



2N[®] NetSpeaker

IP Audio System



Manual

Version 1.4

www.2n.cz

The 2N TELEKOMUNIKACE joint-stock company is a Czech manufacturer and supplier of telecommunications equipment.



The product family developed by 2N TELEKOMUNIKACE a.s. includes GSM gateways, private branch exchanges (PBX), and door and lift communicators. 2N TELEKOMUNIKACE a.s. has been ranked among the Czech top companies for years and represented a symbol of stability and prosperity on the telecommunications market for almost two decades. At present, we export our products into over 120 countries worldwide and have exclusive distributors on all continents.



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Declaration of Conformity

2N TELEKOMUNIKACE hereby declares that the 2N[®] IP Audio System product complies with all basic requirements and other relevant provisions of the 1999/5/EC directive. For the full wording of the Declaration of Conformity see the CD-ROM enclosed and at www.2n.cz.



The 2N TELEKOMUNIKACE company is the holder of the ISO 9001:2009 certificate. All development, production and distribution processes of the company are managed by this standard and guarantee a high quality, technical level and professional aspect of all our

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Introduction

2N[®] NetSpeaker

2N[®] NetSpeaker is an IP audio system which allows you to play an acoustic message or any other audio stream from any LAN/WAN-connected PC. All you have to do to get a virtual broadcasting exchange is connect a standard loudspeaker or amplifier to your **2N[®] NetSpeaker**. The virtual exchange helps you play any audio system and create separate zones with different communication contents. You can make use of your existing LAN/WAN while installing your **2N[®] NetSpeaker** system to save the total implementation time and, of course, cut your wiring costs.

The **2N[®] NetSpeaker** system consists of two basic components – a server and an audio converter. The ControlPanel software has been developed to configure the whole broadcasting system. Console and Virtual Sound Card are software products designed for everyday use – broadcasting messages via a microphone and easy music playing respectively. Moreover, you can use the [Android](#) application for basic operations.

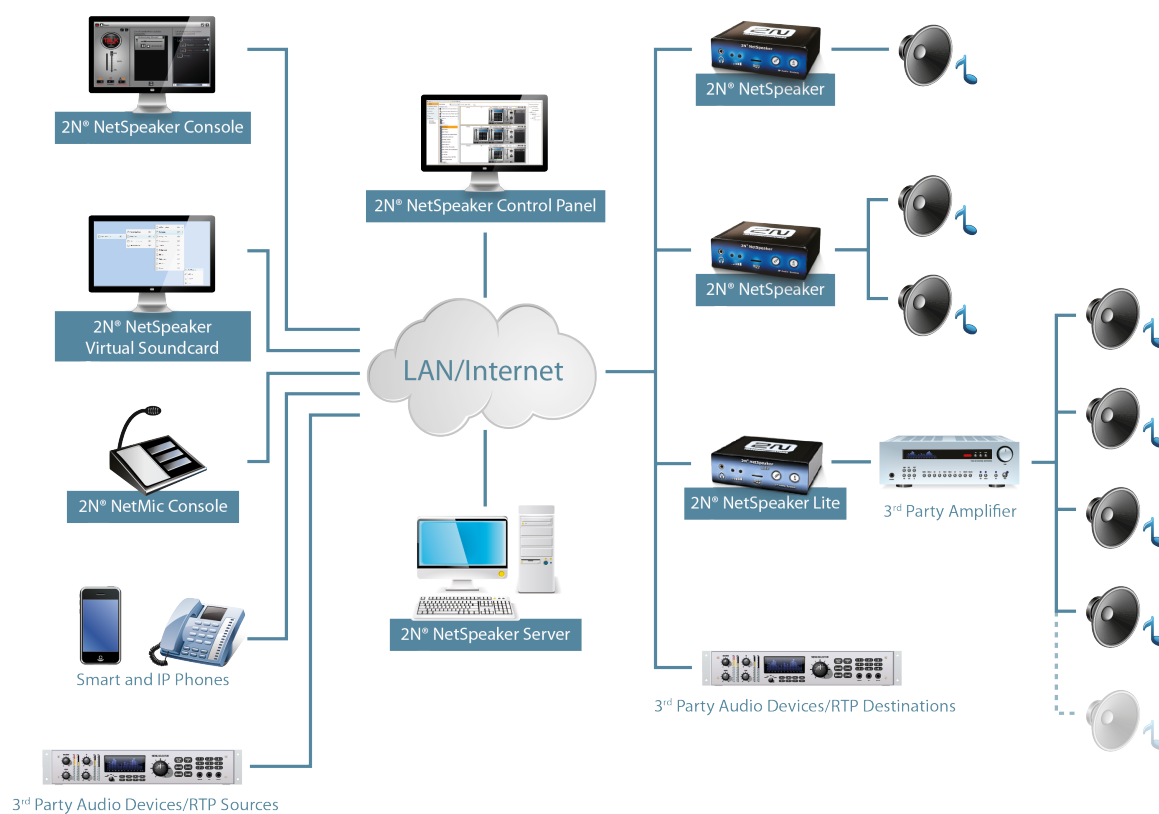


Figure: 2N® NetSpeaker System Layout

Refer to the [Quick Start](#) section for basic information on quick system installation of the 2N® NetSpeaker Server.

2N® NetSpeaker Limits and Specifications

Supported OS

2N® NetSpeaker Server

- WIN VISTA 32/64 bit
- WIN 7 32/64 bit
- WIN Server 2008 R2*
- WIN 8 32/64 bit

2N® NetSpeaker Console, 2N® NetSpeaker Virtual Sound Card

- WIN VISTA 32/64 bit
- WIN 7 32/64 bit
- WIN 8 32/64it

Necessary conditions

- Windows Media Player 11
- Microsoft Visual C + + 2008 Redistributable Package (x86) – installation is required to avoid problems with stability
- Microsoft. NET Framework 4 redistributable package
- *Desktop Experience feature is required on Windows Server (part of User Interface and Infrastructure in MS Windows Server 2012)
- Windows Firewall service running, otherwise the rules for **2N® NetSpeaker** application have to be added manually

VoIP

Without registration: Counterparty calls on the IP address of the predefined **2N® NetSpeaker** IP server and port for the VoIP trunk (eg. 5061).

Registration: **2N® NetSpeaker** - only client **2N® NetSpeaker** registering in the PBX. It cannot switch to mode = SIP registrar proxy (no phones register with it).

microSD Card Support

The SD card must be FAT32 formatted before being plugged into the **2N® NetSpeaker** unit. Otherwise the card is not recognised and formatting via the Control Panel will not work. We recommend that you should synchronise audio files of up to 300MB and up to 150 songs.

Type	Maximum tested size
SD	2G
SDHC	32GB
SDX	2G

Sample of transfer rates	Allocation unit size			
	default	16kB	32kB	64kB
SanDisk UHC-I 4GB	660kbps		1142kbps	-
Kingston HC class 10 16GB	850kbps		600kbps	987kbps
Patriot HC class 4 16GB	1050kbps		1159kbps	1230kbps
Noname HC class 4 4GB	117kbps		590kbps	-

Communication Protocols

Way of communication	Port	Protocol
Control Panel >> Server	6990	proprietary
Console >> Server	6990	proprietary
Virtual Sound Card >> Server	6990	proprietary
Server >> NSPK (passive mode)	6998	proprietary
NSPK >> Server	6999	proprietary
Server >> RTP destination	adjustable	RTP
PC >> NSPK	23	Telnet

SYSLOG

The **2N[®] NetSpeaker Server** allows you to send logs to the syslog server. The **2N[®] NetSpeaker Server** was tested with **rsyslog server** and **Watcher**. For more details on settings and use refer to the Advanced configuration -> Manual for ControlPanel -> [Administrator](#) menu.

Telnet

TELNET is disabled by default immediately after connecting to the **2N[®] NetSpeaker Server** and reactivated after disconnection. To enable TELNET while **2N[®] NetSpeaker** is connected to the server, allow this in the Destinations and Zones tab in the Control Panel.

Minimum Transfer Rates

Audio transfer between the server and **2N[®] NetSpeaker** units:

Audio	option	Server -> NetSpeaker transfer	NetSpeaker -> Server transfer
unicast	32kbps mono	100kbps/unit	60kbps/unit
	64kbps mono	135kbps/unit	60kbps/unit
	128kbps mon/ster	190kbps/unit	60kbps/unit
multicast	32kbps mono	70kbps/group	-
	64kbps mono	100kbps/group	-
	128kbps mon/ster	145kbps/group	-

Communication between SW or audio components:

Communication	Type of data	Transfer rate
ControlPanel <-> NetSpeaker Server	signalling	20kbps
Virtual Sound Card -> NetSpeaker Server	audio + signalling	1650kbps
Console -> NetSpeaker Server	audio + signalling	1650kbps
NetSpeaker Server -> NetSpeaker Expander	audio + signalling	1600kbps/stream

Audio transfer from **2N® NetSpeaker Server** to RTP destinations:


Option	Server -> NetSpeaker transfer
G.711 - uLaw	85kbps
G.711 - uLaw	85kbps
Linear PCM 16bit 44.1kHz Stereo	1500kbps
Linear PCM 16bit 44.1kHz Mono	800kbps


Test Results

HW – CPU, Chipset	Intel Atom Z530	Intel XEON E5645
WIN VISTA – MAX number of sessions/streams/NSPK	WIN VISTA – 5/5/20	-
WIN 7 – MAX number of sessions/streams/NSPK	WIN 7 – 6/6/20	-
WIN 8 – MAX number of sessions/streams/NSPK	WIN 8 – 6/6/20	-
Win Server 2008 R2	-	100/1000/1000
Number of users	1000	10000
Number of VoIP (SIP) trunks/concurrent calls	10/2	100/100


Terms and Symbols Used


The following symbols and pictograms are used in the manual:

 **Safety**
▪ **Always** abide by this information to prevent persons from injury.

 **Warning**
▪ **Always** abide by this information to prevent damage to the device.

 **Caution**
▪ **Important information** for system functionality.

 **Tip**
▪ **Useful information** for quick and efficient functionality.

 **Note**
▪ Routines or advice for efficient use of the device.

User Manuals

This section provides you with basic information on the **2N[®] NetSpeaker** system and use of such user applications as the **2N[®] NetSpeaker Console** and **2N[®] NetSpeaker Virtual Sound Card**.

Here is what you can find in this section:

- [Console Application](#)
- [Virtual Sound Card Application](#)

Console Application

i What you should know

- The **Console** application helps send audio from a microphone or play files.
- **2N® NetSpeaker** system recognizes 3 levels of rights managed by the system administrator.
- **CAUTION:** Freeride is the highest priority user role and shall be preferred in all zones.

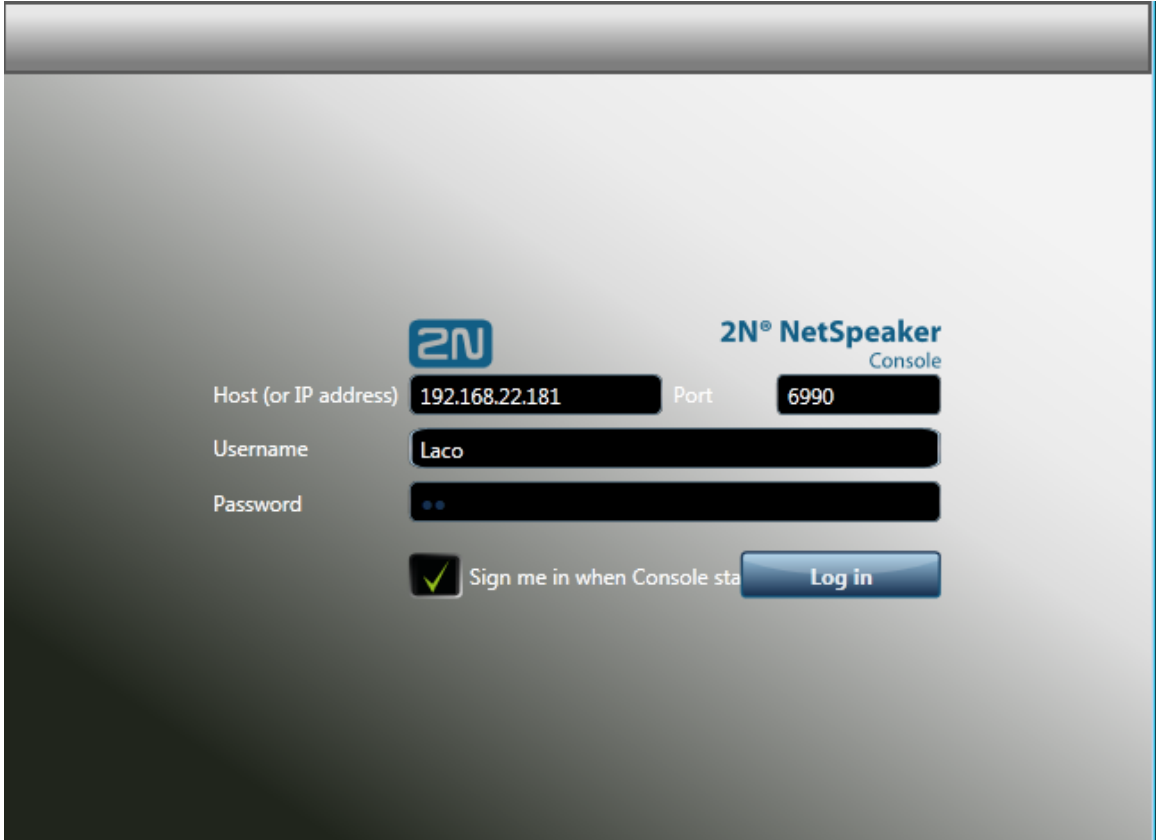
The Console program is used for broadcasting to predefined sessions or inputs for **2N® NetSpeaker** users. It is primarily designed for broadcasting audio from your **microphone** but simple music broadcasting is supported too.

Connection and Settings

The login screen is displayed upon the **Console** start. Create the user name and password using the **ControlPanel** program or ask your system administrator to create and assign the rights to you.

Enter the username and password into the dedicated fields in the Console window upon start. Moreover, configure the correct host name or IP address for login. Click on the setting pictogram in the program header, see figure below, and then on **Server settings** to get into configuration.

Use the **Language settings** to modify the application language.



The screenshot shows the login interface for the 2N NetSpeaker Console. At the top left is the 2N logo. To its right, the text "2N® NetSpeaker Console" is displayed. Below this, there are four input fields: "Host (or IP address)" with the value "192.168.22.181", "Port" with the value "6990", "Username" with the value "Laco", and "Password" with two dots. Below the password field is a checkbox with a green checkmark icon, labeled "Sign me in when Console sta". To the right of the checkbox is a blue "Log in" button.

Figure: Login via Console

Having set all the necessary parameters and entered your username and password, log in. If your login is successful, you get to the **Console** screen to select your role.

User Roles

This screen helps you select a role after login to the **Console** program. The figure shows the window for a user with all roles. Refer to other parts of the manual for role details.

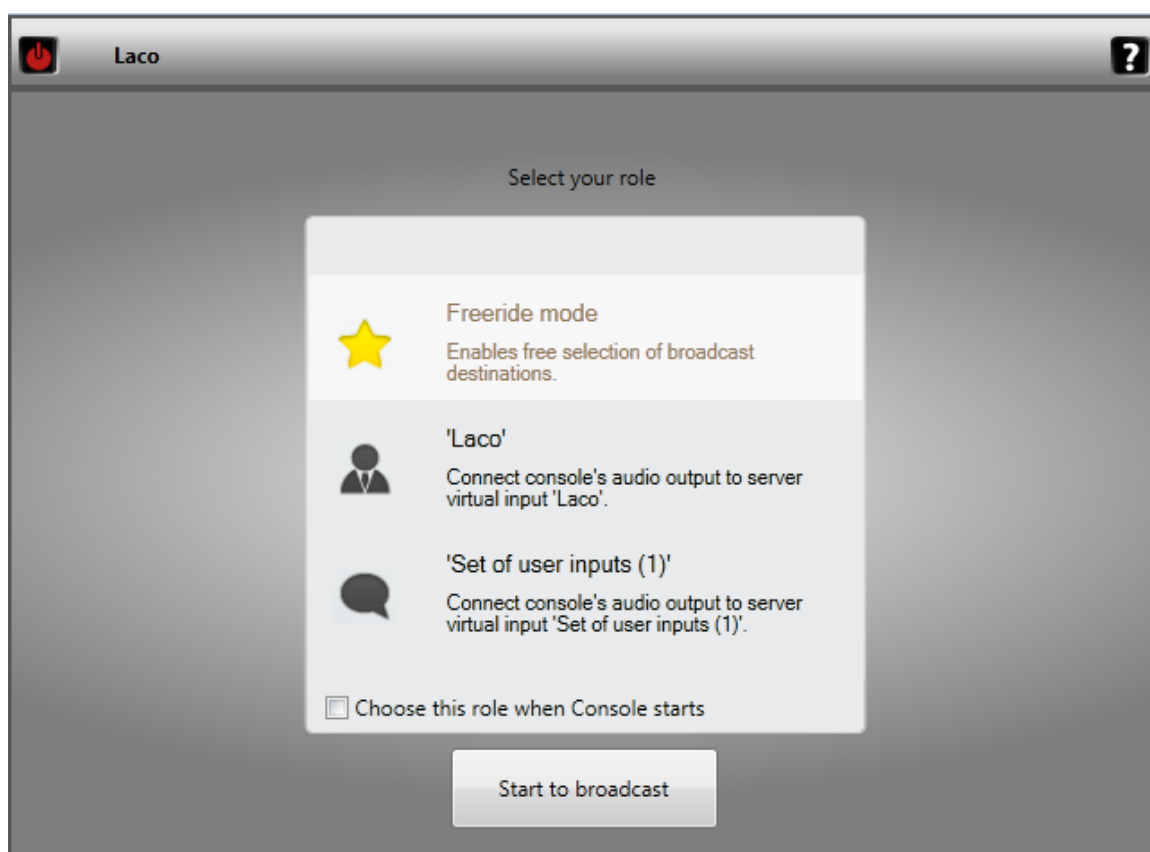


Figure: Console Roles

When you have selected a role, the screen will display the selected role, but the appearance is similar in all cases. New pictograms and the role name get displayed in the application header. To change the role, use the **human** symbol, which returns you to the **role selecting window**. The **"power off"** pictogram is used for **logout** from the **Console** application.

General Console Control

Primarily, Console is designed for broadcasting sounds **via the microphone** or audio/music in the .mp3 .wma .wav format. The left section with the microphone picture controls the microphone and the middle section – List of sounds – helps play audio files. Press the Add button to add a sound to the application. The right-hand section is used for input check and control. Refer to the figure below for the **Console** program control.



Figure: View of Console Control

Output – there are different outputs for different roles.

List of sounds – or list of audio/music sources in files. Click on **Add** and select the required file. Play this file using the **Play** button.

Microphone – the left window section controls the hardware microphone of the PC where Console is running.

- **TALK button** – used for microphone activation. Upon activation, the ON AIR sign goes on and the button changes into **MUTE**. You can broadcast even during audio playing from a file.
- **AUTOMUTE button** – used for enabling the "Automatic microphone activation" function. When you press the button, the **Automute** sign goes on. Let us **give an example**: The "College radio" broadcasts a few songs every evening and the presenter announces every song. In this case, the presenter selects a song from the file at the beginning of broadcasting. He or she selects **Automute** and can talk when the song is over – **Automatic microphone activation**. When the Play button is pushed for another song, the microphone is **automatically deactivated** and the listeners do not hear the studio noise.

You can enable **Listening in** in the Console application too. To do so, push the **ON** button to the right of the lower screen. Listening in **is used** for activation of local listening to played files or microphone sound. Select the device to listen in via the **Setting button** in the right up corner.

Settings

Settings allows you to select a language of your preference, set microphone and device for listening in the audio stream to. Also sound path delay can be changed to ensure smooth audio.

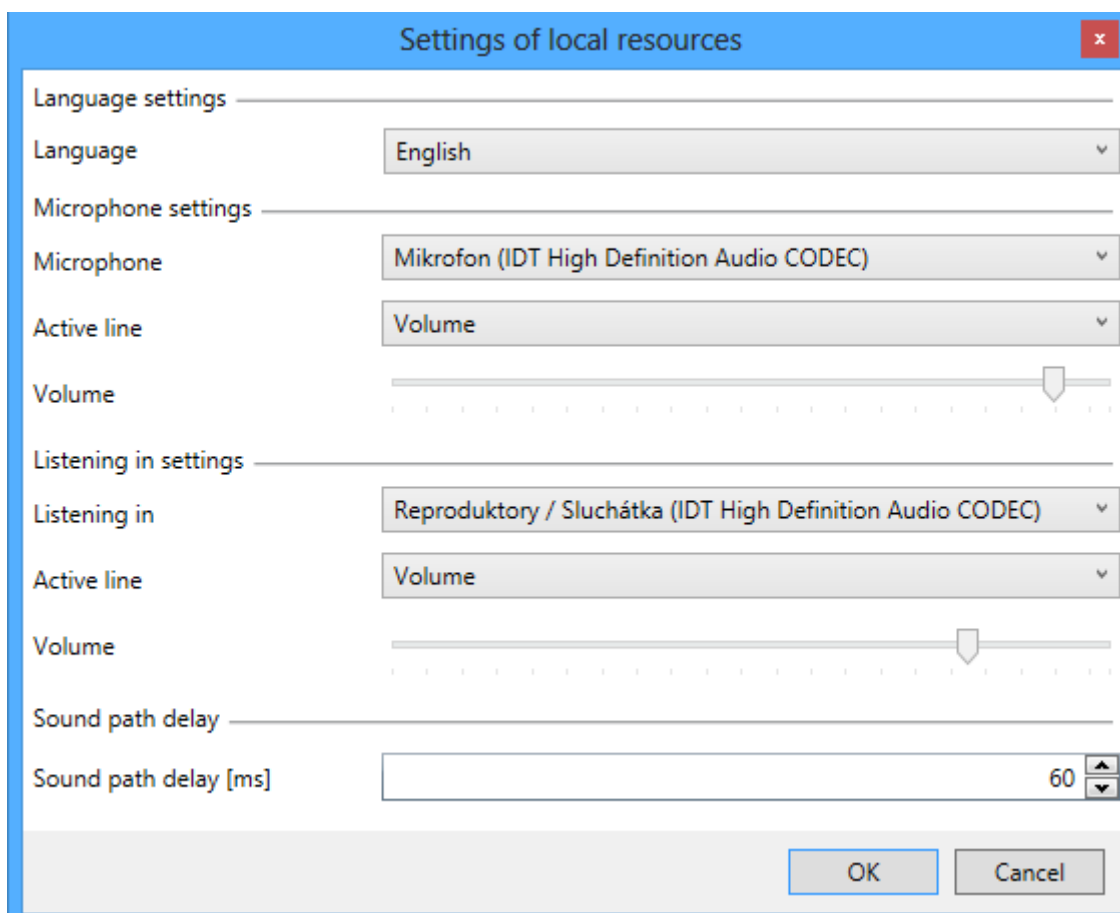


Figure: Settings of the Console application

Freeride mode broadcasting

The Freeride user is assigned the highest user rights and can thus broadcast and play with the highest priority. This user selects the destination itself by ticking off the **2N[®] NetSpeaker** units in the **List of speakers/zones**. Refer to the figure.

