An Axis company

2N SIP Mic

Microphone console

Configuration Manual

Firmware:
Version: 1.0

www.2n.cz

The 2N TELEKOMUNIKACE a.s. 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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2N TELEKOMUNIKACE a.s. administers the FAQ database to help you quickly find information and to answer your questions about 2N products and services. On www.faq.2n.cz you can find information regarding products adjustment and instructions for optimum use and procedures „What to do if...".

2N TELEKOMUNIKACE a.s. hereby declares that the 2N® 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 (if enclosed) or our website at www.2n.cz.

The 2N TELEKOMUNIKACE a.s. 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 products.

Content:

- 1. Product Overview
  - 1.1 Components and Associated Products
  - 1.2 Terms and Symbols
- 2. Description and Installation
  - 2.1 Before You Start
  - 2.2 Electric Installation
  - 2.3 Product Description
- 3. Function and Use
  - 3.1 Configuration
    - 3.1.1 System Status
    - 3.1.2 Network
    - 3.1.3 VoIP
    - 3.1.4 Audio
    - 3.1.5 Buttons
    - 3.1.6 Zones
    - 3.1.7 Action Scheduler
    - 3.1.8 System
    - 3.1.9 Voice Messages
  - 3.2 Setting Examples
    - 3.2.1 Express Settings
    - 3.2.2 Announce to Zone - VAPIX
    - 3.2.3 Voice Message Loading
    - 3.2.4 HTTP Request
  - 3.3 Downloads
- 4. Technical Parameters
- 5. Supplementary Information
  - 5.1 Troubleshooting
  - 5.2 Directives, Laws and Regulations
  - 5.3 General Instructions and Cautions

1. Product Overview

Here is what you can find in this section:

- 1.1 Components and Associated Products
- 1.2 Terms and Symbols

Basic Properties

2N® SIP Mic is an IP microphone console playing live or pre-recorded announcements to up to 12 zones. Together with the 2N SIP speakers, 2N® SIP Mic provides a complete voice announcement distribution system. However, 2N® SIP Mic is more than that. For example, it can accept calls from the 2N intercoms, listen to the zone traffic, schedule announcements and/or load own messages. This makes it an ideal solution for places where identical announcements are played several times a day, such as schools, amusement parks, stores or public transport terminals. Easy power supply via PoE and programming via a web interface are additional bonuses. With integrated VAPIX®, 2N® SIP Mic is capable of playing announcements to AXIS® audio systems and cameras.

Advantages of Use

- Clear and loud speech
- Announcement planner
- VAPIX® support
- Easy control
- Easy one-cable installation (Ethernet + PoE)
- VoIP PBX support (SIP)
- Remote control via DTMF or HTTP commands
- Integrated administration web server
- Streamed audio support
- Applicable as a standard VoIP phone/communicator
- DTMF detection according to RFC2833, in-band and SIP-INFO

Basic Features

- 10/100Base-TX LAN interface
- 12 V DC / 2 A or PoE 802.3af supply
- Integrated speakers and top-quality microphone in package

Caution

- This product, its installation and configuration are not intended for persons with physical, sensory or mental disabilities or persons with limited experience and skills unless expert supervision or relevant instructions are provided to them by a person responsible for their safety.

1.1 Components and Associated Products

Main Unit

Part No. 914431E 	• 2N® SIP Mic

Power Supply

Part Numbers: 91378100 91378100E 91378100US 	• PoE injector – without cable • PoE injector – with EU cable • PoE injector – with US cable • For power supply of intercom via ethernet cable when PoE switch is not available.
Part No. 914102x 	• Stabilised 12 V / 2 A power supply (E – Europe, GB – Great Britain, US – USA) needs to be used when no PoE is available.

Tip

- For more accessories and particular advice please contact your local distributor of 2N products.

1.2 Terms and Symbols

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.

2. Description and Installation

Here is what you can find in this section:

- 2.1 Before You Start
- 2.2 Electric Installation
- 2.3 Product Description

2.1 Before You Start

Product Completeness Check

Before installing this product, check whether the product delivery includes:

- 1x 2N® SIP Mic
- Quick User Manual

Installation Conditions

- 2N® SIP Mic is to be connected to the LAN.
- 2N® SIP Mic is designed for indoor use.
- 2N® SIP Mic may not be operated in damp environment.

2.2 Electric Installation

Electric Installation Step by Step

It is very easy to connect 2N® SIP Mic elec trically. Just find the connectors and controls for initial connection on the back panel :

- connect the additional microphone to the upper connector,
- connect the UTP cable,
- connect a 12 V power supply to the back connector (unless PoE is used).

Caution

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

Insert the enclosed microphone into the DIN 3P connector on the 2N® SIP Mic upper side until its clicks into position. Press the locking button and pull out the microphone to disconnect it.

Microphone Connection

LAN Connection

2N® SIP Mic 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 interface supports 1 0/100 Mbps and can be PoE supplied (IEEE 802.3af).

LAN Connection

The LAN interface is equipped with the Auto MDIX function for automatic straight or cross-over cable detection.

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

Caution

- We recommend the use of a LAN surge protection.
- We recommend using a shielded SSTP cable.

Power Supply Connection

2N® SIP Mic can be fed using active network elements or PoE injectors via the LAN interface. In case this option is unavailable, for proper operation use a 12 V DC / 2 A (Part No. 914102) power supply. External and PoE supplies can be combined as the device can be fed from both the supplies at the same time. Thus, the other supply can be used for backup, for example.

Connect the device via the power jack on the 2N® SIP Mic back side as shown in the figure below.

2N® SIP Mic consumption with different power supplies:

Power supply	Consumption
PoE, IEEE 802.3af	8 W
Part No. 914102x	8 W

2.3 Product Description

2N® SIP Mic is an Ethernet SIP console designed for public sound distribution. 2N® SIP Mic can be connected to a SIP Proxy and communicate with the server via phone calls. This guarantees compatibility with all the supported SIP-based systems.

Use an integrated web interface for 2N® SIP Mic configuration. Apply the 2N® Network Scanner to search all the 2N® SIP Mic units connected.

Control Layout

2N® SIP Mic Controls

Legend:

- A ... call answer / mute button
- B ... call extension button
- C ... function buttons 1 to 12 for playing/announcing to zone
- D ... bar graph – microphone drive indicator
- E ... microphone DIN connector
- F ... integrated speaker

2N® SIP Mic Controls

Button Function States

Each button is backlit. Different backlight colours signal different user states. See below.

Call pick-up / Mute button

Colour	Behaviour	State	Action upon press
White	Shining	At relax	None
Green	Flashing	Incoming call ringing	Answer call
Green	Shining	Active incoming call	Mute microphone
White + (red hang-up)	Shining	Muted	Turn up microphone
Yellow	Shining	Active message recording	End recording
Blue	Shining	Active outgoing call	Mute microphone

Call hang-up button

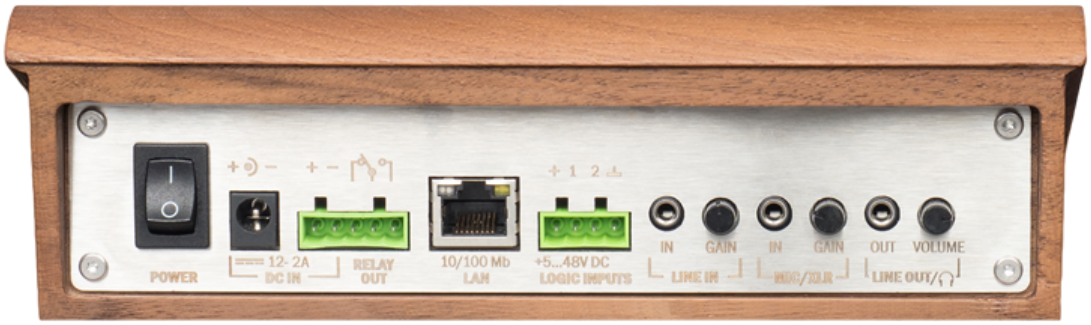
Colour	Behaviour	State	Action upon press
White	Shining	At relax	None
Red	Shining	Incoming / Outgoing call	Hang up / Reject

Function Buttons

Colour	Behaviour	State	Action upon press
White	Shining	At relax	None
White	Flashing	Message playing	End playing
Blue	Flashing	Outgoing call ringing	End call
Blue	Shining	Active outgoing call / Zone announcement	End call / End zone announcement
Green	Flashing	Outgoing ALARM call ringing / DTMF request	None (cannot be terminated) / End call
Green	Shining	Outgoing ALARM call rigning / DTMF request	None (cannot be terminated) / End call
Pink	Shining	HTTP request sent	Return to relax
Yellow	Shining	Active relay contact	As configured, refer to Buttons
Yellow	Flashing	Active message recording	End recording

Colour	Behaviour	State	Action upon press
Red	Shining	Call error or end	None, automatic end *With Announcement after message you can skip over the announcement and end the call immediately.*

Connector Layout



2N® SIP Mic Connectors

Connectors and controls:

- power on/off button
- 12 V DC / 2 A mains adapter connector
- relay output
- LAN – 10/100BASE-TX RJ-45 connector
- logic inputs
- line input – 3.5 mm jack for optional external sound source connection
- MIC input – 3.5 mm jack for optional microphone connection
- Line out – 3.5 mm jack for headset / external speaker connection

Refer to the Technical Parameters for more details.

Factory Reset Press the button on the device bottom to delete all the parameters including the network settings. Hold the button until all the system button red lights go on.Then release the button. The device memory will be deleted. The default network settings are as follows:

- IP address: 192.168.1.100
- Network mask: 255.255.255.0

3. Function and Use

Basic functions:

- SIP call support
- Multicast announcements
- VAPIX(r) announcements
- SIP VoIP announcements
- Voice announcements
- Pre-recorded announcements
- ALARM calls with DTMF announcements
- HTTP/HTTPS request sending
- Multicast listening
- SIP call listening-in
- Audio playing to zone from Audio LINE IN
- Relay activation at call
- Announcement recording via microphone and announcement check

Here is what you can find in this section:

- 3.1 Configuration
- 3.2 Setting Examples
- 3.3 Downloads

3.1 Configuration

Configure 2N® SIP Mic via a PC equipped with any internet browser:

Launch your internet browser (Internet Explorer, Firefox, etc.).

- Enter the 2N® SIP Mic IP address (e.g. http://192.168.1.100/).
- Enter the username Admin and password 2n to log in.

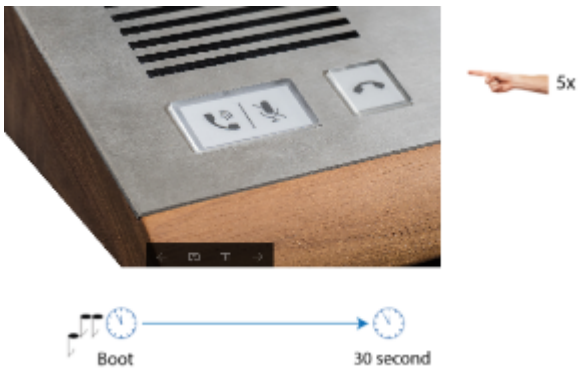
You have to know the device IP address to log in to the integrated web server. By default, 2N® SIP Mic is set to the dynamic IP address mode: the IP address is acquired automatically if a properly configured DHCP server is available in the LAN. Where the DCHP server is unavailable, 2N® SIP Mic can work in the static IP address mode. Refer to the Configuration section for 2N® SIP Mic configuration details.

