bar can be shown or hidden ("View Menu" > "Tool Bar").

### 3 Display area

Scene and panels





System window with tabs

System			×	
Add Device			Collapse All	
RX1 EW-DX EIVIA (EWDXEIVIA) -1	System		1	
PV2 EW/ DV 2 470 200 h	- System			
KAZ, EW-DA 2, 470,200 N	Time	Origin	Message	Severity
RX3, EW-DX 3, 470,200 N	11:17:58	System	Device refresh h	
🗙 🔜 RX4, EW-DX 4, 470,200 N	11:17:58	Sequencer	No valid networ	
× EM500 G3-2	11:17:58	System	Device refresh i	
	11:17:53	Sequencer	Cannot open se	
<b>N</b> NOT, EM150003, 510,0001	11:17:53	Sequencer	No valid networ	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: E	
	11:17:49	System	Plugin loaded: F	
	11:17:49	System	Plugin loaded: L	
	11:17:49	System	Plugin loaded: P	
	11:17:49	System	Plugin loaded:	
	11:17:49	System	Plugin loaded: S	
	11:17:49	System	Plugin loaded:	
Devices Messages				
	Devices	Messages		

With the standard settings, the display area 3 is divided in two. The "panels" for the connected devices are displayed on the left; this region is designated as the scene.

The tabs of the system window are displayed on the right.

#### Scene

In a scene, you can set up and sort panels (see Working with panels). Each panel displays a channel or a connected device.

When you create a new configuration, there is first only the "Master Scene". For a better overview, you can set up additional scenes. You can also copy panels, together with their panel settings, from one scene to another.

#### System window

The system window can be enlarged or reduced by dragging the border between the scene and the system window. By selecting the menu item "View" > "System Window", you can show or hide the system window.

You can toggle between the "Devices" (device list) and "Messages" (message list) tabs.

#### "Devices" tab

The "Devices" tab displays a list of all connected devices.



The devices connected to an EM 373x (COM), EM 373x-II (COM) or EM 6000 are displayed with the channel number (RX 1 / RX 2).



Device is switched on.

Device is switched off or WSM is in "Offline" mode (see Configuring the system in Offline mode).

**D** 

Device is indicated as a panel in the currently selected scene.

#### Color of the device:

- Red: Device is disconnected/offline
- Yellow: Device is unclaimed claim it by setting a new password
- Orange: Device is unauthenticated Password has already been set on the device enter that password and start using device
- Green: device authenticated device has been claimed and authenticated it is online and can be used

You can select one or several devices, drag these, as panels, in the current scene and change the device settings (see Working with panels).



"Messages" tab



System				×
Time	Orig	gin	Message	Severity
11:17:58	Syst	em	Device refresh h	INFO
11:17:58	Seq	uencer	No valid networ	
11:17:58	Syst	em	Device refresh i	
11:17:53	Seq	uencer	Cannot open se	
11:17:53	Seq	uencer	No valid networ	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: E	
11:17:49	Syst	em	Plugin loaded: F	
11:17:49	Syst	em	Plugin loaded: L	
11:17:49	Syst	em	Plugin loaded: P	
11:17:49	Syst	em	Plugin loaded:	
11:17:49	Syst	em	Plugin loaded: S	
11:17:49	Syst	em	Plugin loaded:	
Devices	Messages			

The "Messages" tab displays all messages of the devices. The messages appear in chronological order with their "Origin" and their "Severity".

#### 4 Status bar

To set up the configuration, please switch to offline mode.

1/18/21 1:38 PM

The last message from the devices is displayed on the left in the status bar 4.

The current date and time are displayed on the right.



# Overview of menus

#### The "File" menu

File	e	
	New Configuration	
	Open configuration Ctrl	+0
Η	Save configuration Ctrl	+S
E	Save configuration As	
	Default Configuration	
8	Print Ctrl	+P
18	Save Message Log	
5	Clear Message Log	
	Exit	

New Configuration: Creates a new configuration.

**Open Configuration...**: Opens a saved configuration.

Save Configuration: Saves the current configuration under the same name..

Save Configuration As...: Saves the current configuration under a new name.

Default Configuration: Restores the default configuration.

Print: Prints the current configuration as graphic or text.

Save Message Log ...: Saves the messages in the system window as a file ("Messages" tab).

Clear Message Log: Deletes the messages from the system window ("Messages" tab).

Exit: Terminates the "WSM".

#### The "View" menu





System Window: Shows or hides the system window.

Tool Bar: Shows or hides the tool bar.

Show Grid: Shows or hides the grid for aligning the panels.

Snap to grid: Aligns the panels to the grid if you move the panels.

**Auto Arrange**: Automatically arranges the panels side by side and one below the other, depending on the screen size.

#### The "Scenes" menu

Scenes	
Add new scene	Ctrl+N
Rename scene	F2
Copy Scene/Select and Copy All	
Paste	Ctrl+V
Select all channels	Ctrl+A
Delete scene	
Select Scene	•
A New label	

Add New Scene: Creates a new scene.

Rename Scene: Changes the name of the selected scene.

**Copy Scene**: Copies the current scene.

Paste Scene: Pastes the current scene.

Select all channels: Selects all channels.

**Delete Scene**: Deletes the selected scene from the display. The configuration of the devices is retained.

Select Scene: Changes to a different scene.

New Label: Creates a comment field in the selected scene.



#### The "System" menu



**Remote Access**: Activates or deactivates access to the parameter settings of the devices (see Displaying an overview of parameters).

**Refresh Device List**: Updates (refreshes) the device list in the system window ("Devices" tab). New devices are displayed, previously moved or deleted panels are repositioned in the display area.

Online mode: Enables operation of the connected devices (live operation).

**Offline Mode**: Must be activated for the pre-configuration ("Device Configuration", see **Configuring the system in Offline mode**). Device connections will be interrupted.

**Preferences**: For setting the access rights of different WSM in a network and for activating password protection (see Configuring the system in Offline mode).

#### The "Language" menu



Changes the language of the software interface..

English

Deutsch

Français



### The "Channel" menu

Channel	
Channel sorting	
Properties	
View Style	×
lcon	×
New label	
Identify channel	
Mute audio	
Panel Color	
Use Panel Settings As Default	
Use Default Panel Settings	
Сору	Ctrl+C
Remove/Cut	Ctrl+X

The following menu items can vary and depend on whether you have selected one panel or several panels.

**Channel Sorting...**: Sorts the sequence of panels in a scene according to user default (for EM 373x-II and stationary devices of the ew G3 and 2000 series; see Sorting panels for multichannel systems).

**Properties/Common Properties**: Displays the parameters of the selected device or the common properties of the selected devices.

**View Style**: Displays a submenu with a selection list of three different graphical representations for the "receiver" panels (see Changing the graphical representation of panels).

**Icon**: Displays a submenu with a selection list of different icons and numbers (see Selecting an icon for a panel). Pictures can also be used..

New Label: Creates a label for comments on the selected panel (see Pasting labels).

**Identify Channel**: Displays the device belonging to the panel (for EM 373x-II and stationary devices of the ew G3 and 2000 series; see **Identifying channels**).

Mute audio: Mutes the audio signal.

Panel Color...: Assigns a color to the border of the panel (see Changing the color of a panel).

**Use Panel Settings As Default**: Saves settings such as panel style, size, icon or number and color of the selected panel. These standard panel settings can be applied to other panels (see Defining standard panel settings and applying them).



**Use Default Panel Settings**: Applies the last saved standard panel settings to the selected panel (see Defining standard panel settings and applying them).

Copy: Copies the selected panel to the clipboard (see Adding a panel to a different scene).

**Remove/Cut**: Deletes the selected panel from the display area. The panel can be pasted to another scene. The settings of the panel and the device settings are retained (see Adding a panel to a different scene).

**Paste**: Copies the panel from the clipboard to the selected scene (see Adding a panel to a different scene).

#### The "Frequency Manager" menu

Frequency Manager	
Easy Setup	Ctrl+E
Professional Setup	Ctrl+F

**Easy Setup**: Detects and allocates unused frequencies to the system (see "Easy Setup" frequency management).

**Professional Setup**: Detects and allocates unused frequencies to the system (see "Professional Setup" frequency management).

#### The "Applications" menu

Applications	
Device Configuration	Ctrl+D
Stationary Devices	•
Firmware Update	Ctrl+U
🐱 RF Level Recorder	Ctrl+L
Spectrum Analyzer	Ctrl+M

**Device configuration**: Device pre-configuration in offline mode (see Configuring the system in Offline mode).

**Stationary Devices**: Allows to define, add and export new frequency ranges for existing stationary devices (see Defining, adding and exporting new frequency ranges for stationary devices).

Firmware Update: Starts the firmware update (see Updating the firmware of devices).

**RF Level Recorder**: Monitors the field strength of a receiver's diversity channels over a defined period of time and records the measured values (see The "RF Level Recorder" tool).



**Spectrum Analyzer**: Checks a defined frequency range for signals; monitors these signals and records the measured values using a stationary receiver (see The "RF Spectrum Analyzer" tool).

#### The "Help" menu



**Help...**: Opens a window in which the online help is displayed.

About...: Opens a window in which the version number is displayed.



# Layout of the panel

Every panel displays a stationary device. The graphical representation of the panel depends on the device type and the settings made under "View Style" in the "Channel" menu. For details on the possible settings, see Working with panels.

The following screenshot shows an example panel:



A red dot in the panel indicates that you have access rights for these devices (see Using several WSM software in a network).



### 1 Icon / number / picture



The top left corner of the panel can be provided with an icon, a number or a picture (see Selecting an icon for a panel).

Depending on the connected device, one of the following icons appears:

#### EM 373x (receivers only)



Lights up: An external word clock generator is connected and switched on.



Flashes: The receiver is not synchronized with the word clock generator (see instruction manual of the device).


The receiver is working with the internal word clock generator.

## EM 9046 (receiver only)



Streaming is not enabled (for information on how to enable streaming, see **Configuring streaming**).



Streaming is enabled but no stream is played. The letter R indicates that RTP/RTSP streaming is used.



RTP/RTSP streaming is active and streams can be listened to.

## 2 Name of the device

The name set on the device is displayed. The name can be changed in the "Properties" window (see Setting parameters in the "Properties" window).



## 3 Frequency and channel display

The frequency of the device appears below its name. The channel is displayed below the frequency (see "Easy Setup" frequency management and Working with panels).



## 4 Diversity display

The active antenna is displayed in green.



The labeling of the diversity sections depends on the device type:

- 3000 series receivers: "A" and "B"
- ew G3 and 2000 series receivers: "I" and "II"



## 5 Field strength display

The bar graphs indicate the current field strength. The horizontal yellow line indicates the set squelch threshold (see Working with panels).

If the field strength is below the squelch threshold, the bar appears in red and the audio output is muted.



## 6 Status field / Display of the audio outputs AF and COM

If a threshold value on the device is exceeded or undershot, a message appears in the status field.



The messages are highlighted in different colors. The part of the panel to which the message refers is also highlighted.

For the list of warning and error messages, see Warning and error messages.



## 7 Modulation display

Level indicator for the audio level at the transmitter.



The threshold values are displayed in color in the modulation display. A yellow section in the bar graph indicates that the transmitter is fully modulated. An additional red section indicates overmodulation. If this occurs, reduce the modulation level on the transmitter.

The modulation displays depend on the device type:

- 3000 series receivers: "Dev"
- ew G3 and 2000 series receivers and stationary transmitters: "AF"

With these receivers, the modulation can be shown in different views (see Changing the graphical representation of panels).

- "Variant" 1 and 3: The modulation is shown as a bar graph.
- "Variant" 2: The modulation is shown as a colored box. The display changes between three colors, depending on the state.

## 8 Battery status

The battery symbol indicates the charge status of the batteries. The graphical representation depends on the device and battery type (primary cells or accupack).



- Green: The battery is fully charged.
- Yellow: The battery is about half discharged.
- Red: The critical level is reached. The battery symbol flashes red. Additionally, a message appears in the panel, the system window ("Messages" tab) and the status bar.



The remaining accupack capacity is additionally displayed for ew G3 and 2000 series devices.



# Configuring the system in Offline mode

The WSM allows you to configure your wireless system in Offline Mode where and whenever you want. The set parameters can directly be transferred to your Sennheiser devices before the show. This helps you to save valuable set-up time at the production venue.



Creating a new configuration Pre-configuring device parameters Transferring the configuration to the devices



## Creating a new configuration

## Changing to Offline Mode

- Click on "System" > "Offline Mode". OR
- Switch the toggle in the top right corner.



If devices are connected, the link is interrupted. The corresponding panels will be highlighted in gray. The devices in the "Devices" tab of the system window are marked with a red "x".



## Adding devices to the list

Choose the device to be configured The available devices are displayed. Please sel load a configuration from a file.	t the devices to be configured and move to the 'Configurable devices' section. Click 'Add from file' if you wish to
Devices	Configurable devices
EM37311 EM373111 EM3732 EM373211 EM3732com-11 EM3732com-11 EM3006 EM9046 EW-DX EM2 EM300 G3 EM2000 EM2050 G3 EM2050 SR2000 IEM G3 SR2000 IEM G3 SR2000 IEM SR2050 IEM EM 300-500 G4 SR 2006 G4 EM 300-500 G4	EM6000 EW-DX EM2 EM9046 (8 channels)
	Delete Add from file

The window contains two lists. The left-hand list displays all WSM compatible devices. The right-hand list displays your current device selection.

- ▶ In the left-hand list, click on a receiver or a transmitter (IEM).
- Click on ">>".
  - The selected receiver or transmitter (IEM) appears in the right-hand list and is included in the system. Add any number of devices to your system.
- Click on "Next >".

Device configuration								×
Device allocation The selected devices are a	automatically allocated	to device. When all de	vices are at the corr	ect position, press N	lext to continue.			
Device	Port							
✓ EM6000(1)								
EM6000	R×1							
EM6000	Rx2							
EW-DX EM2(2)								
EW-DX EM2	R×1							
EW-DX EM2	Rx2							
✓ EM9046(3)								
EM9046	1							
EM9046	2							
EM9046	3							
EM9046	5							
EM9046	6							
EM9046	7							
EM9046	8							
							-	
						< Back	Next >	Cancel

Devices which occupy two ports are displayed twice. E.g.:



## ew G4/6000 series

- RX 1
- RX 2

## EM 9046

- 1
- 2
- 3
- 4
- 5
- 6
- 7 • 8

# Loading a list

If you wish to change an existing list, you can load this list ("Add from file...") and then add devices to or delete devices from the list.