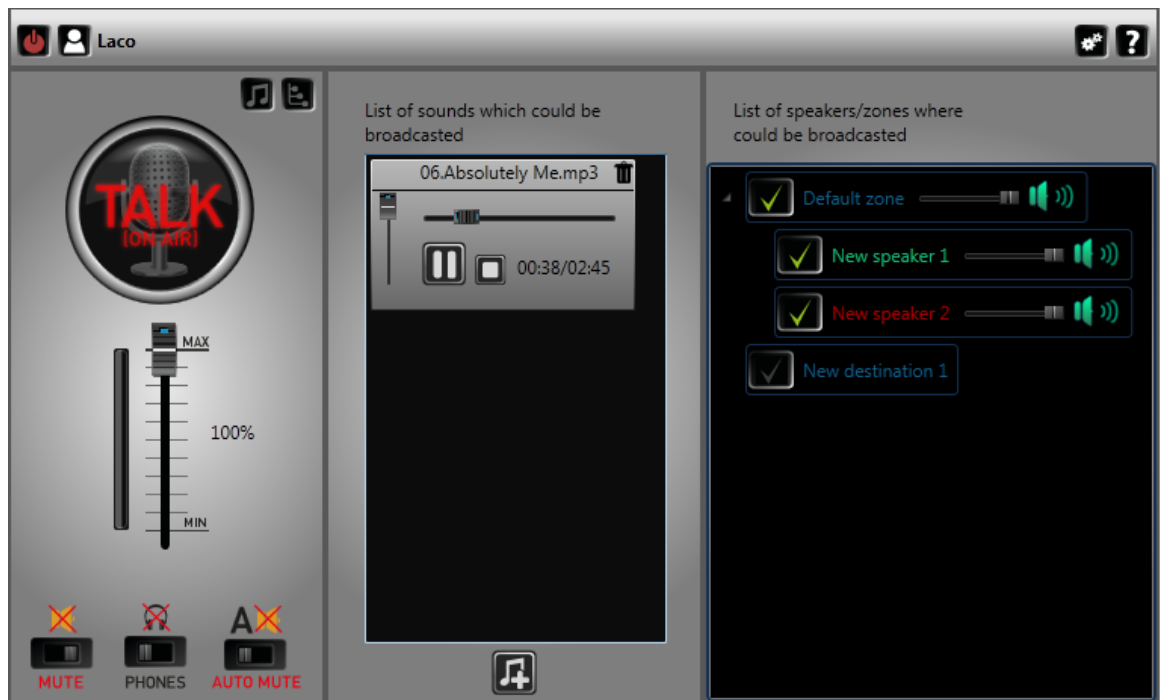


Figure: Freeride Role

Broadcast as "user"

Logged in as a user, you cannot choose where to broadcast. Your user role authorises you to broadcast to sessions to which you are assigned as a user input. Contact your system administrator for more information.

Broadcast as "set of user inputs"

Logged in as a set of user inputs, you cannot choose where to broadcast. Your user role authorises you to broadcast to sessions which contain the set of user inputs assigned to you. Contact your system administrator for more information details on the roles.

Virtual Sound Card Application

i What you should know

- The **2N® NetSpeaker Virtual Sound Card** application and **2N® NetSpeaker Server** are enough for streaming audio to the **2N® NetSpeaker** systems in households and/or small restaurants.
- The **2N® NetSpeaker Virtual Sound Card** also plays Windows system sounds in default. It should be disabled in the Windows Control Panel -> Sound -> Change System Sound by choosing "No sound".

The **2N® NetSpeaker Virtual Sound Card** helps you to play audio files and playlists in a simple and comfortable manner. The application uses the existing audio applications (iTunes, Windows Media Player, Winamp) to stream the currently playing audio into **2N® NetSpeaker**.

When the application is launched, an icon will get displayed in the notification area and you can choose Login for login to the system. The network administrator assigns you a username or you can set your username via the Configuration wizard, which starts after the **2N® NetSpeaker Server** installation. Refer to the [Quick Start manual](#).

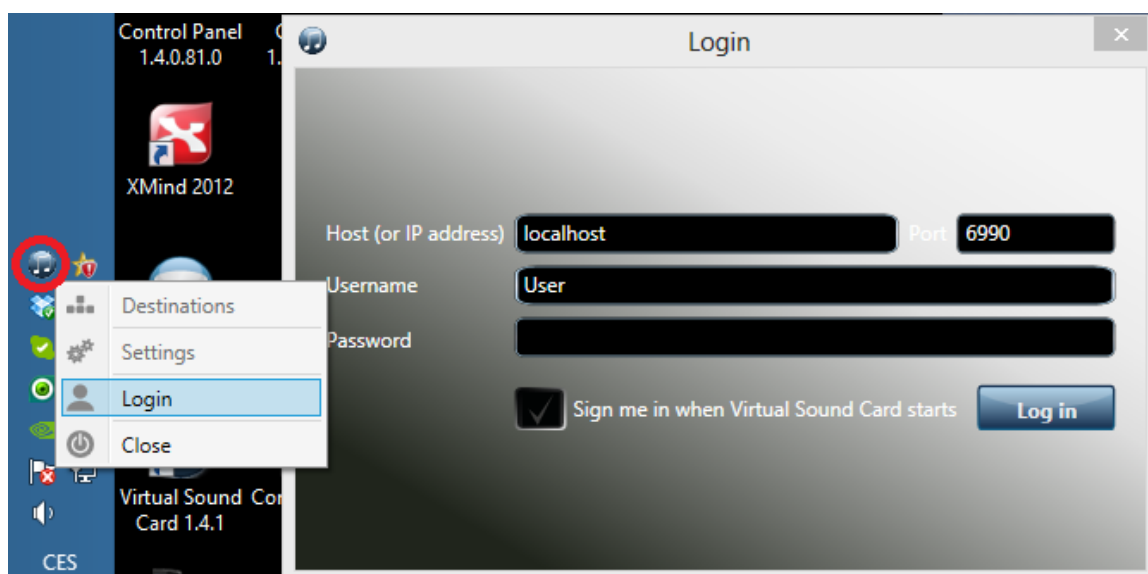


Figure: Virtual Sound Card Application

The next step is to select the destination for the currently playing music/sounds. Use the right mouse button to retrieve the menu over the Virtual Sound Card icon in the notification area; see the figure below.

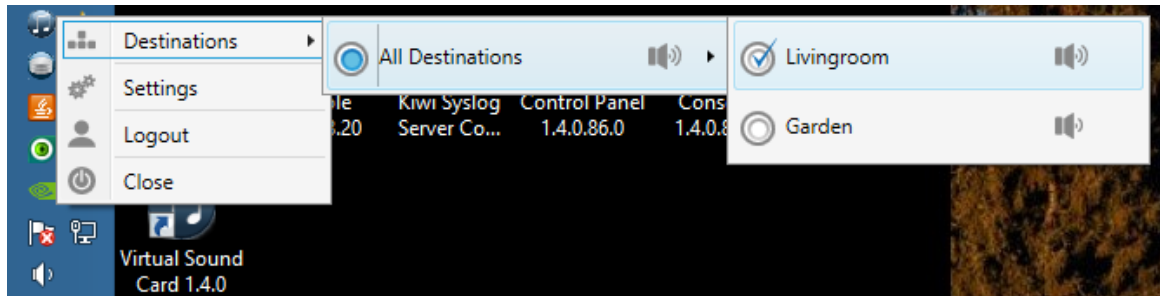


Figure: 2N[®] NetSpeaker Selection

Settings

Settings allows you to select a language of your preference, set volume and select the "Active playback" device for copying the audio stream to **2N[®] NetSpeaker**. Also sound path delay can be changed to ensure smooth playing of files.

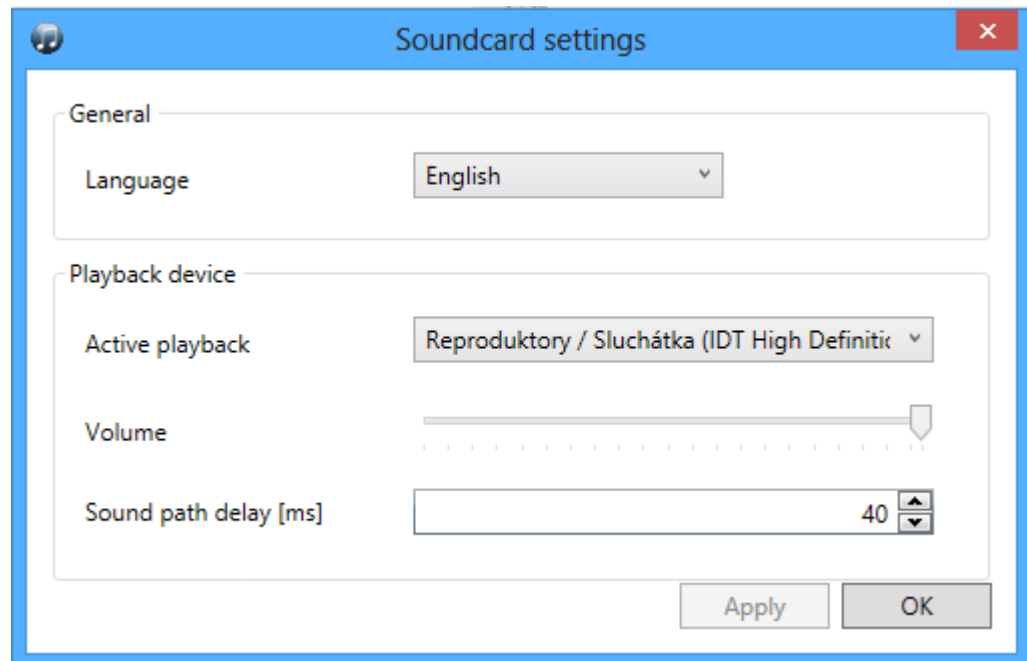


Figure: Virtual Sound Card Settings

Advanced Configuration

This section provides you with all information on the **2N[®] NetSpeaker** system and advanced configuration via the **2N[®] NetSpeaker ControlPanel**.

Here is what you can find in this section:

- [Control Panel Software Manual](#)
- [Samples of Internet Radio Stations](#)

Control Panel Software Manual

i What you should know

- The application **2N[®] Control Panel** may allocate higher amount of the memory thanks to a keeping logs from entire system. Closing application in time when not used is recommended.

2N[®] NetSpeaker ControlPanel is a user friendly application used for administration of all features of the **2N[®] NetSpeaker Server**.

Here is what you can find in this section:

- [Sessions](#)
- [Destinations and Zones](#)
- [Audio Sources](#)
- [Scheduler](#)
- [microSD](#)
- [Users](#)
- [Administrator](#)

Sessions

What you should know

- Audio sources can be type-filtered in the **Input sources** header.
- Upon power up, the server automatically launches and starts playing all sessions that were active before power off.
- A higher priority of the active Session **always guarantees** that this Session will occupy all Destinations assigned to it.
- Licences can cause that some **2N® NetSpeakers** will not play. Refer to Licences in the [Administrator](#) tab for more details.

The session determines the **Source – Destination** connection, i.e. defines which source will be played to which destination (Zones). The left session part defines and helps control the source, the right session part determines the destination and **Session** options.

Session Creation and Preparation for Playing

Click on Session → Create empty session to create a session. You can perform this and other actions by retrieving the floating menu by the right mouse-click.

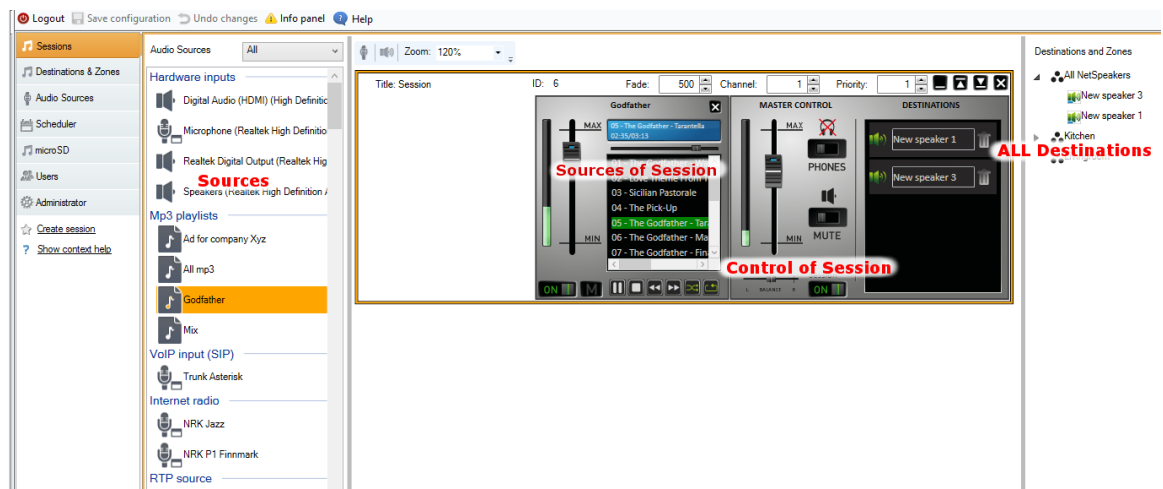


Figure: Session Window Layout

Use **drag&drop** to add a source included in the source list to the session and a destination to the destination list – **Destination targets**. Whether you add destinations by speakers or zones, the resultant functionality will be the same.

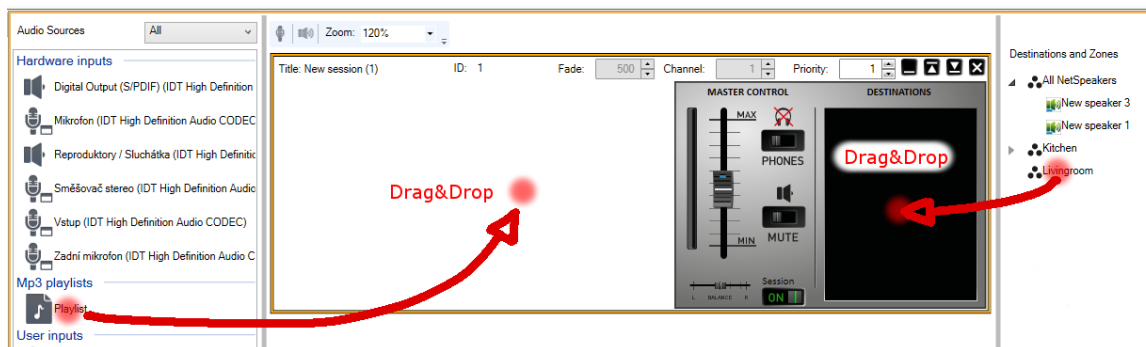


Figure: Adding of Sources and Destinations to Session

The created session is ready for broadcasting to destination(s). If no more parameters are needed, simply press **PLAY** and the added [Sessions](#) or another source will start playing. See the figure at the very end for two types of sources. The common bar contains volume control settings.

Session Control and Launch

Click on **ON** in the Session control section to launch a session; refer to the figure below. The figure below also shows additional session controls.

- **Balance** – set balance for the right/left channel.
- **Listening in** – enable this parameter to listen to remote destinations locally.
- **Volume** – set the main session volume.
- **Sound activation/deactivation** – enable/disable sound for the active session.
- **Destinations** – list of used destinations and zones

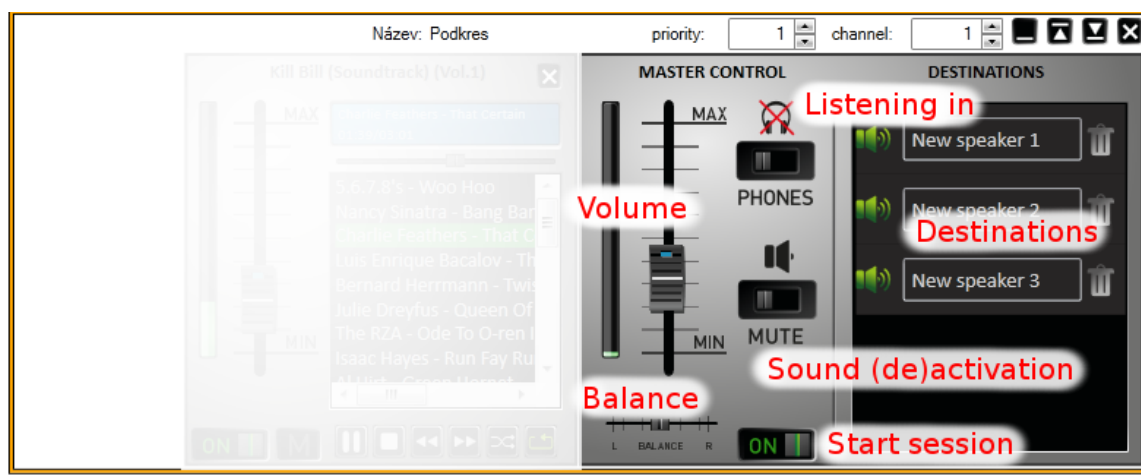


Figure: Session Control

Additional Session Setting Options

Besides the basic settings mentioned in Session Creation and Preparation for Playing, there are additional session settings such as Priority, Channel or Fade situated in the right-hand upper corner.

- **Priority** – set the session priority. The **highest** priority session is always preferred to lower priority sessions. A higher priority of the active Session **always guarantees** that the Session will occupy the destinations assigned to it (the source will play in the destination). The priority range is <1;10>, where priority 10 is automatically assigned to [Freeride role](#) broadcasting.
- **Channel** – set the channel for each session. **2N® NetSpeaker** supports 4 channels for 4 different sources. Set the channel for the **2N® NetSpeaker** units in the [Destinations and Zones](#) tab or by a remote controller on the site.
- **Fade** – set the session fade. The parameter can be used for a gradual sound volume change. The fade range is <500;2000> ms.



Figure: Priority, Channel and Fade Settings

Audio Sources

You can add multiple sources to each session. Use the source tab to create a source (refer to [Audio Sources](#) for details). Add the sources in the **Bar** format. There are two types of bars – one is designed for the Playlist and the other for the rest of the sources. Fig.5 shows the two types.

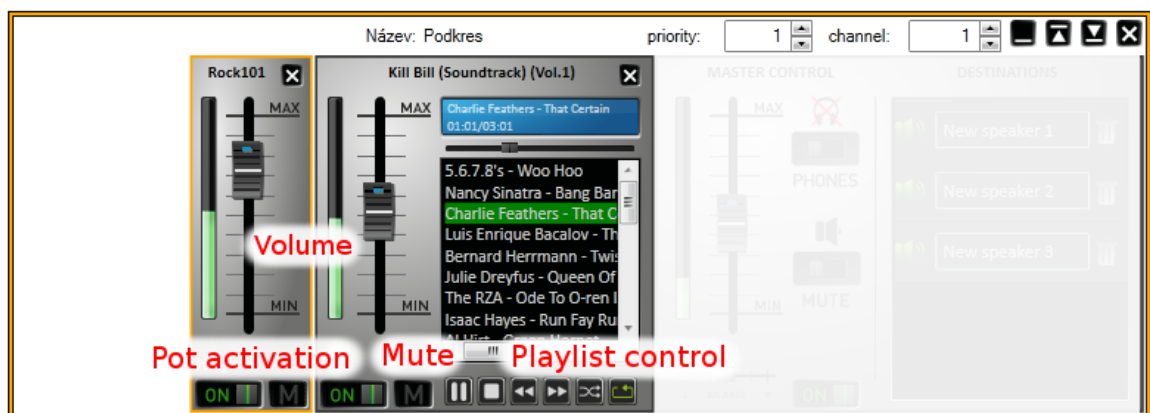


Figure: Volume Bars

Common bar – helps you control volume, balance and sound activation/deactivation. The Internet radio contains a status line displaying information on playing.

Playlist – here you can, besides basic functions, control mp3 files with play/stop, pause, next, previous, shuffle and repeat. Moreover, you can minimise the playlist bar.

Destinations and Zones

i What you should know

- Zones are logical units used for **2N® NetSpeaker** grouping.
- A zone can be added to a Session if you want to play the same music or announce news.
- **2N® NetSpeaker** with the active mode setting connects to the server automatically.
- **2N® NetSpeaker** scanner helps you administer unconnected **2N® NetSpeakers** via the [Administrator](#) tab.
- Once **2N® NetSpeaker** gets connected to the server, its setting by Telnet is prohibited until Telnet is enabled in the configuration.
- A licence is necessary for a proper function of more than one RTP destinations.

This tab helps you administer **2N® NetSpeakers** by assigning them to zones and changing their parameters. The tab includes a Zones tree, a NetSpeaker panel (speakers, zones including contents) and a Zone/NetSpeaker Properties panel.

Zones

Zones helps **divide objects logically** and assign **2N® NetSpeakers** to zones for easier handling (by assigning zones to [Sessions](#)) in extensive installations. Moreover, zones can be regarded as **2N® NetSpeaker** groups.

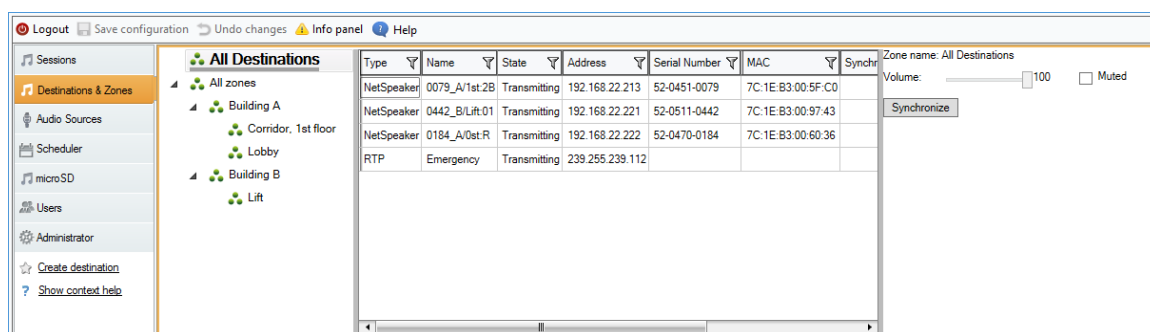


Figure: View of Destinations & Zones

To create a **Zone**, click on the "All zones" selection menu → Create zone or retrieve the floating menu with the right mouse click and select Create zone again. Retrieve the floating menu via the **Zone name** → Rename to rename a zone.

Having clicked on a **Zone**, you can launch [synchronisation](#) of all the speakers assigned to the zone.

The figure below shows how to add a **2N® NetSpeaker** using drag&drop into a zone. In "All Destinations" you can see the list of all **2N® NetSpeakers** and RTP destinations and you can use this list to add a **2N® NetSpeaker** into a zone.

