

Application Note IP horn loudspeaker & IP amplifier module -Getting started – v1.2

This Application Note describes how to update the IP horn loudspeakers or the IP amplifier module and how to setup and configure some basic use cases.

Related Products:

LHN-UC15L-SIP | LHN-UC15W-SIP | AMN-P15-SIP

Severity:

□ Immediate action required

 $\hfill\square$ Action strongly recommended

 \boxtimes Informative

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1. Introduction

This Application Note describes how to get the IP horn loudspeakers and the IP amplifier module up and running. On the example of the wide angle IP horn loudspeaker, it will be described how to update the firmware and make some basic configuration. The long throw horn loudspeaker and the amplifier module can be configured in almost the same way.

Products:

LHN-UC15L-SIP	=	SIP based long throw IP horn loudspeaker
LHN-UC15W-SIP	=	SIP based wide angle IP horn loudspeaker
AMN-P15-SIP	=	SIP based IP amplifier module

Notice!

The screenshots of the IP horn WEB GUI were made with the firmware v2.1 (2.1.869).

2. Unpacking and Powering

To access the cable connections, do the following:

- 1. Using a T20 Torx screwdriver, remove the four cover screws.
- 2. Lift the cover from the chassis with care.

The back of the loudspeaker/amp module is shown as reference view bellow.



Connecting to network

The IP horn loudspeaker and the IP amplifier module support PoE/PoE+ power supply mode. You need one Ethernet cable to connect to a PoE switch (e.g. PRA-ES8P2S) or an injector for a convenient installation. For the most reliable operation, always use shielded CAT-5e or higher class cables.

The network port LED turns on a few seconds after the network cable is connected, indicating that PoE/PoE+ power has been successfully applied.

There are two lights on the Ethernet jack:

- A solid green LED (right) indicates the port is operating at 1000 Mbps (1 Gbps). It flickers to indicate network activity.
- An orange/yellow LED (left) indicates a network link of 100 Mbps. It flickers to indicate network activity.

Notice!

The cable gland has a small diameter that makes it impossible to feed a network cable with a connector crimped through the gland. Check the manual for detailed information.

3. Getting Started

The configuration of the loudspeaker and the module is done via WEB based GUI.

Before starting configuration and operation of the loudspeaker and the module, it is advised to do the following:

- 1. Download the latest firmware and update the IP horn/amp
- 2. IP address detection and hostname detection
- 3. Logon with the web browser

3.1. Firmware Update

You can get the firmware from the product page at <u>www.boschsecurity.com</u>. It is recommended to use the latest firmware version.

You perform firmware updates via the Firmware Upload Tool (FWUT) version 9.10 or above. You can the required Firmware Upload Tool (FWUT) from the product page on <u>www.boschsecurity.com</u>.

To update the firmware of the device, do the following:

1. Click on the "Firmware.msi" file to start the Firmware Setup Wizard. There is one installation file for the two IP horn loudspeakers and one installation file for the IP amplifier module.



It will copy the firmware in the folder C:\ProgramData\Bosch\OMNEO\Firmware. Notice, that the FWUT needs to be installed upfront.

腸 Bosch LHN15SIP Firmware V	_		×	
OMNEO Media Networking Architecture	Welcome to the Bosch I Firmware V2.1.869 Set	_HN15Si up Wiza	IP rd	
BOSCH	The Setup Wizard will install Bosch V2.1.869 on your computer. Click I to exit the Setup Wizard.	LHN 15SIP F Next to con	Firmware tinue or C	ancel
	Back	lext	Can	cel

2. Set your PC's network adapter to DHCP to automatically obtain an IP address.

Internet P	Internet Protocol Version 4 (TCP/IPv4) Properties								
General	Alternate Configuration								
You can this cap for the a	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.								
() Ob	tain an IP address automatical	у							
OUs	e the following IP address:								
IP ad	dress:								
Subn	et mask:								
Defa	ult gateway:								
() Ob	tain DNS server address auton	natically							
OUs	e the following DNS server add	resses:							
Prefe	erred DNS server:								
Alterr	nate DNS server:								
U Va	alidate settings upon exit		[Advan	ced				
			OK		Cancel				

Notice!