×

< Back Finish Cance



After selecting a device, the names	s of the properties are shown in the "Pro	perties settings" window.				
Configurable devices	Property settings: Check the p	properties to be downloaded				
✓ EM6000(1)	Name	Value			Uni ^	
EM6000 470,200 MHz EM6	000 Frequency Range	470.200 - 713.800 MHz	~	MHz		
W-DX EM2(2)	Name	EM6000				
EW-DX EM2 470,200 MHz EW-	DX 1 Bank	B1	$\sim$			
<ul> <li>EM9046(3)</li> </ul>	Channel	0	$\sim$			
EM9046 470,000 MHz EM9	046 Frequency	470,200	*	MHz		
EM9046 470,000 MHz EM9	046 Encryption	Off	$\sim$			
EM9046 470,000 MHz EM9 EM9046 470,000 MHz EM9	046 > Frequency List				100	-
EM9046 470,000 MHz EM9	046 Y Sync Settings Tx					Save
EM9046 470,000 MHz EM9	046 Mic/Line mode	Auto	~			Copy properties
EM9046 470,000 MHz EM9 EM9046 470,000 MHz EM9	046 Gain	0	~	dB		Pasta proportion
	Low cut	30	~	Hz		Paste properties
	Display	Frequency	~		C	Copy/Paste is pos windows standard
	Lock	Off	~		i i	multi-selection wi
	Cable	Line	~			CTRL+left mouse Shift+left mouse !
	Power LED mode	On	~		C	CTRL+C/Apple+C
	RF Power	Standard	~			CTRL+V/Apple+V Copy is enabled o
	Sync Option:	Frequency only			8	it least one prope
	<ul> <li>Command mode</li> </ul>				s	selected. Paste is only if valid prope
		0-				opied to the clipt

## Pre-configuring device parameters

#### Changing device parameters

In the left-hand list, click on a device.

✓ The "Property settings" list displays the device parameters.

Unmatch All Select All

The parameters displayed depend on the type of the device.

The left-hand column (Name) displays the device parameters. The two columns on the right of it display the corresponding values (Value) and units (Unit).

**i** If you are changing the settings for the "Frequency", "Bank" and "Channel", the "Frequency" setting is prior-ranking. The bank and channel are selected according to the selected frequency.

Specific information on the parameters can be found in the instruction manuals for the devices. The settings of individual devices can also be changed later when the devices are already connected (see Changing the parameters of a device).

Click on the entry field or on the arrow next to the corresponding parameter.

Enter the desired value or select a value from the selection list. Make sure that the device type and the frequency range match. Information on the frequency range is given on the type plate.



## Copying parameters and pasting them to other devices

- Click on the device whose parameters you want to copy.
- Click on "Copy Properties" to copy the parameters.
- Click on the device to which you want to assign the copied parameters.
- Click on "Paste Properties" to paste the copied parameters to the device.

### Saving parameters

- Click on "Save".
- Select the folder in which you want to save the file.
- In the dialog box, enter a name for the "wsm" file.
- Set all parameters.
- Click on "Finish".
  - In the "Device" tab of the system window, the configured devices appear. To the left of them a red "x" is shown.





## Transferring the configuration to the devices



- Connect the devices.
- Switch on all devices.

## To change to Online mode:

- Click on "System" > "Online mode".
  - You can use either the parameters from the offline configuration or the device parameters.



## If you want to use the device parameters:

- Click on "Load device settings to WSM".
  - The WSM takes over the device parameters. The offline configuration is not used in this case.

×



#### If you want to transfer the set parameters from the offline configuration:

- Click on "Match configuration to devices".
  - The connected devices are searched. The following window appears.

Device configuration

Map device The configured and available devices are shown. Mismatched devices are shown in red. At least one actual device must be present for the wizard to proceed.

onfigured:				The position of actual of Actual	devices can l	be char	nged b	oy drag & drop.
Device type	Frequency	Name	Port	Device type	Frequency	Name	Port	Frequency range
EM6000 EM6000 EM300-500 G4-2 EM300-500 G4-3 EM300-500 G4-3 EM300-500 G4-3	472.800 MHz 481.400 MHz 0.000 MHz 0.000 MHz	4-1 4-2 EM300-50 EM300-50	Rx1 Rx2 Rx1 Rx1	<ul> <li>EM6000 EM6000, -1</li> <li>EM6000</li> <li><not found="" yet=""></not></li> <li>Not yet found&gt;</li> </ul>	472.800 MHz 481.400 MHz - -	4-1 4-2 -	Rx1 Rx2	470.100 - 713.900 MHz 470.100 - 713.900 MHz - -
omparison result:	:							Refresh device
:M6000 (EM6000) -1 - - EM60 - EM60 - BM60 M 300-500 G4-2 - No M 300-500 G4-3 - No	Matched with: EM60 00: 4-1 Rx1 - Matcher 00: 4-2 Rx2 - Matcher matching device fou matching device fou	000 (EM6000) -1 d with EM6000: 4-1 F d with EM6000: 4-2 F ind ind	Rx1 Rx2					

The left-hand list displays the pre-configured devices ("Offline Configuration"). The right-hand list displays all currently connected devices. The device assignment appears in the "Comparison result" window.

The assigned devices are highlighted in the list on the left.

- Green: Configuration matches the connected device.
- Orange: Channel bank of the device does not match the configuration. A manual check of the device is necessary.
- Red: No suitable device found (e.g. differing frequency range).
- Black: Device found on a different port and assigned automatically.

If devices are marked black or red, you can:

- re-connect the receivers according to the configuration,
- change the configuration ("< Back").

#### To connect the devices according to the configuration:

- Connect all devices marked black to the corresponding ports.
- Click on "Refresh Device List" to update the list.

# 4. Working with the software

Detailed description of software and configuration of connected Sennheiser devices.

Related information Claiming Updating the firmware of devices Factory reset for EW-DX Frequency management "Easy Setup" frequency management "Professional Setup" frequency management Working with scenes Working with panels Configuring devices Recording the field strength using the tools

# Claiming

Device claiming is a feature of the Sennheiser Control Cockpit Software and Wireless System Manager that allows the user to claim ownership of their Sennheiser devices, providing an extra layer of security and control. It allows assigning a device to one or more remote installations which prevents any unauthenticated device control within the network.

The channels of unclaimed devices are marked as "unclaimed" in the channel view. Unclaimed devices are also shown in the device list in yellow. With a right mouse click on the device in the device list, users can start the claiming process by clicking on "claim".

A modal appears where users can set a password for the device.

After setting a password the device is claimed to the WSM. To use the device with another client the user needs to know the password. With a right mouse click user can authenticate on an already claimed device.

Claiming single device Bulk claiming Authentication during operation Changing the password



## Claiming single device

The channels of unclaimed devices are marked as "unclaimed" in the channel view. Unclaimed devices are also shown in the device list in yellow.



## To claim a single device:

Connect the device's control network port to the network.



Right-click on the displayed device and select **Claim**.





The device has been claimed.



## Bulk claiming

It is also possible to claim several devices at the same time.

## To claim multiple devices at once:

- Select the devices you want to claim and right-click on them.
  - ✓ The Bulk Claiming option appears.

>	â	EM6000 (EM600	0) -1	
	â	EW-DX EM2 (EV		
~		EW-DX EM2 Dat	Bulk Claim 📐	-9] -3
		🍸 💿 RX1, EW-	Reset	
		🍸 💿 RX2, EW-	Restart	
	â	EW-DX EM4 (EV	Delete	
			belete	

Enter the new passwords and click on **Bulk Claim**.

Bulk Claiming Dialog	×
Please enter a new password for these devices.	
Make sure to remember this password, as it will be required to authenticate these devices in the future. For security reasons, it cannot be displayed in the application.	
The password must be at least 10 characters long and include at least one of each:	
• Lowercase letter (a–z) • Uppercase letter (A–Z) • Digit (0–9) • Special character	
New Password	
1	
Confirm New Password	
Claimed Devices: 0 0/2	2
Cancel Bulk Claim	



✓ The progress will be displayed in the progress bar.

Click on **Finish** to complete the process.

✓ The devices have been claimed.



## Authentication during operation

Authentication is required to use the device with another client or re-assign it to a different device. This typically occurs if the device was previously used by another client.

In such cases, the device's channels will be marked as unauthenticated, and the device will appear in orange in the device list.





## To authenticate the device during operation:

Right-click on the unauthenticated device and select Authenticate.

> 👜 EW-DX EM4 (EWDXEM4D) - [] -4	Properties	
	Authenticate Enable Legacy Mode	
	Enable 3rd Party Access	
	ldentify	
	Reset	
	Restart	
	Delete	

A new password window appears.

Authentication Dialog	×
Authentication is required to confirm your identity before managing the device. Enter your credentials t proceed.	o
Password	
Cancel Authenticate	

Enter the password of the device.

Click on Authenticate.





## Changing the password

Change the password for the device.

After claiming a device (see Claiming single device), you can change the password.

## To change the password:

- Right-click on the device in the "Device List".
- Click on "Change Password".





Enter the old and the new password.

Change Password Dialog	×
Please enter a new password for this device.	
Make sure to remember this password, as it will be required to authenticate the device in the future. For security reasons, it cannot be displayed in the application.	
The password must be at least 10 characters long and include at least one of each:	2
•Lowercase letter (a–z) •Uppercase letter (A–Z) •Digit (0–9) •Special character	
Old Password	
New Password	
Confirm New Password	
Cancel Change	

Click on "Change".





# Updating the firmware of devices

The "Wireless Systems Manager" allows you to update the firmware of the connected Sennheiser devices.

Related information Displaying the firmware versions of the devices Downloading the latest firmware update from the Internet Preparing the firmware update

## Displaying the firmware versions of the devices

You can display the firmware versions of the connected devices.



Example EM 6000:

Syste	m EM6000 (EM6000) ✓ ℝ RX1, 4-1, 472 ✓ ℝ RX2, 4-2, 481 × EM 300-500 G4-2 × EM 300-500 G4-3	-1 Properties Delete		₽×			
	Properties						×
	Device Info						
	Name:	EM6000					
	Mac Address:	00:1b:66:82:7d:16	Ve	ersion:	3.1.1.152	2	
	Booster Feed:	Off					
	Clock:	48 kHz					
	Network						
	Mode:	Auto	•				
	IP Address:	169.254.23.125					
	Subnet:	255.255.0.0	G	ateway:	0.0.0.0		-
Re	emote Inactive	ОК		Can	icel	Apply	



## Downloading the latest firmware update from the Internet

Sennheiser is continuously improving the WSM software.

- Select the current firmware package (SENNPKG file) on the Sennheiser website at sennheiser.com/wsm and start the download.
- Click on "Open".
  - The file is automatically saved in the "New Releases" subfolder of the program folder. If this folder already contains a file, this file is moved to the "Archive" folder.



## Preparing the firmware update

Only the firmware is updated, the device settings remain the same.

## To prepare the firmware update:

Switch on all receivers and transmitters.

Switched-off devices will be ignored during update.

Click on "Applications" > "Firmware Update".

Firmware package The default firmware package is: Choo	ackad
Firmware package The default firmware package is: The selected firmware package is: Choo	
The default firmware package is:  Choo	
The selected firmware package is: Choo	
The selected firmware package is: Choo	
The selected firmware package is: Choo	
Choo	
	000
	ose

If there is a new firmware version available in the "New Releases" folder of the program folder, it is displayed in the "The selected firmware package is:" field.

You can select a firmware package (SENNPKG file) for your Sennheiser devices.

## To use the firmware version from the "New Releases" folder:

Click on "Next >".

✓ The connection to the devices is checked.

## To use another version:

- Click on "Choose...".
- Select the desired SENNPKG file.



Click on '	"Next >".
------------	-----------

✓ The connection to the devices is checked.

Firmware update           Device update details           Connected end devices are listed under the device. By default, the device of the device of the device of the device.	e devices to be updated are marked as checked.	Please select the devices
Connected devices	Firmware package <pre>     em6000_V_3_1_1.sennpkg EM6000 - Version: 3.1.1.152 </pre>	
Estimate	l update time:	
	< Back	Start Cancel

The "Firmware package" box on the right displays all available firmware versions from the selected SENNPKG file. The "Connected devices" box on the left displays the corresponding connected devices.

Devices with an older firmware version are automatically ticked.

### To not update the firmware in a device:

- ▶ In the "Connected devices" window, click on the check box of the device.
  - ✓ The tick is removed. The firmware is not updated.

### If you want to transmit an older firmware version to a device:

Click on the "Allow downgrade" check box.

✓ A tick appears.

▶ In the left column, click on the check box of the device.

A tick appears. The older firmware version will be transmitted to the devices during firmware update.

**i** Portable Sennheiser transmitters (see Compatible Sennheiser products) can be updated via their associated receivers (via the infrared interface).

## NOTICE



# Risk of data loss if transfer is interrupted during firmware update!

Data may be lost if the transfer is interrupted. The devices may also be damaged as a result.

- When updating the firmware, do not interrupt any device connection to the stationary devices.
- Do not disconnect power from the devices. Preferably use fully charged batteries for the portable devices!
- Since the updating process takes about 40 seconds, firmly position the portable devices in front of the infrared interface.



## To start the firmware update:

### **i** Updating **EW-DX** to version 4.0:

- The update cannot be undone.
- After the update, an authentification of the devices is neccessary.
- Legacy Mode has to be activated, if communicating via SSCv1 is used.
- Third-party access via SSCv2 must be configured.

<u> </u>	You are about to upgrade your EW-DX device from an older firmware version to version 4 or higher. This update introduces new security features, including encrypted and authenticated control communication.
	Important Information:
	<ul> <li>This update is permanent and cannot be reverted to a previous firmware version.</li> <li>After the update, the device will require authentication and an initial setup before it can be used.</li> <li>Legacy Mode: If your setup relies on SSCv1 communication, you will need to re-enable Legacy Mode to maintain compatibility with third party systems that still use this protocol.</li> <li>3rd Party Access (SSCv2): For increased security and future-proofing, use 3rd Party Access, which communicates via SSCv2 and requires device authentication. You will therefore need to set a password for 3rd Party Access.</li> </ul>
	Do you want to proceed with the update?
	Confirm

- Click on "Start".
- Follow the instructions of the wizard.

## Dante firmware update

- **i** The firmware of the Dante modules is updated using the "Dante Controller" software.
- Download the software audinate.com/dante-controller.
- Follow the instructions in the software.



# Factory reset for EW-DX

EW-DX devices can be reset via the Wireless Systems Manager.

## To reset the device:

- Right-click on the device in the "Device List".
- Click on Reset.



## Click on Yes.

🔟 Rese	et X
4	Your device will be reset to default settings and will restart. Do you want to continue?
	Yes No





## Frequency management

There are two types of frequency management:

- "Easy Setup" frequency management allows to coordinate unused frequencies for small multi-channel systems and to allocate the frequencies to the devices.
- "Professional Setup" frequency management allows to coordinate unused frequencies for large multi-channel systems and to allocate the frequencies to the devices.

## Easy Setup

You can use "Easy Setup" for an ad-hoc on-site installation in online mode.

"Easy Setup" can be performed with or without a frequency presetscan.

During the frequency presetscan

- the factory presetfrequencies (presets) and
- the frequencies stored in the channel bank "U" of the selected receiver are checked.

## **Professional Setup**

You can use "Professional Setup" for an ad-hoc on-site installation in online mode and for planning an installation in offline mode.

In both cases, licenses, licensable areas and legal regulations can be taken into account in the coordination.

"Professional Setup" can be performed with or without a frequency scan.

During the frequency scan

• the complete spectrum of the selected frequency range is checked.



# "Easy Setup" frequency management

i Individual device parameters can also be configured after "Easy Setup" (see Working with panels).

## Launching the "Easy Setup" frequency management

- Deactivate the RF signal (RF Mute) of all portable transmitters for which you want to find unused frequencies.
  - **i** The WSM automatically deactivates the RF signal of connected stationary transmitters.
- Switch on all possible sources of interference (e.g. light sources, video walls) and all other transmission links.
- Click on "Frequency Manager" > "Easy Setup".
- Follow the instructions of the wizard.