Should the device be still unavailable (forgotten IP address, LAN configuration change, etc.), find the IP address using a device button.

IP Address Lookup

Do the following to find the 2N® SIP Mic IP address:

- Connect 2N® SIP Mic to a power supply (or disconnect and reconnect it if already supplied).
- Wait for the sound signal .
- Press the hang-up button on the device five times.
- 2N® SIP Mic reads its IP address.
- If the address is 0.0.0.0, it means that 2N® SIP Mic did not get the IP address from the DHCP server.



Note

- Be sure to enter the button sequence within 10 seconds after the sound signal activation for security reasons. The button press timeout is 2 s.

DHCP is active after factory reset and the device obtains the IP address automatically. If you switch DHCP off, the default IP address, subnet mask and DNS server are configured as mentioned below.

Warning

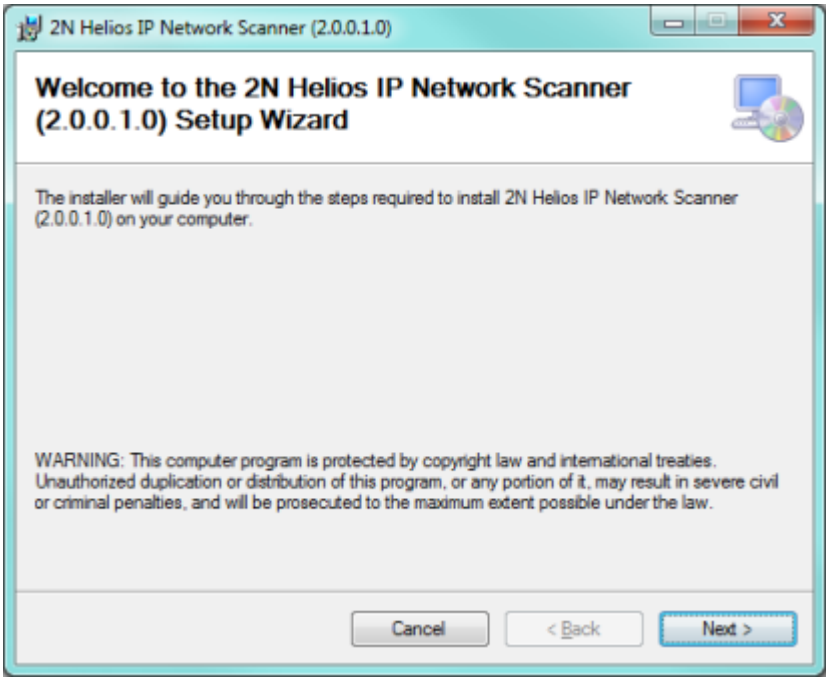
Default network settings:

- IP address 192.168.1.100
- Mask 255.255.255.0
- DNS 1 192.168.1.1

Description of 2N® IP Network Scanner

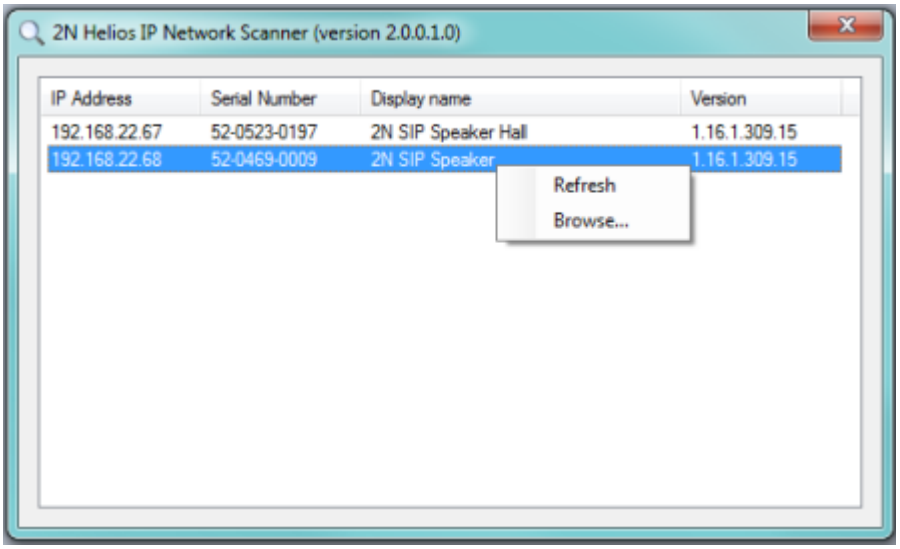
The purpose of this application is to find the dynamic **2N® SIP Mic** IP address in the local IP network. Download the application from **www.2n.cz**.

1. Run the **2N® IP Network Scanner** installer.
2. The installation Wizard guides you through the installation.



2N® IP Network Scanner Installation Wizard

- After installing the 2N® IP Network Scanner application, run the application using the *Start* menu of the Microsoft Windows operating system.
- Upon launch, the application starts searching the LAN automatically for all 2N® SIP Mic with an assigned or statically set IP address. The devices are then listed in a table.



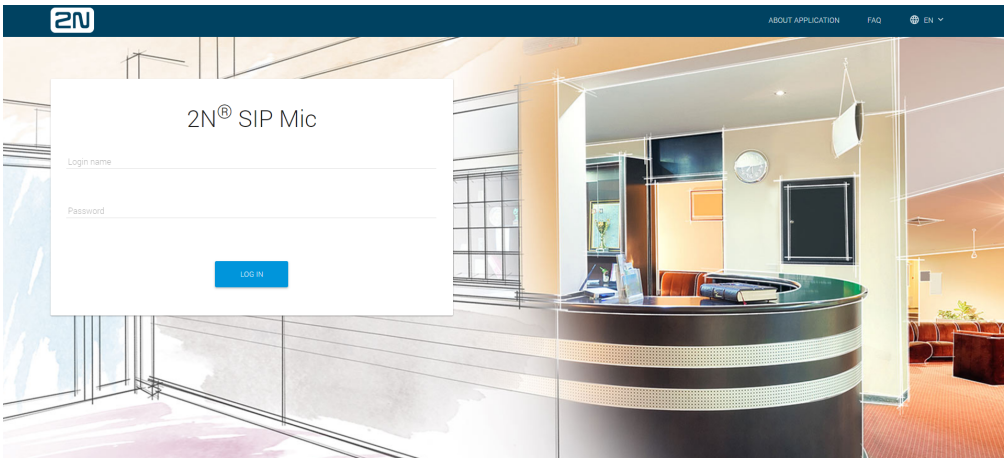
2N® IP Network Scanner Window

- Select the 2N® SIP Mic to be configured. Click on it with the right-hand mouse button and select *Browse...* to open the web browser window, log in to 2N® SIP Mic and start configuring as described in the Login subsection below.

Login

In the web browser enter the IP address of 2N® SIP Mic. Subsequently, a login screen will be displayed. The default login username and password are as follows:

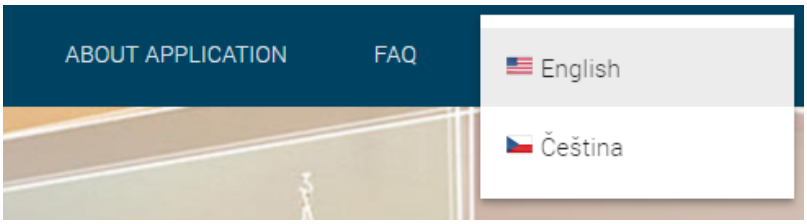
- Username: Admin
- Password: 2n



If the login screen does not appear, an incorrect IP address was entered into the web browser or the 2N® SIP Mic administration web server was turned off. If you are not sure of the IP address of 2N® SIP Mic, use the 2N® IP Network Scanner application as described in the Description of 2N® IP Network Scanner subsection.

Language Selection

You can select the language using the tag menu in the right-hand upper corner as shown in Figure below.

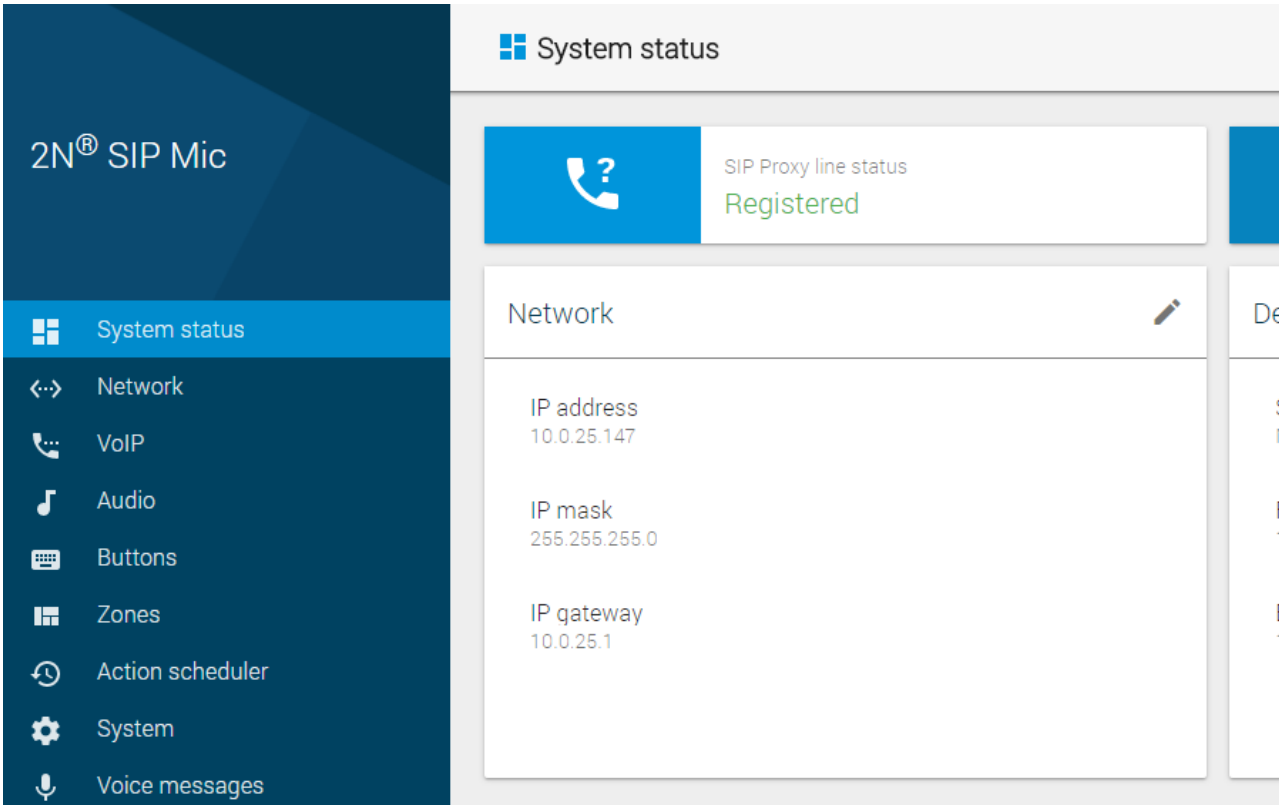


Language selection

Start Screen

The start screen is displayed whenever you log in to the 2N® SIP Mic web interface. Use the System status menu in the left-hand upper corner of the navigation bar to return to the start screen any time. Choose the web interface language to the right.