By default, the IP horn/amp is set to DHCP and thus you will get an IP address in the same range.

- 3. Connect your PC to the same network/switch as the IP horn/amp. Attention, the IP horn/amp and the PC must be in the same subnet.
- 4. Open the OMNEO Firmware Upload Tool and select your network adapter.



5. From the File menu, select Options.

OMNEO Firmware	Upload Tool			- 🗆 X
File View Help Options Exit Alt+F4	are Upload	ΤοοΙ		BOSCH
Devices LHN15SIP				
Device name LHN15SIP-11A91F	Version 2.00.0800	State Idle	Progress	

6. Check if the Image folder is "C:\ProgramData\Bosch\OMNEO\Firmware". If not, click the Change button, navigate to the folder where the firmware is and click OK.

Firmware images	C:\ProgramData\Bosch\C	MNEO\Firmwar	el	Change
Include su	ub folders			
oploading				
Maximum num	ber of concurrent uploads re connection	20 🜲		

7. Make sure, that "Use secure connection" is unchecked and click OK.

Firmware Upload	Tool Options			>
Firmware images	C:\ProgramData\Bo	sch\OMNEO\Firmware	0	Change
Uploading Maximum num	ber of concurrent uplo	oads 20 🜲		
User name	admin	~	Manage security users	
				ОК

	wale opioau i	001			(9=9)	BOS
	•					
evices						
HN15SIP				1		
Device name	Version	State	Progress			
HN15SIP-11A91F	2.00.0800	Idle				

9. From the list of firmware, select a firmware and click the Start button.

Select firmware f	for upload			
Available firmwa	are			
Model name	Version	Description	Size	File name
LHN15SIP	2.1.869	LHN15SIP IP Hom Speaker running Session Initiation Protocol	88 MB	C:\ProgramData\Bosch\OMNEO\Firmware\LHN15SIP\V2.1.869
				Cancel Start

10. When the upload is completed, the State tab displays "Finished" and your device is ready to be used.

e View Help							
MNEO Firm	ware Upload	ΤοοΙ			Θ	BOS	C
evices							
HN15SIP	Version	State	Progress				
	2.01.0969	Finished	riograda				
HIVIDDIE-TIADIE	2.01.0005	Finished					

Notice!

Do not disconnect the device while the update is running. If the update fails, disconnect the device and connect it again. Repeat the update process.

Firmware Update troubleshooting:

- The IP horn/amp does not show up in the Firmware Upload Tool:
 - Check if you have selected the correct network adapter. This is only asked during startup of the Firmware Upload tool.
 - Make sure, that "Use secure connection" is unchecked.
 - Your PC needs to have an IP address in the same range as the IP horn/amp. Set your PC to DHCP and reset the IP settings of the IP horn/amp by pressing and holding the physical reset button for 6 - 10 seconds: the IP address of the IP horn/amp will reset to factory default (DHCP). For more details, please go to chapter 5.
 - Deactivate all other network adapters (e.g. WIFI).
 - Check firewall settings (FWUT needs to have the right to communicate through the firewall: Windows -> Allow an app through firewall).
- The update fails:
 - Disconnect the device and connect it again. Repeat the update process.
 - If the update fails, it may show 1.0 as Version. If this happens the IP horn/amp is in a kind of failsafe mode and you can restart the firmware update.
 - Don't use WIFI. Always use an Ethernet cable connection for firmware update.
 - The "Downloads" folder should not be used. Use a folder where you have read and write access rights.
- The IP horn/amp is shown in the FWUT, but greyed out:
 - Use Firmware Upload Tool V9.1 or later.
- The firmware is not visible in the FWUT:
 - First start the Firmware Setup Wizard (or copy the firmware into a folder) and then start the FWUT and select the corresponding folder.

3.2. IP address detection and hostname detection

IP address detection with the Firmware Upload Tool

The OMNEO Firmware Upload Tool can be used to discover the IP address of the IP horn/amp.