Z Easy Setup	×
System category The Easy Setup wizard needs to know whether you want to setup a wireless microphone system or a wireless monitoring system (IEM). Please select a category and click "Next".	system
System category	
Wireless monitoring system	
O Wireless microphone system	
	_
Next >	Cancel



### "Easy Setup" with or without frequency presetscan

> You can allocate unused frequencies in various ways:

Z Easy Setup			>
Scan Mode selection Select "Preset Scan" to get the occupied frequencies from SR devices or "Continue without Scan" to use the actu	ual frequency list f	from the transmit	ter.
Scan details			
Preset Scan with portable receiver (EK IEM)			
O Continue without Scan			
	< Back	Next >	Cancel

• "PresetScan with portable receiver (EK IEM)" / "PresetScan":

To find occupied as well as unused frequencies in the current vicinity of the system, perform a frequency presetscan.

• "Continue without Scan":

To allocate already known unused frequencies to stationary devices, specify these frequencies without a frequency presetscan.

You can then allocate these unused frequencies to the portable devices.

## Monitoring system

#### Performing a frequency presetscan

When operating both monitoring and microphone systems via the WSM, you first have to perform the frequency presetscan for the monitoring system.

The frequency presetscan is always performed for all frequencies in the selected channel bank.

**i** The stationary transmitters of the corresponding frequency range are automatically switched off during the frequency presetscan.

#### Performing a frequency presetscan using a portable receiver

The frequency presetscan is performed using a portable receiver. You then transfer the scan results to the associated stationary transmitter.

The WSM retrieves the data from the transmitter.



- Before starting the frequency presetscan, switch off all portable transmitters of your system. Otherwise, frequencies used by switched-on transmitters will not be displayed as "unused".
- Start the frequency presetscan on the receiver (see the instruction manual of the receiver).

upported TEM fr	equency range
Connected ewo frequency rang	3/ewG4/2000 series transmitters are shown below in the list. Please select a transmitter to read later the EK scan results. Please select the ri le to disable the SRs during the scan process to avoid scan errors.
× ×	
levice	Supported frequency range
. IEM G4-C-4	/34,000 - //6,000 MHZ
	*****
_	

### Allocating frequencies to stationary transmitters

- > You can allocate frequencies automatically or manually.
  - Automatic allocation:

If you have connected more transmitters (IEM) from one frequency range than free channels are available in one channel bank, the RF signals of the surplus transmitters (IEM) are muted.

• Manual allocation:

If you assign the same frequency to several transmitters (IEM), only the first transmitter with this frequency is transmitting. The RF signals of the surplus transmitters are muted.

asy Steup Allocate freque Either man "Finish".	ncies to the transmitters: ually drag and drop the frequency from the	frequency list to the transmitter in the transmitter list or select the "Automatii	allocation" option and click
SR-300G3 : 78	0.000 - 822.000 MHz	Transmitters	
<ul> <li>Bank 4</li> <li>Ch1</li> <li>Ch2</li> <li>Ch3</li> <li>Ch4</li> <li>Ch5</li> <li>Ch6</li> <li>Ch7</li> <li>Ch8</li> <li>Ch9</li> <li>Ch10</li> <li>Ch11</li> <li>Ch12</li> <li>Ch13</li> </ul>	792.050 MHz 795.825 MHz 796.950 MHz 802.425 MHz 810.4250 MHz 811.4250 MHz 811.4250 MHz 813.500 MHz 790.100 MHz 793.325 MHz 813.826 MHz 813.890 MHz 798.600 MHz	SR-300G3 790.100 MHz SR-300G3 792.175 MHz	
		Allocate automatically	
		< Bac	k Finish Cancel



## Microphone system

**i** When operating both monitoring and microphone systems via the WSM, you first have to perform the frequency presetscan for the monitoring system (see Monitoring system).

Easy Setup					
eceiver select Connected re	ion eceivers are shown below in the list.	Please select a receiver and click "Next" for the frequency setup.			
Receiver	Frequency range	Device/Port			
54 - EM1	626,000 - 698,000 MHz	EM 300-500 G4-Bw-3/Rx1			
<					
· · · · · ·					
		<	Back	Next >	Cance

## Performing a frequency presetscan

The frequency presetscan is always performed for all frequencies in the selected channel bank.

Z Easy Setup				×
Scan Mode selection Select "Preset Scan" to get the occupied frequencie	s from EM devices or "Continue without Scan" to use	e the actual frequency list	from the receiver.	
Scan details				
Selected receiver: G4 - EM1 626,000 - 698,0	00 MHz EM 300-500 G4-Bw-3/RX1			
Preset Scan     Continue without Scan	☑ Preset Scan × Preset Scan is in progress 6%			
	Cancel			
		< Back	Next >	Cancel
		< Back	Next >	Cancel



## Allocating frequencies without a frequency presetscan

When you allocate frequencies without a frequency presetscan, interference with transmitters in the vicinity of the system may result.

## Allocating frequencies to stationary receivers

You can allocate frequencies automatically or manually.

• Automatic allocation:

If you have connected more receivers from one frequency range than free channels are available in one channel bank, the WSM re-assigns the last frequency assigned several times.

• Manual allocation:

You can assign the same frequency to several receivers.

4 - EM1 : 626,000 - 698,000 MHz	Receivers		
<ul> <li>bar(7)</li> <li>Ch1 632, 150 MHz</li> <li>Ch2 632, 525 MHz</li> <li>Ch3 632, 525 MHz</li> <li>Ch4 633, 500 MHz</li> <li>Ch5 634, 100 MHz</li> <li>Ch6 633, 375 MHz</li> <li>Ch7 636, 125 MHz</li> <li>Ch1 6637, 175 MHz</li> <li>Ch1 667, 755 MHz</li> <li>Ch1 664, 250 MHz</li> <li>Ch1 664, 250 MHz</li> <li>Ch1 665, 502 MHz</li> <li>Ch1 665, 502 MHz</li> <li>Ch1 665, 502 MHz</li> <li>Ch1 665, 503 MHz</li> <li>Ch1 665, 504 MHz</li> <li>Ch1 665, 505 MHz</li> </ul>	V Gerenni	662,300 MH2	
Ch15 655,025 MHz Ch15 656,525 MHz Ch16 663,500 MHz	~		

Defining, adding and exporting new frequency ranges for stationary devices

Applications Help		
🛃 Device Configuration	Ctrl+D	
Stationary Devices	•	Import configuration file
Firmware Update	Ctrl+U	Export configuration file
RF Level Recorder	Ctrl+L	Generate configuration file
Spectrum Analyzer	Ctrl+M	

The "Stationary Devices" menu item in the "Application" menu allows you to define, add and export new frequency ranges for existing stationary devices.

The new frequency ranges are saved, together with the data of the frequency range definition file (xml file) supplied with the WSM, as a new file under a new file name. This new frequency range definition file can be edited, imported and exported.

Using the commands "Generate configuration file"; "Import configuration file" and "Export configuration file", you can create a new frequency range definition file and import or export a frequency range definition file.

## To import an frequency range definition file (xml file):

- Click on "Stationary Devices" > "Import configuration file".
- Select the desired frequency range definition file.

## To export an frequency range definition file (xml file):

- Click on "Stationary Devices" > "Export configuration file".
- Select a folder and enter a name for the frequency range definition file you want to export.

### Creating a new frequency range definition file

- Click on "Stationary Devices" > "Generate configuration file".
- Click on "Browse input file" 1.
- Select the frequency range definition file.
- Click on "Browse output file" 2.
- Select a folder and enter a name for the frequency range definition file you want to create.
- From the "Device type" drop down list 3, select the desired device type (e.g. "Receivers" or "Transmitters").
- From the "Devices" drop down list 4, select the desired device (e.g. EM 9046).


Click on "Add" 5 to define a new frequency range for the selected device.

Z Add device pr	operties			?	×
Use default de	finition file				
:/Resources/Defa	ultDeviceDefinitio	n.xml	Browse in	put file	
ocuments\Sennhe	iser\Wireless Sy	stems Manager/DeviceDefinitionFile/DeviceDefinition.xml	2 Browse ou	tput file	
Device type: Rece	iver	4 ▼ Devices: EM 9046 ▼	5 Ad	ld	
6 Device	Device type	Frequency rar Search step			
Edit	Delete				
			ОК	Cancel	

- ▶ In the "Frequency suffix" field 1, enter an alphanumeric value.
- Enter the minimum frequency of the new frequency range in the "Min. frequency" field 2.
- Enter the maximum frequency of the new frequency range in the "Max. frequency" field 3.
- Select the desired search step from the "Search step" drop down list 4.
  - The default (and minimum) search step is 25 kHz. The search step can be incremented in multiples of 25.

The "Frequency string" 5 displays all the values entered in the fields.

Add device properties				? ×
Receiver (EM 6000)	2		3	
Frequency suffix:	Min. frequency: 470.000	🚔 MHz 🛛 Max. fr	equency: 999.0	000 🌻 MHz
5	Search step: 25	🚔 kHz		
Frequency string: Format: A (Min Freq - Max Fre	q MHz) 🔄			
			ОК	Cancel



- The newly defined frequency range is added to the list area 6 of the "Add device properties" window.
  - **i** The "OK" button is only enabled when all fields are valid. You can delete newly added frequency ranges from the list area 6 by clicking on "Delete".

			Browse input file			
ocuments\Se	nnheiser\Wireless	ceDefinition.xml	Browse outp	ut file		
Device type:	Receiver	<ul> <li>Device</li> </ul>	s: EM 9046	•	Add	
Device	Device type	Frequency range	Search step			
> EM 904	6 Receiver	xyz (470 - 999 MHz	25			
Edit	Delete					

In the "Add device properties" window, click on "OK".

✓ The new frequency ranges are added to the frequency range definition file.

 You can define frequency ranges for all eight booster ranges of an EM 9046 receiver.

Receiver/Luic (Lin	3040)								
Frequency suffix:			Min. frequency:	470.000	\$	MHz	Max. frequency:	999.000	ф МН
			Search step:	25	\$	kHz			
Frequency string:	(470 - 999 MHz)								
	Name	Prefix		Min frequency	(MHz)	Max frequency (MHz)			
	Booster range 1			470.000	\$	999.000 🗘			
	Booster range 2			470.000	-	999.000 🗘			
	Booster range 3			470.000	-	999.000			
	Booster range 4			470.000	-	999.000			
	Booster range 5			470.000	-	999.000 🗘			
	Booster range 6			470.000	-	999.000 🗘			
	Booster range 7			470.000	\$	999.000 🜻			
	Booster range 8			470.000	\$	999.000 🗘			
							OK	0	ncel



## "Professional Setup" frequency management

- **i** For information on the differences between "Easy Setup" and "Professional Setup", refer to the chapter Frequency management.
- Launching the "Professional Setup" frequency management
  Overview of the "Professional Setup" window
  The tabs
  Devices
  Frequencies/bands
  System Regions
  Spare Groups
  Coordination
  Allocation
  Markers
  Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum

## Launching the "Professional Setup" frequency management

- Deactivate the RF signal (RF Mute) of all portable transmitters for which you want to find unused frequencies.
  - **i** The WSM automatically deactivates the RF signal of connected stationary transmitters.
- Switch on all possible sources of interference (e.g. light sources, video walls) and all other transmission links.
- Click on "Frequency Manager" > "Professional Setup". The following gives an overview of the tabs and setting possibilities of the "Professional Setup" window.

Information on the regional frequency grid, on performing/ importing a frequency scan and on analyzing the frequency spectrum can be found in the chapter Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum.



## Overview of the "Professional Setup" window

Profess	sional Se	tup											-		×
1 Dev	/ices	Fre	equenci	es/Bands S	system regions Spare	jroups	Coordination	[O] Allo	cation N	larkers	Log messages				
2 Scar	n		-	Channel name	Stationary device	System f	requency range	Frequency	Portable devi	ice Spar	e frequencies				
				EM6000	EM 6000 (RF mode: LR)	470,200	- 558,000 MHz	470,200 MH	SK/SKM 600	0 0					
			-	EM6000	EM 6000 (RF mode: LR)	470,200	- 558,000 MHz	470,200 MH	z SK/SKM 600	0 0					
			-	EMG4	EM 300-500 G4	520,000	- 558,000 MHz	520,000 MH	2 SK/SKM 300	G4 0					
			*	EW-DX 1	EW-DX EM2 (RF mode: LD off	470,200	- 550,000 MHz	470,200 MH	EW-DX SKM	0					
			-	EW-DX 2	EW-DX EM2 (RF mode: LD off	470,200	- 550,000 MHz	470,200 MH	EW-DX SKM	0					
3 Add	devices	E	Edit devic	es Delete de	vices								Start f	requency (	scan
		_													
		୍ୱ	€.	1 🌬 💌	×								Device fil	ters (all)	
	<u> </u>					_	_	_		_	_				
4															
dB	<u> </u>						<u> </u>					_			
	40 -							Default - F	light-Click to Set	Regional Inf	formation				
													System item	filters (all)	
												M P			
5	- <sup>30</sup>				EM 300-500 GH + AS (520 + 5										
	25				90/90M 300 64+ 45 (520 + 5										
							100 000 000 713 000 10								
			-			acca (nor made)	0.00 P 0.00 P 712,800 P								
		-	W-DK BM2 (R	F maae LD an) - Q1-9 (47	0.00 - 55000 992)										
		<u> </u>	EW-D	X SKM - Q1-9 (470.200 - 55	0.000 MHz)										
		<u> </u>	sx	/SKH 6000 - A1-A4 (470.200	) - 558.000 MHz)							8	Freq./band	filters (all)	
												<b>V</b>			
	5											-			
	0	4	80	500 52	0 540 560	580	600	620	540 66	0	580 700				
2	Q	9						CalculateO	urrentCoordinati	onResult: En	d of calculation of curre	nt coordination			

## 1 Tabs: Devices", "System regions", etc.

For detailed information on the tabs, please refer to the section The tabs.

## 2 Upper window area

Displays the devices, system regions, etc. in list form (the representation displayed depends on the active tab).

The size of the upper and lower window areas can be changed by dragging.

## 3 Buttons area

The buttons available depend on the active tab. The "Devices" tab, for example, offers you the following options:

- Setting new devices
- Editing already existing devices
- Deleting devices
- Starting a frequency scan



## 4 List box and buttons of the graphical overview

dBm 💌

Adjusts the RSSI scale of the y-axis: iV, dB, dBm



Zooms out/zooms in (shortcut key Win: Ctrl +  $\uparrow/\downarrow$ , Mac: cmd +  $\uparrow/\downarrow$ )



Generates a report



Imports a frequency scan

|--|--|

Exports a frequency scan



Deletes a frequency scan

## 5 Graphical overview

Displays devices, markers, intermodulation products, system regions, usable and unusable frequency bands and frequencies.

To navigate horizontally (shortcut key Win: Ctrl +  $\leftarrow \rightarrow$ , Mac: cmd +  $\leftarrow \rightarrow$ ):



To zoom the visible area in or out:



To move the current position to the left/right:



**i** When clicking on "Add freq./band..." in the "Frequencies/Bands" tab or on "Add marker..." in the "Markers" tab, the frequency at the current position of the movable triangle is taken as the default value.