Click the Log out button in the right-hand upper corner of the screen to quit 2N® SIP Mic.



The start screen is also the first menu level and quick navigation (click on the pencil symbol) to selected **2N® SIP Mic** configuration sections. Some tiles also show selected service states.

Configuration Menu

2N® SIP Mic configuration consists of 9 main menus – **System status**, **Network**, **VoIP**, **Audio**, **Buttons**, **Zones**, **Action scheduler**, **System** and **Voice messages**, each of which is divided into submenus; see the survey below.

System Status

- **SIP Proxy line status** – line state info
- **Operation time** – **2N® SIP Mic** operation time
- **Lock state** – lock state
- **Network** – LAN connection settings
- **Device** – device info
- **Date and time** – real time and time zone settings

Network

- LAN – LAN connection settings

VoIP

- Settings – SIP proxy, codecs, etc. settings
- Common – second call settings
- Status – line state info

Audio

- Settings – ringing volume and key beep settings

Buttons

- button action settings

Zones

- zone parameter settings

Action scheduler

- action settings

System

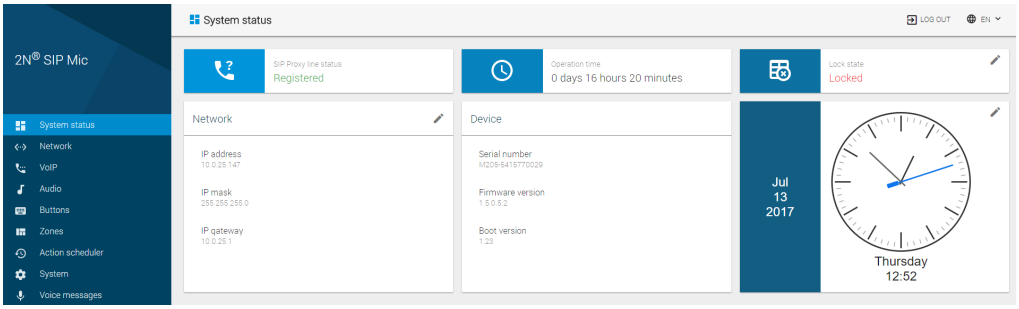
- Configuration – user parameters, date and time
- Maintenance – configuration backup and reset, firmware upgrade, reboot, factory default

Voice messages

- voice and system message settings and upload

3.1.1 System Status

The **System status** menu provides a clear survey of **2N® SIP Mic** current state and information. The page is divided into six sections: **SIP proxy line status**, **Operation time**, **Lock state**, **Network**, **Device** and **Date and time**. Some sections provide just information, some can be configured with the aid of the pencil symbol in the left-hand upper part.



SIP Proxy Line Status

Provides information on the current state of the SIP Proxy line. SIP Proxy line is configured in the VoIP menu and helps **2N® SIP Mic** register with the set SIP Proxy. **2N® SIP Mic** makes all outgoing SIP calls and receives incoming calls via this line. The available options are as follows: Inactive, Active, Registered, Registration in progress and registration error. The meanings are as follows.

Inactive	The SIP line is off.
Active	The SIP line is set in the VoIP menu but registration is not allowed (Outgoing only).
Registered	The SIP line is registered and functional (Outgoing and incoming calls).
Registration in progress	The registration request was sent but no answer has been received yet because the SIP Proxy server is busy or the request was sent to a wrong address.
Registration error	A wrong name or password was used or the station has not been found. Check the VoIP settings or contact the VoIP provider or your SIP Proxy administrator.

The SIP line can be operated without registration. However, you cannot receive incoming calls as the SIP Proxy does not know where to find the device. Outgoing calls are not affected by this mode.

Operation Time

Provides information on the 2N® SIP Mic operation time from the last restart or disconnection (upgrade, switch off, power outage, etc.). The data is for information only.

Lock Status

Displays the lock state information: Locked and Unlocked. If the state is Locked, no action button can be pressed on the console except for the call answer/reject button and microphone muting button. Click the editing icon to redirect to the System menu.

Network

Displays the current network settings of 2N® SIP Mic. Click the editing icon to get to the Network menu. The data is for information only.

Device

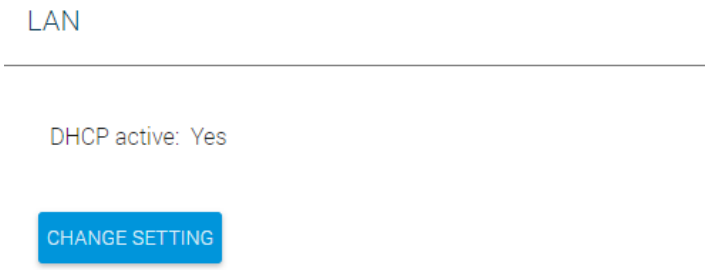
Displays the serial number, firmware version and bootloader version. The data is for information only.

Date and Time

Displays the current date and time in 2N® SIP Mic. The data is for information only. Click the editing icon to get to the System / Date and time menu.

3.1.2 Network

2N® SIP Mic is connected to the Local Area Network with a valid IP address, which must be properly set or obtained from the DHCP server in the LAN. Configure the IP address and DHCP server on the Network tab.

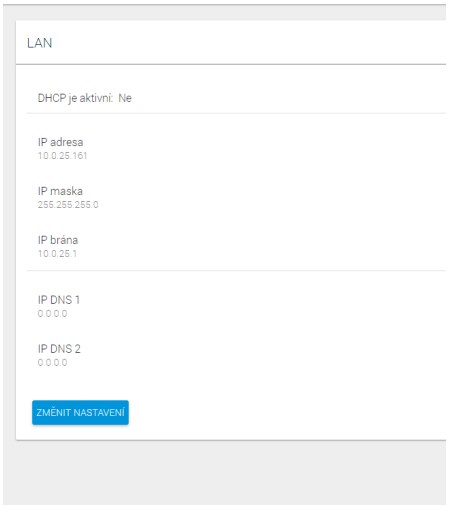


Tip

- To find your intercom IP address, download the 2N® Network Scanner from www.2n.cz for free or use the mechanism described in your intercom's installation manual – the intercom communicates the IP address to you via a voice function.

LAN

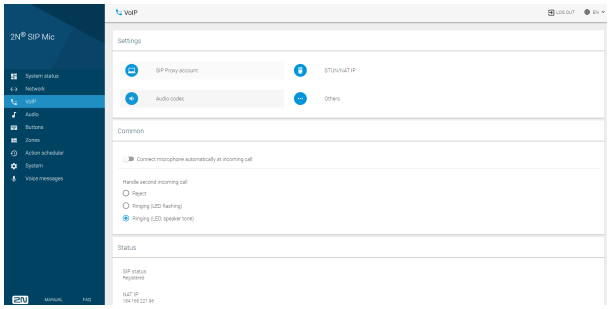
By default, the device automatically gets the IP address from the DHCP server in the LAN. The current IP address is always displayed in the System status menu on the start screen. If there is no DHCP server available in your LAN, use the manual network configuration.



- IP address – static IP address. The address is used together with the parameters below unless Activate DHCP is selected.
- IP mask – set the network mask.
- IP gateway – default gateway address for communication with devices outside the LAN.
- IP DNS 1 – primary DNS server address for translation of domain names to IP addresses.
- IP DNS 2 – secondary DNS server to be used where the primary DNS is unavailable.

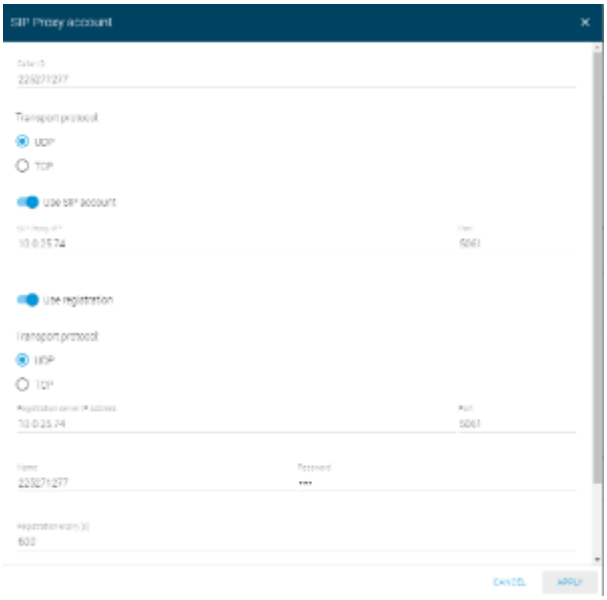
3.1.3 VoIP

There are three SIP telephony sections in this menu. Use the Settings to set relevant call setup parameters, Proxy and registration server addresses, codec parameters and priorities and special actions during calls. Common helps you define how the device should receive calls or deal another incoming call. The Status section is for information only.



Settings

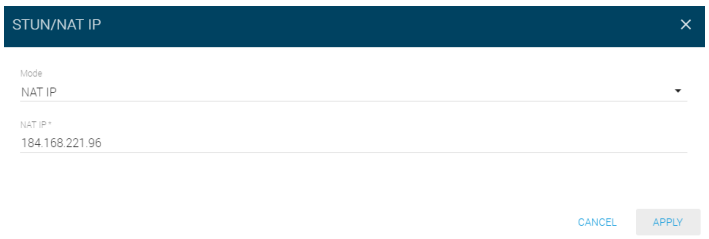
SIP Proxy account – set the user account parameters on the SIP Proxy Server: registration, protocols and registration expiry.



- Caller ID – set your own phone number (or another unique ID consisting of characters and digits), which, together with the domain, identifies 2N® SIP Mic in calls and registration.
- Transport protocol – specify whether the UDP or TCP should be strictly used for SIP and RTP transmission.
- Use SIP account – allow the SIP Proxy use.