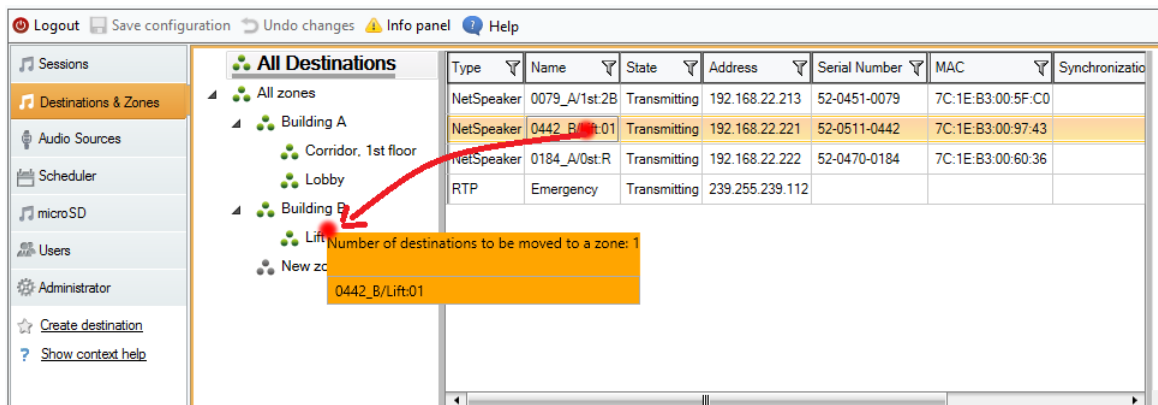


Figure: How to Add **2N® NetSpeaker** to Zone

Destination list and filter

The Destination list is included in a simple table and allows you to choose which columns shall be visible. Retrieve the floating menu with the right mouse button and choose "Select columns". Destinations can then be displayed in the descending/ascending order for one of the used columns.

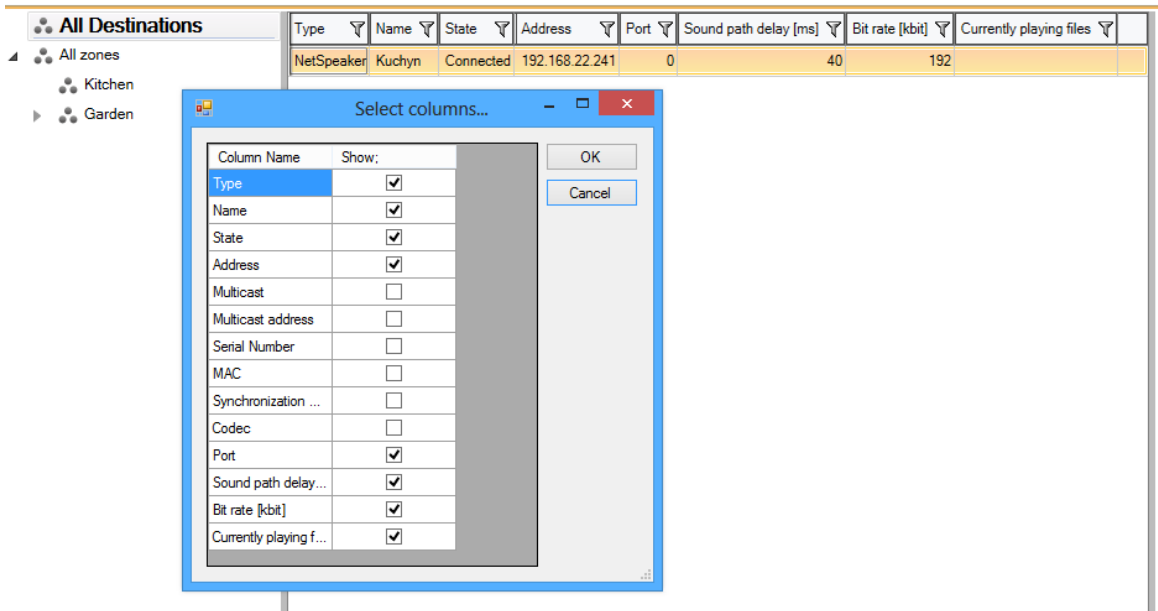


Figure: Destination List Columns

Moreover, you can use a filter in this table, which is extremely helpful for large installations. Click on the funnel symbol to retrieve the filter settings. See the figure below for filter settings and simple queries.

Type	Name	State	Address	Serial Number
NetSpeaker	0079_A/1st:2B	Connected	192.168.22.2	
NetSpeaker	0442_B/Lift:01	Connected	192.168.22.2	
NetSpeaker	0184_A/0st:R	Connected	192.168.22.2	
RTP	Emergency	Not connected	239.255.239.	

Select All

- 192.168.22.213
- 192.168.22.221
- 192.168.22.222
- 239.255.239.112

Show rows with value that

Is equal to

 aA

And

Is equal to

 aA

Filter Clear Filter

Figure: Destination List Filter

2N[®] NetSpeakers

Use the drag&drop function to move the selected speaker from the list of loudspeakers to the required zone. Use the floating menu -> Remove to **remove** a speaker from the zone to the loudspeaker list.

The **2N[®] NetSpeaker** properties are divided as follows:

Type	Name	State	Address	Serial Number
NetSpeaker	0079_A/1st:2B	Connected	192.168.22.213	52-0451-0079
NetSpeaker	0442_B/Lift:01	Connected	192.168.22.221	52-0511-0442
NetSpeaker	0184_A/0st:R	Connected	192.168.22.222	52-0470-0184
RTP	Emergency	Not connected	239.255.239.112	

Speaker name	<input type="text" value="0079_A/1st:2B"/>	<input type="button" value="Restart"/>
Assigned connection		<input type="button" value="Blink"/>
SD card state	Ejected	<input type="button" value="Synchronize"/>
State	Synchronization is not active	<input type="button" value="Format"/>
Progress	<div style="width: 100%; height: 10px; background-color: #ccc;"></div>	
Serial number	52-0451-0079	
MAC address	7C:1E:B3:00:5F:C0	

Audio parameters

Volume

100%

0% Mute

Power supply	PoE
Speaker impedance	Not connected
Max. gain	<input type="text" value=""/>
Sound path delay [ms]	<input type="text" value="40"/>
Sampling frequency [Hz]	<input type="text" value="44100"/>
Bits per sample	<input type="text" value="16"/>
Channels	<input type="text" value="STEREO"/>
Bit rate [kbit]	<input type="text" value="192"/>

Advanced settings

Disable multicast	<input type="checkbox"/>
Disable remote controller	<input type="checkbox"/>
Enable telnet	<input type="checkbox"/>
Switch on relay while transmitting	<input type="checkbox"/>
Channel	<input type="text" value="1"/>
Button mode	<input type="text" value="Volume"/>
Proxy	<input type="text" value="Use server"/>

Figure: 2N® NetSpeaker Setting Properties

Speaker information

Here find the loudspeaker **name**, which can be changed, **connection** if existing and **synchronisation** status. Press the **Restart** button to restart **2N® NetSpeaker** and **Blink** to make LED blinking and sound notification to discover **2N® NetSpeaker** on site. Click on **Synchronise** to launch synchronisation as set in the [microSD](#) tab for the current **2N® NetSpeaker** only.

SD card state – informs whether or not the SD card has been connected and is ok.

State – announces one of the following synchronisation states:

- Synchronisation is not active
- Waiting for synchronisation
- Synchronisation in progress
- Synchronisation error
- Synchronisation completed
- Ready for synchronisation
- Calculation in progress
- Synchronisation postponed
- Formatting SD card

Audio parameters

This section is devoted to loudspeaker sound parameters.

- **Volume and mute** – use this parameter to set the loudspeaker volume. This setting will not be active until saved. Use remote control or press the **2N[®] NetSpeaker** buttons.
- **Power supply** – **2N[®] NetSpeaker** detects this parameter to inform the server of the type of power used.
- **Speaker impedance** – is automatically detected if **2N[®] NetSpeakers** uses loudspeaker(s). This information is provided during the **2N[®] NetSpeaker** start.
- **Maximum gain** – select a power supply and loudspeaker type to determine the maximum gain.
- **Sound path delay** – set the expected delay – buffer size – for **2N[®] NetSpeaker** for Wi-Fi installations, or potentially unreliable packet deliveries should be changed to 500ms or more.
- **Sampling frequency** – set the audio signal sampling frequency.
- **Bits per sample** – define the count of bits per audio signal sample.
- **Channels**– define the count of audio signal channels – stereo/mono bridged
 - stereo - using two independent audio channels through a configuration of two loudspeakers
 - mono - only one channel is used to transmit audio signal and both loudspeakers produce the same sound
- **Bit stream** – define the count of bits to be transmitted in 1s of pure audio signal. The IP packet overhead is not included in this information.

Advanced settings

- **Disable multicast** – multicast is a Point-to-Multipoint transmission option, which saves the network capacities (if implemented in network elements) and server resources. Multicast can be turned on globally in the [Administrator](#) tab. Multicast can be adjusted for each speaker individually.
- **Disable remote control** – disable remote **2N® NetSpeaker** setting.
- **Enable Telnet** – Telnet connection is disabled by default for security reasons upon **2N® NetSpeaker unit – 2N® NetSpeaker Server** connection. Select this option to enable Telnet even during **NetSpeaker–Server** connection. This option, however, is not recommended for security reasons.
- **Switch on relay while transmitting** – select this option, for example, to switch on/off the external amplifier if available.
- **Channel** – set the **2N® NetSpeaker** channel.
- **Button mode** – select the HW button mode – channel switching or volume setting. Or, deactivate the buttons.
- **Expander** – is an advanced feature of the **2N® NetSpeaker** system, which enables load balancing through the network of expanders and this option is used to assign **2N® NetSpeaker** to the particular Expander.

Generic RTP Output

Enables interconnection (via sound) of the **2N® NetSpeaker Server** with all devices that support audio by the RTP protocol with codec G711, L16. The output is the defined codec and IP address that will broadcast sound. Thus defined, the output can then be used as a general-defined output audio from a session. A **licence** is necessary for a proper function of the RTP destinations.

Type	Name	State	Address	Serial Number
NetSpeaker	0079_A/1st:2B	Connected	192.168.22.213	52-0451-0079
NetSpeaker	0442_B/Lift:01	Connected	192.168.22.221	52-0511-0442
NetSpeaker	0184_A/0st:R	Connected	192.168.22.222	52-0470-0184
RTP	Emergency	Not connected	239.255.239.112	

Destination name:

Audio codec:

IP Address:

Port:

TTL:

Licenses owned: Yes

Figure: RTP Destination Setting Options

Properties of RTP Destinations

This section is devoted to RTP destinations.

- **Destination name** – this parameter shows the name of the RTP destination and can be changed.
- **Audio codec** – allows you to select the required audio codec. You can choose one of the following 4 options:
 - G711 u-Law
 - G711 A-Law
 - Liner PCM 16 bit Stereo
 - Liner PCM 16 bit Mono
- **IP Address** – set the multicast IP address.
- **Port** – set the port.
- **TTL** – "Time to Live" allows you to set TTL of multicast packets for this destination: -1 means system default and we recommend you not to change this parameter. This parameter may cause network overload if not used in cooperation with a network specialist.
- **Licence owned** – shows if a valid licence was successfully added.

Bulk Settings

Bulk settings allows changes to be saved for multiple **2N[®] NetSpeakers**. If you select multiple **2N[®] NetSpeakers**, a grey strip shows up to indicate that you can change settings for more **2N[®] NetSpeakers**. First select the parameter to be changed. Then change this parameter and press Enter. The final step is to save the modification with the Save button. See the figure below.

Type	Name	State	Address	Serial Number
NetSpeaker	0079_A/1st:2B	Connected	192.168.22.213	52-0451-0079
NetSpeaker	0442_B/Lift:01	Connected	192.168.22.221	52-0511-0442
NetSpeaker	0184_A/0st:R	Connected	192.168.22.222	52-0470-0184
RTP	Emergency	Not connected	239.255.239.112	

Properties

3. Multi Mode Save

Speaker information

Speaker name:

Assigned connection:

SD card state:

State:

Progress:

Serial number:

MAC address:

Audio parameters

Volume

100%

0% Mute

Power supply

Max. gain:

Sound path delay [ms]: 2.

Sampling frequency [Hz]:

Bits per sample:

Channels:

Bit rate [kbit]:

1.

Figure: 2N® NetSpeaker Bulk Settings

Audio Sources

i What you should know

- It **is necessary to assign** the created working source (SIP, playlist, microphone...) to a session in the [Sessions](#) menu to define where the contents should be played.
- **2N® NetSpeaker** supports several types of input sources for specific applications.
- The HW sources are based on the **server PC** sound card. External sound cards can be used too.

Hardware Inputs

HW inputs are inputs of your server – PC on which the **2N® NetSpeaker** Server is running; refer to the system architecture in [Introduction](#). A microphone, internal/external sound card and/or mixer are used for playing locally stored music using a standard audio player.

Playlists

This is a classic principle of playlist creation in common music players. Click on the "+" button to chose **mp3, wma or wav files** to create a new playlist. You can select more files than one (with the Shift button).

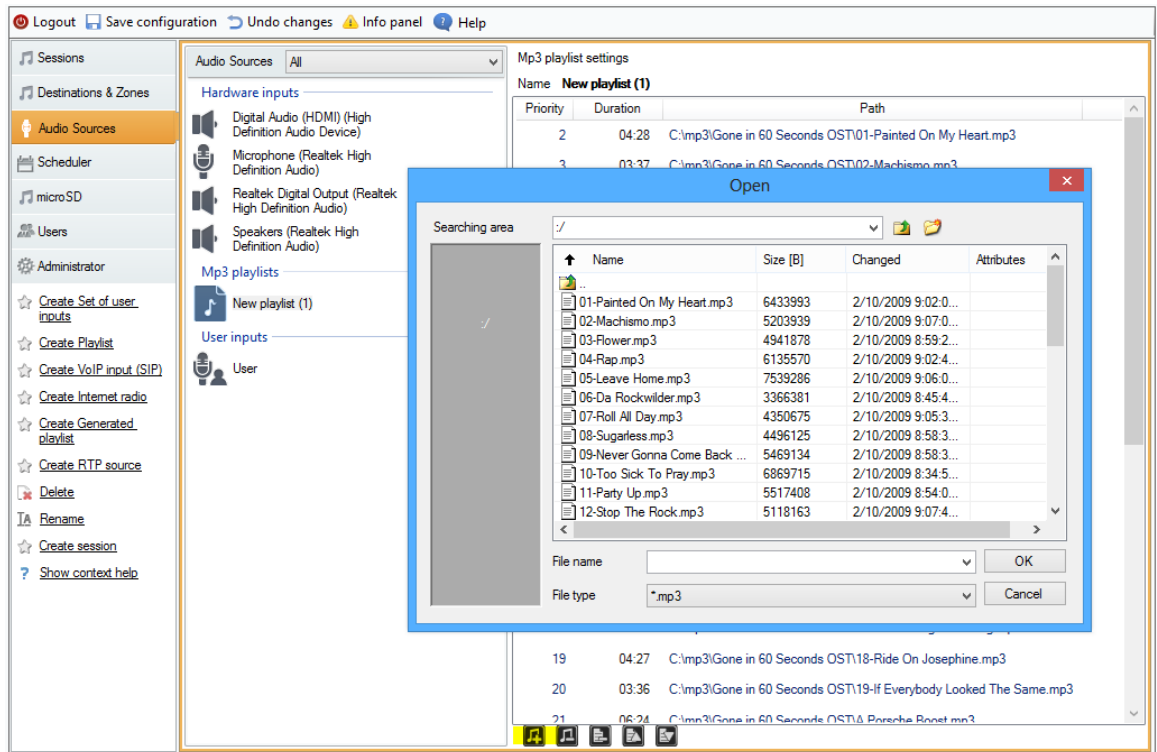


Figure: Adding of Audio Files to Playlist

To add files to the new playlist from a PC other than that on which the server is running, use the Import file option in the Administration > File manager menu.

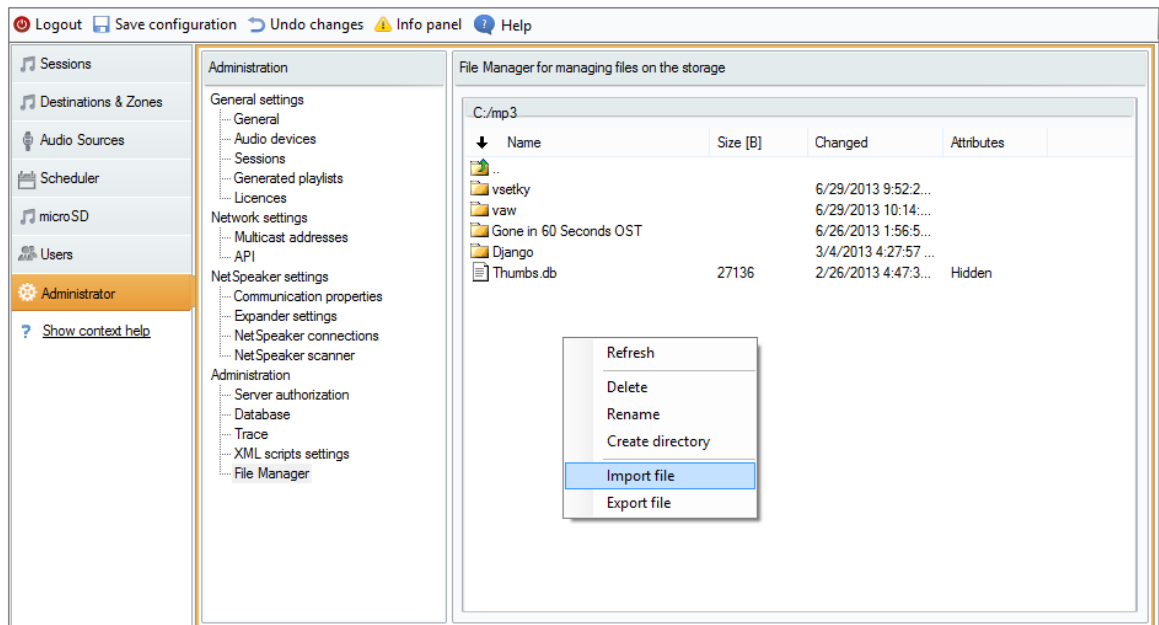


Figure: Import of Audio Files to Server

This way you can fill the server with mp3 files even remotely via the WAN.

Sets of User Inputs

Set of user inputs is a group of rules rather than an actual input. The rules define users with the right to use the input and also assign inputs to rooms if necessary.

Example: Suppose a language school has English and German classrooms. There are 4 teachers in the school: Mr. Cook, Ms. Scott, Hr. Himmel and Fr. Moselle. Use the set of user inputs to create **English classroom input** and **German classroom input**.

- Enable the "English classroom" virtual input for Mr. Cook and Ms. Scott.
- Enable the "German classroom" virtual input for Hr. Himmel and Fr. Moselle.

Doing this, you have created the possibility to play audio in the classrooms and let the teachers simply choose classrooms using the [Console](#) tool.

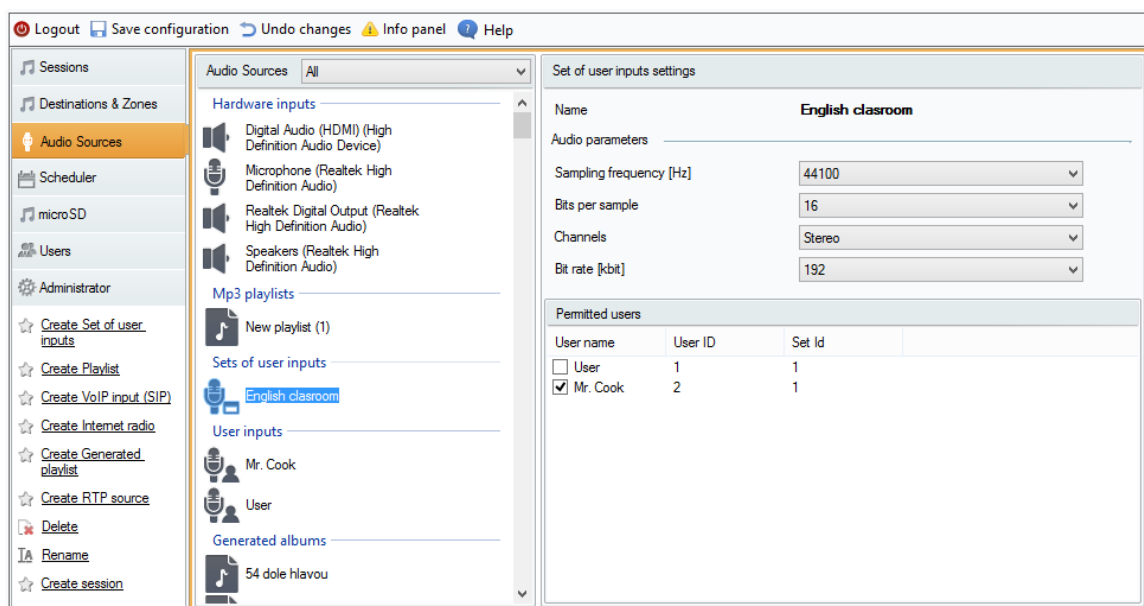


Figure: Adding of English Teachers to Set of User Inputs

Internet Radio

The Internet radio source allows you to insert URI of the selected radio and set radio delay (in ms) – characterises the radio buffer size.

Supported radio formats are **mp3** and **wma**.

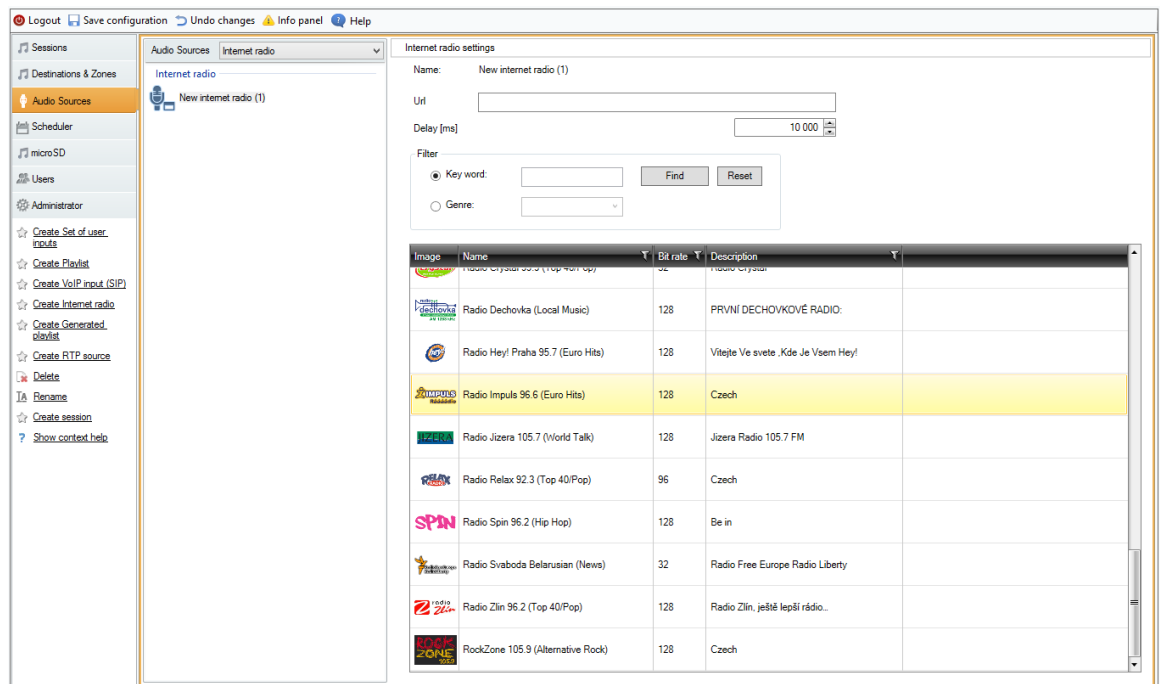


Figure: Internet Radio Parameters

User Input

User input is assigned to the user and defines the audio stream parameters from the user for playing from [Console](#), for example. The figure below shows the default input settings.