## 6 Device filters

Views/hides devices, items and frequencies/frequency bands in the graphical overview

## 7 System item filters

Views/hides devices, items and frequencies/frequency bands in the graphical overview

## 8 Freq./band filters

Views/hides devices, items and frequencies/frequency bands in the graphical overview

## 9 "View toggle" icon

Views/hides the graphical overview and the filters

Default view



## The tabs

The "Professional Setup" window contains 8 tabs. The tabs 1 to 6 ("Devices" to "Allocation") are arranged from left to right in the most logical order for a live setup:

Devices Frequencies/Bands System regions Spare groups Coordination [0] Allocation Markers Log messages

### Devices

- Sets Sennheiser devices and custom devices and edits the device settings
- Saves devices including their channel names as configurations ("Save preset...")
- Scans the frequency range defined by the selected stationary receivers for signals (frequency scan) and detects used frequencies or interfering signals from extraneous sources (spectrum analysis)

## Frequencies/Bands

- Sets prioritization levels for frequencies and frequencies bands to be taken into account in the frequency coordination (Priority: "Low", "Medium", "High")
- Marks frequencies and frequencies bands as unusable or being interfered with so that they can be excluded from the frequency coordination

## System regions

- Defines system regions for devices that are spatially and temporally separated in order to avoid the calculation of intermodulation products
- Limits certain devices or device groups to a frequency range

## Spare groups

- Determines spare frequency groups for the most important transmission links
- Requests a certain number of spare frequencies from the coordination while ensuring an efficient use of the frequency spectrum

## Coordination

• Calculates intermodulation-free frequencies with different prioritization levels and optimally coordinates all frequency requirements



## Allocation

• Allocates frequencies to channels

## Markers

• Sets colored markers and labels them with names in order to mark different positions in the frequency spectrum

### Log messages

• Displays information, warnings and errors



## Devices

#### Performing or importing a frequency scan

Information on performing or importing a frequency scan and on analyzing the frequency spectrum can be found in the chapters Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum and Analyzing the frequency spectrum.

Related information Setting devices Editing device parameters Fixing the frequency of a device Deleting devices

## Setting devices

- Click on "Add devices...".
- In the "System" 1 area, decide whether you want to set Sennheiser devices or custom devices.
  - **i** If you have already saved device presets (area 6), they can be selected from the "Preset" list box.
- In the "Properties" area 2, select the naming scheme for your channels ("Channel name").
  - If you use the default channel name "Ch 001" and enter a channel number
     > 1 in area 7 ("Add xx channel"), the channels are numbered consecutively.
     If, however, you enter an name into the "Channel name" field, all channels of the device will be assigned this name.

#### If you use Sennheiser devices:

- In the "Devices" area 3, first select your receiver.
  - The other list boxes in the "Devices" area 3 are filled in automatically.
- Adjust the settings in the list boxes according to your needs.

- Depending on the selected transmitter/receiver combination, the list boxes in "System frequencies" area 4 are filled in automatically.
- If necessary, adjust the minimum frequency spacings 5.
- ▶ In area 7 ("Add xx channel"), select the desired number of channels.
- If required, save your entries as a preset(area 6).
  - **i** Please note that the number of channels selected in area 7 will not be saved.

Please note that the number of channels of the particular device type is added to the device list displayed in the upper window area of the "Devices" tab.

**i** Clicking on "OK" adds one device at a time and then closes the window. If you have added several devices by using the "Add" button, click on "Cancel" to close the window.

Maximum noise -87 🔆
Maximum noise -87
Maximum noise -87
arameters
500 🛨 kHz
0 🔆 kHz 2Tx 1M(5) 0
3

If you use custom devices:

- **i** The "Properties" area 2 looks different.
- Select a device from the "Device type" list box and specify its maximum noise level.
- If necessary, adjust the minimum frequency spacings.
- Adjust your settings in the "System frequencies" area 4.
- ▶ In area 6 ("Add xx channel"), select the desired number of channels.

- If required, save your entries as a preset(area 5).
  - **i** Please note that the number of channels selected in area 6 will not be saved.

Add devices	×
System Preset Select existing preset  Sennheiser devices Custom devices	
2 Properties Channel name Ch 003	Device type FM mic
Spacing parameters           Carriers         400 ÷         kHz           2Tx IM(3)         200 ÷         kHz         2Tx IM(5)         200 ÷         kHz           3Tx IM(3)         200 ÷         kHz         3Tx IM(5)         200 ÷         kHz	
4       System frequencies         Overlapping frequency range       480.000 ÷         -       865.000 ÷	Frequency / MHz add
Search step 25 🔆 kHz	
5 Delete preset Save preset	6 Add 1 🕂 channel

After confirming the "Add devices" window by clicking on "OK", the device list 1 is displayed in the upper window area of the "Devices" tab.



If the "Device ranges" check box is activated, the frequency range used by the devices is displayed as a black bar 2 in the graphical overview. The 8 booster ranges of the EM 6000 receiver are displayed as purple bars.

Professi	onal S	etup							_		×
Devi	ces	Frequencies/Ban	ds Syste	m regions	Spare groups	Coordinatio	on [0] Alle	ocation	Markers	Log	
Scan	Г	*	Channel na	Stationary devi	System frequen	Frequency	Portable dev	Spare fre	quencies		
	I	*	4-1	EM 6000 (RF	470,200 - 558,0	472,800 MHz	SK/SKM 6000	0			
	E		4-2	EM 6000 (RF	470,200 - 558,0	481,400 MHz	SK/SKM 6000	0			
		<b>*</b>	G4 - EM1	EM 300-500 G4	626,000 - 698,0	662,300 MHz	SK/SKP/SKM	0			
_	_										
Add d	evices	Edit devices De							Start fre		
										. ,	
	Θ.								Device	filters (al	l)
			9						💌 Digital		
									FM mics		
dB	- 1				, 				🗹 IEM syst		
	40 2:	1 22 23 24 25 26 27	28 29 30 31	32 33 34 35 3	6 37 38 39 40 4	1 42 43 44 4	15 46 47 48 4	9 50 51	Others		
	25								System it	em filters	(all)
									🔽 🗹 Markers		
1									📊 🗹 Intermo		
									Device r		
									Spare gi		
	20					CVD/CVM SAA C	- Pur (626 - 6				
	2		EM 6	000 (RE mode: LD) *	470 200 - 713 800 MH	7 SKF/SKM 300 G	- BW (020 - 0		Noise th		
		SK/SKM 6000 - A1-A4 (470.3	200 - 558.000		E	- 4 300-500 G4 - Bi	v (626 - 698 M		Erec /ba	nd filters (	all
	10								Isable h	ands	(un)
	5								Vi Unusahk		
									🔽 🗹 Interfere		
	0	480 500 520	540	560 580	600 620	640 660	680	700	🔽 🗹 Discrete		
						urrentCoordinatio	inResult: End of cal	culation of c	urrent coordinatio		



## Editing device parameters

#### To edit channel names and other device parameters using the dialog window:

- From the device list, select a device and click on "Edit devices...".
- Edit the device parameters.

#### To edit the parameters of other devices when the "Edit devices" window is already open:

- ▶ Use the "<<" and ">>" buttons 1 to navigate to other devices.
  - Before you can edit other devices, you are asked to save the changes made to the current dialog window by clicking on "OK" 2.

Edit devices		×
System Preset Select existing preset	<u> </u>	
Sennheiser devices     Custom devices		
Channel name G4 - EM1		
Devices		
Receiver EM 300-500 G4	×	Squelch 5 dB 🗾
Transmitter       SK/SKM 300 G4         System frequencies       Obycourse         System frequency rang       626,250 ÷	anges made? OK Cancel Carners 375 ± kHz	
Search step 25 - kHz	2Tx IM(3) 125 🛨 kHz	2Tx IM(5) 75 🕂 kHz
	3Tx IM(3) 75 🕂 kHz	3Tx IM(5) kHz
Delete preset Save preset		Cancel



## Fixing the frequency of a device

You can fix the allocated frequency of a device so that the device cannot be allocated a different frequency during coordination.

### To fix the frequency of a device:

 Right-click on a device in the device list and select "Fix frequency" from the shortcut menu 1.

Professional Setup

	Devices		Frequencies	System regions S			pare groups	Coordinatio	on [0] Alle	
I	Scan	₹	*	Cha	nnel na	Stationary	devi	System frequen	Frequency	Portable dev
I				4-1		EM 6000 (F	F	470,200 - 558,0	472,800 MHz	SK/SKM 6000
I			<u></u>	- 4-2 		EM 6000 (F	F	470,200 - 558,0	481,400 MHz	SK/SKM 6000
				Fix freque	ency 🔃	M 300-500	) G4	626,000 - 698,0	662,300 MHz	SK/SKP/SKM
				Edit devi						
I				Delete de						

✓ If the frequency of a device is fixed, a lock icon appears next to the frequency of the device 2.

#### To "unfix" the frequency from the device:

Right-click on the device and select "Unfix frequency" from the shortcut menu.

-	rofessio	onal Se	tup									
Γ	Devi	Devices Frequencies/Bands		s Syster	n regions	S	pare grou	ups	Coordination [0		0] Alloca	
	Scan		Char		Channel na	Stationary dev	/i	System fre	equen	Frequency	Portab	le dev
				4-1		EM 6000 (RF .		470,200 -	5 <b>58,</b> 0	472,800 MHz	SK/SKI	M 6000
			🥯 I	Linfiy Eroo		EM 6000 (RF .		481,400 -	481,4	💼 481,400 MHz	SK/SK	M 6000
		<b>V</b>	🧒	UNINTIES	uency	EM 300-500 G	4	626,000 -	698,0	52,300 MHz	SK/SK	P/SKM
					es							
I				Delete de	vices							



## Deleting devices

- From the device list, select one or several devices and click on "Delete devices..." or right-click on a device and select "Delete devices" from the shortcut menu.
- Confirm the safety query.



## Frequencies/bands

# Setting prioritization levels for the frequency coordination and excluding frequencies from the frequency scan

The "Frequencies/Bands" tab allows you to mark frequencies and frequency bands as unusable or being interfered with so that they are excluded from the frequency coordination.

ZIn addition, you can specify how frequencies and frequency bands are to be prioritized in the frequency coordination (Priority: "Low", "Medium", "High"). If, for example, you set the prioritization level for a license frequency to "High", this frequency will be highly prioritized in the frequency coordination.

#### **Related information**

Setting frequencies/frequency bands Importing licensed frequencies Importing frequency lists Exporting frequency lists Analyzing the frequency spectrum Editing frequencies/bands

## Setting frequencies/frequency bands

- In the "Frequencies/Bands" tab, click on "Add freq./band..." or rightclick on the blank space in the upper window area of the "Frequencies/ Bands" tab to add the frequency or band.
- Select a presetfrom the "Preset" 1 list box.
   Or
- Select a frequency type from the "Type" 2 list box. The corresponding option button in the "Priority" 3 area is automatically selected by default. Frequency type:
  - Discrete frequency
    - Priority default: "Medium"
  - Interference frequency
    - Priority default: "Blocked"
  - Usable band
    - Priority default: "Medium"
  - Unusable band
    - Priority default: "Blocked"
- If necessary, adjust the prioritization level for the coordination of usable frequencies/ bands in the "Priority" area 3.



- Adjust the noise level 4.
- ▶ If required, save your settings as a presetor delete existing presets in area 5.

Add frequency/band	×
Preset Select existing preset	
2 Type Discrete frequency	
Name Frequency 001	
Frequency 547.558 📩 MHz	
Tolerance +/- 0 🙀 kHz	
Priority 3 🗢 High	
Medium	
🗢 Low	
Noise level 4 -102 📩 dBm	
J	
Delete preset	
0	K Cancel

After confirming the "Add frequency/band" window by clicking on "OK", the unusable frequency band 1 is displayed in the upper window area of the "Frequencies/Bands" tab.

In the graphical overview, the unusable frequency band 2 is highlighted in transparent red:

**i** Note that the tolerances of discrete frequencies and Interference frequencies are given in brackets (e.g. +/- 500 kHz).

Professional Se	etup					- 🗆 ×
Devices	Frequencies/Ba	ands System regions	Spare groups	Coordination	0] Allocation M	larkers Log messages
👼 Name	^	Туре	Frequency/Band	Priority	Noise level	
🐷 Frequer	nz 001	Discrete frequency	592,000 MHz (±0 kHz)	) 🦲 Medium	10 dB	
👘 👼 Frequer	nzband 002 🚺	Usable band	592,000 - 613,100 MHz	z 🛛 🌔 Medium	16 dB	
👘 🐡 Frequen	zband 003	Unusable band	545,500 - 581,500 MHz	z X Blocked	5 dB	
						L-N
Add freq./ba	and Edit freq./ban	d Delete freq./band No	oise threshold 🧧 🕂 dB	nalyze frequency	spectrum. Import licenses	Import lst Export lst
Q		<u>ا</u> ا				Device filters (all)
						Digital
						FM mics
dB 💌						IEM systems
40 - 21	. 22 23 24 25 26	27 28 29 30 31 32 33	34 35 36 37 38 39	9 40 41 42 43 4	4 45 46 47 48 49 50	Others
35						System item filters (all)
						Markers
30		9				Intermodulation
25						
						System regions
20				EM 300-500 G4	- Bw (626 - 698 MHz)	📊 🗹 Scan data
15 -		EM 6000 (RF	mode: LD) · 470.200 - 713.	800 MHz		Noise threshold
	SK/SKM 6000 - A1-A4 (4	70.200 - 558.000 MHz)		SK/SKP/SKM 500	G4 - Bw (626 - 698	Freq./band filters (all)
10						Usable bands
5						🔽 🔽 Unusable bands
						Interference frequencies
	480 500	520 540 560	580 600 6	20 640	660 680 700	Discrete frequencies



## Importing licensed frequencies

You can import licensed frequencies that are available as follows:

- Extension: .csv
- Frequency data is to be written as follows::
  - MHz (e.g. 600; 600.0) or
  - MHz.kHz (e.g. 600.768; 600.7; 600.76) or
  - MHz,kHz (e.g. 600,768; 600,7; 600,76)
- Delimiters:
  - ; (#59) or
  - | (#124) or
  - : (#58) or
  - tab (#09) or
  - \CR (#0D)

To import licensed frequencies:

- Click on "Import licenses..." in the upper window area.
- Select the text file.
  - The frequencies are imported as usable discrete frequencies with a high prioritization level in the frequency coordination.



## Importing frequency lists

You can import frequencies/bands that are available as comma-separated value files:

- Extension: .csv
- Frequency data is to be written as follows:
  - MHz (e.g. 600; 600.0) or
  - MHz.kHz (e.g. 600.768; 600.7; 600.76) or
  - MHz,kHz (e.g. 600,768; 600,7; 600,76)
- Delimiters:
  - ; (#59) or
  - | (#124) or
  - : (#58) or
  - tab (#09) or
  - \CR (#0D)

To import frequency lists:

- Click on "Import list..." in the upper window area.
- Select the text file.
  - ✓ The frequencies are added to existing or imported frequencies.



## Exporting frequency lists

You can export existing frequencies/bands as comma-separated files.

- Extension: .csv
- The following data must be exported as semicolon-separated values:
  - name
  - type
  - frequency data in kHz (e.g. 600000 or 600768)
  - tolerance
  - lower frequency (in the case of discrete or interference frequencies, the lower frequency equals the discrete/interference frequency)
  - upper frequency (in the case of discrete or interference frequencies, the upper frequency equals the discrete/interference frequency)
  - priority
  - noise level
- Click on "Export list..." in the upper window area.