- **SIP Proxy IP*** – enter the opponent IP address (operator, PBX) to which **2N® SIP Mic** should connect for call direction.
- **Port** – set the SIP Proxy listening port (typically 5060).
- **Use registration** – allow registration with the opponent and specify the phone number for registration (Caller ID). If the device is not registered, no call setup requests can be set to it.
- **Transport protocol** – choose UDP or TCP for SIP communication.
- **Registration server IP address** – set the opponent IP address (operator, PBX) to which **2N® SIP Mic** should connect for registration requests.
- **Port** – set the SIP Registrar server listening port (typically 5060).
- **Name** – set the user name for **2N® SIP Mic** authentication.
- **Password** – set the password for **2N® SIP Mic** authentication. If your IP PBX does not request authentication, the parameter is not applied.
- **Registration expiry** – set the registration expiry to control the registration request load of your network and SIP Registrar. The SIP Registrar can modify the expiry without letting you know.
- **Timeout after wrong SIP registration** – set the timeout for the **2N® SIP Mic** to register after an unsuccessful registration attempt.

STUN/NAT IP – STUN server helps NAT clients (i.e. the PCs behind the firewall) set up phone calls to the VoIP hosted outside the LAN.



- **Use local IP** – use the local device IP address.
- STUN
  - **STUN server** – enter the STUN server address (IP or domain name). The address is used if STUN IP is selected in the RTP interface configuration.
  - **Port** – set the port to be used for STUN. The default value is **port 3478**.
- STUN, keep alive
  - **STUN server** – enter the STUN server address (IP or domain name). The address is used if STUN IP is selected in the RTP interface configuration..
  - **Port** – set the port to be used for STUN. The default value is **port 3478**.

- **Refresh rate** – define the keep-alive packet sending period. The default value is 600 s.

- **NAT IP** – enter the public IP address and NAT port to which signalling messages shall be sent by the opponent. Packets are then sent to the PBX as defined in the port routing and router IP address settings.

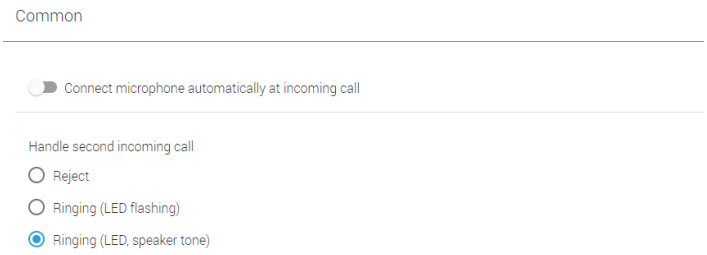
Audio codec

- **Send DTMF via** – choose the DTMF sending type.
  - **Inband (Audio)** – allow the classic DTMF sending in the audio band using standardised dual tones.
  - **RFC2833** – allow DTMF sending via RTP according to RFC-2833.
  - **SIP info** – allow DTMF sending via SIP INFO messages according to RFC-2976.
- **DTMF payload type** – set the payload type for DTMF: any value from 96 to 127. Make sure that the Proxy and end terminals are identical to make the function work properly.
- **RTP port** – set the local RTP port to be the source of the RTP stream sent from the device.
- **Codec priority** – enable/disable the use of audio codecs offered at the call setup and set the priority. The options are G.711a (alaw), G.711u (ulaw) and G.722.
- **Codec settings** – set the codec specific parameters.
  - **Codec name**
  - **Blocks** – set the size of the data block to be sent. Used for more effective use of the bandwidth.
  - **Use VAD** – use VAD for data transmission optimisation. Packets are not sent when the user is not speaking. VAD stands for Voice Activity Detector.

Others

- **Receive SIP from any IP address (not only from SIP Proxy)** – select receiving SIP messages from addresses other than SIP Proxy. Used for direct calling to an IP address, for example.
- **Send 200 OK and Bye after call rejection** – allow sending 200 OK and BYE messages after call rejection. It is a specific setting. The call is then identified as received and immediately terminated on the Proxy. Normally, the call is rejected with cause "404 Not Found".
- **Answer incoming call automatically** – set the **2N® SIP Mic** incoming call answer type:
  - **No – 2N® SIP Mic** does not answer incoming calls automatically. Receive the call manually.
  - **Yes – 2N® SIP Mic** answer incoming calls immediately automatically.
  - **For x seconds – 2N® SIP Mic** receives incoming calls in x seconds automatically. Set a value in the range of 1–3600. The maximum ringing time is not applied in this case.
- **Maximum ringing time** – set the maximum call setup and ringing time in which outgoing calls are terminated automatically. Set a value in the range of 1–3600. This parameter is applied only if the preceding parameter is set to No.

Common

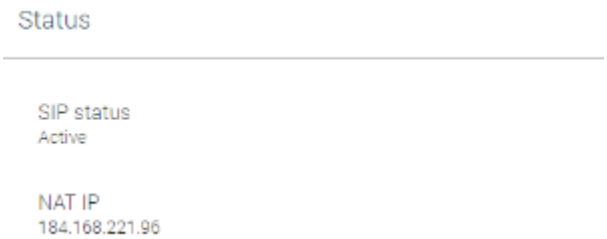


- Connect microphone automatically at incoming call – this parameter is applied only if automatic call answering is selected (VoIP / Settings / Others menu). If you answer calls manually, it is not applied.
- Handle second incoming call – set how to handle a call that comes in while another call is active. The default value is Reject.
  - Reject – the other incoming call is rejected.
  - Ringing (LED flashing) – the other incoming call is signalled by flashing LEDs but does not affect the currently made call.
  - Ringing (LED, speaker tone) – the other incoming call is signalled by flashing LEDs and ringing tone from the speaker. The ringing tone of the other call is different from the common ringing tone.

Note

- 2N® SIP M ic is capable of serving up to two calls at the same time. The third and next incoming calls are rejected.

Status



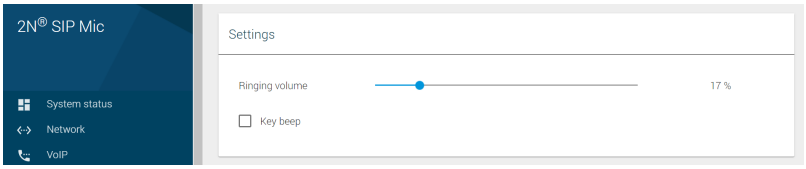
- SIP status – display the current SIP Proxy line status: Inactive, Active, Registered, Registration in progress and Registration error. Refer to the System Status subsection for details.

- NAT IP – display the set IP address for NAT if used. 0.0.0.0 is displayed when STUN server or Local IP is used.

3.1.4 Audio

Settings

- **Ringing volume** – set the device ringing volume (incoming call tone).
- **Key beep** – enable/disable the key beep.



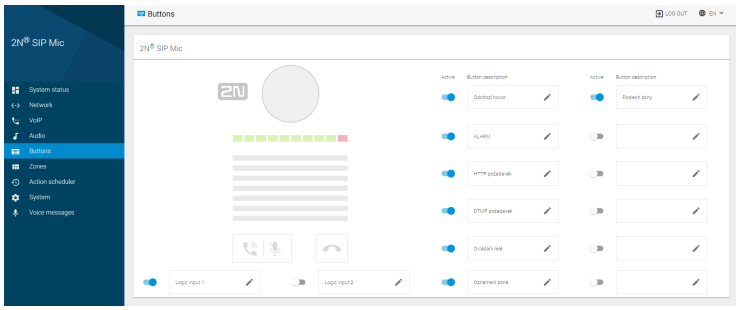
See the device back panel for more volume and sensitivity controls.

The LINE IN signal gain is achieved mechanically using a rotary potentiometer on the panel back. Microphone sensitivity is controlled in the same way. The amplifier is the same for the primary microphone attached to the device upper panel and an external microphone MIC IN. Plug the connector into the socket to switch the signal direction. This means that the two microphones are never active at the same time. The attached external microphone has the priority. The LINE OUT and integrated speaker work analogously.

3.1.5 Buttons

Assign one of seven available functions to the 2N® SIP Mic buttons on this page. See the button survey below. Logic inputs are located below the call controlling buttons on the device back side. By default, all the available buttons are inactive and assigned no action. The options are as follows:

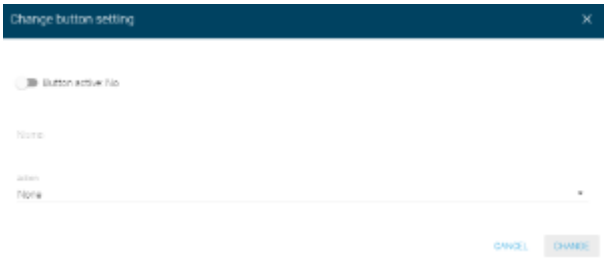
- Outgoing call – when the button is pressed, a call is set up to the set destination via SIP Proxy.
- Outgoing call ALARM – when the button is pressed, a call is set up to the set destination via SIP Proxy. The DTMF code or a voice message is played after the setup.
- HTTP request – when the button is pressed, an HHTP request is sent from 2N® SIP Mic.
- DTMF request – when the button is pressed, a call is set up to the set destination via SIP Proxy. The selected DTMF code is played after the setup.
- Relay control – the button controls the relay whose terminals are located on the 2N® SIP Mic back.
- Announce to zone – the button activates the defined announcement to a zone.
- Listen to zone – the button activates the defined listening to a zone.



Change Button Setting

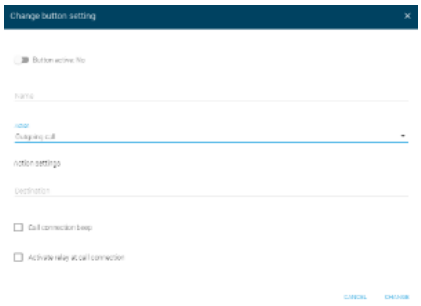
Click the edit symbol at the button to be edited to open a dialogue window. Each type of action includes three identical options.

- Button active – activate the button to enable the action to be executed.
- Name – button name.
- Action – choose one of seven available actions.



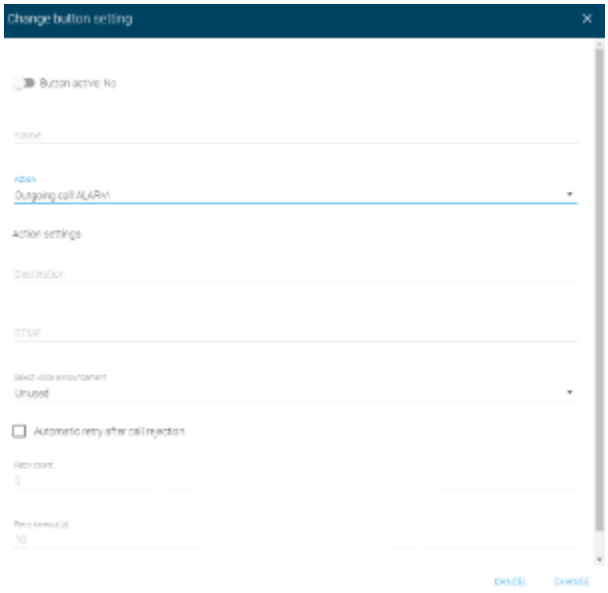
Outgoing Call

- Destination – set the destination (phone number or IP URI) to which the call shall be directed via SIP Proxy.
- Call connection beep – set the call connection beep for 2N® SIP Mic. This selection is inactive by default.
- Active relay at call connection – activate the relay at call connection. This selection is inactive by default.