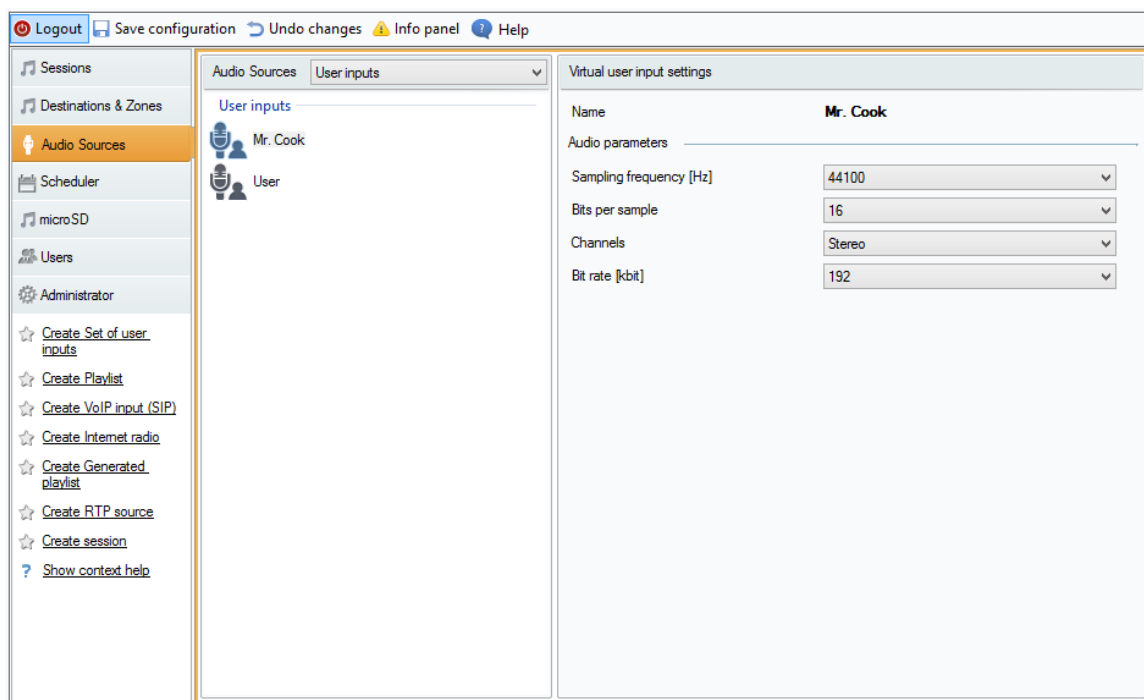


Figure: User Input Parameters

Generic RTP Input

It is a common audio input. All devices that can transmit audio using RTP protocol and codec G711, L16 can serve as a sound source for the session. The sound source is defined by the listening port, the IP address if unicast is not necessary to define (this is the IP address of the server). If the 2N[®] NetSpeaker Server listens on the defined multicast address, it is necessary to enter this address (then considered the specified port + IP multicast). If it is necessary to provide a sound source, it is possible to define the source IP address.

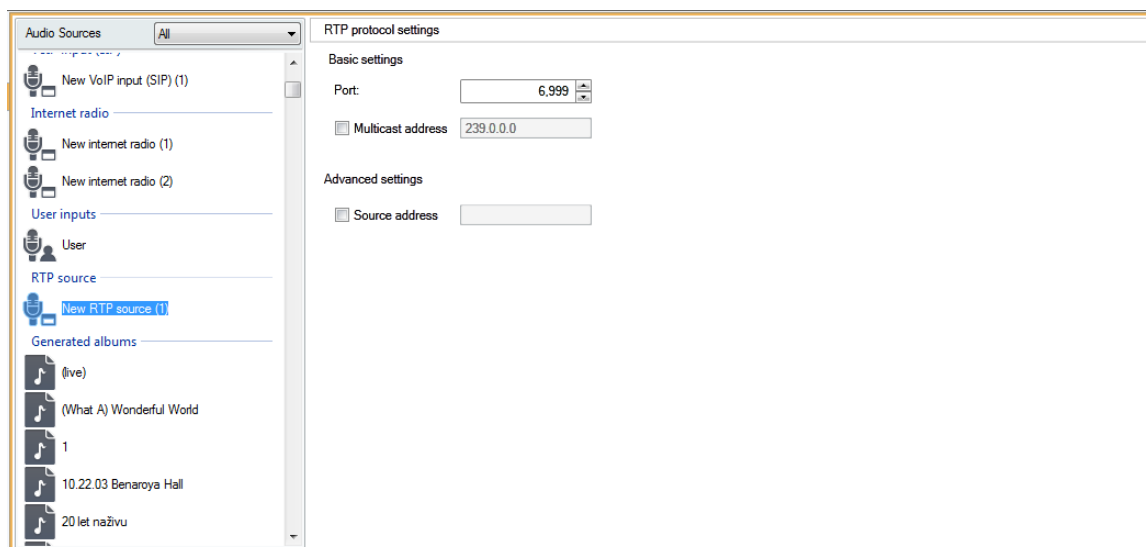


Figure: Generic RTP Input

NetMic

The NetMic is [HW console](#) for the streaming into 2N[®] NetSpeaker system. NetMic will automatically connect to 2N[®] NetSpeaker Server with name "New NetMic" if NetMic is connected to the LAN network. Basics settings for NetMic are possible to be made on the Audio Sources tab. It is possible to set audio parameters as Sampling frequency, Bits per second rate, Bit rate or Channel. Setting Sound path delay will improve sound experience in networks with higher latency.

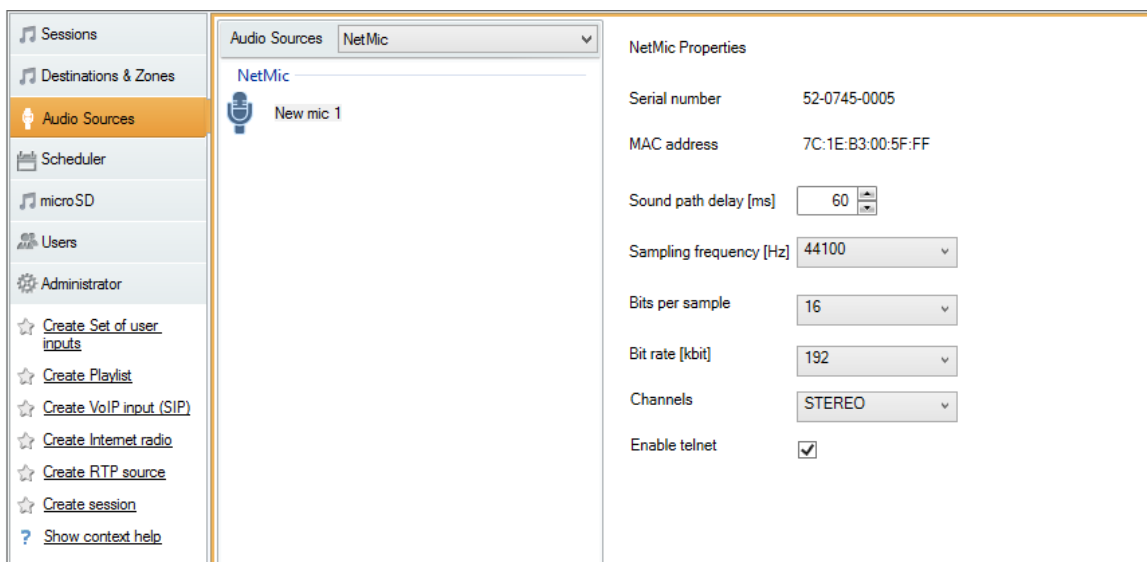


Figure: NetMic settings

VoIP Input

The SIP source helps you connect **2N® NetSpeaker** to a VoIP (Voice over IP) PBX as a VoIP station via the SIP or using VoIP trunk. You have to know the PBX IP address, username and password (if requested) and the port to establish connection to the PBX. Refer to the subsections below for the parameters and setting options.

Another option is to allow direct VoIP calls to **2N® NetSpeaker Server** by choosing Local SIP input. Then you have to assign the source to a session. Now **2N® NetSpeaker Server** is able to receive direct VoIP calls from VoIP phones.

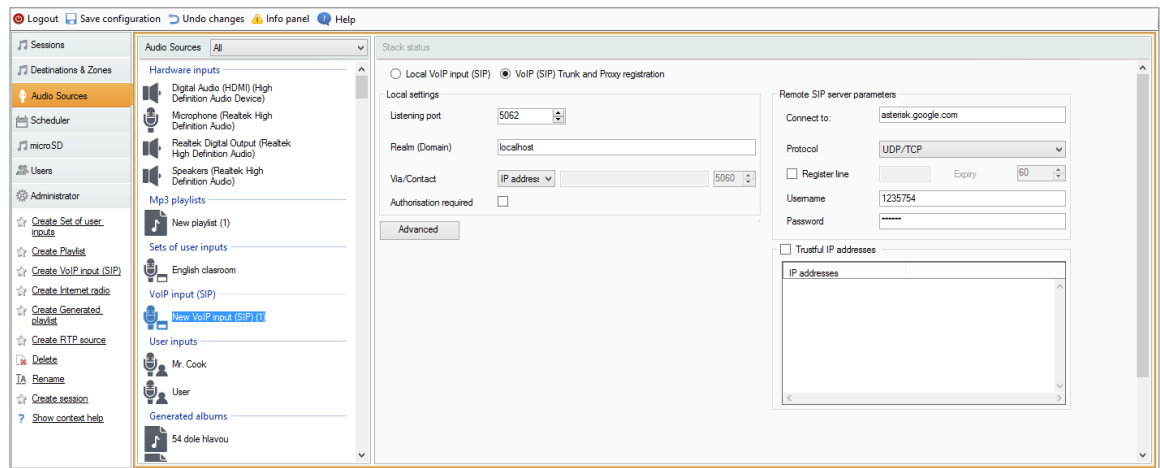


Figure: SIP Source Setting

Source status

Refer to the upper menu section for information on the stack (communication protocol) type and current status.

- **SOCK_TCP_ERROR** – TCP socket failed to open.
- **SOCK_UDP_ERROR** – UDP socket failed to open.
- **CREDS_IN_ERROR** – authorisation server unavailable.
- **CREDS_OUT_ERROR** – authorisation client unavailable.
- **REALM_CONFLICT** – realm collides with another port's realm/alias.
- **STUNNING** – public address obtaining from STUN server in progress.
- **STUN_TIMEOUT** – STUN server inaccessible.
- **EXPIRED** – public address validity expired.
- **SIP_REGISTERING** – gateway registration in progress.
- **REG_TIMEOUT** – REGISTRAR server inaccessible.
- **REG_NOT_AUTH** – registration unauthorised.
- **REG_REJECTED** – registration rejected with error.

Local settings

- **Listening Port** – is a local port of the 2N[®] NetSpeaker Server via which the given gateway is communicating with the counterparty.
- **Realm(Domain)** – define the domain over which this gateway is communicating. The domain and port specified here are relevant for subsequent call routing to the 2N[®] NetSpeaker Server. The Request-URI field including Realm(Domain) + port are checked for incoming INVITE messages. If the values match the SIP GW setting, the packets are routed to the 2N[®] NetSpeaker Server. The INVITE messages are served too whose Request-URI values are included in the **Aliases** field.
- **Via/Contact header** – define the contents of the Via and Contact headers. The following options are available:
 - **IP address** – fill in the unique PBX IP address.
 - **FQDM** – the header includes the PBX Host Name, which can be filled on the PBX IP interface.
 - **NAT** – fill in the fixed public IP address and NAT port to which signalling messages for the PBX should be sent by the counterparty. Packets are routed to the PBX based on the set port routing IP address on the router.
 - **STUN** – fill in the STUN server address and port to identify the current address behind the NAT router.
- **Authorisation required** – activate authorisation request for incoming calls from the counterparty. User login data are used for call authorisation. All logins are always searched through.

Remote SIP server parameters

- **Connect to** – set the IP address or DNS name of the counterparty (operator or another PBX) to which you want to connect the 2N[®] NetSpeaker server via a trunk (where call and registration requests shall be routed). To use a port other than 5060, specify the port behind the colon (192.168.122.43:5071).
- **Protocol** – specify whether UDP and/or TCP shall be used for transmission. If you choose NAPTR (Name Authority PoinTeR), a query to the DNS is made first and, depending on the reply, the proper transmission protocol is set. The **Use DNS SRV** parameter can be used with this setting and suitable DNS only.
- **Register line** – enable registration with the counterparty and specify the gateway registration number (Caller ID). No call setup requests can be resent to an unregistered gateway.
- **Validity** – set the registration validity term. The resultant value can be defined by the counterparty (if shorter).

Authorisation data

- **Name** – user name for registration with the counterparty.
- **Password** – password for registration with the counterparty.

Trustful IP addresses

The parameter helps secure the 2N[®] NetSpeaker Server against undesired call attempts via the given SIP Gateway. Tick off this option to make the PBX process only the requests coming from trustworthy IP addresses included in the list. Add, remove or modify an IP address to/in the list using the buttons to the right of the IP address list or the context menu retrieved in the IP address list with the right-hand mouse button.

Other parameters – SIP

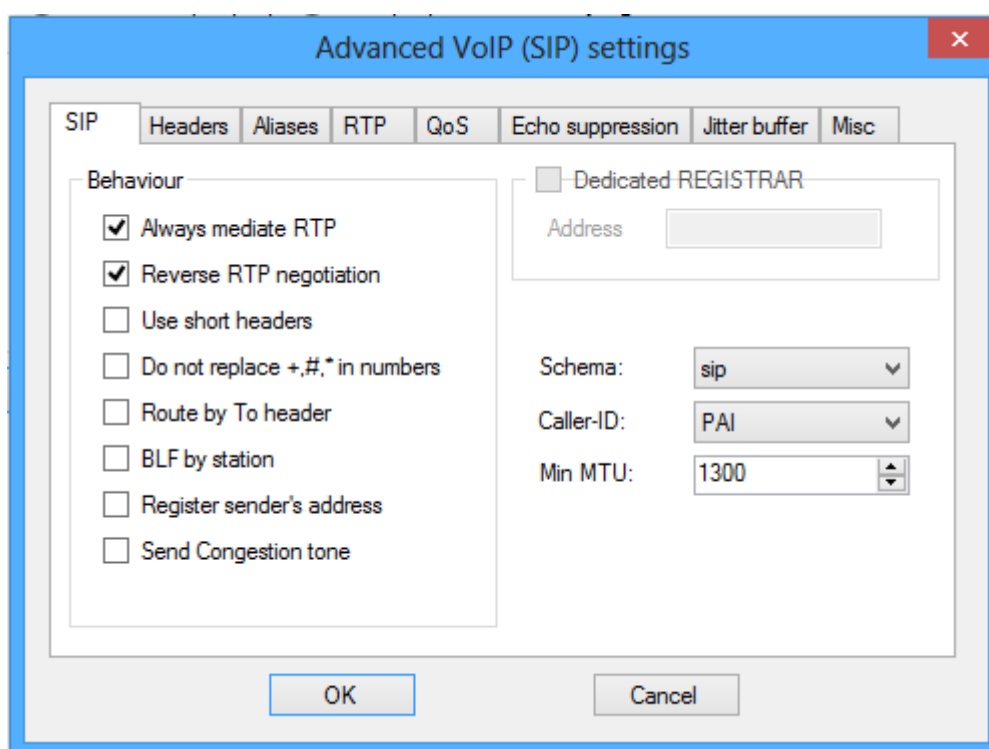


Figure: Other Parameters

- **Always mediate RTP** – enable this parameter to route the RTP stream via the PBX VoIP card in all cases. Otherwise, the RTP stream might be routed outside the PBX (for VoIP – VoIP connections) and the PBX processes only signalling for such a call.
- **Reverse RTP negotiation** – tick off this option to set the codec negotiating method. If you do not tick off this option, the PBX offers codecs in the INVITE message.
- **Use short headers** – tick off this option to use abbreviated header items for outgoing SIP packets. Example: From = f, To = t, Via = v. This optimisation helps minimise data to be transmitted.
- **Do not replace +, #, * in numbers** – if you do not tick off this option, the above mentioned characters will be replaced with adequate strings %xx in numbers. Tick off the option to send the characters.
- **Route by To header** – if you tick off the option, incoming call routing on the port will obey the **To** header setting. Otherwise (and by default!), **calls are**

routed by the Request URI header.

- **Dedicated Registrar** – is used for the gateway only and helps route registration to another server.
- **Address** – IP address of the selected Registrar server.
- **Port** – port of the selected Registrar server.
- **Scheme** – set the **sip** or **tel** scheme in the "To" and "From" headers of the SIP. **tel** is used for networks based on the numbering plan according to recommendation E.164.
- **Min. MTU** – set the minimum packet length for obligatory use of TCP in the UDP&TCP mode. The recommended maximum value is 1448 bytes.

Headers

- **Complete domain** – specify the domain to be used within the **From** and **To** headers.
- **Send information – P-Asserted-Identity** – activate the P-Asserted-Identity header for the INVITE message. This header is used for CLIR transmission to the counterparty, giving it information on the calling number even in the case of active CLIR (Calling Line Identification Restriction). By default, the header is enabled on the SIP Gateway and disabled on the SIP Proxy.

Aliases

Use this option to specify additional Realms(Domains) to be accepted on this port. Such incoming calls (their INVITEs) will be routed to this port whose Request-URIs match the given SIP GW or SIP Proxy settings and Domains or Aliases.

RTP

- **DSP**– here you can optimise data to be transmitted. Packets are not sent while the user is not speaking. VAD stands for Voice Activity Detection.
 - **Disabled VAD**
 - **VAD acc. to G.729 Annex B**
 - **VAD light**
- **Generate comfort noise** – enable comfort noise generating. As users of classic analogue lines are used to some background noise, this option simulates a similar call impression to them.
- **Mask lost packets** – enable optimised computing of probable contents of lost packets.

QoS

The **TOS/DiffServ** section helps you set outgoing packet parameters which define the packet priority for processing by network elements.

- **SIP** – hexadecimal priority value for SIP packets.
- **RTP** – hexadecimal priority value for RTP packets.
- **Default values** – restore the default values for the two parameters.

Echo suppression

Use this tab to activate various echo cancelling methods.

-

- - **Suppression disabled**
 - **Profile G.168 8 ms**
 - **Profile G.168 16 ms**
 - **Profile G.168 32 ms**
 - **Profile G.168 64 ms**
 - **Profile G.168 128 ms**
- **Delay [ms]**
- **Adaptive suppression**
- **Non-linear processing**
- **Reuse of coefficients**
- **Automatic control**

Jitter buffer

Set the parameters in this tab to optimise packet delay fluctuation during network passage.

- **Delay [ms]**
- **Depth [ms]**

Automatic adaptation

- **Short adaptation parameters**
- **Low [ms]**
- **High [ms]**
- **Threshold**

Miscellaneous

- **Receive marks in call**
 - **Mode** – set the supported DTMF receiving mode for calls.
- **Send marks by INFO method**
 - **DTMF** – select one of the two DTMF sending modes using the SIP INFO method. The modes have different formats of the DTMF transmitting message.
- **KeepAlive**
 - **Period** – define the KeepAlive packet sending interval. The default value is 10s.
- **STUN server**

The STUN server helps NAT clients (i.e. PCs behind the firewall) set up telephone calls with the VoIP provider hosted outside the LAN.

- **Address** – complete the STUN server address (IP or domain name) to be used if the STUN IP method is selected in the port RTP interface configuration. The default value is **stunserver.org**.
- **Port** – set the port to be used for STUN. The default value is **port 3478**.

Scheduler

i What you should know

- If the "Create actions for session activation and deactivation automatically" option is enabled, session activation/deactivation is set together with the first action for the session.
- If you power up the server while the event "is in progress", the actions will not be performed. The server must always be activated **before the beginning** of the event.
- Action: session activation automatically enables all playlists in the session.

Scheduler

Scheduler is used for creating actions based on playlists. You can schedule various actions for the playlists and assign them to time. A set of actions for playlists is called **Event** and you can control multiple playlists in multiple sessions within one event. Fig.1 shows an example of event with two sessions. One contains a playlist, the other is without a playlist.

Event Creation

As mentioned above, the event is a set of actions to be executed over playlists. Therefore, prepare a session including the required playlists before creating an event. Only then you can start creating an event as follows:

Procedure:

Create a new event – use one of the following methods: click on the Scheduler tag and then on the **Create event** menu item, or use the floating menu. Also, you can assign an event to a date before creation by clicking on the required day and then on **Create event**.

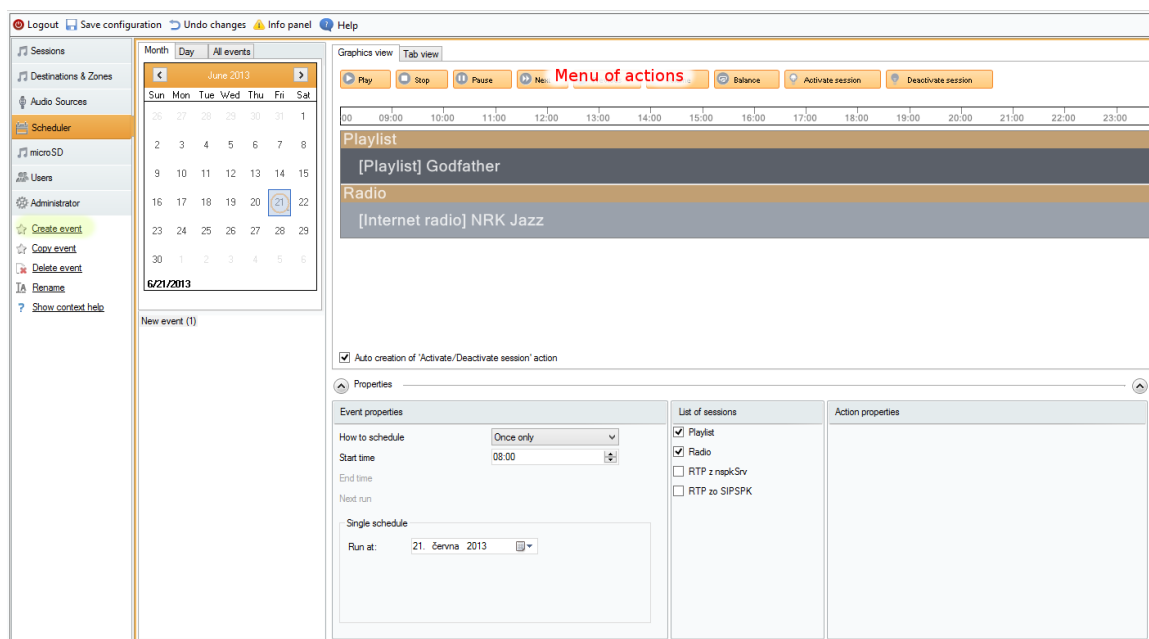


Figure: Scheduler Tag

Set event start – click on **Event** to display the event setting option to the left. Set the type, starting time and repeating intervals. The setting options depend on the action type: **Action setting options:**

- **Not scheduled** – this event will never be performed.
- **Daily** – the event will start at the set time every day (or as set in the **Every xth day**).
- **Weekly** – the event will start at the set time of the set days every week or **Every xth week**.
- **Monthly** – select a day in the month for the action start and also in which months the action shall occur **Once only**.