## Analyzing the frequency spectrum

You can analyze the frequency spectrum or set and/or import frequencies/frequency bands. If the corresponding button is grayed out, you have not yet performed a frequency scan in the "Devices" tab.

- Charge the regional frequency grid of your country (see Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum).
- Make sure that you have performed a frequency scan in the "Devices" tab or that you have imported scanned frequencies (see Performing or importing a frequency scan).
- Analyze the frequency spectrum by clicking on "Analyze frequency spectrum..." in the upper window area of the "Frequencies/Bands" tab.

You can reduce the interference frequencies for any scan data by increasing the noise threshold to the desired value. The noise threshold is indicated by a red line in the graphical overview. You can view/hide the noise threshold line in the graphical overview by activating/ deactivating the "Noise threshold" check box in the "System item filters" area.

Scan data can also be viewed/hidden in the graphical overview by activating/deactivating the "Scan data" check box in the "System item filters" area.



## Editing frequencies/bands

### Editing frequencies/bands

- From the upper window area, select a frequency/band and click on "Edit freq./ band...".
- Edit the parameters of the frequency/frequency band.

#### Deleting frequencies/bands

- From the upper window area, select a frequency/band and click on "Delete freq./ band...".
- Confirm the safety query.

## System Regions

## Defining and managing system regions

Defining system regions is useful in the following circumstances:

- You want to operate certain devices or device groups in defined frequency ranges.
- Certain devices are used spatially separated, e.g. on different stages or in different studios.
- Certain devices are used temporally separated.
- Microphone and monitoring systems are to be set and managed separately.

You can use the system regions feature to separately set and manage microphone and monitoring systems. This adds a clear visual distinction for a better overview of the systems that are separated according to frequencies. Intermodulation products are calculated as usual.

If certain devices are used spatially separated, they may not be able to influence each other through intermodulation products under certain conditions.

If devices are used temporally separated, intermodulation cannot occur.

In both cases, you should define system regions and inform WSM that there is no risk of intermodulation products. In the "Coordination" tab, usable frequencies are then calculated without taking intermodulation products into account, giving you the maximum spacing between the coordinated frequencies.

Related information Defining system regions Editing system regions

## Defining system regions

- Make sure that the "Devices" tab contains device data.
- In the "System regions" tab, click on "Add system region..." or rightclick on the blank space of the "System regions" tab and select "Add system region" from the shortcut menu.
- Enter a name for the system region in the "Name" field 1.
  - The default name "Region 01" is displayed in the "Name" field; as system regions are added, they are numbered in consecutive order.
- From the "Devices in no system region" box 2, select a device or a transmission link and then click on the white right-pointing arrow.

- The device/transmission link is moved to the "Devices in this system region" box 3.
- Repeat these steps for the other devices/transmission links.

If you can ensure that the devices are used spatially or temporally separated:

Activate the "Independent calculation of intermodulations" 4 check box.

If you have defined system regions in order to achieve a frequency range separation of systems but you cannot rule out the possibility of interference with other devices:

Make sure that the "Independent calculation of intermodulations" 4 check box is not activated.

	Add system	m region							×
	Name Region	01							
	Devices in no s				0				
2	Name	Frequency range	Stationary device	Portable dev.	3	Name	Frequency range	Stationary device	Portable dev.
	4-1	470.100 - 558.000 MHz	EM 6000	SK/SKM 600(		4-2	481.400 - 481.400 MHz	EM 6000	SK/SKM 9000
					⇔				
	<b>\$</b>			\$					
						Frequency rang	e		
	Independe		lulations			481.400 ÷	- 481.400 MHz		
	4							Г	Olf Connect
									OK Cancel

After confirming the "Add system region" window by clicking on "OK", the system region 1 is displayed in the upper window area of the "System regions" tab.

If the "System regions" check box is activated, the frequency range used by the system region is displayed as a blue bar 2 in the graphical overview:







## Editing system regions

#### To mark system regions as "independent" without opening the dialog window:

Activate/deactivate the "Independent" check box.

## To edit the names of system regions, to mark system regions as "independent" and to edit other parameters using the dialog window:

- In the upper window area, right-click on a system region and select "Edit system region" from the shortcut menu or select a system region and click on "Edit system region...".
- Edit the parameters of the system region.

#### Deleting system regions

- In the upper window area, right-click on one or several system regions and select "Delete system region" from the shortcut menu or select a system region and click on "Delete system region...".
- Confirm the safety query.



## Spare Groups

### Defining and managing spare frequency groups

The "Spare groups" tab allows you define groups of radio systems for which a specified number of shareable spare frequencies is to be calculated.

A spare frequency group can consist of different systems (e.g. Digital 9000). One condition for this is, among other things, that the frequency ranges of the systems overlap.

The WSM calculates the possible spare frequencies within the overlapping frequency range which are compatible with all systems of the spare frequency group.

If the operating frequency of a system is being interfered with, you can choose from a defined number of compatible frequencies that allow for flexible use.

Related information Defining spare groups Editing spare groups

## Defining spare groups

- Make sure that the "Devices" tab contains device data.
- In the "Spare groups" tab, click on "Add spare group...".
- Enter a name for the spare group in the "Name" field 1. The default name "Spare Group 001" is displayed in the "Name" field; as spare groups are added, they are numbered in consecutive order.
- From the "Devices" box 2, select a system region and then a transmission link and ...
  - click on the white right-pointing arrow to move the transmission link to the "Group members" box 3 or
  - with the left mouse button pressed, drag the transmission link into the "Group members" box 3.
- Repeat these steps for the other transmission links.
  - If you select a device from a system region in the "Devices" box 2 to add it to the "Group members" box 3, only devices having an overlapping frequency range with the selected device are listed in the "Devices" box 2. All other devices are hidden.
- In the "Number of spare frequencies" field 4, enter the number of spare frequencies to be available in case of need. This number is displayed in the "Spare frequencies" column in the "Devices" tab.



The overlapping/shared frequency range for the devices added in the spare group is shown behind "Shared frequency range" 5. This shared frequency range is considered for coordination.

The "Portable device" column 6 in the "Group members" box 3 lists the available portable device for each stationary device in the list.



After confirming the "Add spare group" window by clicking on "OK", the spare group 1 is displayed in the upper window area of the "Spare groups" tab.

If the "Spare groups" check box is activated, the frequency range used by the spare group is displayed as a gray bar 2 in the graphical overview.





## Editing spare groups

- From the upper window area, select a spare group and click on "Edit spare group...".
- Edit the parameters of the spare group.
- > You can edit any parameter (e.g. name, number of spare frequencies).
- You can also remove devices from the "Group members" box by selecting the device and clicking on the left-pointing white arrow.

#### Deleting spare groups

- From the upper window area, select a spare group and click on "Delete spare group...".
- Confirm the safety query.

## Coordination

#### Coordinating intermodulation-free frequencies

The "Coordination" tab allows the calculation and coordination of intermodulation-free frequencies that are suitable for the prespecified frequency conditions.

The coordination depends on the following parameters:

- Devices set in the "Devices" tab
- Settings made in the "System regions", "Frequencies/Bands" and "Spare groups" tabs

#### Starting the coordination

- Make sure that the "Devices" tab contains device data (either self entered or automatically read in).
- Check if all the desired settings have been made in the "System regions", "Frequencies/Bands" and "Spare groups" tabs.
- ▶ In the upper window area of the "Coordination" tab, click on "Start coordination".
  - The coordination of intermodulation-free frequencies starts.
- The coordination results are displayed on the left hand side 1 of the upper window area and are continuously updated.
- The header 2 of the "Coordination" tab displays the number of coordination results. This information remains visible even when you change to another tab.
- If you select a coordination result, the coordinated frequencies are displayed in the "Selected coordination" box 3 on the right hand side of the upper window area and are also shown as solid, colored lines 4 in the graphical overview.
- In addition, the calculated intermodulation products 5 are displayed.





## Allocation

#### Allocating frequencies to channels and editing allocations

The "Allocation" tab allows you allocate frequencies to channels, either by drag and drop or automatically, and to edit the allocations.

#### Selecting a coordination result for the allocation

- Make sure that you have calculated intermodulation-free frequencies in the "Coordination" tab.
- From the "Coordination" tab 1, select a coordination result 2 for the allocation:

	Devices	System	n regions	Freque	ncies,	/Bands	Spare gr	oups Coordinat
ì	Result no.	IM ratin	Priorities			Unusa	Pre-allocated	
I	Current	100%	Hi: 0 / Med:	0 / Lo: <b>0 /</b> I	Und	1	2	
I	1	100%	Hi: 0 / Med:	2 / Lo: 0 / I	Und	0	1	
I	2	100%	Hi: 0 / Med:	2 / Lo: <b>0 /</b> I	Und	0	1	Pause coordination
I	3	100%	Hi: 0 / Med:	2 / Lo: 0 / I	Und	0	1	
I	4	100%	Hi: 0 / Med:	2 / Lo: <b>0 /</b> I	Und	1	0	
I	5	100%	Hi: 0 / Med:	2 / Lo: <b>0 /</b> I	Und	1	0	
I	6	100%	Hi: 0 / Med:	2 / Lo: <b>0 /</b> I	Und	1	0	



Change to the "Allocation" tab 1.

The frequencies are displayed in the "Selected coordination" box 2 on the left hand side and the channels are displayed in the "Allocations" box 3 on the right hand side of the upper window area:

	Professional Setup									- 0	ı ×			
1	Devices	Frequ	uencies/I	Bands	System	egions	Spare groups		Coordination [6	5]	Allocation	Mark	cers L	og m ◀
	Selected	coordina	tion						Coordinated fre	iquency	Allocations			
Ľ	Frequency	IM rating	Noise	Priority	Target sy	System r	Spacings		+ Frequency targ	et 🔽	Channel na	Status	Frequency	Device t.
1	514,175	100%	0 dB	Undefin	Digital	Region 01	Carrier: 200kHz		Allocated frequ		4-1	¢	472,800	Digital
1	514,375	100%	0 dB	Undefin	Digital	Region 01	Carrier: 200kHz		X No frequency to		4-2	×	481,400	Digital
1	662,000	100%	0 dB	Undefin	FM mic	-	Carrier: >375kHz	: / 2T	Allocate auto	matically	G4 - EM1	¢	662,300	FM mic
1									Thotate doto	madeday	Madonna	¢		Digital
1														
1									Send to connect	ed devices				
1	¢							Þ	Show uncoordi		(C)			
ſ	6											1 -	Device filtr	ers (all)
													Digital	
	dB 💌											E E	IEM systems	
	40	21 22 23	24 25 3	26 27 28	29 30 31	32 33 34	35 36 37 38	39 4	0 41 42 43 44	45 46 47	48 49 50 51		Others	
	25												System item	filters (all)
	30 —													
	25												Device rang	
													Spare group	
									EM 300-500 C4 -	Put (626 - 609 M	4U=)		Scan data	
	15 -	SK/SKM 60	00 - A1-A4	470.200 - 5	58.000 MHz)	·			SK/SKM 300 G4 -	Bw (626 - 698 I		E E		
					EM	6000 (RF mod	e: LD) 470.200 - 71	3.800	MHz				Freq./band f	ilters (all)
	10												Usable band	ls
	5		Region 01 (4	70 - 558 MH	z)								Unusable ba	
			Madonna (4	70 - 558 MH	z)									
Į	0-	480	500	520	540	560 58	10 600	620	640 6	60 680	700		Discrete fre	quencies
Ē														

#### Allocating frequencies

- Using drag and drop, drag the frequencies from the "Selected coordination" box 2 and drop them on channels in the "Allocations" box 3. Or
- Automatically allocate frequencies to channels by clicking on "Allocate automatically".
  - Allocated frequencies appear as dotted lines in the graphical overview.

#### To delete individual allocations:

Click on the allocations and drag them from the "Allocations" box 3.

#### To delete all allocations:

Click on "Delete all allocations..." in the upper window area of the "Allocation" tab.



#### Sending allocations to connected devices

- Click on "Send to connected devices..." in the upper window area of the "Allocation" tab.
  - If the squelch level of online devices is less than the noise level of the frequencies allocated to the devices, the following window opens, showing the recommended squelch levels for the listed devices.

Send to connected devices								
Some device properties have to be set as recommended below. Deselect the values which shall be left untouched!								
Channel na	Squelch	Mono/Stereo						
ew IEM	✓ -1 dB -> 0 dB	ОК						
	_	_	_					
		Continue	ancel					

The recommended squelch levels are sent to the corresponding devices together with the allocated frequencies.

If you want to continue using the previously set squelch levels:

- In the "Squelch" column, deactivate the check boxes for the corresponding devices and click on "Continue".
  - **i** Before you can change parameters such as the squelch level, you must activate the "Remote Access" menu item in the "System" menu.

?

 $\times$ 

The "Sending status" window shows a progress bar 1, indicating the progress of frequency allocation to the connected devices in percent. The list of messages 2 displays progress information in text form.






### Markers

#### Setting and editing markers

The "Markers" tab allows you to set colored markers and label them with names in order to mark certain positions in the frequency spectrum.

#### Setting markers

- Click on "Add marker...".
- Enter a name 1 and select a frequency 2 and a color 3.
- Enter a comment 4 if necessary.

🗷 Add r	narker X
1 Name	Refernce
2 Frequency	523.247 ÷ MHz
3 Color	
4 Comment	
	OK Cancel Apply

After confirming the "Add marker" window by clicking on "OK", the marker 1 is displayed in the upper window area of the "Markers" tab.

In the graphical overview, the marker appears as a vertical line 2. The upper end of the marker shows a downward pointing triangle and the label of the marker:

Professional Setup						- 🗆 X
Devices System regions	Frequencies/Bands	Spare groups	Coordination [3	3] 🔲 Allocat	ion Marker	s Log messages
🤲 📩 Name	Frequency	Color	Comment			
- 002	650.357 MHz		1			
Refernce	523.247 MHz					
U						
Add marker Edit marker Del	ete marker					
						Device filters (all)
						☑ Digital
			<u></u>			💌 FM mics
dBm 💌	Referrice			002		🗹 IEM systems
-30			Default - Right-Clic	k to Set Regional Information		🗹 Others
40						System item filters (all)
-10						Markers
-50					<u>e</u>	Intermodulation
-60						Device ranges
						System regions
-70 SK/SKM 9000 - A1-A4 (*	(7).1 - 558 MHz)					🗹 Scan data
-80 SK/SKM 6000 - A1-A4 (-	7).1 - 558 MHz)					Noise threshold
-00	EM 6	000 - 470.100 - 713.90	0 MHz			Freq./band filters (all)
						💌 Usable bands
-100 - Region 01 (470 -	5.58 MHz)					🗹 Unusable bands
-110 Spare group 001 (4:	0 - 558 MHz)				ا السنام	Interference frequencies
480 500 5	20 540 560	580 600	620 640	660 680	700	Discrete frequencies
Project: test.wsm		Marker ac	ided (2): 002			2021-01-18 10:36 AM

#### **Editing markers**

- From the upper window area, select a marker and click on "Edit marker...".
- Edit the parameters of the marker.

#### **Deleting markers**

- From the upper window area, select a spare group and click on "Delete marker...".
- Confirm the safety query.



# Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum

After having made all relevant settings in the tabs of the "Professional Setup" window, you can now perform the following steps.

Related information Information on the regional frequency grid Loading the regional grid bar of your country Performing or importing a frequency scan Analyzing the frequency spectrum

# Information on the regional frequency grid

The regional frequency grid provides information on which frequencies in your country are reserved for primary use (TV broadcasters, mobile phone operators, etc.). The frequencies' availability for secondary use by your radio systems can be determined manually using the regional grid or by means of an automatic spectrum analysis. Always make sure to comply with the regulatory and legal requirements for secondary use. Check if a more appropriate or up-to-date regional grid definition is available for your venue, e.g. as a download from the Sennheiser website at sennheiser.com.

- Analyze the frequency spectrum at your venue (see Analyzing the frequency spectrum).
- Read and follow the regulatory and legal requirements for secondary use by your radio systems.



# Loading the regional grid bar of your country

- Right-click on the active regional grid bar.
- Click on "Change regional grid...".
- Select the desired file and then click on "Open".





# Performing or importing a frequency scan

#### To perform a frequency scan at the venue of the planned event:

In the "Devices" tab, activate the desired devices in the "Scan" column of the device list.



Click on "Start frequency scan" in the buttons area.



### To import a frequency scan:

Click on the "Import frequency" button in the graphical overview.

After the frequency scan has been performed/imported, the scan result appears transparent light blue in the graphical overview:



# Analyzing the frequency spectrum

Change to the "Frequencies/Bands" tab and click on "Analyze frequency spectrum...".

The analysis result appears in list form in the upper frequency window and is also displayed graphically in the graphical overview.

	Name	Туре	Frequency/Band	Priority	Noise level
🤝	TV 33	Usable band	566,000 - 574,000 MHz	Medium	5 dB
	TV 34	Usable band	574,000 - 582,000 MHz	🔵 Medium	5 dB
*	TV 35	Usable band	582,000 - 590,000 MHz	🔵 Medium	5 dB
*	TV 36	Usable band	590,000 - 598,000 MHz	🔵 Medium	5 dB
	TV 37	Usable band	598,000 - 606,000 MHz	🔵 Medium	5 dB
*	TV 38 (exkl.)	Unusable band	606,000 - 614,000 MHz	× Blocked	5 dB
*	TV 39	Usable band	614,000 - 622,000 MHz	Medium	5 dB
*	TV 40	Usable band	622,000 - 630,000 MHz	🔵 Medium	5 dB
*	TV 41	Usable band	630,000 - 638,000 MHz	🔵 Medium	5 dB
1	TV 42	Usable band	638,000 - 646,000 MHz	🔵 Medium	5 dB
	TV 43	Interference frequency	650,000 MHz (±4.000 kHz)	🗙 Blocked	5 dB



Usable frequency ranges are displayed in transparent green (can be viewed/ hidden via the "Usable bands" check box in the "Freq./band filters" area.

Unusable frequency ranges are displayed in transparent red (can be viewed/ hidden via the "Unusable bands" check box in the "Freq./band filters" area).

Interference frequencies appear as vertical orange lines (can be viewed/hidden via the "Interference frequencies" check box in the "Freq./band filters" area):



Interference frequencies are not taken into account in the intermodulation calculation and are ignored when new frequencies are placed.

Discrete frequencies appear as vertical green lines (can be viewed/hidden via the "Discrete frequencies" check box in the "Freq./band filters" area):



These frequencies can be prioritized in the calculation over overlapping usable frequencies or undefined frequencies by assigning them a higher priority.

- Evaluate the result of the spectrum analysis:
  - Are there any interference frequencies or frequency bands that are marked as occupied but you know for sure that they can be used?
  - Are there any frequencies/frequency bands that are marked as usable but you know for sure that they cannot be used?
  - Do the settings in the "Priority" column still apply to your current transmission situation?
- Adjust the result of the frequency spectrum analysis:
  - From the upper frequency range, select the entries and click on "Edit freq./ bands...".
  - Modify the desired settings.



# Working with scenes

The WSM allows you to define views, the so-called "scenes". In each scene, you can set up and move panel (see Working with panels). Thus, the scenes only display the transmission links relevant to you.

Master Scene Adding new scenes Selecting a scene Renaming a scene Copying and pasting scenes Deleting a scene Scene commentary (label)

### Master Scene

When you create a new configuration, there is first only the "Master Scene".

The "Master Scene" has the following particularities in comparison with other scenes:

• As soon as a new device is detected, it automatically appears as a panel in the "Master Scene". All other scenes are not affected.

The "Master Scene" is an overview help. Therefore, do not use the "Master Scene" for configurations that you want to use repeatedly.

• You cannot delete or rename the "Master Scene".



### Adding new scenes

Click on "+" next to "Master Scene".

Or

- Click on "Scenes" > "Add New Scene".
  - ✓ The new scene is added. A new tab with the name "Scene 1" appears.

The display area of the scene is empty at first.

You can now drag panels in the new scene (see Creating panels) or use the scene for one of the tools (see Recording the field strength using the tools).



# Selecting a scene

Master S	Scene	Band 1	Band 2	Final		
Clic	k on the ta	ab of the de	sired scene.			
$\checkmark$	The sce	ne appears	in the displa	y area.		
	Or					
Clic	k on "Scer	nes" > "Sele	ct Scene".			
$\checkmark$	The sub	menu conta	ining the na	mes of the	scenes appears.	
Clic	k on the d	esired scen	e.			
$\checkmark$	The sce	ne appears	in the displa	y area.		
Scenes	System	Languag	e Chann	el Frequ	uency Manager	Applica
Add	new scer	he		Ctrl+N		2

_			
	Add new scene	Ctrl+N	A 🚟 ?
	Rename scene	F2	
	Copy Scene/Select and Copy All		
	Paste	Ctrl+V	
	Select all channels	Ctrl+A	
	Delete scene		
	Select Scene	•	Master Scene
Α	New label		Band 1
			Band 2
			✓ Final



# Renaming a scene

You cannot rename the "Master Scene".

### To rename other scenes:

- Click on the tab of the scene you want to rename.
- Click on "Scenes" > "Rename Scene..." or press the "F2" key.
- Enter a new name for the scene.

🗷 Ren	ame		$\times$
-Scene Name:	Scene 1	-	
	ОК	Cancel	



# Copying and pasting scenes

You can copy the contents (panels or tools) of a scene and paste them into a new scene.

To copy the contents of a scene and paste them into another:

- Click on the tab of the scene you want to copy.
- Click on "Scenes" > "Copy Scene".
- Click on "Scenes" > "Paste Scene".

The contents of the copied scene are pasted.



### Deleting a scene

When deleting a scene, the configuration of the devices is retained.

You cannot delete the "Master Scene".

- Click on the tab of the scene you want to delete.
- Click on "Scenes" > "Delete Scene".





## Scene commentary (label)

You can paste labels into a scene to provide a better overview. The labels can be freely dragged and re-sized.

#### Pasting labels

- In the "Scenes" menu, click on > "New Label".
  - ✓ A label appears in the scene. The cursor blinks in the middle of the label.
- Enter your commentary.
  - The font size is automatically adjusted to the size of the label.



**i** To change the text at a later time:

- Right-click on the label.
- Click on "Edit".
- Change the text in the label.

#### **Dragging labels**

- Click on the label.
  - The move symbol appears.
- Move the label to the desired position.

#### **Re-sizing labels**

- Click on the edge of the label.
  - Selection points appear at the edge of the label.
- Drag on one of the selection points to change the size of the label. Dragging one of the corner selection points changes both the height and width of the label.

#### **Deleting labels**

- Right-click on the label.
- Click "Delete".



# Working with panels

The WSM enables you to keep a clear overview of even large systems (see **Display area**). The scalable panels display the most important parameters of your transmission links.

Creating panels Enlarging/reducing panels Selecting several panels Changing the graphical representation of panels Warning and error messages Aligning and moving panels Adding a panel to a different scene Sorting panels for multi-channel systems Identifying channels Panel commentary (label) Deleting panels

# Creating panels

#### To create a new panel:

- In the system window, click on the "Devices" tab.
- Click on a device and keep the mouse button pressed.
- Drag the device in the scene.
  - A new panel appears in the scene.

In the system window, an eye appears next to the device. The eye indicates that the corresponding device is displayed in the currently selected scene as a panel.



# Enlarging/reducing panels

There is a dashed area in the lower right corner of the panel.

### To steplessly reduce or enlarge the panels:

- Click on the dashed area.
- Keep the mouse button pressed and drag the panel to the left (= reduce) or to the right (= enlarge).



**i** When you considerably zoom out a panel, the scales are hidden to provide a better overview.



### Selecting several panels

When you select several panels, you can move, copy and cut them simultaneously, you can display the common parameters of the channels and you can edit these channel parameters (see Configuring devices).

#### To select several panels:

- Click on a panel and keep the "Ctrl"/"Cmd" key pressed.
- Click on further panels in order to select them.

✓ The selected panels are highlighted in color.

Or

- Click on the background while keeping the left mouse button pressed.
- With the mouse pointer, draw a rectangle over the desired panels.

✓ The selected panels are highlighted in color.



# Changing the graphical representation of panels

The WSM allows you to choose between different settings and graphical representations for the panels.

Related information Changing the graphical representation of a panel Selecting an icon for a panel Changing the color of a panel Defining standard panel settings and applying them

# Changing the graphical representation of a panel

### To change the graphical representation for a panel:

- Right-click on the panel.
- Click on "View Style".





- Select a panel style:
  - Panel styles for receivers



• Panel styles for transmitters



**i** The panel style for a "transmitter" panel depends on the device settings.

When you considerably zoom out a panel, the scales are hidden to provide a better overview.



### Selecting an icon for a panel

To provide for a better overview, you can assign an icon corresponding to the instrument or a number to each panel. Alternatively, you can assign pictures – e.g. photos of the performers.

#### UTo select an icon for a panel

- Click on the desired panel.
- Click on "Channel" > "Icon".

Channel Frequency Manager Applic	ations	Help	)	
Channel sorting				
Properties				
View Style	×			
Icon	•	Ì	Trumpet	
New label		N.	Guitar	
"Identify channel" is not supported		P	Vocal	
Panel Color		2	Bass	
		<b>W</b>	Accordion	
Use Panel Settings As Default			Flute	
Use Default Panel Settings		/	Clarinet	
Сору	Ctrl+C	ø	Saxophone	
Remove/Cut	Ctrl+X	9	Percussion	
		ð	Trombone	
		<i>4</i>	Violin	
			Picture	
			Set Number	►
			No icon	

Select one of the icons.

✓ The icon appears in the upper left corner of the selected panel.

Or

- Click on "Set Number" and select a number between 1 and 50.
  - The number appears in the upper left corner of the selected panel.

Or

- Click on "Icon".
- Select a graphic or a picture.



Click on "Open".

✓ The picture appears in the upper left corner of the selected panel.





# Changing the color of a panel

### To assign a color to the border of the panel:

- Click on the desired panel.
- Click on "Channel" > "Panel Color".
- Select a color.



# Defining standard panel settings and applying them

### To define standard panel settings:

- CSet up a panel as desired.
- Click on the panel.
- Click on "Channel" > "Use Panel Settings As Default".

#### To apply the last saved standard panel settings to the panels:

- Select one or several panels.
- Click on "Channel" > "Use Default Panel Settings".



### Warning and error messages

### Status field / Display of the audio outputs AF and COM

If a threshold value on the device is exceeded or undershot, a message appears in the status field.



The messages are highlighted in different colors. The part of the panel to which the message refers is also highlighted.



### Warning and error messages

Anzeige

- MUTE
  - yellow: The device is muted.
- NO LINK
  - yellow: No link or the transmitters ratio signal is off.
- RX MUTE
  - yellow: The channel is muted.
- TX MUTE
  - yellow: The transmitter is muted.
- PEAK
  - red: The device is overmodulated.
- LOW BATT
  - red: The device's battery is almost flat.
- LOW RF
  - red: The squelch threshold is almost reached.
- Low Signal
  - red: The received signal is too low or has a poor quality.
- AF PEAK
  - red: The audio level is overmodulated.
- RF PEAK
  - red: The radio signal is overmodulated.
- ENCR. ERR. (Encryption Error)
  - red: The encryption is mismatched.

The message also appears in the system window ("Messages" tab) and in the status bar.

### EM 3732 Command

With the EM 3732 Command twin receiver, the status field appears in alternation with the current status of the audio and command outputs (see EM 373X instruction manual):





AF out: is switched on // Command: is switched on



AF out: is switched off // Command: is switched on





AF out: is switched on // Command: is switched off

AF COM

AF out: is switched off // Command: is switched off



# Aligning and moving panels

#### Moving panels

- Click on a panel or select several panels.
- ▶ Keep the left mouse button pressed and drag the panel(s) to the desired position.

#### Aligning panels to the grid

- Click on "View" > "Show Grid" to show the grid.
- Click on the panel and keep the mouse button pressed.
- Drag the panel to the desired position in the scene.
  - If the "Snap to grid" menu item is activated, the panel is automatically aligned to the grid.

#### Arranging panels automatically

- Click on "View" > "Auto Arrange".
  - ✓ A tick appears in front of the menu item. The panels are arranged side by side.



# Adding a panel to a different scene

Select one or several panels.

#### To copy or cut a panel:

- Click on "Channel" > "Copy" or "Remove/Cut".
- Click on the tab of the desired scene.
  - ✓ The scene appears on the display area.
- Click on "Channel" > "Paste".
  - ✓ The panel appears in the selected scene.



# Sorting panels for multi-channel systems

The following function allows you to conveniently determine the sequence of the panels.

**i** EM 9046 receivers are automatically sorted according to their channels.

#### To change the sequence of the panels:

- Click on "Channel" > "Channel sorting ...".
- Follow the instructions of the wizard.

#### Channel Sorting

 $\times$ 

	rou are ac	ple to re-arrange all cr	nannels by dra	ag & drop.			
New order	Name	Frequency range	Frequency	Device type		Position	
1 j 2	G4 - EM1 4-1	626,000 - 698,000 MHz 470,200 - 713,800 MHz	662,300 MHz 472,800 MHz	EM 300-500 G4-BW-3 EM6000 (EM6000) -2	Left		
3	4-2	470,200 - 713,800 MHz	481,400 MHz	EM6000 (EM6000) -2	Right		



# Identifying channels

The "Identify channels" function allows you to quickly identify connected devices of the ew G3, ew G4, 2000 series, Digital 6000, Digital 9000 and EM 3732-II receivers.

- Click on a panel.
- Click on "Channel" > "Identify Channel".

"Identified" appears on the display of the selected device.



# Panel commentary (label)

You can paste labels into the panels to provide a better overview. The labels can be freely dragged.

#### Pasting labels

- Right-click on the panel.
- Click on "New Label".



Enter your commentary.

The font size is automatically adjusted to the size of the label. You cannot resize the label, as the label size is dependent on the panel size.

**i** To change the text at a later time:

- Right-click on the label.
- Click on "Edit".

#### **Dragging labels**

Click on the label.

The move symbol appears.

Move the label to the desired position.

#### **Deleting labels**

- Right-click on the panel.
- Click on "Delete".



# **Deleting panels**

#### To remove unused panels from the display area:

- Right-click on the panel.
- Click on "Remove/Cut".
  - ✓ The panel is deleted. The panel settings are lost.