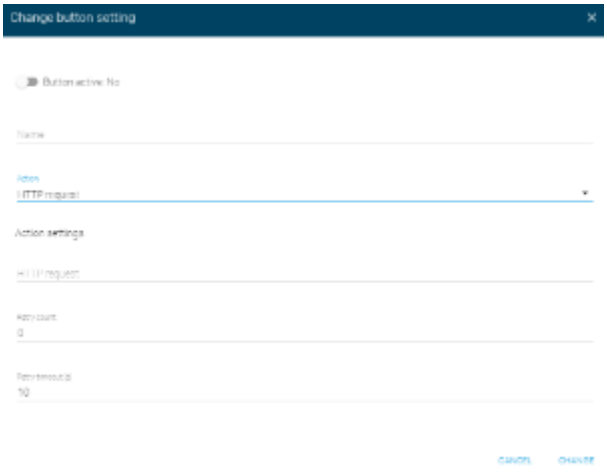
Outgoing Call ALARM

- Destination – set the destination (phone number or IP URI) to which the call shall be directed via SIP Proxy.
- DTMF – enter the DTMF code to be sent from 2N® SIP Mic after call connection. Not completed by default.
- Select voice announcement – select a voice message to be played at call connection. No voice message is selected by default.
- Automatic retry after call rejection – select automatic retry after call rejection. The selection is inactive by default.
    - Retry count – set the count of call setup retries after call rejection: 0 to 30. The default value is 0.
    - Retry timeout – set the timeout in seconds for call setup retries: 0 to 30. The default value is 10 s.



HTTP Request

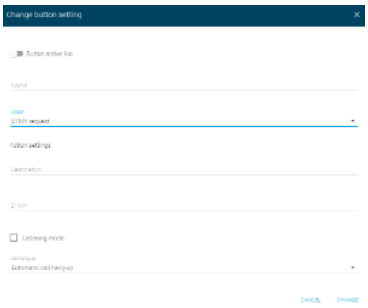
- **HTTP request** – set the HTTP request to be sent from **2N® SIP Mic** when a button is pressed.
- **Retry count** – set the count of HTTP request sending retries if unsuccessful: 0 to 30. The default value is 0.
- **Retry timeout** – set the timeout in seconds for HTTP request sending retries: 0 to 30. The default value is 10 s.



DTMF Request

- **Destination** – s et the destination (phone number or IP URI) to which the call shall be directed via SIP Proxy.

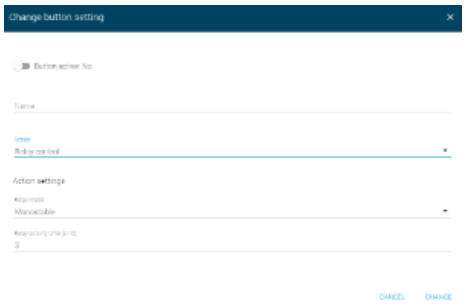
- **DTMF** – set the DTMF code to be sent from **2N® SIP Mic** when a button is pressed. Set the DTMF sending method in the VoIP menu.
- **Listening mode** – play the DTMF code using the **2N® SIP Mic** speaker.
- **Call hang-up** – define the call hang-up. The options are Automatic call hang-up (default) and Repeated button press call hang-up.



Relay Control

Press a **2N® SIP Mic** button to control the relay in one of the following three modes:

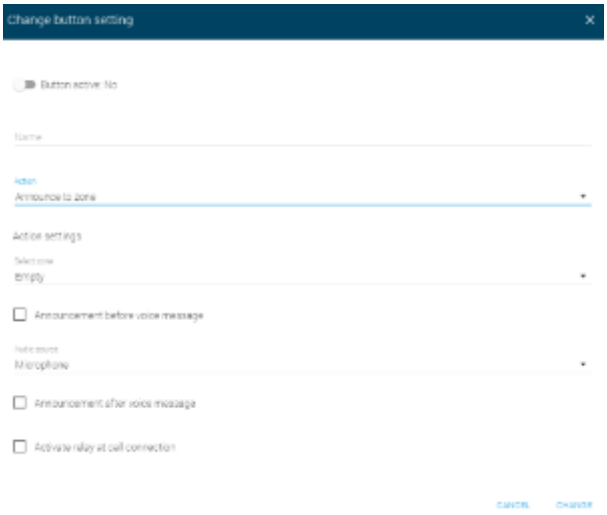
- **Monostable** – the relay is activated for a defined period of time.
  - Relay activity time
- **Bistable** – the relay state changes for a period of time defined by the parameter.
  - Minimum activation time
- **Activate relay by pressing a button** – the relay is active while the button is being pressed, yet for the minimum time specified here.
  - Minimum activation time



Announce to Zone

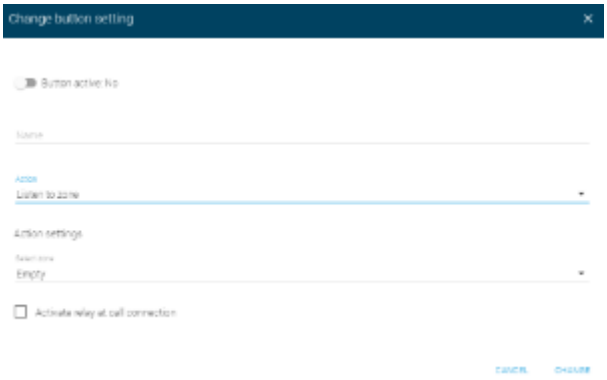
- **Select zone** – select a zone for the announcement. Set the zone in the Zones menu.

- Announcement before voice message – enable playing announcements before voice messages. Load a message of your own in the System messages / Voice messages menu. Disabled by default.
- Audio source – set the audio source to be used for announcements. The default value is Microphone.
  - Audio message
    - Voice message – set the voice message to be played. Load a voice message in the Voice messages menu.
  - Microphone
  - Input line – use the signal brought to the 2N® SIP Mic input.
    - Automatically after timeout expiry – make the announcement end after a timeout expiry. Set values 0 to 9600. The default value is 10.
    - By pressing a button – make the announcement end when a button is pressed.
- Announcement after voice message – enable playing announcements after voice messages. Load a message of your own in the System messages / Voice messages menu. Disabled by default.
- Active relay at call connection – the relay is activated when the call is connected. The selection is inactive by default.



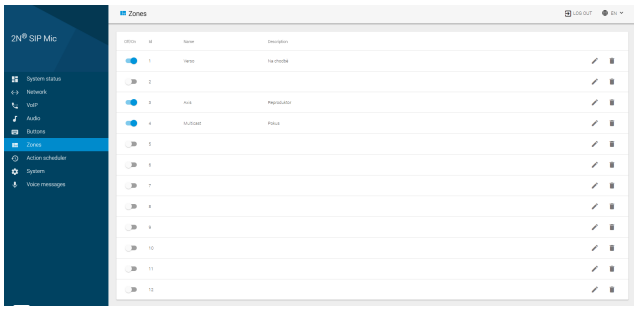
Listen to Zone

- Select zone – select a zone for the announcement. Set the zone in the Zones menu.
- Activate relay at call connection – the relay is activated when the call is connected. The selection is inactive by default.


Change button setting
Button active: No
Name
Action
Listen to zone
Action settings
Select zone
Empty
Activate relay at call connection
CANCEL
CHANGE

3.1.6 Zones

Find 12 pre-defined zone positions in the menu. Activate the zones using a button. If set yet inactive, a zone cannot be called or announced to. Click the trash bin to delete a row setting.



The following options are shared by all the zones:

- State – on or off
- Name – zone name, up to 20 chars
- Description – brief description, up to 60 chars

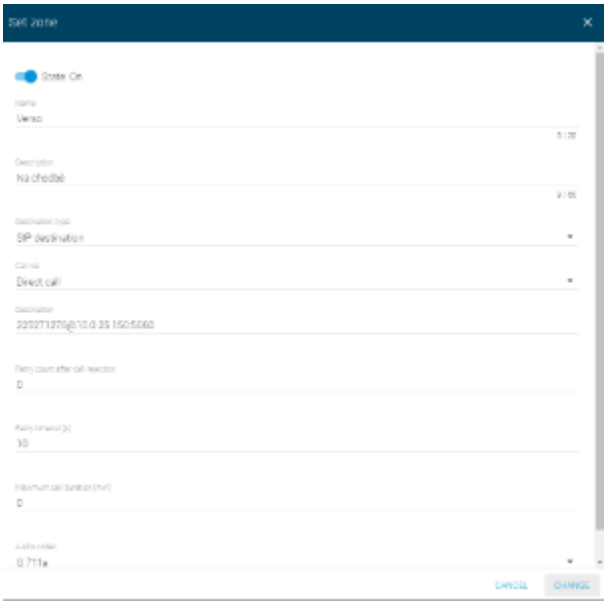
The setting forms are specific for the selected announcement destinations. See below. The following types of destinations are available:

- SIP destination – define the call type: SIP proxy or direct call.
- Multicast address – define the address to which the stream is sent for the announcing device.
- VAPIX destination – set the address for VAPIX communication.

SIP Destination

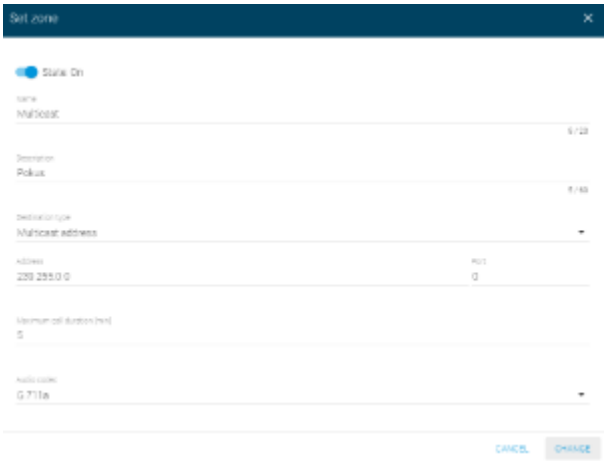
- Call via
  - SIP Proxy – use the SIP Proxy set in the VoIP menu for outgoing calls.
  - Direct call – route the call directly without the use of a SIP Proxy. The required destination format is identification@ip_address:port.
- Destination – enter the phone number for SIP Proxy or SIP URI for direct calls.
- Retry count after call rejection – set the count of call setup retries after call rejection: 0 to 10. The default value is 0.
- Retry timeout – set the timeout in seconds for call setup retries: 0 to 30. The default value is 10 s..
- Maximum call duration – set the maximum call duration after which the call shall be terminated: 0 to 60 min. The default value is 0 min – the parameter is not applied, the call duration is unlimited.

- Audio codec – set the audio codec for outgoing RTP packet encryption: G.711a (alaw) or G.711u (ulaw).