Event properties

New event (1)

How to schedule: Weekly (selected), Not scheduled, Daily, Weekly, Monthly, Once only

Start time: [empty]

Next run: [empty]

Single schedule

Run at: 16. dubna 2012

Figure: Event Settings

Action Setting

Having created an event according to Subs. 6.1. above, specify the contents of the event, i.e. what shall be played and when.

Month: July 2012

Calendar: Sun, Mon, Tue, Wed, Thu, Fri, Sat

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

7/3/2012

Paladium

Graphic View | Tab View

Play Stop Pause Next Previous Volume Balance Position Activate session Deactivate session

08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00

Activate session (1)

[Generated playlist] Deleted Scenes From The Cutting Room Floor - Nová relace (1)

New session (1)

[User] Fr. Moselle

New session (2)

[Internet radio] Rock101

Auto creation of 'Activate/Deactivate session' action

Properties

Event properties

How to schedule: Once only

Start time: 08:00

End time: Unscheduled

Paladium

Single schedule

Run at: 3. července 2012

List of sessions

Nová relace (1)

New session (1)

New session (2)

Action properties

Type of action: Play (Deleted Scenes From The Cutting Room Floor - Nová relace (1))

Action start time: 09:08:45

Time Δ from scheduler beginning: 1 8 45

Play from selected file

*** PLAY FROM BEGINNING ***

Figure: Action Setting and Display

The "Action Setting and Display" figure shows an example of a scheduled action. The

Activate/Deactivate session actions are added automatically to the beginning and end of each event. If you disable this property, however, the scheduled actions will not start running in an inactive session. Also, **all playlists are switched on automatically** in a session that moves into the **active** state. Therefore, assign the **STOP action** to the beginning of the playlists that are not to be played.

Drag&drop the required action above the time axis of the event from the **offer of actions** in the time axis header (see the figure). **Always** move the action to the playlist to be controlled within one session. A session can contain multiple playlists and all the playlists can be administered.

You can modify the actions created as mentioned above according to the requirements of the given event. Click on an action and edit its parameters in the "Action setting" window. Refer to the "Action Setting and Display" figure for details on the **Play** action.

You can set different parameters than shown in Fig. 3 for different types of actions. You can set the start time only for most action types and other properties for some of them:

- **Play, Stop, Others, Previous and Activate/Deactivate session** – set the start time only.
- **Volume** – set the playlist volume – the volume level plus a smooth volume change.
- **Balance** – set the playlist balance – in addition to start time, set a smooth balance change via the **Change duration time** option.

In the **List of sessions** it is possible to choose the sessions that shall be used for the event.

Event Display

There is an event list in the left part of the Scheduler tag. Display the list in any of the following views: **Month, Day** or **All events** by selecting a card.

- **Month view** – select this card to display a calendar for navigation. Click on a date to run the events associated with the selected date.
- **Day view** – having selected a date in the Month view, click on the Day card to display the required day details. Like with the Month card, you can only see the actions assigned to the selected date.
- **All events** – select this card to display all the events available.

microSD

i What you should know

- The SD card must be FAT32 formatted before being inserted in **2N[®] NetSpeaker**.
- **2N[®] NetSpeaker** has no RTC of its own. Connectivity to the server after HW restart is required for successful time synchronisation. Connection failures are irrelevant.
- We recommend to synchronise up to 100 MB of the contents.
- One action launched at time and one action launched by the button press are always valid on one **2N[®] NetSpeaker**.
- The synchronisation rate depends on the SD (SDHC) card type.
- The content is synchronised automatically at a defined time or manually in the [Destinations & Zones](#) tab.
- The content is synchronised only if nothing is being played from the server.
- Volume from the online playback is kept for the SD card playback. There is no separate SD card (offline) volume.

microSD is used for administration of SD cards inserted in the **2N[®] NetSpeaker** system, synchronisation of these cards with the defined content and setting of action starts.

microSD Tab Layout

Synchronisation actions related to the SD card (inserted in **2N[®] NetSpeaker**) are managed via the microSD tab. The layout of this tab is rather complex. Refer to the figure below for an overview of functions.

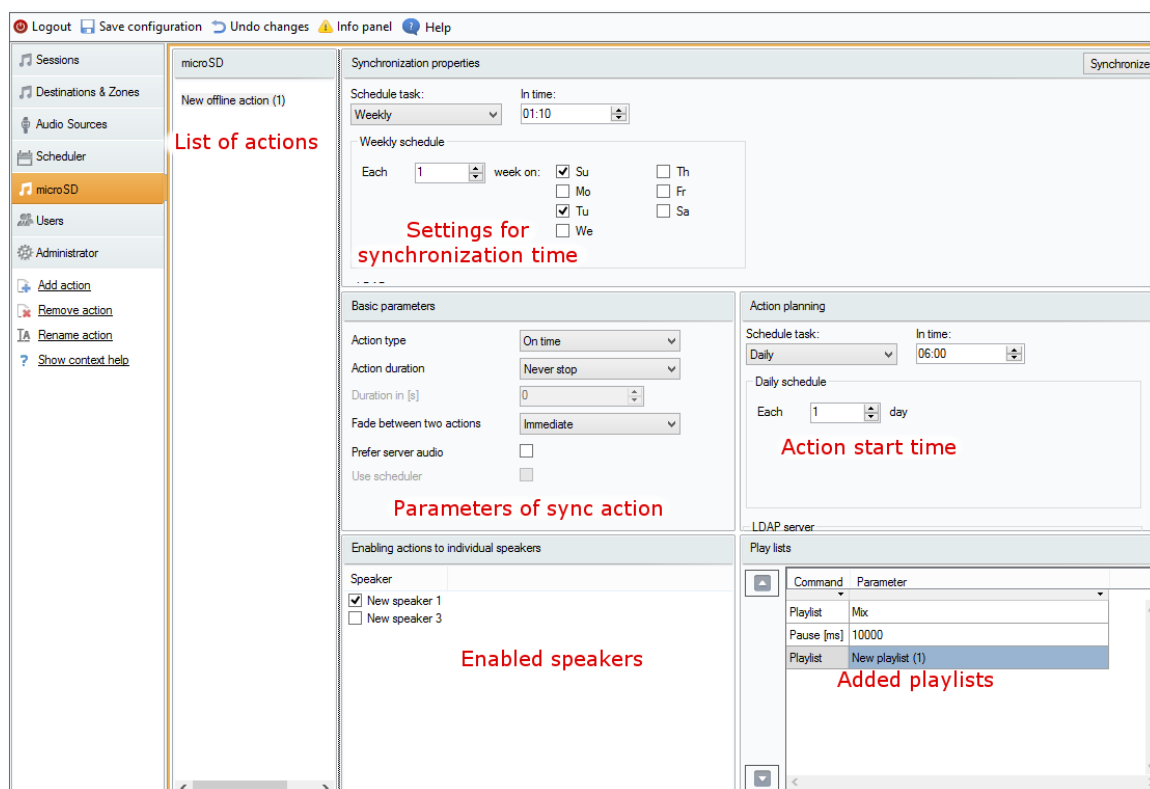


Figure: microSD Tab Layout

The **left section** is dedicated to the list of **Actions for synchronisation**, the right-hand window part includes settings of action properties. These settings are divided logically as follows:

- **Synchronisation properties**
- **Basic parameters**
- **Action planning**
- **Enabling action to individual speakers**
- **Playlists**

The subsections below provide details on these logical parts.

Synchronisation properties

In this section, you can set and schedule action synchronisation. The following options are available:

- Not scheduled – perform synchronisation manually by pushing the Sync Now! button, or
- At defined time with the "Daily", "Weekly", "Monthly" and "Once only" options. Each of these options can be further set. This setting specifies the time when the selected synchronisation shall be launched. Fig. 2 shows an example of configuration for a one-month progress of updates.

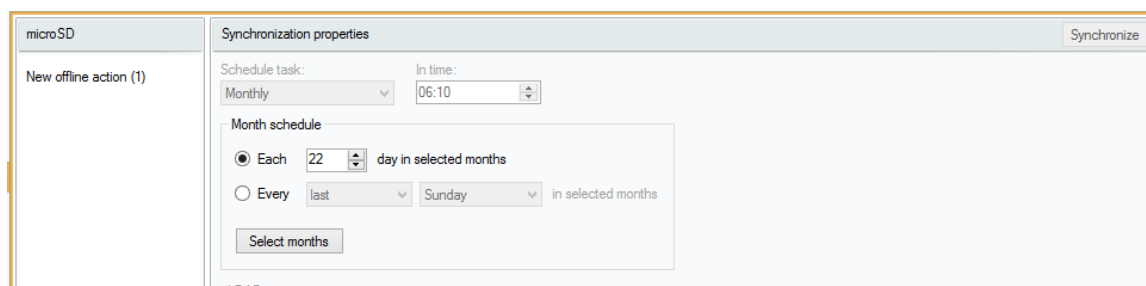


Figure: Synchronisation Properties

Basic parameters

These parameters define how the action shall behave: its trigger and behaviour upon start.

Action type – define the action trigger: either the logical input to **2N® NetSpeaker** (action **On logic input**) or a time value (**At time**). If you select time, select the time value and start day in **Action planning**; refer to Subs. 6.1.3., Action Planning. More possibilities for Actions are added by the **Play from SD** card and **On connection loss** action types.

- **On logic input** - the action starts in case of logical input. Refer to the Digital Input and Output subsection in [HW description](#).
- **At time** - the action starts at the defined time.
- **On connection loss** - the action starts in case the connection gets lost e.g. the **2N® NetSpeaker Server** power supply fails.
- **Play from SD** - the action starts whenever the audio stream stops or gets interrupted, e.g. Session is disabled, **2N® NetSpeaker Server** is down, etc.

Action duration – set the action end.

- **Specific time** – set the action duration using the following **Duration in (s)** field.
- **Repeat n-times** – define how many times the playlists selected in the Playlist shall be played. Use the **Repeat count** item.
- **Never stop** – make playing never stop. This option is particularly comfortable in connection with the HW button: press the button once to start the action and repress it to stop the action.

Basic parameters	
Action type	On logic input
Action duration	Never stop
Duration in [s]	0
Prefer server audio	<input type="checkbox"/>
Use scheduler	<input type="checkbox"/>

Figure: Basic Parameters

Action planning

If you select an action scheduled for start **at time**, it is necessary to schedule the action correctly. To do this, use the **Action planning** section. Fig. 3 shows a weekly schedule, but you can choose any of the following types of planning:

- **Not scheduled** – this action will never start.
- **Daily** – the action will start at the set time every day (or as set in the **Every xth day**).
- **Weekly** – the event will start at the set time of the set days every week or **Every xth week**.
- **Monthly** – select a day in the month for the action start and also in which months the action shall occur **Once only**.

Action planning	
Schedule task:	In time:
Weekly	22:10
Weekly schedule	
Each	1 week on:
	<input checked="" type="checkbox"/> Su
	<input type="checkbox"/> Mo
	<input checked="" type="checkbox"/> Tu
	<input type="checkbox"/> We
	<input type="checkbox"/> Th
	<input type="checkbox"/> Fr
	<input type="checkbox"/> Sa

Figure: Weekly Schedule

Enabling actions to individual speakers

Define the speakers for which the action shall be enabled. These speakers will be synchronised with the server and the files will be saved onto the SD card for each **2N[®] NetSpeaker**.

Playlist

Select the playlist(s) in the Playlist to be played when the given offline action starts. Also you can select command pause to add pause between playlists. Use the arrows to assign priorities to the playlist(s).

<p>Basic parameters</p> <p>Action type: On time</p> <p>Action duration: Never stop</p> <p>Duration in [s]: 0</p> <p>Prefer server audio: <input type="checkbox"/></p> <p>Use scheduler: <input type="checkbox"/></p>	<p>Action planning</p> <p>Schedule task: Daily</p> <p>In time: 06:00</p> <p>Daily schedule</p> <p>Each 1 day</p>						
<p>Enabling actions to individual speakers</p> <p>Speaker</p> <p><input checked="" type="checkbox"/> 1st floor</p> <p><input checked="" type="checkbox"/> Lobby</p>	<p>Play lists</p> <table border="1"> <thead> <tr> <th>Command</th> <th>Parameter</th> </tr> </thead> <tbody> <tr> <td>Pause [ms]</td> <td>1000</td> </tr> <tr> <td>Playlist</td> <td>Ad for company Xyz</td> </tr> </tbody> </table>	Command	Parameter	Pause [ms]	1000	Playlist	Ad for company Xyz
Command	Parameter						
Pause [ms]	1000						
Playlist	Ad for company Xyz						

Figure: Playlist

Example of Synchronisation Action Configuration

Suppose company Xyz intends to play ad spots in its **2N[®] NetSpeaker** system at 6 a.m. every day. As the spots vary every week, it will be necessary to synchronise the **2N[®] NetSpeaker** system early in the morning on Mondays.

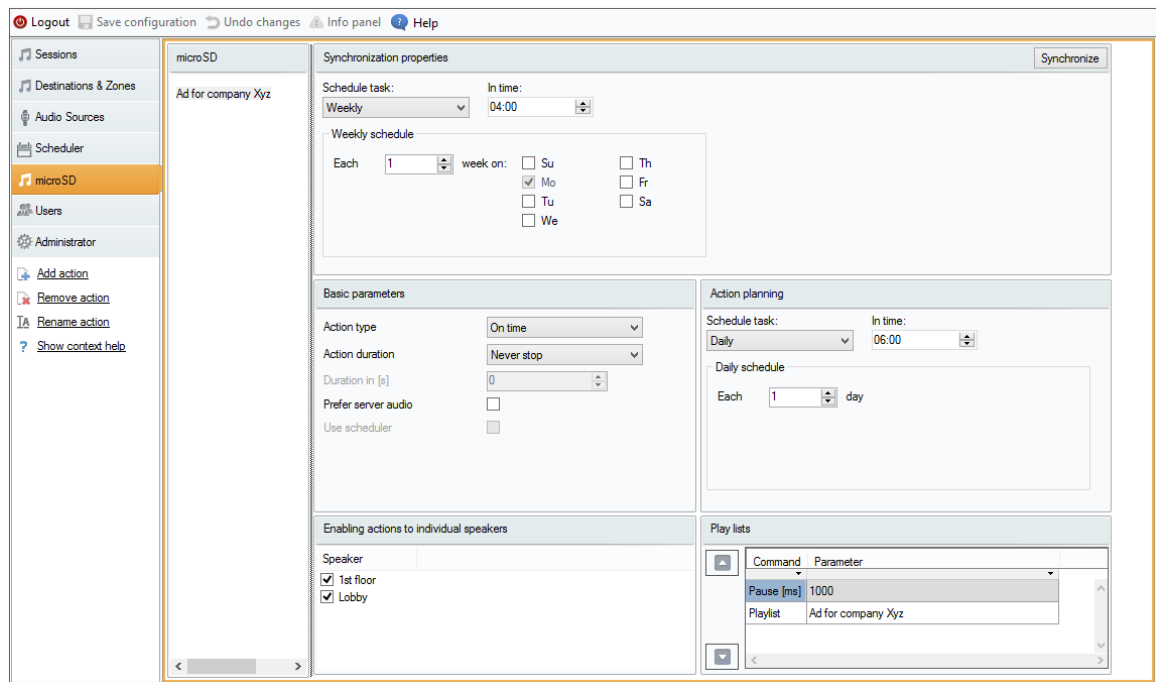


Figure: Example of Xyz Ad Setting

Create a new action called "Xyz advertisement" via the microSD tab.

1. Set the weekly synchronisation option in the **Synchronisation properties**, refer to Fig. 6., selecting Monday.
2. Now set the **basic parameters**. Select the **At time** action type and **Repeat n-times** with $n=1$. Tick off the other options and **Schedule action start**. Suppose you want to play the commercial spot at 6 a.m. every day. Therefore, select **Daily planning with start at 6:00**.
3. Select the **2N[®] NetSpeaker** units in the **Enabling action to individual speakers** to be involved in the action.
4. **Caution! Make sure that the selected 2N[®] NetSpeaker units contain the SD cards via the [Destinations & Zones](#) tab.**
5. Now select the playlist to be saved on the SD card and played at the defined time. Retrieve the floating menu in the **Playlist** section with the right-hand mouse button and select **Add**. Choose Playlist -> "Xyz advertisement" from the pop-up menu.
6. **Save the setup!**

Users

i What you should know

- This menu helps you create users and specify user rights.
- A created user can log in to the ControlPanel, Virtual Sound Card, Console and/or mobile applications (Android, iPhone).
- **2N[®] NetSpeaker** uses 2 levels of authorisation – User level and Administrator.
- **2N[®] NetSpeaker** uses 2 levels of permission – user input role and freeride role.

The Users tab is used for user administration. It helps you create and delete users and change user rights (user roles).

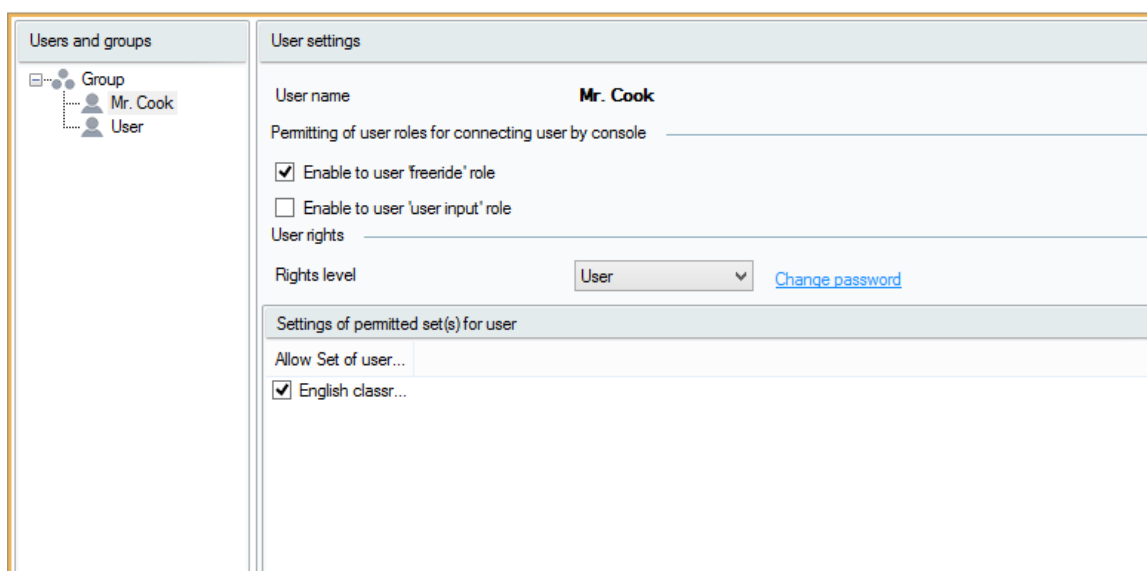


Figure: Users tab Layout

The figure shows the Users tab with the **User settings** to the right. You can define the user rights for Console or Virtual Sound Card user connection.

- **"Freeride" role** - the user itself defines what and where to be played. This user has the right to play without restrictions and without using pre-defined sessions. The user has access to all destinations and its broadcasting has the highest priority.
- **"User input" role** - this user will be assigned the "home" session for broadcasting by the system administrator.

Rights level - select the User or Administrator level. The Administrator cannot log in to the Console and Virtual Sound Card, but may use the 2N[®] NetSpeaker ControlPanel software.

Sets of User Inputs

The system administrator defines the set of user inputs to certain sessions; refer to [Audio Sources](#) for details. These inputs can then be assigned/provided to users in the **Permit user connection to set of user inputs** section. This section includes a list of all sets of user inputs and helps you assign a user to an input by ticking off the option.

Administrator

i What you should know

- Your network can be overloaded by wrong settings made in this tab.
- Trace can be saved and help communicate your problem to the **2N[®] Technical Support** department.
- Multicast is disabled in **2N[®] NetSpeaker** by default.
- The **2N[®] NetSpeaker** scanner allows you to see **2N[®] NetSpeaker** even if **2N[®] NetSpeaker** does not obtain the IP address from the network. For a proper function you have to assign the IP address manually in this case. This, however, works in switched networks only.
- Virtual Network adapters may cause malfunction of the **2N[®] Net Speaker** scanner.
- Access via API is restricted to 10 clients by default and can be changed.

The **Administrator** tab helps you set other **2N[®] NetSpeaker** parameters and monitor the state of the system. The tab contains general settings and administration.

Table of Contents:

- [General Settings](#)
 - [General](#)
 - [Audio devices](#)
 - [Sessions](#)
 - [Licences](#)
- [Network Settings](#)
 - [Multicast addresses](#)
 - [API](#)
- [2N[®] NetSpeaker Settings](#)
 - [Communication properties](#)
 - [Expander settings](#)
 - [2N[®] NetSpeaker connections](#)
 - [2N[®] NetSpeaker scanner](#)
- [Administration](#)
 - [Server authorisation](#)
 - [Database](#)
 - [Trace](#)
 - [XML script setting](#)
 - [File manager](#)

General Settings

General

General allows you to set the ControlPanel language and external syslog server for logs.

The **language** can be chosen by the Application language selector.

The **SYSLOG server** is used for logging the **2N® NetSpeaker Server** information on an external server. After the IP address and destination port are set, the server messages will be sent automatically. The **TCP protocol** is used for packets and therefore it is necessary to enable TCP connection on your syslog server.

Log description:

```
1,RADIO_DISCONNECT,"New session
(1)","http://api.play.cz/danceradio192.mp3.m3u","Nové internetové rádio
(1)"

Par1: 1 - id of message. After server restart number is set to 0
Par2: RADIO_DISCONNECT - type of message (see below)
Par3: "New session (1)" - source of message
Par4: "http://api.play.cz/danceradio192.mp3.m3u" - subject of change
Par5: "New internet radio (1)" - name of subject
```

The parameters are UTF-8 encoded and Type writer double quotes (" ") are used. If the text contains ' ', then prefix \' is used. It means that Speaker "Kitchen" will be coded as "Speaker \'Kitchen\'" in the parameters.