The set device parameters are retained. The eye in the system window is removed for this scene.

#### To restore all panels:

- Click on "System" > "Refresh Device List".
  - All stationary devices appear as panels with the default panel settings in the display area. The previous panel settings are lost.

#### To restore individual panels:

Read the chapter Creating panels.

# Configuring devices

Configuring streaming Setting parameters in the "Properties" window Enable Legacy Mode Enable Third Party Access

# Configuring streaming

The WSM allows you listen to live audio streams received by EM 9046 receivers.

The WSM supports streaming of RTP/RTSP audio received by compatible EM 9046 receivers.

Related information Streaming using RTP/RTSP Streaming using Dante

# Streaming using RTP/RTSP



If the WSM is in online mode and an EM 9046 is connected to your computer, you can stream audio using the RTP/RTSP protocol and listen to it by clicking on the headphone icon on the EM 9046 channel strip.



A gray headphone icon indicates that the EM 9046 receiver is offline or that the firmware of the EM 9046 does not support RTP/RTSP streaming.

RTP/RTSP streaming is supported from the following EM 9046 firmware version: EM9046\_3\_0\_3 (for how to update the EM 9046 firmware, see Updating the firmware of devices).



### To start RTP/RTSP steaming:



Click on the headphone icon.

 $\checkmark$  The background of the icon turns blue, indicating that the stream is





Using the RTP/RTSP streaming protocol (R) you can listen to one channel at a time.



### Streaming using Dante

#### Required hardware

You require an EM 9046 receiver equipped with an EM9046 DAN module (a Dante module provided by Sennheiser).

#### **Required software**

For Dante playback, you require Dante Virtual Soundcard by Audinate.

You additionally require the "AVS Firmware Updater" software developed by AuviTran to update the firmware of the EM 9046 DAN modules. The "AVS Firmware Updater" is only available for Windows.

#### To turn on Dante Virtual Soundcard:

- > Open the Dante Virtual Soundcard Control Panel.
- Click on the grayed out power on/off button.
  - The power on/off button turns green, indicating that Dante Virtual Soundcard is turned on (for more information, refer to the Dante Virtual Soundcard User Guide).




### Setting parameters in the "Properties" window

You can configure stationary devices and the corresponding portable devices using the "Properties" window. To do so, select one or several panels (see Selecting several panels).

#### To display the parameters of the selected device:

- ▶ Right-click on a panel.
- Click on "Properties" or "Common Properties"
  - The parameters for the device appear in the left column ("Name"). To the right, the associated values ("Value") and units ("Units") are shown.

riopenies				
Name	Value		Unit	
Name	G4 - EM1			
Bank	12	•		
Channel	1	•		
Frequency	662,300	\$	MHz	
Squelch	5	•	dB	
Lower frequency limit	626,000		MHz	
Upper frequency limit	698,000		MHz	
AF out	15	-	dB	
Equalizer	Flat	-		
RX Mute	Off	•		
Pilot tone	Active	•		
Auto lock	Inactive	•		
Warning AF peak	Inactive	•		
Warning Low Battery	Inactive	•		
Warning Low RF Signal	Inactive	•		
Warning RF mute	Inactive	•		
Warning Tx mute	Inactive	-		
Warning Rx mute	Inactive	-		
Frequency list				
<ul> <li>Sync settings SK</li> </ul>				
Auto lock	Ignore	•		
Sensitivity SK	Ignore	•	dB	
RF power	Ignore	•		
Mute Mode	Ignore	•		
<ul> <li>Sync settings SKM</li> </ul>				
Auto lock	Ignore	-		
Constituity SVM	lanoro	-	4P	
vice is disconnected	iable 💮	ОК	Cancel	Apply

#### Dialog window of a wireless microphone system

Dialog window of a wireless monitoring system



Name	Value				
Name				Unit	
1	ew IEM				
Bank	U1	•			
Channel	User defined frequency	•			
Frequency	734,000	<b>+</b>	MHz		
Lower frequency limit	734,000		MHz		
Upper frequency limit	776,000		MHz		
Sensitivity	-21	-			
Mode	Stereo	•			
Auto lock	Inactive	-			
RF mute	Off	-			
RF power	Standard	•			
Warning AF peak	Inactive	-			
Warning RF mute	Inactive	-			
Frequency list					
<ul> <li>RX Sync settings</li> </ul>					
Auto lock	Ignore	•			
Balance	Ignore	-			
Mode	Ignore	•			
Limiter	Ignore	-			
High Boost	Ignore	-			
Squelch	5	-			

If you have selected several devices, only the identical, i.e common, parameters of the devices are displayed. All other fields contain no information.

## Using spare frequencies from the "life belt" option

Name	Value		Unit		
Name	EM9046				
Presets	40.1	•			
Frequency		MHz			
Command Mode	add	•			
Encryption	off	•			
Channel State	normal	•	2	Spare frequency	? ×
Sync Settings Tx				spare nequency	
Attenuation	4	• dB	Please select a spa	re frequency. To set yo	ur device to
Low cut	30	• Hz	the new frequency,	click 'Set'.	
Display	Name	•	487.500 MHz 480.250 MHz		
Lock	off	•	403.4.30 MPL		
Cable emulation	UNE	•			
RF Mode	LR.	•			
				Cancel	Set

- **i** The "life belt" icon in the "Properties" window is only enabled if you have configured your system using "Professional Setup" (see "Professional Setup" frequency management), i. e. if
- you have allocated coordinated frequencies as spare frequencies,
- the spare frequencies are within the frequency range of the device,
- the system region of the spare frequencies is the same as the system region of the device and
- the device type of the spare frequency is the same as the device type of the device.

The "life belt" icon provides access to the "Spare frequency" dialog which lists the precoordinated spare frequencies that can be used if the operating frequency of your system is disturbed or interfered with.

**i** The disturbed frequency is displayed in light gray font in the "Spare frequency" dialog.

If you select a spare frequency from the "Spare frequency" dialog, this frequency is removed from the "Spare frequencies" dialog and assigned to the device in the "Properties" window.



If there are no spare frequencies available for the frequency range, the life belt icon in the "Properties" window is disabled.



## Changing the parameters of a device

#### Before you can change parameters, you must activate the "Remote Access" menu item:

Click on "System" and check if the "Remote Access" command is ticked.

#### If "Remote Access" is not ticked:

- Click on "Remote Access".
  - You may be requested to enter a password (see Protecting the WSM with a password). A tick appears in front of the menu item. A red dot appears in the panel. When you call up the "Properties" window, "Remote Active" is displayed in the lower part of the window.

The parameters that you can change depend on the respective device type. Specific information on the parameters can be found in the instruction manuals for the devices.

- Click on the arrow next to the corresponding parameter.
- Select the desired value.



## Enable Legacy Mode

#### Set the devices to SSCv1.

After switching to SSCv2 and completing the claiming processes, it is now possible to revert the devices back to SSCv1 using Legacy Mode.

SSCv2 and SSCv1 will run in parallel.

Products and consols with SSCv1 can be accessed after enabling Legacy Mode.

**i** Enabling Legacy Mode might pose a security risk.

#### To enable Legacy Mode:

- Right-click on the device in the "Device List".
- Click on "Enable Legacy Mode".

5 3	DW DV DV4 (DWDVDV4D) [01.0]	-4
i	Properties	· ·
	Change Password	
	Enable Legacy Mode	
	Enable 3rd Party Access	
	ldentify	
	Reset	
	Restart	
	Delete	

Click on "Yes".





#### To disable Legacy Mode:

- Right-click on the device in the "Device List".
- Click on "Disable Legacy Mode".



Click on "Disable".

🗷 Disa	able Legacy Mode	×
▲	This action will disable the Legacy mode on the device Do you want to disable?	e.
	Disable Cancel	





## **Enable Third Party Access**

Get access to the products via an third party client.

In the Wireless Systems Manager you can set up third-party access to allow other clients (not Sennheiser) to access the devices.

Creating a username with a password for each product is necessary.

#### To enable Third Party Access:

- Right-click on the device in the "Device List".
- Click on "Enable 3rd Party Access".



Enter a username and a password.

Z 3rd Party Access	×
This device allows third-party systems to access its data. The dialog helps you configure external access we maintaining security. Only grant access to trusted third parties.	nile
The password must be at least 10 characters long and include at least one of each:	
•Lowercase letter (a-z) •Uppercase letter (A-Z) •Digit (0-9) •Special character	
Username	
ThirdParty	
Password	
Enabling third-party access introduces potential security risks. Proceeding confirms your acceptance of these risks.	
Cancel Enable	

Activate the checkbox.

Z 3rd Party Access	×
This device allows third-party systems to access its data. The dialog helps you configure external access whil maintaining security. Only grant access to trusted third parties.	2
The password must be at least 10 characters long and include at least one of each:	
•Lowercase letter (a–z) •Uppercase letter (A–Z) •Digit (0–9) •Special character	
Username	
ThirdParty	
Password	
•••••	
Enabling third-party access introduces potential security risks. Proceeding confirms your acceptance of these risks.	
Cancel Enable	

Click on "Enable".



#### To disable Third Party Access:

- Right-click on the device in the "Device List".
- Click on "Disable 3rd Party Access".

> 🚨 EW-DX EM4	(FWDXFM4D) - [O1-9] -4	
	Properties	
	Change Password	
	Disable Legacy Mode	
	Disable 3rd Party Access	
	Identify	
	Reset	
	Restart	
	Delete	

Click on "Disable".

🗷 3rd Par	Access >	×
<u>.</u>	you wish to disable 3rd Party Access	?
	Disable Cancel	J

✓ Third Party Access has been enabled/disabled.



## Recording the field strength using the tools

The "RF Spectrum Analyzer" tool The "RF Level Recorder" tool Working with the tools Setting the frequencies - "RF Spectrum Analyzer" only Overview of the buttons of the tools Starting the field strength recording Interrupting the field strength recording Canceling the field strength recording Deleting the last field strength recording Zooming the "RF Level" window in/out Temporarily saving recordings and comparing them Marking measured values and commenting on them Finding minimum and maximum values Saving recording data Loading previously saved recording data Printing recording data

## The "RF Spectrum Analyzer" tool

The "RF Spectrum Analyzer" tool allows you to get a clear picture of the frequency spectrum on location and provides you with all the necessary information for planning your wireless system – more up to date and reliable than any list.

**i** If you want to use the "RF Spectrum Analyzer" tool during live operation, select a receiver that is not required in the transmission.

After you have completed the measurement with the "RF Spectrum Analyzer", you have to set the frequency of the receiver again.

#### Calling up the "RF Spectrum Analyzer"

- In the system window, click on the "Tools" tab.
- Double-click on the "RF Spectrum Analyzer" icon.

## .ii



The "RF Spectrum Analyzer" window



#### 1 Toolbar

• see Buttons in the toolbar

#### 2 Selection area

Receiver	Set frequency	RF Threshold	Set time		
EM9046 470,000 MHz	▼ Range	▼ -87 🚔 dBm	Now	26/01/2021 11:39	$\sim$

In the selection area, you can:

- select a stationary receiver (see Selecting a stationary receiver for the recording),
- select the frequency range (see Setting the upper and lower limit of the frequency range (Range)) and
- presetthe start time for the recording (see Presetting the start time for the recording).

#### 3 Recording bar

• see Buttons in the recording bar



# Found frequency (HHz)

This window displays the measured field strength of the different frequencies within the receiver's frequency range as vertical bars (display range of up to 40 dB).

The set squelch threshold is given as a reference. The squelch threshold is shown as a horizontal dotted line.

free	occupied	Squelch

- Green: "free": The field strength is below the squelch threshold and is displayed as an unused frequency.
- Red: "occupied": The field strength is above the squelch threshold and is displayed as an occupied frequency.
- Yellow: "squelch": Squelch threshold.

The squelch threshold can be adjusted in the "Parameter" window (see Setting parameters in the "Properties" window).

#### 5 "Memory", "Found Frequencies" and "Frequency (MHz)" displays

#### "Found Frequencies" display

The "Found Frequencies" displays the occupied frequencies detected during the recording as red squares.

#### "Frequency (MHz)" display

The frequencies are shown on the x-axis of the "Frequency (MHz)" line. The frequency range depends on the selected receiver and the setting made under "Set Frequencies".

#### "Memory" display

The "Memory" display is only shown if a recording from the temporary memory is displayed (see Temporarily saving recordings and comparing them).

## 4 "RF Level" window (display range of up to 40 dB max.)



#### 6 Display of the current date and time

The current date and time are displayed. Date and time are taken from the operating system.



#### 7 "Comment" field

Important occurrences can be marked and commented. The markers are displayed as vertical blue lines. A blue flag appears above them.



When you click on a marker, the line and the flag turn to orange. When you move the mouse pointer over a marker, a box will appear above the marker, indicating the time and the measured field strength of both antennas.



When you have clicked on a marker, you can enter a comment in the "Comment" field. A "C" appears in the flag of the marker. The comment is displayed again when you click on the marker (see Marking measured values and commenting on them).

#### 8 Buttons of the "Memory", "Marker" and "Zoom" group

• see Buttons in the "Memory" group and Buttons in the "Marker" group



## The "RF Level Recorder" tool

The "RF Level Recorder" tool allows you to check the reception quality of your wireless microphone system. You can record the field strength of any transmitter in any area of the stage and, if necessary, optimize the antenna positions using the detailed graphical representation provided by the tool.

#### Calling up the "RF Level Recorder"

- In the system window, click on the "Tools" tab.
- Double-click on the "RF Level Recorder" icon.



#### The "RF Level Recorder" window



#### 1 Toolbar

• see Buttons in the toolbar



#### 2 Selection area

Receiver		Set time			Duration
4-1 472,800 MHz	•	Now	26/01/2021 11:42	$\sim$	1 min 💌

In the selection area, you can:

- select a stationary receiver (see Selecting a stationary receiver for the recording)),
- presetthe start time for the recording (see Presetting the start time for the recording) and
- set the recording duration (see Setting the recording duration "RF Level Recorder" only).

#### 3 Recording bar

• see Buttons in the recording bar

#### 4 "RF Level" window (display range of up to 40 dB max.)

This window displays the field strength of the receiver's diversity channels over a defined period of time.



The measured values of the field strength "RF Level" are displayed as colored bars over the defined measuring duration. Field strength levels of up to 40 dB max. can be displayed.



- Red: Diversity channel Antenna I/Antenna A
- Green: Diversity channel Antenna II/Antenna B
- Yellow: Squelch threshold
- White: Muted



#### 5 "Memory", "Diversity" and "Rec Time" displays

#### "Memory" display

The "Memory" display is only shown if a recording from the temporary memory is displayed (see Temporarily saving recordings and comparing them).

#### "Rec Time" display

The measuring duration is shown together with the current time on the x-axis of the "Rec Time" line. The measuring duration depends on the setting made under "Duration" (see Setting the frequencies – "RF Spectrum Analyzer" only).

#### "Diversity" display

The colored bars in the "Diversity" line display the active diversity section.

- Red: The measured field strength of "Antenna I" / "Antenna A" is higher than that of "Antenna II" / "Antenna B"
- Green: The measured field strength of "Antenna II" / "Antenna B" is higher than that of "Antenna I" / "Antenna A"
- White: The measured field strength of both antennas is below the squelch threshold; the receiver is muted

#### Example:

At 15:00 o'clock, the bar is green, i.e. antenna I/A is active. At 16:00 o'clock, the field strength of antenna II/B is stronger. Antenna II/B becomes active and the bar in the "Diversity" line is displayed in red.