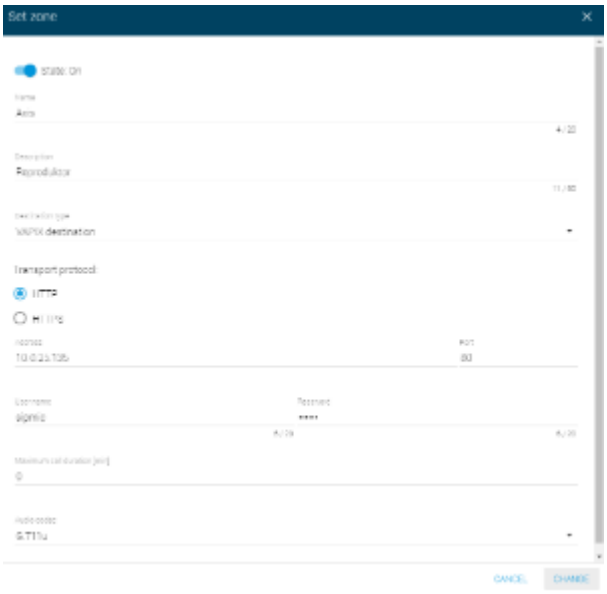
Multicast Address

- Address – set the multicast IP address to which multicast RTP packets are sent. The allowed range is 239.0.0.0 ~ 239.255.255.255.
- Port – set the destination port to which the audio stream is sent.
- Maximum call duration – set the maximum call duration after which the call shall be terminated: 0 to 60 min. The default value is 0 min – the parameter is not applied, the call duration is unlimited.
- Audio codec – set the audio codec for outgoing RTP packet encoding: G.711a (alaw) or G.711u (ulaw).



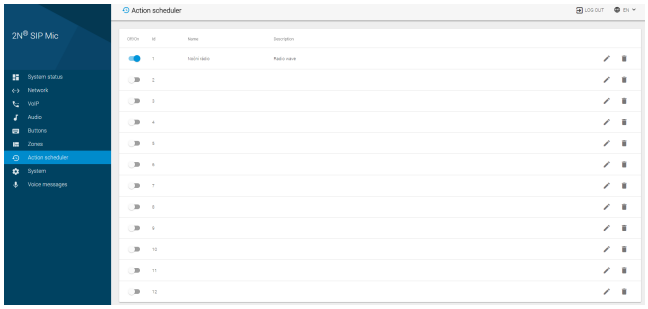
VAPIX Destination

- Transport protocol – select the type of audio stream transmission: unsecured HTTP or secured via ssl in HTTPS.
- Address – set the IP address to which RTP packets are sent.
- Port – set the destination port via which the device listens.
- User name – set the user name for authentication.
- Password – set the password for authentication.
- Maximum call duration – set the maximum call duration after which the call shall be terminated: 0 to 60 min. The default value is 0 min – the parameter is not applied, the call duration is unlimited.
- Audio codec – set the audio codec for outgoing RTP packet encoding: G.711a (alaw) or G.711u (ulaw).



3.1.7 Action Scheduler

The menu includes 12 defined actions. Just use the switch to enable/disable the action. If the switch is inactive for an action, the action settings are not used. An action is generated supposing that it is activated and all the set conditions are met. You can only use the scheduler to generate the actions that are configured via a button. However, it is not allowed to generate actions that require a microphone. Each zone is assigned a name and short description. Click the pencil symbol to open a zone setting dialogue. Click the trash bin to delete the zone setting and deactivate the zone.



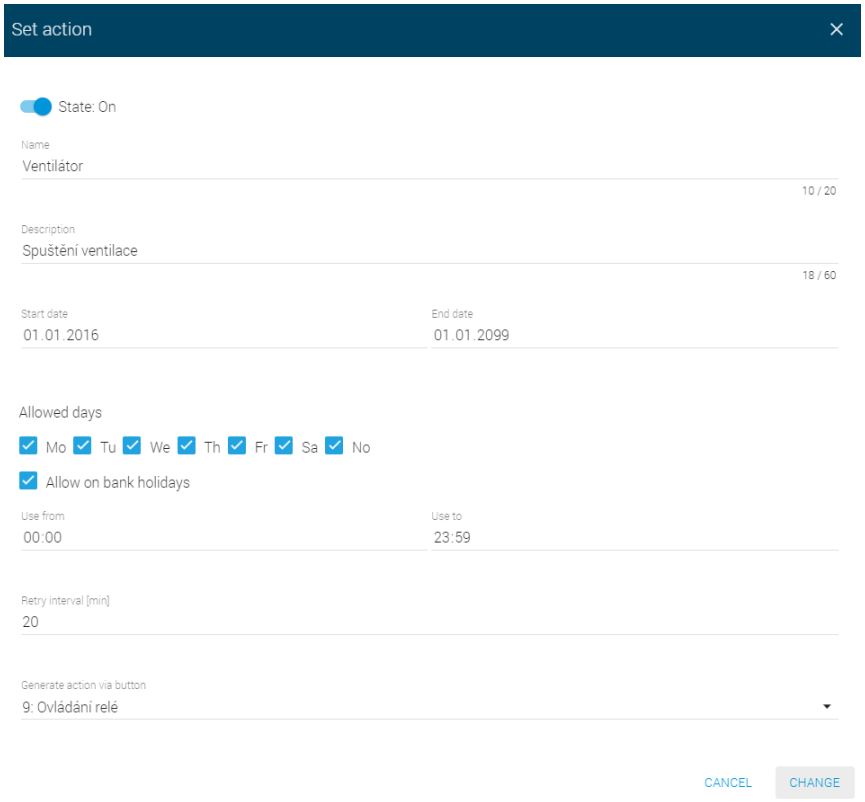
Note

Some 2N® SIP Mic actions cannot be set using the Action scheduler:

- Outgoing call – cannot be set due to the use of a microphone and speaker.
- Announce to zone – can be set to a limited extent due to the use of a microphone and speaker. Use the Audio message and Input line as a source only.
- Listen to zone – cannot be set due to the use of a microphone and speaker.

Action Setting

The following settings are available in the dialogue window.

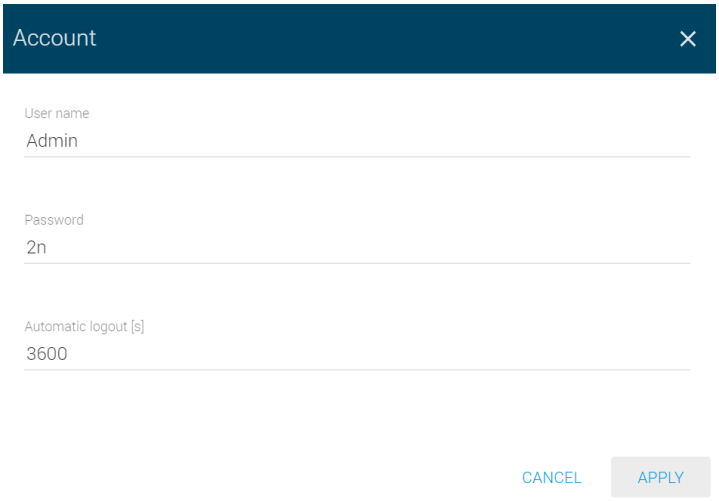


- **State** – activate/deactivate an action: On or Off. The default value is Off.
- **Name** – add the name of the action to be generated, up to 20 characters.
- **Description** – add a description of the action to be generated, up to 60 characters.
- **Start date** – set the date from which the action is active.
- **End date** – set the date on which the action becomes inactive.
- **Allowed days** – set the weekdays and holidays on which the action is active.
- **Use from** – set the time at which the action is generated for the first time.
- **Use to** – set the time at which the action is not generated any longer.
- **Retry interval** – set the action repeating interval: 5 to 120 minutes. The default value is 60 minutes.
- **Generate action via button** – make sure that any action to be generated is configured for a **2N® SIP Mic** button. Use the **Buttons** menu for setting.

3.1.8 System

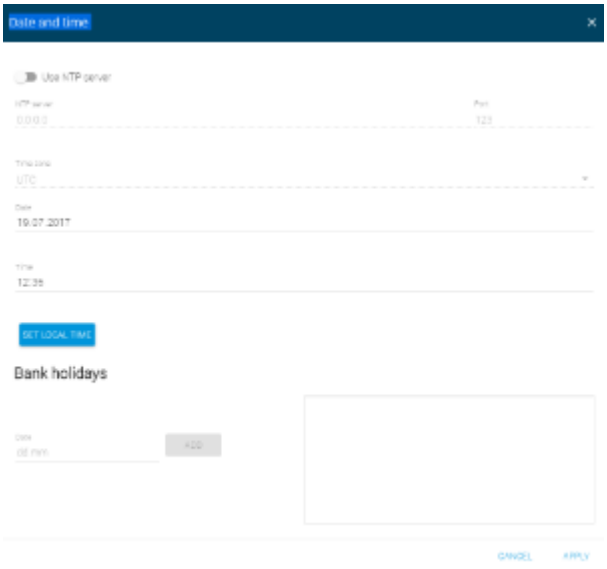
Configuration

Account



- User name – set the user name for 2N® SIP Mic web login.
  - Default user: Admin
- Password – set the password for 2N® SIP Mic web login.
  - Default password: 2n
  - We strongly recommend you to change the password upon your first login!
- Automatic logout – set the 2N® SIP Mic automatic web interface logout time: 10–3600 s. The default value is 600 s.

Date and time



- **Use NTP server** – use the NTP server for internal time synchronisation with **2N® SIP Mic**. Enable the function to deactivate the manual local time setting.
  - **NTP server** – set the NTP server IP address to be used for **2N® SIP Mic** internal time synchronisation.
  - **Port** – set the NTP server port to be used for **2N® SIP Mic** internal time synchronisation.
  - **Time zone** – set the time zone for the **2N® SIP Mic** installation site. Winter /summer time is not considered automatically.
- **Date** – set a date in the DD.MM.RRRR format.
- **Time** – set a time value in the HH:MM 24-hour format.
- **Set local time** – use the button to synchronise the **2N® SIP Mic** time with your current PC time value. Press Apply to set the time value in whole minutes.

Syslog – this function has not been implemented yet.

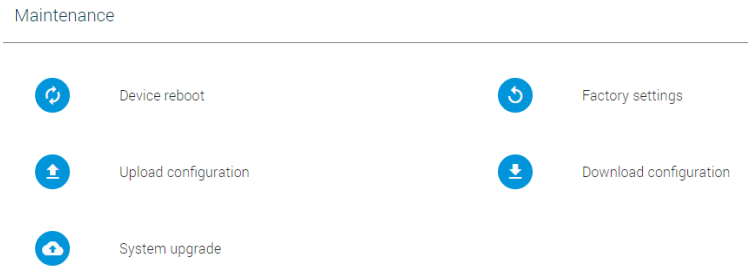
Console lock – lock the console to prevent the action buttons from being used. Locking is signalled by backlight flashing of the button pressed.

Note

- The console lock only controls the upper panel buttons. The logical inputs attachable to the back panel remain active.