Types of logs:

SPEAKER_LOGIN - NetSpeaker has been logged in; Par3=Speaker
 SPEAKER_LOGOUT - NetSpeaker has been logged off; Par3=Speaker
 SPEAKER_CONNECT - NetSpeaker has been connected to session;
 Par3=Speaker,Par4=Session
 SPEAKER_DISCONNECT - NetSpeaker has been disconnected from session;
 Par3=NetSpeaker name
 FILE_CONNECT - Session starts playing song; Par3=Session,Par4=name of file with
 full path,Par5=Name of playlist
 FILE_DISCONNECT - Session stops playing song; ,Par3=Session,Par4=name of file
 with full path,Par5=Name of playlist
 USER_CONNECT - User was connected to session; Par3=Session,Par4=User
 USER_DISCONNECT - User was disconnected from session;
 Par3=Session,Par4=User
 VIRTUAL_CONNECT - Virtual input was connected to session;
 Par3=Session,Par4=Virtual input
 VIRTUAL_DISCONNECT - Virtual input was disconnected from session; Par3=Session,
 Par4=Virtual input
 RADIO_CONNECT - URL input (radio) was connected to session;
 Par3=Session,Par4=URL address,Par5=Name of radio
 RADIO_DISCONNECT - URL input (radio) was disconnected from session;
 Par3=Session,Par4=URL address,Par5=Name of radio
 HW_CONNECT - HW input was disconnected to session; Par3=Session,Par4=HW
 input source's name
 HW_DISCONNECT - HW input was disconnected from session;
 Par3=Session,Par4=HW input source's name
 VOIP_CONNECT - VoIP input was connected to session; Par3=Session,Par4=Voip so
 urce's name
 VOIP_DISCONNECT - VoIP input was disconnected from session;
 Par3=Session,Par4=Voip source's name
 RTP_CONNECT - RTP source was connected to session; Par3=Session,Par4=Rtp
 source's name
 RTP_DISCONNECT - RTP source was disconnected from session;
 Par3=Session,Par4=Rtp source's name

Audio devices

Audio devices allows you to select the local sound device for listening-in. Listening-in is a capability to listen to sessions locally, which makes troubleshooting easier. Select the device to which the sound will be routed. These devices depend on the PC configuration.

Sessions

Sessions allows to set more session parameters.

- **Show sessions from connected consoles** – see even sessions that are created by the Console and Player users with the Freeride privilege.

Licences

This tab is used for licence administration. Licences allow you to use functions of the **2N® NetSpeaker system**. After Windows upgrade or HW upgrade, the licence will be valid. In any case contact the Technical Support.

Without a licence you can use up to **5 2N® NetSpeakers** and **1** RTP destination. By default, an 800h trial licence is active and allows you to use all features of the **2N® NetSpeaker** system without any limitations.

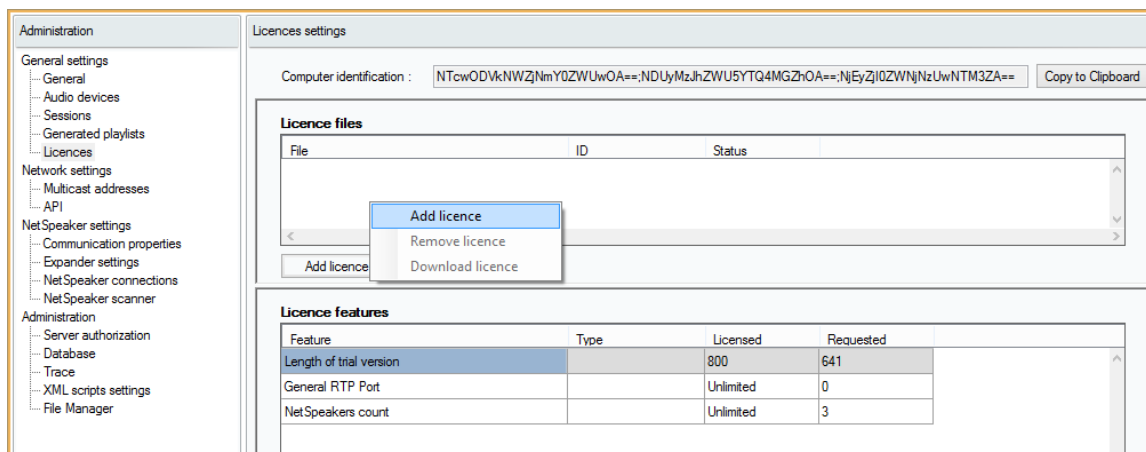


Figure: Licence Settings

Network Settings

Multicast addresses

Set the multicast addresses. Select multicast for the address range, multicast for the port range or single IP address transmission. The default address scope is 239.0.0.0/8. The figure below shows the default setting for the address range. If the range of addresses is set, then multicast is used. Each group of speakers with the same settings (session, delay, bitrate...) use one multicast stream.

The **TTL** parameter allows to change **time to live** for multicast packets. **Use -1 to ensure that the system default is used!** Some special **2N® NetSpeaker** applications require a change of these settings but it should be done only in cooperation with a network specialist.

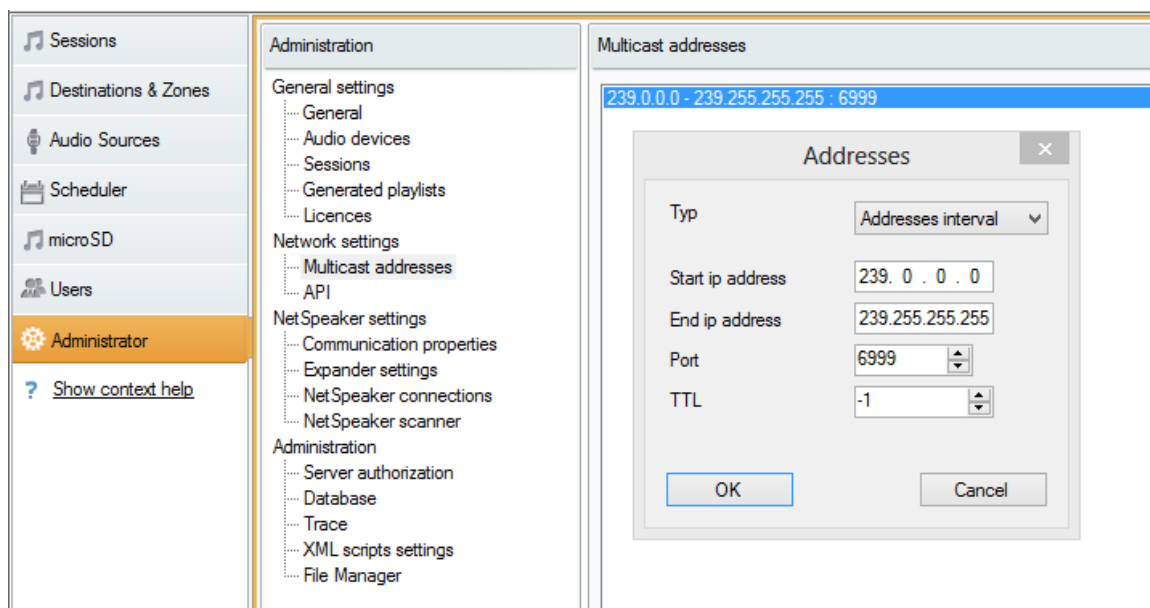


Figure: Multicast Setting Options

API

API settings set the port for **2N[®] NetSpeaker API** connection and client restriction.

XML API allows an external 3rd party application (e.g. iPhone application, tablet application) to control the system. HTML API allows to send basic commands to the **2N[®] NetSpeaker Server** and control sessions. HTML API is primary used by VoIP phones or intercoms but the command can be also sent from a web application.

2N[®] NetSpeaker Settings

Communication properties

Communication properties set the server domain for the connected **2N[®] NetSpeaker** units to avoid connection to another **2N[®] NetSpeaker** Server in the network.

Expander settings

2N[®] NetSpeaker Expander is an advanced function of **2N[®] NetSpeaker**, which allows traffic load balancing through the **2N[®] NetSpeaker Expanders** used in the network. Contact 2N TELECOMMUNICATION a.s. for more information.

2N[®] NetSpeaker connections

Set the connection parameters for **2N[®] NetSpeakers** in the passive mode (refer to the **2N[®] NetSpeaker** scanner below). **Save** the parameters to establish connection to **2N[®] NetSpeaker**.

Parameters:

- **Connection timeout** – define the time interval between the connection making attempts.
- **IP address** – set the **2N[®] NetSpeaker** IP address.
- **IP port** – set the **2N[®] NetSpeaker** port; 6998 is the default value.
- **Automatic firmware upgrade** – disable the **2N[®] NetSpeaker** firmware upgrade.

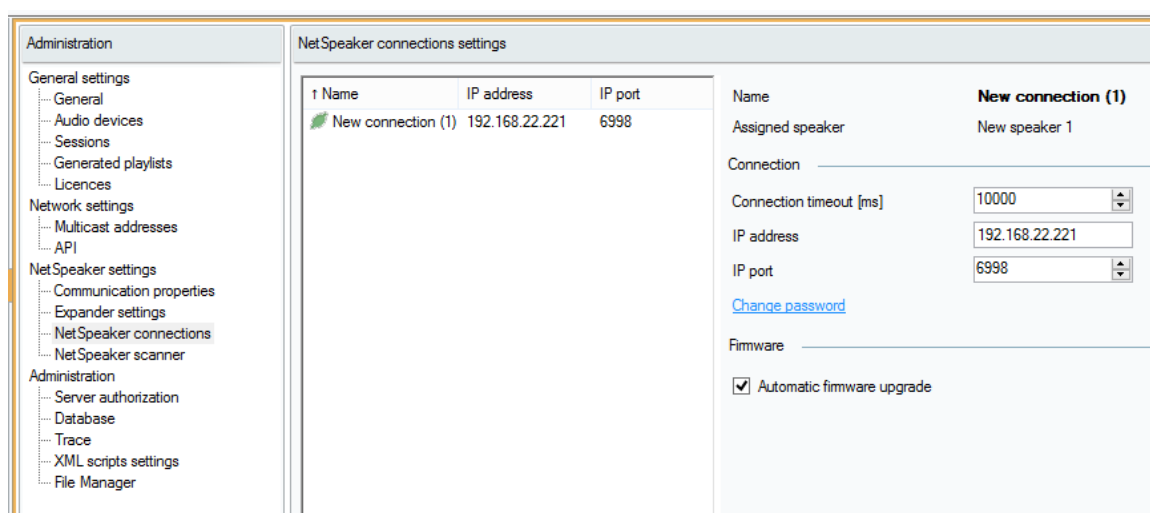


Figure: Connection Parameters

2N[®] NetSpeaker scanner

Use the **2N[®] NetSpeaker** scanner to search for the **2N[®] NetSpeaker** units and their settings in the network. All speakers available in the network are displayed to the left. Having selected a speaker, you can change its parameters in the right-hand part to make it connect to the **2N[®] NetSpeaker Server** automatically (active mode), or using the **NetSpeaker connections** parameters.

Parameters:

- **DHCP client on** – select on/off to determine whether **2N[®] NetSpeaker** shall use the network setting obtained from the network via the DHCP, or use the

statically set parameters.

- **IP address** – 2N[®] NetSpeaker IP address.
- **IP mask** – network mask.
- **IP gateway** – network gateway.
- **Server IP address** – 2N[®] NetSpeaker Server IP address.
- **Domain** – 2N[®] NetSpeaker with the set domain is assigned to the server with the same domain. 2N[®] NetSpeaker automatically takes over the domain of one of the servers in the network.
- **Description** – enter optional details on the selected 2N[®] NetSpeaker unit.
- **Mode**– select the passive/active/search mode.
 - **Passive mode** means that it is necessary to set connection to 2N[®] NetSpeaker from the server side in the **NetSpeaker settings** -> **NetSpeaker connections** section.
 - **Active mode** means that 2N[®] NetSpeaker gets connected to the 2N[®] NetSpeaker Server automatically using the **Server IP address** parameter.
 - **Search mode** means that 2N[®] NetSpeaker finds the 2N[®] NetSpeaker Server in the network automatically, takes over the domain and gets connected to the server.

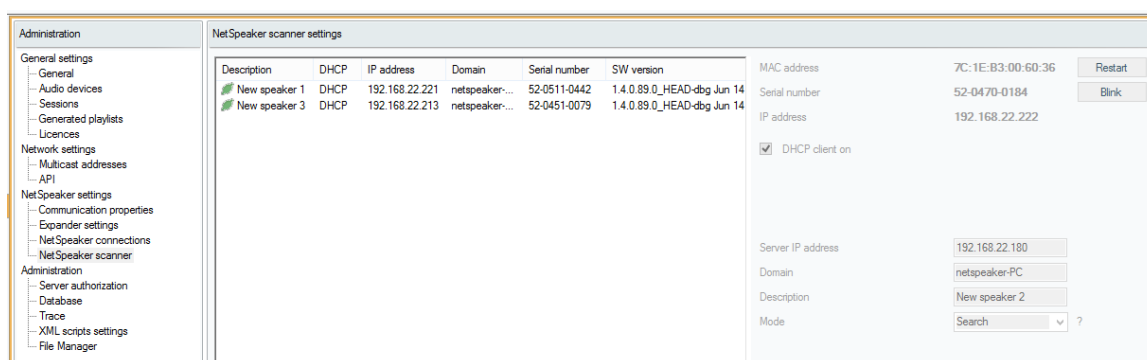


Figure: Scanner

Administration

Server authorisation

- **Server authentication to 2N[®] NetSpeaker** – set the password for server authentication to 2N[®] NetSpeaker.
- **2N[®] NetSpeaker authentication to server** – set the password for 2N[®] NetSpeaker authentication to server.
- **Administrator login authentication password** – change the main administrator password of the Administrator user.

Database

Database displays database tables. Changes of the parameters in DB are possible but **reckless changes can corrupt 2N[®] NetSpeaker Server !**

The **Cfg_PollTout** parameter in the **MSGBT_CHAN** table sets the timeout for communication lost. A 2500ms timeout is set by default and 4x2500ms represents a timeout for communication between the **2N[®] NetSpeaker Server** and the **2N[®] NetSpeaker units** or **2N[®] NetSpeaker ControlPanel**. This parameter can improve the **2N[®] NetSpeaker** performance in networks with complicated structures and .

The **Cfg_Port** parameter in the **MSGBT_LL_TCPSRV** table allows you to change default ports for incoming communication from the **2N[®] NetSpeaker units** to the **2N[®] NetSpeaker Server** (port 6999) and from the **2N[®] NetSpeaker ControlPanel** to the **2N[®] NetSpeaker Server** (6990). If a change of this parameter is made on the server side, it has to be made also on the client side (**2N[®] NetSpeaker**, **2N[®] NetSpeaker Control Panel**) too.

The **NTPQueryTimeout** parameter in the **NSPK_SRVT_GLOBAL** table allows you to change the time synchronisation timeout. This parameter can improve the **2N[®] NetSpeaker** performance in networks with complicated structures.

The **NSPK_SRVT_STATS_SND_BUFFER** table shows statistical data on communication for short (10s - 60s) and overall time periods.

Trace

Full listing of information exchange between the **2N[®] NetSpeaker** system components. Use the floating menu to retrieve more functions such as:

- **Settings** – set automatic trace saving onto a disk of the PC where the ControlPanel is running.
- **Filter** – create a filter for existing IDs or characters (**string**).
- **Save to file** – save the current system trace using the floating menu ->Save to file.
- **Import/Export settings** – save settings of colour rules for filters.

You will be asked to capture trace if you are communicating with the 2N Technical Support. It can be done by the right mouse click into the trace space and choice of Save to file.

XML script setting

Display the XML scripts while configuring **2N[®] NetSpeaker** as full or simplified listings – listing of debug functions.

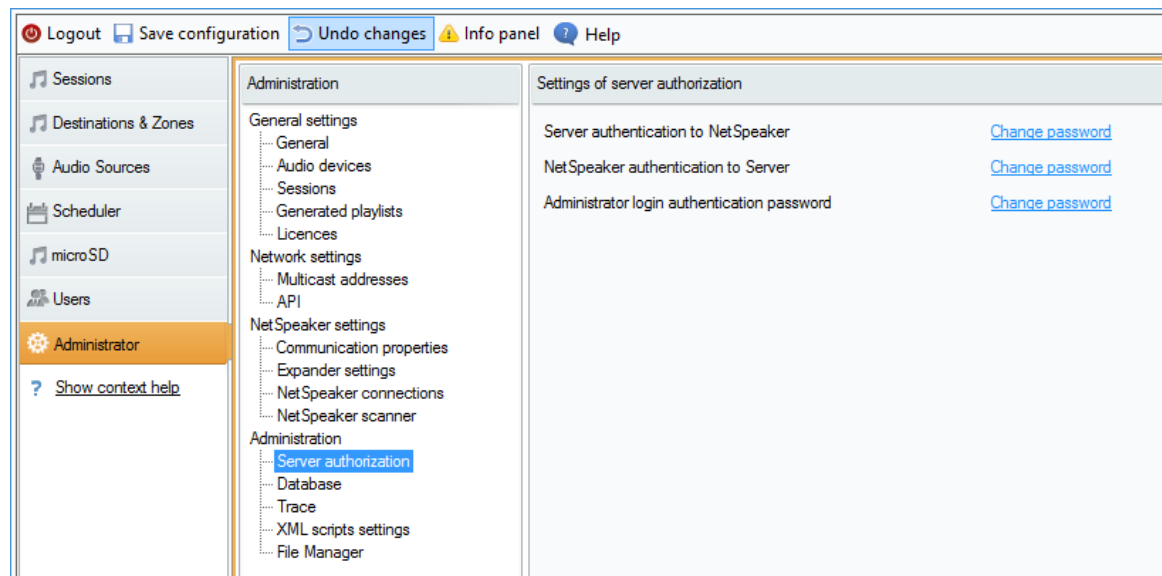


Figure: XML Script for Password Saving

File manager

It allows you to manage the folders and files on your discs.

- **Refresh**– refresh the current path in folder.
- **Delete**– delete file/folder.
- **Rename**– rename file/folder.
- **Create directory**– create a directory in current folder.
- **Import file**– copy a file to the current folder.
- **Export file**– copy a file from the current folder.

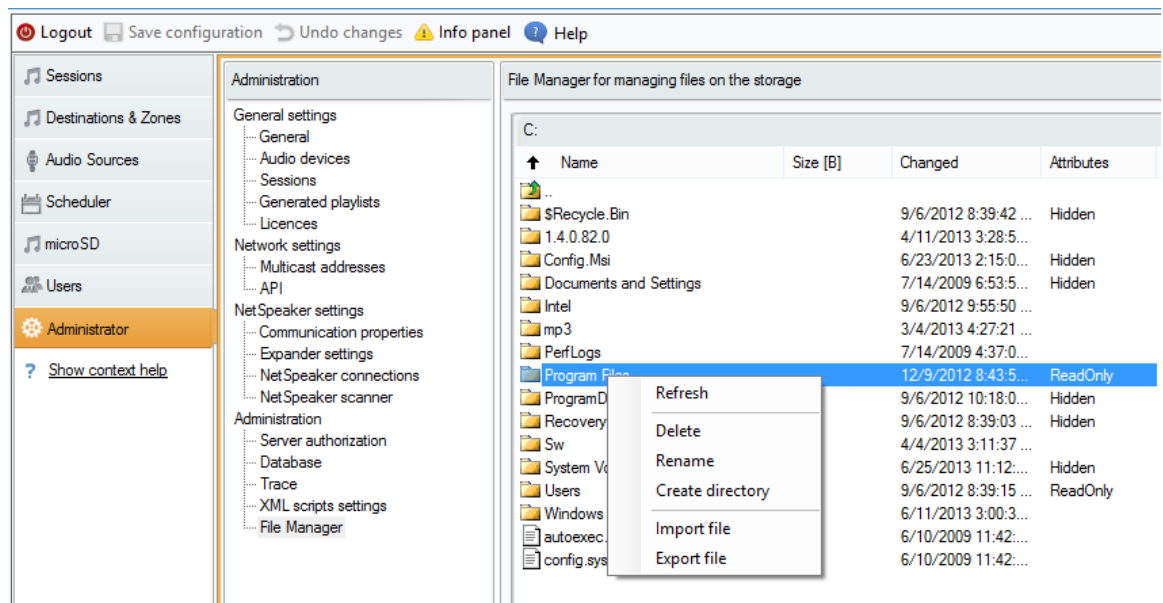


Figure: File Manager

HW description

This section provides you with full HW description of **2N® NetSpeaker** units.

Here is what you can find in this section:

- [2N® NetSpeaker](#)
- [2N® NetSpeaker Lite](#)
- [2N® NetMic](#)

2N® NetSpeaker



Figure: 2N® NetSpeaker – Basic Unit 914010E 2N® NetSpeaker with L-profiles (914105E)

Accessories:

- PoE Injector 91378100
- 12V DC/2A Adapter 914102x (E – Europe, GB – Great Britain, US – USA)
- Remote Controller 914101E

- L-profiles 914105E

Product Description

2N® NetSpeaker is a LAN audio converter designed for public sound distribution through the **2N® NetSpeaker** System. It is connected to the **2N® NetSpeaker** system via the local area network (LAN). It communicates with the **2N® NetSpeaker Server**, receives the audio stream, decodes it and converts it into an analogue signal. **2N® NetSpeaker** is equipped with an integrated 14W amplifier for direct loudspeaker connection. **2N® NetSpeaker** can be controlled by two front panel buttons or an infrared remote controller. **2N® NetSpeaker** is equipped with a digital input and output, which extend the converter options and may be helpful in special applications. **2N® NetSpeaker** helps you extend the internal FLASH memory using MicroSD memory cards. Use the integrated Telnet server to make basic settings for connection of **2N® NetSpeaker** into the LAN (refer to the Basic Parameter Settings). Apply the **2N® NetSpeaker** Software for configuration and use of all functions (refer to the **2N® NetSpeaker** Software User Manual).