#### 6 Display of the current date and time and the set recording duration

The current time, the date and the recording duration are displayed. Time and date are taken from the operating system. The recording duration is set under "Duration" (see Setting the frequencies – "RF Spectrum Analyzer" only).



#### 7 "Comment" field

Important occurrences can be marked and commented. The markers are displayed as vertical blue lines. A blue flag appears above them.

When you click on a marker, the line and the flag turn to orange. When you move the mouse pointer over a marker, a box will appear above the marker, indicating the time and the measured field strength of both antennas.



14:43
Ant I: 0,0 dB
Ant II: 0,0 dB

When you have clicked on a marker, you can enter a comment in the "Comment" field. A "C" appears in the flag of the marker. The comment is displayed again when you click on the marker (see Marking measured values and commenting on them).

Comment	
Level OK	

8 Buttons of the "Memory", "Marker" and "Zoom" group

• see Buttons in the "Memory" group and Buttons in the "Marker" group



## Working with the tools

#### To select a stationary receiver:



#### To preseta start time for the recording:

i You can either start the recording immediately, or you can preseta start time

Click on the arrow in the "Set Time" field.

Set time							
O Now	26/01/	26/01/2021 11:54 ~					
	e		Janu	ia <b>ry</b> , 2	2021		9
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
	28	29	30	31	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
	1	2	3	4	5	6	7

- Click on the arrows to the left and right of the month to change the month and the year.
- Click on the day to select the date to be entered into the date field.
- Enter the time directly in the "Time:" field.
- Make sure that all relevant devices for the recording are switched on at that time and that the WSM is running.
  - **i** If you want to use the "Spectrum Analyzer" tool during live operation, select a receiver that is not required in the transmission.



#### To set the recording duration – "RF Level Recorder" only :

- **i** You can select a recording duration from 1 minute to 24 hours.
- Click on the arrow in the "Duration" field.
- Select the recording duration from the list.

	Duration
	1 min 🔹
	1 min
	2 min
	5 min
	10 min
	30 min
-	1 hour
	2 hours
	4 hours
	8 hours
	24 hours



## Setting the frequencies - "RF Spectrum Analyzer" only

#### To manually set the frequency range to be recorded:

Click on the arrow in the "Set Frequency" field.

Set frequency	
Range	-
Range	
Preset	
TV channel	

Select one of the following menu items:

- "Range" to set the upper and lower limit of a frequency range (see Setting the upper and lower limit of the frequency range (Range))
- "Preset" to select the channel bank of a receiver (see Selecting a channel bank of a receiver (Preset))
- "TV Channel" to select the TV channels (frequencies) to be taken into account during the recording (see Selecting TV frequencies (TV Channel))



#### Setting the upper and lower limit of the frequency range (Range)

- **i** You can set the upper and lower limit of the frequency range to be recorded. Both frequencies must be within the frequency range of the receiver.
- Click on "Range".



Click on the arrow in the "Start" field

Frequency range	$\times$
Start frequency:	
470.100	-
470.100	
470.125	
470.150	
470.175	
470.200	
470.225	
470.250	
470.275	

- Select the lower limit.
- Click on the arrow in the "Stop" field to select the upper limit.
  - The "Frequency (MHz)" display (x-axis) is scaled to the selected frequency range. Only the selected frequency range is recorded.



#### Selecting a channel bank of a receiver (Preset)

- **i** You can select a channel bank of a receiver in order to only record the frequency range of this channel bank.
- Click on "Preset".

Preset		$\times$
		_
Bank 1		^
Bank 2		
Bank 3		
Bank 4		
Bank 5		
Bank 6		$\sim$
Cancel	ОК	

Select a channel bank (e.g. "Bank 1") by clicking on it.

The "Frequency (MHz)" display (x-axis) is scaled to the frequency range of the selected channel bank.

Only the frequencies in the selected channel bank are recorded.



#### Selecting TV frequencies (TV Channel)

- **i** You can select TV frequencies from within the device's frequency range to be taken into account during the recording.
- Click on "TV Channel".



Click on "Country" and select an entry.

TV channels		×
<ul> <li>TV channel 21(470-478)</li> <li>TV channel 22(478-486)</li> <li>TV channel 23(486-494)</li> <li>TV channel 24(494-502)</li> <li>TV channel 25(502-510)</li> <li>TV channel 26(510-518)</li> </ul>	^ ~	Country : Europe  America China Europe Japan
Cancel OK		

Activate the desired check box to select the TV frequencies to be recorded.

✓ A tick appears.

## Overview of the buttons of the tools

#### Buttons in the toolbar



Opens a saved recording.



Saves the current recording under the same name.



Saves the current recording under a new name.



Prints the contents of the "RF Level" window of the current recording (up to 40 dB max.).

#### Buttons in the recording bar



Starts a recording.



Cancels the recording.



Interrupts the recording.



Deletes the last recording.

## Buttons in the "Memory" group





#### Buttons in the "Marker" group





## Starting the field strength recording

After you have set the recording duration, you can start the field strength recording. To start the recording:

Click on the "Now" option button under "Set Time".

● Now ○ 1/18/21 12:26 PM ~	Set time Now	O 1/18/21 12:26 PM	~
----------------------------	-----------------	--------------------	---

Click on "Start".

If you have not yet saved the last recording, you will be asked if you want to save it (see Saving recording data).



## Interrupting the field strength recording

#### To interrupt the recording:

- Click on "Pause".
  - The field strength levels are not recorded during this time. Only the "Squelch" bar continues to move. The recording duration is not changed by an interruption.

#### To continue the recording:

Click on "Start".

✓ The field strength recording is continued.



## Canceling the field strength recording

#### To cancel the recording:

Click on "Stop".

To start a new recording and to overwrite the cancelled recording:

Click on "Start".



## Deleting the last field strength recording

#### To delete the last recording:

- Click on "Clear".
  - ✓ The recording is deleted form the memory and from the "RF Level" window.



## Zooming the "RF Level" window in/out

The "Zoom" function allows you to zoom the "RF Level" window in and out. A zoomed-out window provides a better overview, a zoomed-in window shows details.





## Temporarily saving recordings and comparing them

The "Memory" function allows you to temporarily save recordings. The measured values (bars) of the previous recording are displayed lighter.

The superimposed measured values of the current recording a displayed darker. This allows you to compare two recordings.

#### Temporarily saving a recording

- Click on "Copy".
  - The measured values are copied to the temporary memory. The comments and markers are not taken over.

After you have made another recording, you can show the previous recording by clicking on "Show" and directly compare the two recordings.

#### Showing the recording from the temporary memory

- Click on "Show".
  - The "Memory" line appears. The "Memory" line shows the colored bars displaying the respective active diversity section as shown before in the "Diversity" line.

The "RF Level" window displays the measured values (bars) of the recording from the temporary memory. These bars are displayed lighter while the superimposed bars of the current recording a displayed darker.



#### Hiding the recording from the temporary memory

- Click on "Hide".
  - The measured values (bars) of the recording from the temporary memory are hidden but are retained in memory.



#### Deleting the recording from the temporary memory

- Click on "Clear".
  - The measured values (bars) of the recording from the temporary memory disappear from the "RF Level" window and are deleted from the temporary memory.



## Marking measured values and commenting on them

In order to be able to better evaluate the measured values of a recording, you can use the "Marker" function. This allows you to mark the measured values and provide them with a comment.

#### To mark a measured value and comment on it:

- Click on "Set".
- Move the cross to the measured value you want to mark.
- > Place a marker by clicking on the measured value.
  - The marker is displayed as a blue line with a blue flag.
- Enter your comment into the "Comment" field.
  - Subsequently, a "C" appears in the flag.



#### To delete a marker:

- Click on the marker.
- Click on "Delete".

✓ The marker and the corresponding comment are deleted.

#### To hide all markers:

Click on "Hide".

The markers are hidden.

#### To show all markers:

- Click on "Show".
  - The markers are shown.



#### To show a comment on a marker:

- Click on the marker.
  - The color of the marker changes to orange. The comment is shown in the "Comment" field. You can change or add to your comment by clicking in the "Comment" field and entering your changes.

Comment	
Level OK	

## Finding minimum and maximum values

#### Searching for the minimum field strength - "RF Level Recorder" only

- **i** The "RF Level Recorder" allows you to search for measured field strength values that are below the squelch threshold. The search always refers to the measured values of both antennas.
- Click on "Search Low RF".
  - The lowest measured field strength value that is below the squelch threshold is displayed. A marker appears at this point.
- Click again on "Search Low RF" to search for the next higher measured value.

#### Searching for the maximum field strength - "RF Spectrum Analyzer" only

- **i** The "RF Spectrum Analyzer" allows you to search for field strength peaks.
- Click on "Search RF Peak".
  - The highest measured field strength value is displayed. A marker appears at this point.
- Click again on "Search RF Peak" to search for the next lower measured value.



## Saving recording data

You can save the data of a recording as a CSV file.

You can open and edit this file with any spread sheet program. Make a copy of the CSV file before editing it.

#### To save a file:

Click on "Save".

✓ The data is saved.

#### To save a file under a new name:

- Click on "Save as".
- ▶ If necessary, select a different folder in which to save the file.
- Enter a file name.


## Loading previously saved recording data

To load a previously saved recording (CSV file):

- Click on "Open".
- Select the desired file.



### Printing recording data

#### To print the current "RF Spectrum Analyzer" window:

- Click on "Print".
- Configure your printer and click on "Print".

# 5. Troubleshooting

The most frequent questions and answers summarized in a chapter.

Frequently asked questions

If a problem occurs

Glossar

## Frequently asked questions

Which Sennheiser hardware is compatible to WSM Software?

#### Compatible Sennheiser products

#### Which third party spectrum scans are supported?

WSM supports the following frequency scans

- Rohde & Schwarz FSH/FPH (\*.csv)
- RF Explorer (\*.csv)
- Tektronix RSA (\*.csv)
- Aim TTi (\*.csv)
- Shure Wireless Workbench (\*.sdb2)
- Anritsu (\*.csv, \*.spa)

#### Why is my master scene changing from time to time?

Our master scene contains automatisms. New devices will be added automatically. For individual configuration, we recommend setting up your own scenes.

#### Working with scenes

#### Why can I not use the monitoring while being in Professional Setup?

Professional setup was originally developed as an independent software. With the integration into WSM, it is unfortunately not possible to use other parts of the software at the same time.



#### Why can't WSM discover all my devices?

Some of our devices use Multicast Domain Name System (mDNS) to be recognized. If you have setup an IP address manually and MDNS is turned off, WSM will not find those devices. Alternatively, you can add those by manually typing in the IP address with the "Add device" feature.

Registering a device with a static IP address

#### Why do I need Apple's Rosetta to use WSM?

Apple Rosetta enables applications designed for Intel-based Macs to run on Macs with Apple Silicon processors. WSM leverages certain components designed for Intel architectures. In order to ensure a smooth usage of WSM on Apple Silicon Macs, Rosetta is therefore required.

## If a problem occurs

If a problem occurs that cannot be solved with the proposed solutions:

• You can access Sennheiser customer service at sennheiser.com/service-support

#### Or

• contact your local Sennheiser partner.

Additional information on the transmitters and receivers can be found in the individual instruction manuals on the product pages at sennheiser.com/download.

Related information Hardware Software

### Hardware

- First check the connections and cables of the devices.
- Check if all devices are switched on.



### Software

#### The program does not launch

- Check that your PC satisfies the system requirements (System requirements).
- Check the settings of your firewall; the WSM may be blocked by a setting.

#### The receiver panel does not appear

- **i** The firmware in the receiver has not yet been updated.
- Update the firmware in the receiver (see Updating the firmware of devices).

#### Device is not found

- **i** Device is switched off
- Switch on the device. Firewall blocks the WSM
- Enable the corresponding ports for the WSM. Device is separated by a router
- Manually register the device with the WSM (see Registering a device with a static IP address).

## Glossar

#### ASIO

Audio Stream Input/Output (ASIO) is a computer sound card driver protocol for digital audio specified by Steinberg, providing a low-latency and high fidelity interface between a software application and a computer's sound card. ASIO allows musicians and sound engineers to access external hardware directly. Interface support is normally restricted to Microsoft Windows.

#### Deviation

Modulation deviation; modulation of the transmitter.

#### Easy Setup

Function for allocating unused frequencies; a frequency presetscan can be performed to check all factory presetfrequencies (presets). The spectrum of the selected frequency range is only checked selectively.

#### Firmware

Software that resides on a chip in the device. It can and, sometimes, must be updated. Updates can be downloaded from the Sennheiser website.

#### Frequency scan

Function for detecting (identifying) unused and occupied frequencies in the immediate vicinity. The complete spectrum of the selected frequency range is checked. The detected intermodulation-free frequencies can be allocated to the devices manually or automatically.

#### Intermodulation

Interference due to intermodulation can occur if at least 2 transmitters close to the receiving antenna produce high input signals in the receiver. The two high frequencies generate intermodulation products at nonlinearities in the receiver (e.g. in the mixer). This can also occur if 2 transmitters are operated too close to one another.

Fully new frequencies result from this which may interfere with the system's other usable frequencies.

#### Intermodulation

Störungen durch Intermodulationen können auftreten, wenn wenigstens 2 Sender zu nahe an der Empfangsantenne hohe Eingangssignale am Empfänger erzeugen. Die beiden Frequenzen mit den hohen Pegeln bilden an Nichtlinearitäten im Empfänger (z. B. im Mischer) Intermodulationsprodukte.

Diese Störungen können auch beim Betrieb von zwei Sendern auftreten, wenn sie zu nah beieinander betrieben werden. Es entstehen vollkommen neue Frequenzen, die unter Umständen andere Nutzfrequenzen des Systems stören.

#### Panels

Each panel displays a channel. The panels contain, among other information, the name of the device, the current frequency and the field strength display.

#### Presets

Unchangeable, factory presetfrequencies that are stored in the channels of a channel bank (except channel bank "U").

The frequencies within a channel bank are intermodulation-free.

#### **Professional Setup**

Function for allocating compatible frequencies; a frequency presetscan can be performed to check the complete spectrum of the selected frequency range; interfering frequencies from external devices can be excluded before the allocation of frequencies.

#### Squelch

Squelch is a circuit function that eliminates annoying noise (hissing noise) when the transmitter is switched off or when there is no longer sufficient RF power received by the receiver. The squelch suppresses all signals that fall below a certain threshold value. Only if a wanted signal of sufficient strength is received does the squelch open again.

#### WDM

The Windows Driver Model (WDM) is a framework for device drivers that was introduced with Windows 98 and Windows 2000.

WDM drivers are designed to be forward-compatible so that a WDM driver can run on a version of Windows newer than what the driver was initially written for, but doing that would



mean that the driver cannot take advantage of any new features introduced with the new version.

# 6. Contact

Contact information in case of questions about our products and/or services.



#### Questions about the product / Help with technical issues

If you have any questions about our products and/or services, please do not hesitate to contact us at https://www.sennheiser.com/support.



Sennheiser electronic SE & Co. KG | Am Labor 1 | 30900 Wedemark | Germany