Maintenance

This section only describes the action buttons that generate direct actions to be confirmed using a dialogue window.



- **Device reboot** – restart **2N® SIP Mic**. The entire restart process takes about 30 s.

  Once **2N® SIP Mic** obtains the IP address after restart, the login window is displayed automatically.

- **Factory reset** – reset all the **2N® SIP Mic** parameters except for network settings.

  To reset **2N® SIP Mic** fully, use the Reset button on the device bottom.

- **Upload configuration** – upload configuration from backup. Press the button to display a dialogue window for you to choose the configuration file to be uploaded.

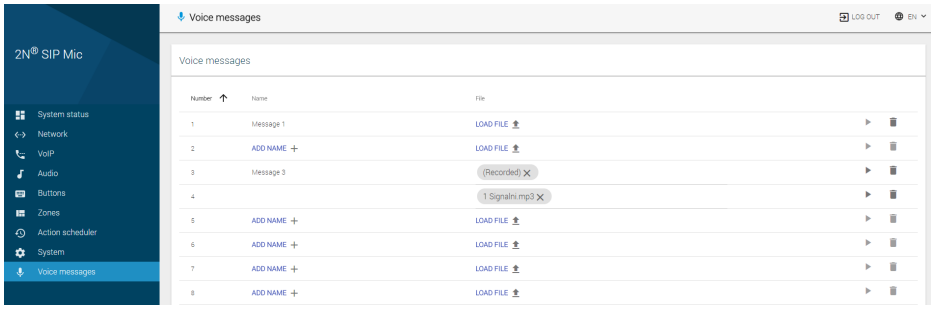
- **Download configuration** – back up the current **2N® SIP Mic** configuration. Press the button to download the full configuration to be saved on your PC.

- **System upgrade** – upgrade your **2N® SIP Mic** firmware. Press the button to display a dialogue window for you to choose the firmware file for your **2N® SIP Mic**. **2N® SIP Mic** is automatically restarted upon a successful firmware upload to make full use of the new firmware. The entire upgrade process takes less than 1

minute. Refer to www.2n.cz for the latest 2N® SIP Mic firmware version. The firmware upgrade does not affect the configuration. 2N® SIP Mic checks the firmware file and prevents you from uploading a wrong or corrupt file.

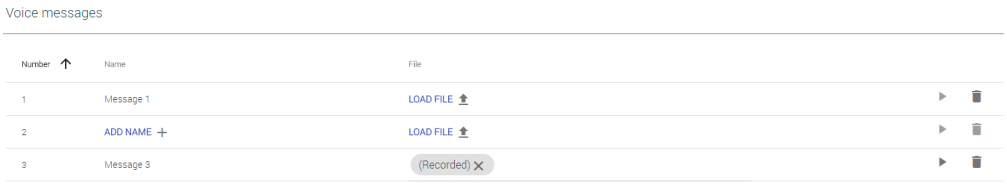
3.1.9 Voice Messages

This menu includes a survey of 14 user message positions in the device for zone announcements. You can load messages in files, play pre-defined messages or remove messages from the device. You can arrange the rows from A to Z or vice versa in each column.



Voice Messages

- Number – set the message serial number: 1–14.
- Name – add the message name of your own, up to 60 characters. If the message is loaded automatically via a button, the name is always Message x, where x denotes the message number.
- Load file – open a dialogue window to select the path to the audio file on your PC hard drive. Click the cross to delete a message without changing the message number.
- Play/Stop – press Play to play a message. Click Stop, which does not appear until the playing starts, to stop playing the current file. Sound is played to your PC system speakers or attached headset.
- Delete – delete a file including its name irretrievably.

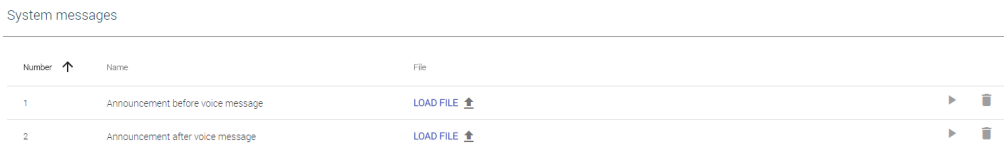


Note

- The allowed format of the files to be played is MP3.
- Once loaded, the file is resampled to 32 kHz to be transmitted via the SIP and VAPIX protocols.
- The maximum file size is 8 MB regardless of its length.

System Messages

- Number – set the message serial number: 1–2.
- Name – add the message name. The System message names are fixed and invariable.
  - 1 – announcement before voice message
  - 2 – announcement after voice message
- Load file – open a dialogue window to select the path to the audio file on your PC hard drive.
- Play/Stop – press Play to play a message. Click Stop, which does not appear until the playing starts, to stop playing the current file. Sound is played to your PC system speakers or attached headset.
- Delete – delete a user loaded file. The name does not change and the original system tone is restored upon deletion.



3.2 Setting Examples

The following subsections provide examples of the 2N® SIP Mic settings. The simplest examples are always chosen, so some functions can be neglected for simplification. Refer to the Configuration subsections for full details.

- 3.2.1 Express Settings
- 3.2.2 Announce to Zone - VAPIX
- 3.2.3 Voice Message Loading
- 3.2.4 HTTP Request

3.2.1 Express Settings

The steps below describe how to set a new 2N® SIP Mic device quickly for announcing to a multicast zone via a microphone. This is what you need for operation:

- 2N® SIP Mic
- microphone
- supply adapter
- UTP cable with PoE for LAN connection

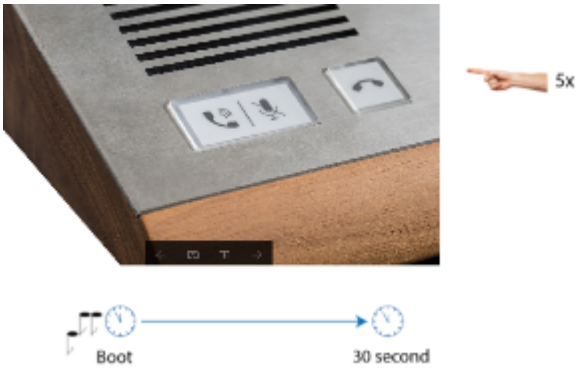
Use a PC connected to the same network as 2N® SIP Mic to configure the basic parameters.

Step 1: Connection

Pack out 2N® SIP Mic and connect the microphone and supply adapter included in the delivery. Insert a power cable connected to your LAN into the LAN connector on the back.

How to find the 2N® SIP Mic IP address:

- Turn on the device switch.
- Wait until you can hear the sound signal .
- Press the call hang-up button on the device five times.
- 2N® SIP Mic reads its IP address.
- If the address is 0.0.0.0, it means that 2N® SIP Mic did not get its IP address from the DHCP server. In that case contact your network administrator.



Having found the IP address, open any web browser on a PC connected to the same network.

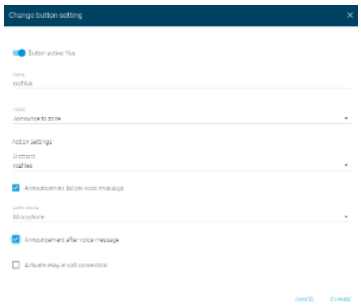
Enter **http://found_IP_address/** into the address row.

Confirm your selection. If **2N® SIP Mic** is connected in the right network, its configuration web page opens up.

- Log in using the **Admin** user name and **2n** password.

Step 2: Button Setting

Configure multicast announcing for a button. Go to the Buttons menu to display the button and logic input list. Choose one of the 12 system buttons, press the switch to activate it and click the pencil symbol. The following dialogue window opens up:

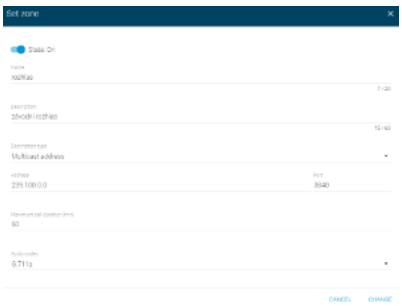


Enter a button name into the Name field. The description will be displayed in the menu. Go to Action and select Announce to zone. The menu will change according to the action selected. Select a zone in Action settings. Always choose the first zone even it lacks description. Enable Announcement before/after voice message if necessary. Select Microphone as the Audio source.

Click Change to save the settings.

Step 3: Zone Setting

To execute the action via the set button, set the zone to be announced in the Zones menu. There is a list of 12 zones in the menu. Activate zone 1, which you selected while setting the button. Click Edit to open the following dialogue:



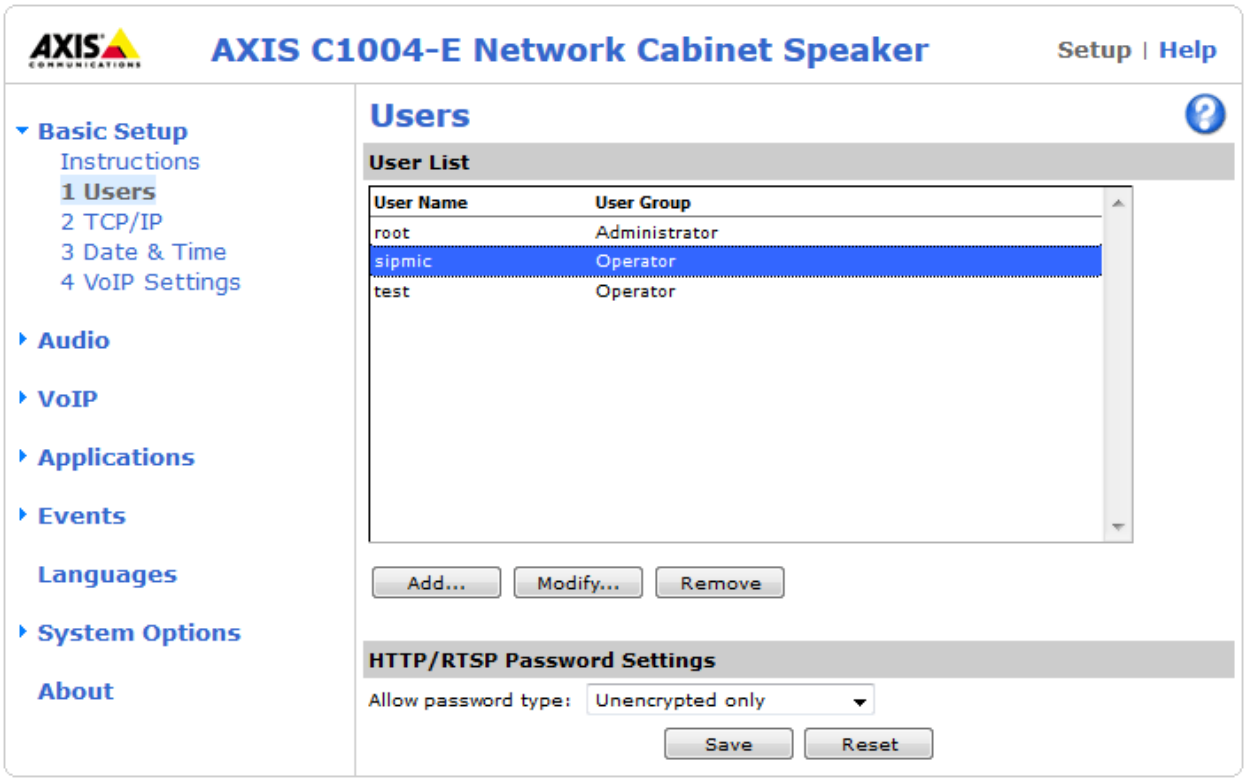
Select the zone name and description. Always choose Multicast address as the Destination type. Enter the future multicast address into the Address field. Doing this, remember to use the allowed address range: 239.0.0.0 to 239.255.255.255. Complete the address and port to which 2N® SIP Mic shall send the RTP stream. The devices that enable multicast messages to be played shall log in to this address to receive the RTP stream. Now define the Maximum call duration and Audio codec to be used for transmission. Click Change to save the settings. Configure the receivers as specified in their respective manuals to receive transmissions from the multicast address chosen by you. Now the settings are completed.