1. Set your PC's network card to DHCP to automatically obtain an IP address.

Internet F	Protocol Version 4 (TCP/IPv4)	Propertie	s		×
General	Alternate Configuration				
You car this cap for the	n get IP settings assigned auton bability. Otherwise, you need to appropriate IP settings.	natically if y ask your r	your ne networ	etwork sı k adminis	upports strator
() ()	btain an IP address automatical	у			
	se the following IP address: —				
IP ac	ddress:				
Subr	net mask:				
Defa	ult gateway:				
() ()	btain DNS server address auton	atically			
OUs	se the following DNS server add	resses:			
Prefe	erred DNS server:				
Alter	nate DNS server:				
V	alidate settings upon exit			Adva	nced
			ОК		Cancel

Notice!

By default, the IP horn/amp is set to DHCP and thus you will get an IP address in the same range.

- 2. Connect your configuration PC to the same network/switch as the IP horn/amp. Attention, the IP horn/amp and the PC must be in the same subnet.
- 3. Launch the OMNEO Firmware Upload Tool and select your network adapter.



4. Click in the View menu on Select columns.

OMNEO Firmware	Upload Tool				-		×
The View Help Available DM Devices in Logging.	firmware n failsafe mode F3 F4		_		0	BOS	C
Device name	Version	State	Progress				
						Uplo	ad
overed "LHN15SIP"	devices: 1 - Total nur	nber of devices: 1					

5. Select IP address and click OK.

Select Device List Columns	8_8		×
Select the additional columns that	will appear	in de devi	ice list.
Domain name Serial number Inventory code Role Port NAC address			
	ОК	Cano	cel

6. The FWUT discovers the device, and its IP address appears in the IP address tab.

					0
vices IN15SIP					
evice name	IP address	Version	State	Progress	
HN15SIP-11A91F	192.168.1.94	2.01.0869	ldle		

Hostname detection

The hostname is a combination of the product type and the last 6 digits of the MAC address. The MAC address can be found on the device label. The hostname is displayed in the FWUT or can be assembled as shown below.

General:	https://HOSTNAME.local
Horn loudspeaker:	https://lhn15sip-11a91f.local
Amplifier module:	https://amn15sip-11a97a.local
https lhn15/amn15 6 digits .local	Secure and encrypted connection Product type Last 6 digits of the MAC address Domain name (local)

Hostname/Device name in the FWUT

Q	OMNEO Fi	rmware Up	pload Tool				_		×
F	ile View	Help							
(MNEO	Firmw	are Upload	ΙΤοοΙ			Θ	BOS	СН
	Devices LHN15SIP								
	Device name	e	IP address	Version	State	Progress			
	LHN15SIP-1	1A91F	192.168.1.94	2.01.0869	ldle				
									_
									_
									_
									_
								Uploa	d
Dis	scovered "LHN15SIP" devices: 1 - Total number of devices: 1								

IP address detection with the Bosch Configuration Manager

The Bosch Configuration Manager provides various functions for configuration of video cameras including a Network Scan. The Network Scan automatically detects all compatible devices present in a network, including the IP horn/amp. You can download the Bosch Configuration Manager from https://downloadstore.boschsecurity.com.

1. Set your PC's network adapter to DHCP to automatically obtain an IP address.

Internet Protocol Version 4 (TCP/IPv4) Properties								
General Alternate Configuration								
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.								
Obtain an IP address automatica	lly							
O Use the following IP address:		- 1						
IP address:	· · · · ·							
Subnet mask:								
Default gateway:								
Obtain DNS server address auto	matically							
Use the following DNS server ad	dresses:	- 1						
Preferred DNS server:								
Alternate DNS server:								
Validate settings upon exit	Advanced							
	OK Cano	el						

Notice!

By default, the IP horn/amp is set to DHCP and thus you will get an IP address in the same range.

- 2. Connect your configuration PC to the same network/switch as the IP horn/amp. Attention, the IP horn/amp and the PC must be in the same subnet.
- 3. Launch the Bosch Configuration Manager and set an application password if not yet done.