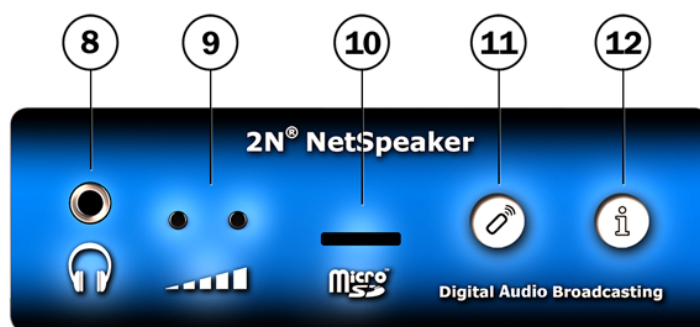


Figure: 2N® NetSpeaker Front Panel

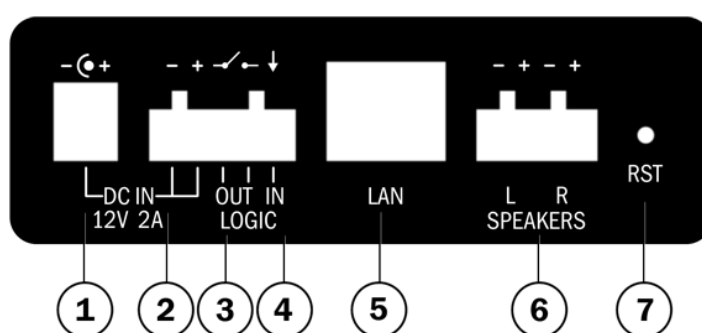


Figure: 2N® NetSpeaker Back Panel

1. 12V DC/2A power supply adapter connector
2. Alternative power supply connection terminals
3. Relay output with galvanic isolation for external 24V/1A AC/DC load switching
4. Digital input 5 – 24V (without galvanic isolation) for external sensor/button, etc.
5. 10/100BASE-TX LAN RJ-45 connector
6. Integrated amplifier output terminals for 1 or 2 loudspeakers
7. RESET button
8. Headphone/line output for standard headphones/external amplifier
9. Universal buttons with programmable functions
10. MicroSD card slot for higher internal memory capacity
11. Infrared signal receiver for remote control
12. Operational status colour LED indicators

2N® NetSpeaker Parameters

Parameter	Value
Dimensions	105 x 34 x 86 mm
Dimensions (incl. L-profiles)	130 x 34 x 86 mm
Weight	300 g

External power supply	12V DC / 2A	
LAN supply	PoE IEEE 802.3af	
Status signalling	1 RGB LED on front panel	
Local control	2 buttons on front panel	
Remote control	1 infrared sensor on front panel	
LAN connection	RJ-45 connector on back panel	TX with Auto-MDIX function
Power amplifier output	4 terminals on back panel	STEREO/MONO with auto detection
Frequency range	20Hz - 20kHz (+/- 0.5dB)	
Harmonic distortion	0.05% @ 1kHz	
Signal-to-noise ratio	91dB	
Headphone/Line output	STEREO 3.5mm jack on front panel	
Digital output	24V 1A AC/DC relay output, galvanically isolated	
Digital input	5 to 24V DC digital input, galvanically non-isolated	
Memory capacity extension	MicroSD card slot on front panel	
Sound compression	MPEG-2 Audio Layer III (MP3)	
Bandwidth	32-320kbps	

Caution

- Be sure to connect the **2N® NetSpeaker** power supply as the last step. The same applies to PoE supply from the LAN.

Installation

If you intend to use your **2N® NetSpeaker** unit in various interiors, please stick the four feet included in the delivery onto the bottom side of the device to avoid scratching of the underlying surface.

Surface Mounting:

Use the L-profiles (order no. 914105) to mount your **2N® NetSpeaker** unit on a wall or another solid surface. Insert the L-profiles in the sides of the assembly and fit them with four screws to keep the device in place. You can use the dowels and screws included in the delivery. Follow the instructions below while drilling the mounting holes.

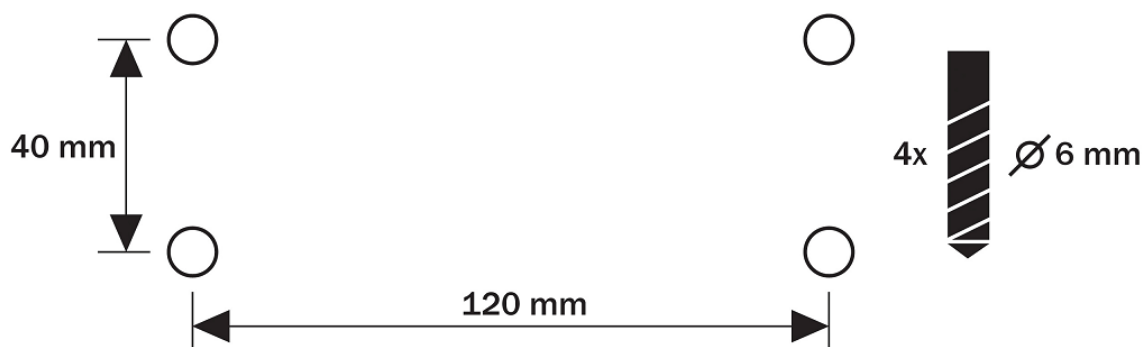


Figure: Mounting Holes

- Electric Installation
- Electric Installation Step by Step

It is very easy to connect **2N® NetSpeaker** electrically. Follow the steps below to avoid equipment damage or electrical injury:

1. Connect a loudspeaker, headphones or an external amplifier.
2. Connect the digital input and output.
3. Insert the microSD card.
4. Connect the UTP cable.
5. Connect a 12V power supply (unless PoE is used).

Loudspeakers

Loudspeaker connection

2N® NetSpeaker is equipped with a power amplifier for 1 (MONO) or 2 (STEREO) loudspeakers. The loudspeakers to be used must have the nominal impedance of 4Ω–16Ω. Possible configurations and related maximum power outputs (sinus, THD < 1%) are included in the table below:

Loudspeaker	12V/2A Supply	PoE Supply
2 x 40hm STEREO	2 x 2.5W	2 x 2.5W
2 x 80hm STEREO	2 x 7W	2 x 4W
2 x 160hm STEREO	2 x 4W	2 x 4W
40hm MONO	1 x 14W	1 x 8W
80hm MONO	1 x 8W	1 x 8W

Use the **2N® NetSpeaker** back panel terminals marked L + and L - for the left channel and R + and R - for the right channel. Use the left channel terminals for the MONO mode.

Headphone/External amplifier connection

2N® NetSpeaker is equipped with a headphone/external amplifier connector. The 3.5mm jack is available on the front panel.

Digital Input and Output

2N® NetSpeaker is equipped with a relay switch for light signalling/external amplifier/alarm/activation. The **output** is available on terminals marked LOGIC OUT and allows for switching of up to 24V/1A AC/DC loads.

Program the output either to the N/O (normally open) or N/C (normally closed) mode.

Warning: Do not exceed the upper voltage and current limits to avoid irreversible damage of the equipment.

2N® NetSpeaker is equipped with a digital **input** for an optional button, sensor of movement or other applications. This input is available on the LOGIC IN terminal. From 5 to 24V DC voltage can be applied to the input against the ground terminal marked DC IN -. In the case of an external button, the DC IN + terminal can be used, see the figure below.

Warning: Do not exceed the maximum voltage values (24V) applied to the LOGIC IN input to avoid irreversible damage of the equipment.

Note:

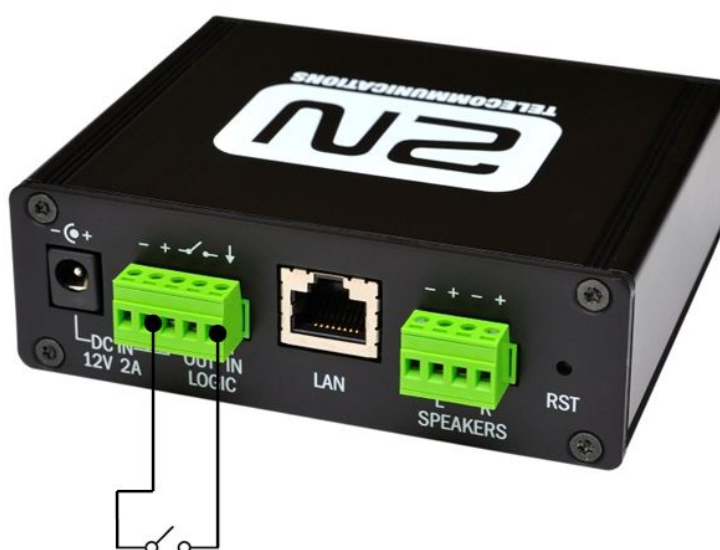


Figure: Logical Input

Memory Card

2N® NetSpeaker is equipped with a microSD card slot for storing music or voice in case the equipment is not connected to the LAN permanently or temporarily. The microSD card slot is available on the **2N® NetSpeaker** front panel.

2N® NetSpeaker Status Indicator (LED)

LED Colour	LED Status	Meaning
Blue		NetSpeaker is ready
White		NetSpeaker is playing stream from session
Violet		NetSpeaker is playing audio from SD card
Green		NetSpeaker is booting
Yellow	flashing	NetSpeaker is booting with factory default settings
Blue	flashing	NetSpeaker is synchronising with the server (SD card content, settings)

2N® NetSpeaker Connection

2N® NetSpeaker can be connected to a standard local area network using a LAN interface via the RJ-45 connector on the back panel. Always use CAT-5d or higher class cables for reliability reasons. The LAN interface is equipped with the Auto MDIX function for automatic detection of a straight or cross-over cable.

The LAN interface can also be used for the **2N® NetSpeaker** power supply through active network elements or injectors meeting the IEEE 802.3af standard.

Note: With PoE, the integrated amplifier power output is limited to 8W. To utilise the maximum power output of the amplifier, feed **2N® NetSpeaker** from an external 12V DC/2A power supply.

2N® NetSpeaker can be fed using active network elements or PoE injectors via the LAN interface. In case this option is unavailable, use a 12V DC/2A (Part No. 914102E) power supply, or another power supply on condition that you keep the nominal values included in the Electric Parameters subsection.

Connect the 12V DC power supply either to the back panel supply connector marked DC IN, or terminals marked DC IN + and DC IN –.

Warning: If you use an adapter other than the recommended one, do not exceed the nominal supply voltage value of 12V. Also make sure that the supply voltage polarity is correct. Exceeding nominal values and/or incorrect connection may lead to irreversible damage of the equipment.

2N® NetSpeaker Configuration

In some cases, it may be useful to reset the **2N® NetSpeaker** factory values using the RESET button on the back panel. Do this, for example, if **2N® NetSpeaker** ceases to respond, which may be caused by incorrect LAN settings, LAN configuration changes, forgotten password and so on.

Resetting Procedure:

1. Use a thin rigid tool (a toothpick or a paperclip) to press the RESET button on the back panel.
2. Keep the RESET button pressed as long as the front panel LED is shining green (approx. for 10s).
3. Release the button as soon as the LED starts flashing yellow quickly. It means that the configuration in the internal FLASH memory is being deleted.

This operation takes about 50s. Do not disconnect the device from power supply during this period.

Factory Settings:

By default, the parameters have the following factory values:

Parameter Name	Default Value
activemode	1 (ON)
searchmode	1 (ON)
volume	1024
domain	domain
dscr	MAC address
dhcpcclient	1 (ON)
ipaddr	192.168.1.100
netmask	255.255.255.0
defaultgw	192.168.1.1
pwd	admin
srvipaddr	192.168.1.2
srvport	6999
srvpwd	admin

Basic parameter settings

Use the integrated Telnet server for basic **2N[®] NetSpeaker** settings. For connection, use any Telnet Client application downloaded from the Internet, for example. The Telnet server listens at standard port 23.

When the connection has been established, **2N[®] NetSpeaker** displays its serial number and the current firmware version. Enter the password, which is equal to the connection authorisation password from the **2N[®] NetSpeaker Server** (i.e. pwd parameter). The default password is admin.

Telnet Commands to **2N[®] NetSpeaker**

2N[®] NetSpeaker can be controlled using the commands included in the table below. Enter the LC characters only, separate parameters, if any, with a space and confirm every row with Enter.

help	This command displays the list of available commands.
set (parameter)(value)	This command sets the parameter to a selected value. Example: set dhcpclient 1
get (parameter)	This command displays the current parameter value. Example: get dhcpclient
print	This command writes out all parameters including values.
save	This command saves all parameter changes into the 2N[®] NetSpeaker memory.
exit	This command quits connection with the Telnet server.
reboot	This command resets the equipment.

List of parameters

- activemode
 - **2N[®] NetSpeaker** is connecting actively to the **2N[®] NetSpeaker Server**. Remember to set the srvipadr and srvport parameters correctly if 1 is selected.
 - Setting options:

0	2N[®] NetSpeaker passive mode. The server connection is initiated by the 2N[®] NetSpeaker Server .
1	2N[®] NetSpeaker active mode. The server connection is initiated by 2N[®] NetSpeaker .

- Default setting: 1
- searchmode
 - **2N[®] NetSpeaker** is searching for the **2N[®] NetSpeaker Server** in the network and uses the Server's domain.
 - Setting options:

0	Searchmode is disabled
1	Searchmode is enabled

- Default setting: 1
- volume
 - Volume settings for **2N[®] NetSpeaker** where 0 is the minimum and 4096 the maximum value.
 - Default setting: 1024
- domain
 - Domain settings used by **2N[®] NetSpeaker** for communication.

- Default setting:
- descr
 - Descr is an optional parameter describing **2N[®] NetSpeaker**. It is possible to use any string.
 - Default setting: MAC address
- dhcpclient: This parameter enables/disables automatic obtaining of network parameter settings from the DHCP server in the LAN.
 - Setting options:

0	Automatic network parameter obtaining is disabled. Use manual settings: ipaddr, netmask and defaultgw.
1	Automatic network parameter obtaining is enabled.

- Default setting: 0
- ipaddr
 - **2N[®] NetSpeaker** static IP address. Use this setting if dhcpclient is set to 0.
 - Default setting: 192.168.1.100
- netmask
 - Network mask for static IP address setting. Use this setting if dhcpclient is set to 0.
 - Default setting: 255.255.255.0
- defaultgw
 - Default gateway for packets routed outside the LAN. Use this setting if dhcpclient is set to 0.
 - Default setting: 192.168.1.1
- pwd
 - **2N[®] NetSpeaker's** own password for authorising connection initiated by the **2N[®] NetSpeaker Server**. The same password must be stored in the **2N[®] NetSpeaker Server** global settings and must be identical for all **2N[®] NetSpeaker** units in the system. This password is used for Telnet server connection authorisation too.
 - Default setting: admin
- srvipaddr
 - **2N[®] NetSpeaker Server** IP address. Use the setting in the active mode, i.e. if activemode=1.
 - Default setting: 192.168.1.1
- srvport
 - **2N[®] NetSpeaker Server** communication port. Use the setting in the active mode, i.e. if activemode=1.
 - Default setting: 6999
- srvpwd
 - **2N[®] NetSpeaker Server** connection authorisation password. Used both in the active and passive modes of **2N[®] NetSpeaker**. The password must be identical with the **2N[®] NetSpeaker Server** password.

- Default setting: admin

Firmware upgrade

2N® NetSpeaker firmware upgrade runs automatically whenever **2N® NetSpeaker** gets connected to the **2N® NetSpeaker Server**. This guarantees that all connected devices have identical and latest firmware versions. Refer to www.2n.cz for the latest firmware version.

2N® NetSpeaker Lite



Figure: 2N® NetSpeaker Lite Basic Unit, order no. 914013E

Accessories:

- 12V/2A DC Adapter 914102E
- Remote Controller 914101E

Product Description

2N® NetSpeaker Lite is a LAN audio converter designed for public sound distribution through the **2N® NetSpeaker** System. It is connected to the **2N® NetSpeaker** System via the local area network (LAN). It communicates with the **2N® NetSpeaker Server**, receives the audio stream, decodes it and converts it into an analogue signal. **2N® NetSpeaker Lite** can be controlled by two front panel buttons or an infrared remote controller. **2N® NetSpeaker Lite** is equipped with a digital input and output, which extend the converter options and may be helpful in special applications. **2N® NetSpeaker Lite** helps you extend the internal FLASH memory using MicroSD memory cards. Use the integrated Telnet server to make basic settings for connection of **2N® NetSpeaker Lite** into the LAN (refer to the Basic Parameter Settings). Apply the **2N® NetSpeaker** Software for configuration and use of all functions (refer to the **2N® NetSpeaker** Software User Manuals or Advanced Configuration manual).

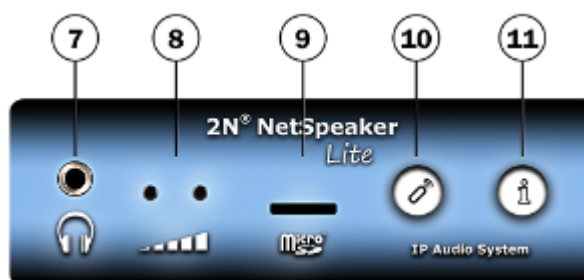


Figure: 2N® NetSpeaker Lite Front Panel

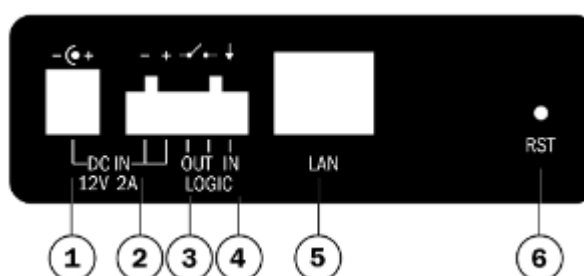


Figure: 2N® NetSpeaker Lite Back Panel

1. 12V DC/2A power supply adapter connector
2. Alternative power supply connection terminals
3. Relay output with galvanic isolation for external 24V/1A AC/DC load switching
4. Digital input 5 – 24V (without galvanic isolation) for external sensor/button, etc.
5. 10/100BASE-TX LAN RJ-45 connector
6. RESET button
7. Headphone/line output for standard headphones/external amplifier
8. Universal buttons with programmable functions
9. MicroSD card slot for higher internal memory capacity
10. Infrared signal receiver for remote control
11. Operational status colour LED indicators

2N® NetSpeaker Lite Parameters

Parameter	Value
Dimensions	105 x 34 x 86 mm
Dimensions (incl. L-profiles)	130 x 34 x 86 mm
Weight	300 g
External power supply	12V DC / 2A
LAN supply	not supported

Status signalling	1 RGB LED on front panel	
Local control	2 buttons on front panel	
Remote control	1 infrared sensor on front panel	
LAN connection	RJ-45 connector on back panel	TX with Auto-MDIX function
Power amplifier output	not supported	
Frequency range	20Hz – 20kHz (+/- 0.5dB)	
Harmonic distortion	0.05% @ 1kHz	
Signal-to-noise ratio	91dB	
Headphone/Line output	STEREO 3.5mm jack on front panel	
Digital output	24V 1A AC/DC relay output, galvanically isolated	
Digital input	5 to 24V DC digital input, galvanically non-isolated	
Memory capacity extension	MicroSD card slot on front panel	
Sound compression	MPEG-2 Audio Layer III (MP3)	
Bandwidth	32-320kbps	

Caution

- Be sure to connect the **2N® NetSpeaker Lite Lite** power supply as the last step.

Installation

If you intend to use your **2N® NetSpeaker Lite** unit in various interiors, please stick the four feet included in the delivery onto the bottom side of the device to avoid scratching of the underlying surface.

Surface Mounting:

Use the included L-profiles to mount your **2N® NetSpeaker Lite** unit on a wall or another solid surface. Insert the L-profiles in the sides of the assembly and fit them with four screws to keep the device in place. You can use the dowels and screws included in the delivery. Follow the instructions below while drilling the mounting holes.

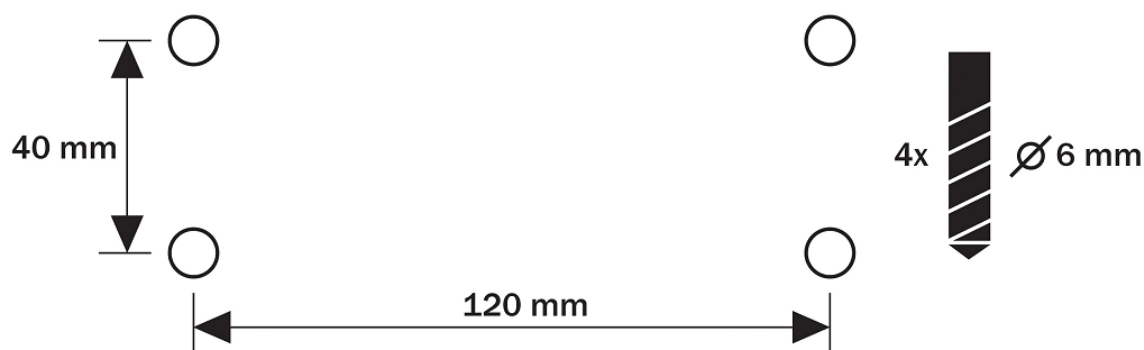


Figure: Mounting Holes

- Electric Installation
- Electric Installation Step by Step

It is very easy to connect **2N[®] NetSpeaker Lite** electrically. Follow the steps below to avoid equipment damage or electrical injury:

1. Connect a loudspeaker, headphones or an external amplifier.
2. Connect the digital input and output.
3. Insert the microSD card.
4. Connect the UTP cable.
5. Connect a 12V power supply.

Loudspeakers

Loudspeaker connection

2N[®] NetSpeaker Lite is equipped with a power amplifier for 1 (MONO) or 2 (STEREO) loudspeakers. The loudspeakers to be used must have the nominal impedance of 4Ω–16Ω. Possible configurations and related maximum power outputs (sinus, THD < 1%) are included in the table below:

Loudspeaker	12V/2A Supply
2 x 40hm STEREO	2 x 2.5W
2 x 80hm STEREO	2 x 7W
2 x 160hm STEREO	2 x 4W
40hm MONO	1 x 14W
80hm MONO	1 x 8W

Use the **2N[®] NetSpeaker Lite** back panel terminals marked L + and L – for the left channel and R + and R – for the right channel. Use the left channel terminals for the MONO mode.

Headphone/External amplifier connection

2N® NetSpeaker Lite is equipped with a headphone/external amplifier connector. The 3.5mm jack is available on the front panel.

Digital Input and Output

2N® NetSpeaker Lite is equipped with a relay switch for light signalling/external amplifier/alarm/activation. The **output** is available on terminals marked LOGIC OUT and allows for switching of up to 24V/1A AC/DC loads. Program the output either to the N/O (normally open) or N/C (normally closed) mode.

Warning: Do not exceed the upper voltage and current limits to avoid irreversible damage of the equipment.

2N® NetSpeaker Lite is equipped with a digital **input** for an optional button, sensor of movement or other applications. This input is available on the LOGIC IN terminal. From 5 to 24V DC voltage can be applied to the input against the ground terminal marked DC IN -. In the case of external button, the DC IN + terminal can be used, see the figure below.

Warning: Do not exceed the maximum voltage values (24V) applied to the LOGIC IN input to avoid irreversible damage of the equipment.

Note:

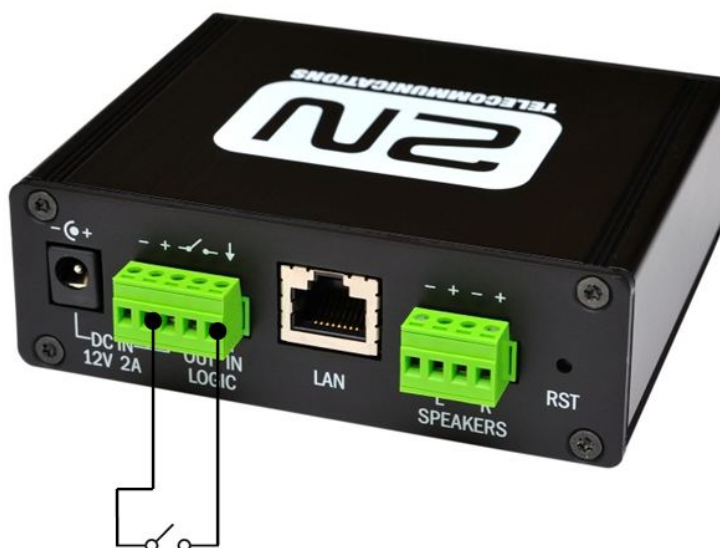


Figure: Logical Input

Memory Card

2N® NetSpeaker Lite is equipped with a microSD card slot for storing music or voice in case the equipment is not connected to the LAN permanently or temporarily. The microSD card slot is available on the **2N® NetSpeaker Lite** front panel.