Step 4: Playing

Once the receivers are configured, you can test the announcing function. Press button 1 on the console. The button should be shining blue and the call hang-up button should be shining red. Now the announcement before voice message is being played to the zone. When the call pick-up button starts shining blue, you can send your own announcement to the zone via an attached microphone. You can mute the microphone during the announcement. To stop announcing, press the call hang-up button or button 1. If this happens when the microphone is inactive, the call is ended immediately. If the microphone is active, the announcement after voice message is played first. Or, you can also press the call hang-up button repeatedly to stop the transmission. When the maximum call duration is achieved, the call is terminated automatically. However, the same procedure applies to it like in the button hang-up case.

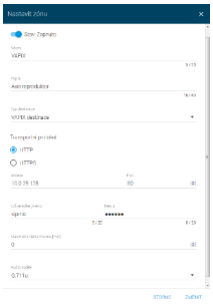
3.2.2 Announce to Zone - VAPIX

VAPIX announcing is similar to multicast announcing. The difference is that VAPIX plays announcements to one device only. It is a proprietary protocol, which enables an RTP stream to be sent to the set address. The advantage is that the communication is secure and every connection is authenticated. Be sure to create a user with operator rights at least in the device. And remember to select Unencrypted only in the HTTP /RTSP Password Settings / Allow password type in the VAPIX settings in the AXIS product.



Further settings relate to 2N® SIP Mic only. You can use the steps included in the preceding subsection. Just change Multicast zone to VAPIX zone. Having set the parameters, adjust steps 2 and 3. If you have not tried express settings, follow steps 1 and 2. Just select VAPIX as the zone in Action settings. Step 3 is as follows for VAPIX:

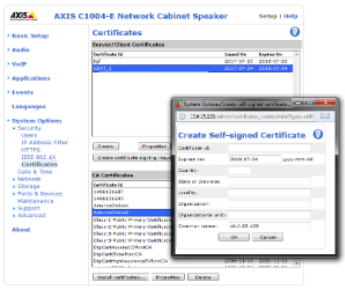
To generate an action via the set button, set the zone to be announced in the Zones menu. There is a list of 12 zones in the menu. Activate zone 1, which you chose while setting the button. Click Edit to open the following dialogue:



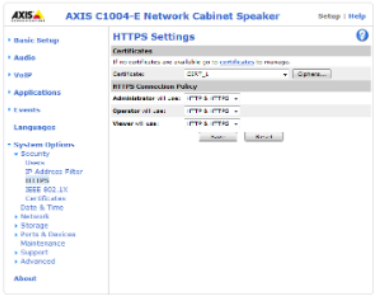
Select the zone name and description. Choose VAPIX destination as the Destination type. There are two Transport protocol options: HTTP or HTTPS. Choose HTTP for simplicity as some additional changes have to be done for HTTPS. Add the speaker IP address into the Address field. Port is set automatically: 80 for HTTP and 443 for HTTPS. If you use other ports for speaker communication for some reason, change the setting accordingly. For VAPIX verification, set the user name and password for 2N® SIP Mic authentication. Make sure that the AXIS user has operator rights at least. Now define the Maximum call duration and Audio codec to be used for transmission. G.711u (uLAW) is the only supported codec for VAPIX at present. Click Change to save the settings. Now you can play announcements to the VAPIX zone as well as to the multicast zone. Refer to step 4 in the preceding subsection.

HTTPS Settings

A security certificate has to be generated in AXIS for HTTPS. Select Create self-signed certificate in the System Options/Security/Certificates menu to create a new certificate.



Go to the System Options/Security/HTTPS menu. Select the new certificate and set the required roles in HTTPS Connection Policy: Operator, HTTP & HTTPS in our case. Click Save for confirmation.



Once you save the changes, you can select HTTPS as the transport protocol in the 2N® SIP Mic settings. Refer to step 4 in the preceding subsection.

3.2.3 Voice Message Loading

There are two ways how to load a voice message to 2N® SIP Mic. You can either add your audio file to the Voice messages menu via a web browser. Or, you can load a message via a microphone or LINE IN. In both the cases, you need a LAN-connected console and PC-based configuration. In the latter case, you have to configure a button to play a message.

Loading via Web

Open Voice Messages to find 14 pre-defined positions for new announcements. Click Load file to open a dialogue window for file loading. Select the audio file from your PC hard drive and click Load. If the file meets all processing requisites, it will be loaded to the device memory. We recommend you to use the WAV format, 8 kHz sampling frequency, 8 bit resolution and thus 64 kbps baudrate and aLAW codec. Or, you can load a record from another file as the device automatically resamples it to the required format. The m aximum size of the file to be loaded is 8 MB.

Note

- The audio record quality gets deteriorated during format resampling and so load your files with this limitation in mind!

Info

- Standard audio formats are supported: .WAV, MP3, etc.
- 8 kHz sampling frequency, 8 bit resolution
- Maximum size of the file to be loaded: 8 MB

Having loaded the file, press Play for check. Use the cross at the record to delete a record and click the trash bin symbol to delete a whole row including the file and filename.

Loading via Microphone

You can also load messages using a microphone or the LINE IN audio input. Make sure that zone announcement is set for a button as described in the Buttons subsection: Audio source, Audio message. Then generate the following actions with a long button press:

- 2-second button press – play the currently set audio message
- 4-second button press – start loading of a new audio message

Note

- Once loading starts, the original audio message is deleted irreversibly.
- The maximum length of the audio message to be loaded is 60 s.

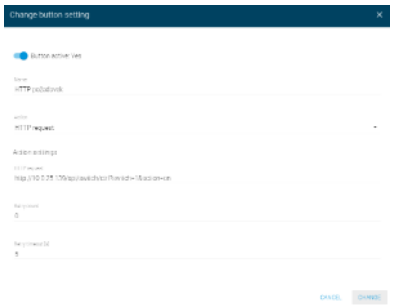
A microphone attached to the front panel is used as the default sound source. If unattached, connect a microphone to the back panel or LINE IN.

3.2.4 HTTP Request

Set the HTTP request to open the door, activate the network relay or send commands to other devices via the 2N® SIP Mic console. See the example below showing how to set the 2N® IP Verso switch activating HTTP command.

Suppose there is a 2N® IP Verso installation at the main entrance to your premises and calling to 2N® SIP Mic is configured for one of its buttons. Press the button to set up an incoming call to 2N® SIP Mic. The operating staff will answer the call and open the door for the caller. Typically, the door is opened by the DTMF code. 2N® SIP Mic, however, is not equipped with a keypad for the code to be entered. Therefore, configure the HTTP command for a button and press the button to send the command to 2N® IP Verso for door lock relay activation.

To set the HTTP command, go to the 2N® SIP Mic configuration and open the button menu. Select one of the buttons, activate it with a switch and click edit to open the following dialogue window.



Add a name to the action. Select the HTTP request from the action list. Set the action using the supported HTTP request format, which, in our case, is as follows:

http://IP_ADDRESS/api/switch/ctrl?switch=1&action=on

Do not set the Retry count unless the HTTP request is denied for a reason. In our case, the call was answered, which means that the device is available and no timeout or retry count need to be configured. Save the setting. Press the button and when it turns pink, the command is successfully sent and a green door-open indicator lights up on 2N® IP Verso. At the same time, the relay is activated and the door opening tone is generated.

Software

2N® IP Network Scanner 3.0.4

Mechanical and Electrical Parameters

- **Dimensions:** 209 x 142 x 65 mm
- **Weight:** 1.600 g
- **External power supply:** 12 V DC / 2 A
- **LAN supply:** PoE IEEE 802.3af
- **LAN connection:** RJ-45 connector on back panel, 10/100BASE-TX with Auto-MDIX function
- **Status signalling:** signalling microphone volume level
- **Local control:** 14 buttons on front panel
- **Speakers:** 2x 1 W stereo, built in
- **Frequency range:** 20 Hz – 20 kHz (+/- 0.5 dB)
- **Harmonic distortion:** 0,05 % @ 1 kHz
- **Signal-to-noise ratio:** 91 dB
- **Headphones output:** stereo jack 3,5 mm, 2x 30 mW, min. 16 Ohm, DR 101 dB, THD+N -85 dB
- **Digital input:** 2x 5 to 48 V DC digital input, galvanically isolated or 1 contact input
- **Main microphone input:** symmetric, XLR, Phantom Supply 24 V, DR 88 dB, THD+N -82 dB
- **Headset microphone input:** jack 3,5 mm, integrated powering for electret microphones, DR 84 dB, THD+N -78 dB
- **Line input:** jack 3,5 mm, symmetric mono or asymmetric stereo, DR 93 dB, THD+N -82 dB
- **Output power:** 8 W (PoE) / 25 W (External power)
- **Audio codecs:** G.711 (PCMA, PCMU)/8 kHz, G.722 (in development)
- **Operating temperature**: 0 ˚C to 40 ˚C (32 ˚F to 104 ˚F)
- **Maximum altitude for intended use**: 2000 m a.s.l.

5. Supplementary Information

Here is what you can find in this section:

- 5.1 Troubleshooting
- 5.2 Directives, Laws and Regulations
- 5.3 General Instructions and Cautions

5.1 Troubleshooting

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

5.2 Directives, Laws and Regulations

Europe

2N® SIP Mic 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 2012/19/EC of the European Parliament and of the Council of 4 July 2012 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 a 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.

5.3 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.

Electric Waste and Used Battery Pack Handling

Do not place used electric devices and battery packs into municipal waste containers. An undue disposal thereof might impair the environment!

Deliver your expired electric appliances and battery packs removed from them to dedicated dumpsites or containers or give them back to the dealer or manufacturer for environmental-friendly disposal. The dealer or manufacturer shall take the product back free of charge and without requiring another purchase. Make sure that the devices to be disposed of are complete.

Do not throw battery packs into fire. Battery packs may not be taken into parts or short-circuited either.

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