	BOSCH
Set application password.	×
Password	0
Confirm	_
Remember	
OK Cancer	
Loading settings	
	Invented for life

4. You can quickly discover the IP address of your device using the Network Scan



3.3. Logon with the web browser

- Open a browser and enter the IP address (https://IPaddress) or the host name (https://HOSTNAME.local) of the device. Accept the risk for the self-signed certificate. There is no default password. This requires you to register the administrative account for the device.
 - Enter a unique username. The username must be 4 64 characters long.
 - Enter a unique strong password for the user. The password must be 8 64 characters long.
 - Choose the language of the interface. Later you can change your preference in *Generic* settings.
 - Register the administrative account.

Bosch LHN15SIP-11A924 × +	-		×
← → C @ (\$\chi_k https://192.168.1.94 \$\chi_k \chi_k \chi_k \q\\ \chi_k \chi_k \q\nu_k \chi_k \chi_k \qu		⊻	=
Initial setun			
Initial Setup			
This device is not configured yet. Please register the administrative account of this device.			
Username			
admin		_	
Password •••••••	<	0	
S Hegister account			
Language English		\sim	

2. The administrative account is now registered and you can login with your Username and Password.

Bosch LHN15SIP-11A924 × +			ı ×
\leftarrow \rightarrow C \textcircled{a} \bigcirc \textcircled{A} https://192.168.1.94	☆ Q Suchen		⊻ ≡
Login Please enter your credentials Username			
Password		٢	
➔ Login Language English		~	

3. Now you are on the GUI landing page *Overview*. Use the *Overview* menu to view the main functions of the web interface and to navigate to these functions in the system using the informative graphical tiles. Each tile displays configuration data and real-time status information of the device. The menu can be opened by clicking on the menu icon in top left corner.



Supported browsers

- Chrome
- Safari
- Firefox
- Microsoft Edge

4. Use Cases4.1. Direct Bosch camera integration for automatic message playing

You may want to link a Bosch camera to the IP horn/amp so that it plays a message when an action occurs. To do this you need to create a special API profile and a rule at the IP horn/amp. Then you need to create a script in the camera using ATSL (Alarm Task Scripting Language) and configure the areas that trigger the alarm at the camera.



To link a Bosch camera with the IP horn/amp, the following steps are necessary:

At the IP horn/amp:

1. You can upload your own messages by using the + or you can use a factory message. Supported file formats are listed in the data sheet.

Bosch LHN15SIP-11A924 × +					- o ×
$\leftarrow \rightarrow$ C @ O	A https://192.	168.1.94/#/messages	☆	Q, Suchen	=
LHN15SIP- 11A924 ×	Messag	es			Bosch
n Overview		Query	Show factory messages	(299 MB free +	
(O) Generic settings		Label			
옷 Users					
🛢 SIP		EVAC 1 EN	\triangleright \Box	¥ 🥒 🖻	
높 Audio					
💬 Messages					
🛱 Rules					
역 Certificates					
Security					
Naintenance					
√≣ Logging					
§ Imprint					
G Logout					

2. Create an API account dedicated for the camera.



3. Create a Rule that leads VGPIs (Virtual General Purpose Inputs) to start the action "activation of messages" and select the message you would like to play with the settings of repeat, abort/stop behavior.

Overview											
Bosch LHN15SIP-11A924 × +											- ø ×
\leftarrow \rightarrow C \textcircled{a}	O 🗛 https://	/192.168.1.94 ^{/#} /rules						☆ Q Suchen			=
LHN15SIP- 11A924	× Rule	s									BOSCH
습 Overview ô Generic settings		Query		Q					+		
A Users		Enabled	Label	Trigger	Schedule	Priority	Action			_	
SIP			Start Message 2	VGPI	Always	2	Start message	Ĵ	Ē		
去 Audio 団 Messages			Start Message 1	VGPI	Always	1	Start message	ſ	Ê		
🛱 Rules											
E∯ Certificates											