2N® NetSpeaker Status Indicator (LED)

LED Colour	LED Status	Meaning
Blue		NetSpeaker is ready
White		NetSpeaker is playing stream from session
Violet		NetSpeaker is playing audio from SD card
Green		NetSpeaker is booting
Yellow	flashing	NetSpeaker is booting with factory default settings
Blue	flashing	NetSpeaker is synchronising with the server (SD card content, settings)

Power Supply Connection

2N® NetSpeaker Lite can be connected to a standard local area network using a LAN interface via the RJ-45 connector on the back panel. Always use CAT-5d or higher class cables for reliability reasons. The LAN interface is equipped with the Auto MDIX function for automatic detection of a straight or cross-over cable.

2N® NetSpeaker Lite can be fed using a 12V DC/2A (Part No. 914102E) power supply, or another power supply on condition that you keep the nominal values included in the Electric Parameters subsection.

Connect the 12V DC power supply either to the back panel supply connector marked DC IN, or terminals marked DC IN + and DC IN -.

Warning If you use an adapter other than the recommended one, do not exceed the nominal supply voltage value of 12V. Also make sure that the supply voltage polarity is correct. Exceeding nominal values and/or incorrect connection may lead to irreversible damage of the equipment.

2N® NetSpeaker Lite Configuration

In some cases, it may be useful to reset the **2N® NetSpeaker Lite** factory values using the RESET button on the back panel. Do this, for example, if **2N® NetSpeaker Lite** ceases to respond, which may be caused by incorrect LAN settings, LAN configuration changes, forgotten password and so on.

Resetting Procedure:

1. Use a thin rigid tool (a toothpick or a paperclip) to press the RESET button on the back panel.

2. Keep the RESET button pressed as long as the front panel LED is shining green (approx. for 10s).
3. Release the button as soon as the LED starts flashing yellow quickly. It means that the configuration in the internal FLASH memory is being deleted.

This operation takes about 50s. Do not disconnect the device from power supply during this period.

Factory Settings:

By default, the parameters have the following factory values:

Parameter Name	Default Value
activemode	1 (ON)
searchmode	1 (ON)
volume	1024
domain	domain
dscr	MAC address
dhcpcclient	1 (ON)
ipaddr	192.168.1.100
netmask	255.255.255.0
defaultgw	192.168.1.1
pwd	admin
srvipaddr	192.168.1.2
srvport	6999
srvpwd	admin

Basic parameter settings

Use the integrated Telnet server for basic **2N[®] NetSpeaker Lite** settings. For connection, use any Telnet Client application downloaded from the Internet, for example. The Telnet server listens at standard port 23.

When the connection has been established, **2N[®] NetSpeaker Lite** displays its serial number and the current firmware version. Enter the password, which is equal to the connection authorisation password from the **2N[®] NetSpeaker Server** (i.e. pwd parameter). The default password is admin.

Telnet Commands to **2N[®] NetSpeaker Lite**

2N® NetSpeaker Lite can be controlled using the commands included in the table below. Enter LC characters only, separate parameters, if any, with a space and confirm every row with Enter.

help	This command displays the list of available commands.
set (parameter)(value)	This command sets the parameter to a selected value. Example: set dhcpclient 1
get (parameter)	This command displays the current parameter value. Example: get dhcpclient
print	This command writes out all parameters including values.
save	This command saves all parameter changes into the 2N® NetSpeaker Lite memory.
exit	This command quits connection with the Telnet server.
reboot	This command resets the equipment.

List of parameters

- activemode
 - **2N® NetSpeaker Lite** is connecting actively to the **2N® NetSpeaker Server**. Remember to set the srvipadr and srvport parameters correctly if 1 is selected.
 - Setting options:

0	2N® NetSpeaker Lite passive mode. The server connection is initiated by the 2N® NetSpeaker Server .
1	2N® NetSpeaker Lite active mode. The server connection is initiated by 2N® NetSpeaker Lite .

- Default setting: 1

- searchmode
 - **2N® NetSpeaker Lite** is searching for the **2N® NetSpeaker Server** in the network and uses the Server's domain.
 - Setting options:

0	Searchmode is disabled
1	Searchmode is enabled

- Default setting: 1

- volume
 - Volume settings for **2N® NetSpeaker Lite** where 0 is the minimum and 4096 the maximum value.

- Default setting: 1024
- domain
 - Domain settings used by **2N® NetSpeaker Lite** for communication.
 - Default setting:
- descr
 - Descr is an optional parameter describing **2N® NetSpeaker Lite**. It is possible to use any string.
 - Default setting: MAC address
- dhcpclient: This parameter enables/disables automatic obtaining of network parameter settings from the DHCP server in the LAN.
 - Setting options:

0	Automatic network parameter obtaining is disabled. Use manual settings: ipaddr, netmask and defaultgw.
1	Automatic network parameter obtaining is enabled.

- Default setting: 0
- ipaddr
 - **2N® NetSpeaker Lite** static IP address. Use this setting if dhcpclient is set to 0.
 - Default setting: 192.168.1.100
- netmask
 - Network mask for static IP address setting. Use this setting if dhcpclient is set to 0.
 - Default setting: 255.255.255.0
- defaultgw
 - Default gateway for packets routed outside the LAN. Use this setting if dhcpclient is set to 0.
 - Default setting: 192.168.1.1
- pwd
 - **2N® NetSpeaker Lite's** own password for authorising connection initiated by the **2N® NetSpeaker Server**. The same password must be stored in the **2N® NetSpeaker Server** global settings and must be identical for all **2N® NetSpeaker Lite** units in the system. This password is used for Telnet server connection authorisation too.
 - Default setting: admin
- srvipaddr
 - **2N® NetSpeaker Server** IP address. Use the setting in the active mode, i.e. if activemode=1.
 - Default setting: 192.168.1.1
- srvport
 - **2N® NetSpeaker Server** communication port. Use the setting in the active mode, i.e. if activemode=1.
 - Default setting: 6999

- srvpwd
 - **2N[®] NetSpeaker Server** connection authorisation password. Used both in the active and passive modes of **2N[®] NetSpeaker Lite**. The password must be identical with the **2N[®] NetSpeaker Server** password.
 - Default setting: admin

Firmware upgrade

2N[®] NetSpeaker Lite firmware upgrade runs automatically whenever **2N[®] NetSpeaker Lite** gets connected to the **2N[®] NetSpeaker Server**. This guarantees that all connected devices have identical and latest firmware versions. Refer to www.2n.cz for the latest firmware version.

2N® NetMic



Accessories:

- PoE Injector 91378100
- 12V DC/2A Adapter 914102x (E – Europe, GB – Great Britain, US – USA)

Product description

The 2N® NetMic hardware console, with microphone, enables you to make live announcements or broadcast pre-prepared files to different zones. It's a hardware alternative to the 2N® NetSpeaker Console software application that is primarily intended for the public sector, such as schools, courts, railway stations, airports, medical facilities, amusement parks, outdoor swimming pools and sports facilities.

2N[®] NetMic Parameters

Parameter	Value	
Dimensions	209 x 142 x 65 mm	
Weight	1600 g	
External power supply	12 - 32V DC / 1A	
LAN supply	PoE IEEE 802.3af	
Status signalling	level signaling	
Local control	14 buttons on front panel	
Speakers	2x 1W stereo built-in speakers	
LAN connection	RJ-45 connector on back panel	TX with Auto-MDIX function
Power amplifier output	4 terminals on back panel	STEREO/MONO with auto detection
Frequency range	20Hz - 20kHz (+/- 0.5dB)	
Harmonic distortion	0.05% @ 1kHz	
Signal-to-noise ratio	91dB	
Digital input	2x 5 to 48V DC digital input, galvanically isolated or 1x contact input	
Digital output	max. 48V/1A relay output NO/NC, galvanically isolated	
Headphones output	stereo jack 3,5mm, 2x30mW, min. 16Ohm, DR 101dB, THD+N -85dB	
Main microphone input	symetric, XLR, Phantom Supply 24V, DR 88dB, THD+N -82dB	
Headset microphone input	jack 3,5mm, integrated powering for electret microphones, DR 84dB, THD+N -78dB	
Line input	jack 3,5mm, symetric mono or asymeric stereo, DR 93dB, THD+N -82dB	
Sound compression	PCMA, 44.1kHz	

Caution

- Be sure to connect the **2N[®] NetSpeaker** power supply as the last step. The same applies to PoE supply from the LAN.

2N[®] NetSpeaker Configuration

In some cases, it may be useful to reset the **2N[®] NetMic** factory values using the RESET button on the back panel. Do this, for example, if **2N[®] NetMic** ceases to respond, which may be caused by incorrect LAN settings, LAN configuration changes, forgotten password and so on.

Resetting Procedure:

1. Use a thin rigid tool (a toothpick or a paperclip) to press the RESET button on the back panel.
2. Keep the RESET button pressed 10s.
3. Release the button.

This operation takes about 50s. Do not disconnect the device from power supply during this period.

Factory Settings:

By default, the parameters have the following factory values:

Parameter Name	Default Value
activemode	1 (ON)
searchmode	1 (ON)
volume	1024
domain	domain is empty until NetMic is connected to server
dscr	domain is empty until NetMic is connected to server
dhcpcclient	1 (ON)
ipaddr	192.168.1.100
netmask	255.255.255.0
defaultgw	192.168.1.1
pwd	admin
srvipaddr	192.168.1.2
srvport	6999
srvpwd	admin

Basic parameter settings

Use the integrated Telnet server for basic **2N[®] NetSpeaker** settings. For connection, use any Telnet Client application downloaded from the Internet, for example. The Telnet server listens at standard port 23.

When the connection has been established, **2N[®] NetSpeaker** displays its serial number and the current firmware version. Enter the password, which is equal to the connection authorisation password from the **2N[®] NetSpeaker Server** (i.e. pwd parameter). The default password is admin.

Telnet Commands to **2N[®] NetSpeaker**

2N[®] NetSpeaker can be controlled using the commands included in the table below. Enter the LC characters only, separate parameters, if any, with a space and confirm every row with Enter.

help	This command displays the list of available commands.
set (parameter)(value)	This command sets the parameter to a selected value. Example: set dhcpclient 1
get (parameter)	This command displays the current parameter value. Example: get dhcpclient
print	This command writes out all parameters including values.
save	This command saves all parameter changes into the 2N[®] NetMic memory.
exit	This command quits connection with the Telnet server.
reboot	This command resets the equipment.

List of parameters

- activemode
 - **2N[®] NetMic** is connecting actively to the **2N[®] NetSpeaker Server**. Remember to set the srvipadr and srvport parameters correctly if 1 is selected.
 - Setting options:

0	2N[®] NetMic passive mode. The server connection is initiated by the 2N[®] NetSpeaker Server .
1	2N[®] NetMic active mode. The server connection is initiated by 2N[®] NetSpeaker .

- Default setting: 1

- searchmode
 - **2N® NetMic** is searching for the **2N® NetSpeaker Server** in the network and uses the Server's domain.
 - Setting options:

0	Searchmode is disabled
1	Searchmode is enabled

- Default setting: 1
- volume
 - Volume settings for **2N® NetMic** where 0 is the minimum and 4096 the maximum value.
 - Default setting: 1024
- domain
 - Domain settings used by **2N® NetMic** for communication.
 - Default setting:
- descr
 - Descr is an optional parameter describing **2N® NetMic**. It is possible to use any string.
 - Default setting: MAC address
- dhcpclient: This parameter enables/disables automatic obtaining of network parameter settings from the DHCP server in the LAN.
 - Setting options:

0	Automatic network parameter obtaining is disabled. Use manual settings: ipaddr, netmask and defaultgw.
1	Automatic network parameter obtaining is enabled.

- Default setting: 0
- ipaddr
 - **2N® NetMic** static IP address. Use this setting if dhcpclient is set to 0.
 - Default setting: 192.168.1.100
- netmask
 - Network mask for static IP address setting. Use this setting if dhcpclient is set to 0.
 - Default setting: 255.255.255.0
- defaultgw
 - Default gateway for packets routed outside the LAN. Use this setting if dhcpclient is set to 0.
 - Default setting: 192.168.1.1
- pwd
 - **2N® NetMic's** own password for authorising connection initiated by the **2N® NetSpeaker Server**. The same password must be stored in the **2N® NetSpeaker Server** global settings and must be identical for all **2N®**

NetMic units in the system. This password is used for Telnet server connection authorisation too.

- Default setting: admin
- `srvipaddr`
 - **2N[®] NetSpeaker Server** IP address. Use the setting in the active mode, i.e. if `activemode=1`.
 - Default setting: 192.168.1.1
- `srvport`
 - **2N[®] NetSpeaker Server** communication port. Use the setting in the active mode, i.e. if `activemode=1`.
 - Default setting: 6999
- `srvpwd`
 - **2N[®] NetSpeaker Server** connection authorisation password. Used both in the active and passive modes of **2N[®] NetMic**. The password must be identical with the **2N[®] NetSpeaker Server** password.
 - Default setting: admin

Firmware upgrade

2N[®] NetMic firmware upgrade runs automatically whenever **2N[®] NetMicr** gets connected to the **2N[®] NetSpeaker Server**. This guarantees that all connected devices have identical and latest firmware versions. Refer to www.2n.cz for the latest firmware version.

Supplementary Information

This section provides you with all regulatory and supplementary information on the **2N[®] NetSpeaker**.

Here is what you can find in this section:

Table of content:

- [Directives, Laws and Regulations](#)
- [General Instructions and Cautions](#)
- [Troubleshooting](#)

Directives, Laws and Regulations

Europe

2N® NetSpeaker conforms to the following directives and regulations:

Directive 1999/5/EC of the European Parliament and of the Council, of 9 March 1999 – on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity

Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

Directive 2004/108/EC of the Council of 15 December 2004 on the harmonisation of the laws of Member States relating to electromagnetic compatibility

Commission Regulation (EC) No. 1275/2008, of 17 December 2008, implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No. 793/93 and Commission Regulation (EC) No. 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment.

Industry Canada

This Class B digital apparatus complies with Canadian ICES-003. / Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

FCC

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

 **Caution**

- Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- Always use the product for the purpose it was designed and manufactured for, in compliance herewith.
- The manufacturer reserves the right to modify the product in order to improve its qualities.
- This device contains no environmentally harmful components. When the product's service life is exhausted and you would like to dispose of it please do so in accordance with applicable legal regulations.

**2N TELEKOMUNIKACE a.s.**

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E-mail: sales@2n.cz

Web: www.2n.cz

PČ 1672

General Instructions and Cautions

- Please read this User Manual carefully before using the product. Follow all instructions and recommendations included herein.
- Any use of the product that is in contradiction with the instructions provided herein may result in malfunction, damage or destruction of the product.
- The manufacturer shall not be liable and responsible for any damage incurred as a result of a use of the product other than that included herein, namely undue application and disobedience of the recommendations and warnings in contradiction herewith.
- Any use or connection of the product other than those included herein shall be considered undue and the manufacturer shall not be liable for any consequences arisen as a result of such misconduct.
- Moreover, the manufacturer shall not be liable for any damage or destruction of the product incurred as a result of misplacement, incompetent installation and/or undue operation and use of the product in contradiction herewith.
- The manufacturer assumes no responsibility for any malfunction, damage or destruction of the product caused by incompetent replacement of parts or due to the use of reproduction parts or components.
- The manufacturer shall not be liable and responsible for any loss or damage incurred as a result of a natural disaster or any other unfavourable natural condition.
- The manufacturer shall not be held liable for any damage of the product arising during the shipping thereof.
- The manufacturer shall not make any warrant with regard to data loss or damage.
- The manufacturer shall not be liable and responsible for any direct or indirect damage incurred as a result of a use of the product in contradiction herewith or a failure of the product due to a use in contradiction herewith.
- All applicable legal regulations concerning the product installation and use as well as provisions of technical standards on electric installations have to be obeyed. The manufacturer shall not be liable and responsible for damage or destruction of the product or damage incurred by the consumer in case the product is used and handled contrary to the said regulations and provisions.
- The consumer shall, at its own expense, obtain software protection of the product. The manufacturer shall not be held liable and responsible for any damage incurred as a result of the use of deficient or substandard security software.
- The consumer shall, without delay, change the access password for the product after installation. The manufacturer shall not be held liable or responsible for any damage incurred by the consumer in connection with the use of the original password.
- The manufacturer also assumes no responsibility for additional costs incurred by the consumer as a result of making calls using a line with an increased tariff.

Troubleshooting



For the most frequently asked questions refer to faq.2n.cz.

Sound from 2N[®] NetSpeakers is jerky

All components of the 2N[®] NetSpeaker system allows user to change sound path delay for delivering sound with the higher quality. Default delay is set to 40ms which is sufficient for local networks. In case of jerky sound this parameter should be changed.

Audio paramters

Volume

100%

0%

Mute

Power supply	PoE
Left speaker impedance	4.8 Ohm
Right speaker impedance	5.1 Ohm
Sound path delay [ms]	40
Sampling frequency [Hz]	44100
Bits per sample	16
Channels	STEREO
Bit rate [kbit]	192

Figure: Sound path delay settings for the 2N[®] NetSpeaker unit in Destinations and Zones tab

The sound path delays should be also changed for the applications which are communicating with the 2N® NetSpeaker Server and are sending audio to process be processed e.g. 2N® NetSpeaker Console or 2N® NetSpeaker Virtual Sound Card. It can be set in settings menu of these applications.

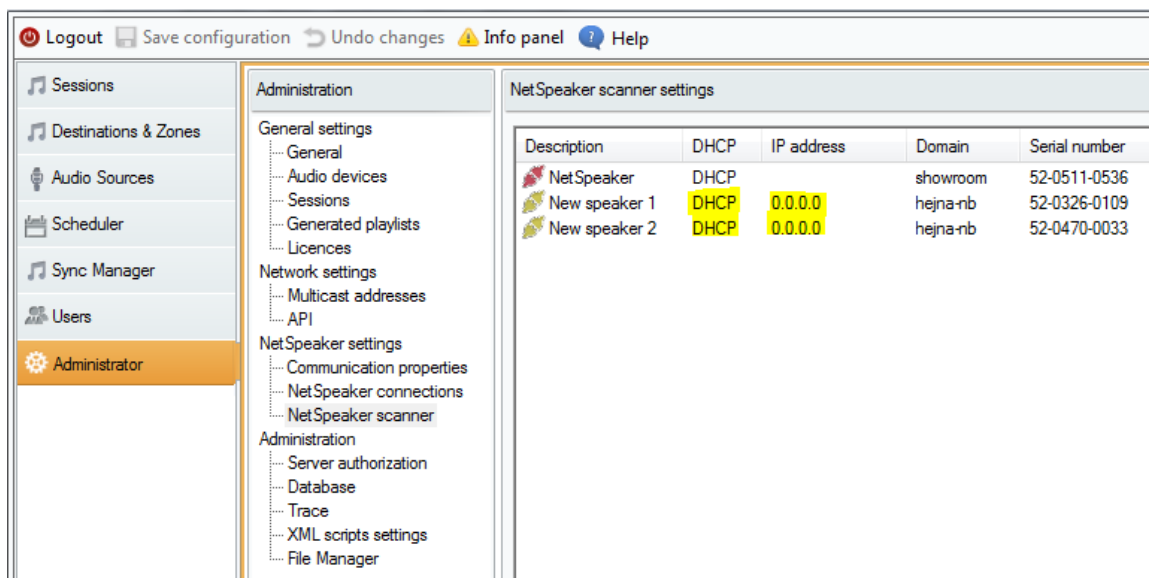
2N® NetSpeaker requires that 2N® NetSpeaker unit assigned IP address automatically

CAUTION even if other devices in the network receive IP address automatically, 2N® NetSpeaker unit does not have get it. Due to restrictions set by the IT department in the network. This setting automatically assigns IP addresses only known/registered devices in the network based on their MAC addresses!

this network setting (DHCP server assigns IP addresses to registered IP devices only) is solved in software version 1.3.6 and higher, which can in menu Administrator > Netspeaker scanner display NsP units connected in the local LAN network based only on their MAC addresses (NsP server sends broadcast into the networks and NsP unit responds to it). Then in NetSpeaker scanner is displayed information DHCP, but shown IP address is not correct. It is displayed: 0.0.0.0
What you can do? In this case, you should provide the MAC address of the NsP units to the IT department and they will register it and allow automatic assignment of the IP addresses.

Second option is to turn the DHCP client OFF and setup the IP address manually. In this case it is necessary to know some free IP address, which can be used for NsP unit in the network. It means, this IP address (the one you would like to use), is not assigned to any other IP device in the network (you can use ping command to check it). Do not forget to setup the IP mask = subnet of the network.

Manual setting could look like this: IP address: 192.168.1.151 IP mask: 255.255.255.0



Obrázek: Picture shows the situation, when the network automatically assigns IP addresses (there is DHCP server in the network), but the device (e.g. NsP unit is not recognized = IT department does not know its MAC address). In this case IP address for NsP unit would not be automatically assigned.

Firewall can also block connection of 2N[®] NetSpeaker unit to the server

Do you have firewall switched ON? It can cause that if 2N[®] NetSpeaker unit disconnects from the server and then tries to connect again via the same port, firewall (eg, ESET Smart Security) will not let it go through. This is not common issue, but it could be one of the reason why you cannot see NsP units in menu Destinations & Zones.

Cannot connect 2N[®] NetSpeaker unit - licensing policy

In new sw version 1.4.1 comes licensing policy, which contains 800 trial license for all features = unlimited RTP destinations + unlimited number of connected 2N[®] NetSpeaker family units.

After expiration of the 800 trial license you can connect/use:

5x 2N[®] NetSpeaker / NetSpeaker Lite units

1x RTP destination

To connect more 2N[®] NetSpeaker family units or to use more RTP destinations, you need to buy additional licenses:

914204E 2N NetSpeaker Server - 1x NSP add on licence

914205E 2N NetSpeaker Server - 1x RTP add on licence (3rd party device)

The screenshot shows the 'Licences settings' page in the 2N software. The interface includes a top menu bar with 'Logout', 'Save configuration', 'Undo changes', 'Info panel', and 'Help'. A left sidebar contains navigation options like 'Sessions', 'Destinations & Zones', 'Audio Sources', 'Scheduler', 'microSD', 'Users', and 'Administrator'. The main content area is divided into two sections: 'Licence files' and 'Licence features'.

Licence files

File	ID	Status
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Licence features

Feature	Type	Licensed	Requested
Length of trial version		800	101
General RTP Port		Unlimited	6
NetSpeakers count		Unlimited	1

Obrázek: Information about used/needed licenses.