rule



Bosch LHN155IP-11A924 × +		- ø ×
$\leftarrow \rightarrow$ C \textcircled{a}	C A https://192.168.194/#/rules ☆ Q. Sudien	=
LHN15SIP- 11A924	Edit rule	BOSCH
② Generic settings	< Edit rule	
A Users	Label Start Message 1	
SIP	Priority — +	
王 Audio 戸 Messages	Trigger settings	
🛱 Rules	Trigger type VGPI Trigger-end stops the action instantly	
⊑β Certificates	Virtual GPI index - +	
Naintenance	Schedule type Always	
-l≣ Logging δ Imprint	Action actions	
G Logout	Action Sectings	
	Speaker Test V Gain (dB) -20.0 + Repeat count 1 +	
	GP0 action NORE	
	Save Cancel	

Notice!

It is a good practice to make sure that the "Trigger-end stops the action instantly" check box is unchecked in the rule settings. This ensures that the message plays until the end of the loop.

1

Details		rule	
Bosch LHIN155IP-11A924 ×	+		- ø ×
$\leftarrow \rightarrow$ C \textcircled{a}	O A https://192.168.1.94/#/rules	숪 Q. Suchen	=
LHN15SIP- 11A924	× Edit rule		BOSCH
Overview	< Edit rule		
Generic settings		_	
名 Users	Start Message 2	Enabled	
SIP	Priority 2	- +	
车 Audio			
💬 Messages	Trigger settings		
🛗 Rules	Trigger type	Trigger and stors the action instantly	
E Certificates	VGPI		
() Security	Virtual GPI index 2	- +	
Naintenance	Schedule type Always	×	
+≣ Logging			
§ Imprint	Action settings		
🕞 Logout	Action type Start message	~	
	EVAC 1 EN 🗸 🗸	Gain (dB) -20.0 - + Pepeat count 1 - +	
	GPO action NONE	~	
	Save		

4. On the *Generic settings* page you can find the ports used for the connection via the API. Please be aware, that the Web and the API interface are using the same ports.

Bosch LHN15SIP-11A924 × +			- a ×
\leftrightarrow \rightarrow C \textcircled{a}	C A https://192.168.1.94/#/maintenance	없 Q. Suchen	=
LHN15SIP- 11A924	Generic settings	DNS settings	H BOSCH
G Overview	DHCP enabled	UHCP enabled	
Generic settings	IPv4 address		
옷 Users	192,100,1.94		
🛔 SIP	255.255.0		
또 Audio	IPr4 gateway 0.0.0.0		
💬 Messages			
🖽 Rules	Interface settings		
트亰 Certificates	interface settings		
1 Security	ONVIF interface settings	Web / API interface settings	
Naintenance		, J	
HE Logging	0MVIF HTTP Port 8000 - +	Web / API HTTP port 80 +	
🔆 Logout (admin)	ONNE HTTPS Port 8443 — +	Web / API HTTPS port - +	
	OMVF RTSP Port - +		
	0NVF UDP Base Port+		
	G.711 audio codec (legacy, low quality) for talk down		
	Save		~

2

At the camera:

1. Set areas, using VCA task (Video Content Analysis tasks), that will trigger an Alarm Task Script.

									_		- 0	×
	General	Connectivity	Camera	Recording	Alarm	VCA	Network	Service		6	BOS	СН
	Main Opera	ation Tamper	Detection	Tasks Met	adata General	tion Met	adata Inspect	ion				
	✓ Task cor	nfiguration										?
VCA task	(1 🔬	Object in Field	11	Ĵ	2×K					F		
VCA task	< 2 🚠	Objekt in Feld	2	Ĵ				4				
						T						
					4						1	
					C3 ć	ון ב			Stream 1		~ =	⊲»
	-											
		+	l									
			61.0									

2. Add a script at the Alarm Task Editor.

										- 0	×
General	Connect	ivity Cam	era Recording	Alarm	VCA	Network	Service		\square	BOSC	H
Alarm	Alarm I/O	Audio Alarn	Alarm Task Editor								
 ✓ Alarm 1 	Task Editor										
				Plac	e for ⁻	the scri	pt				
						Clear					

This script will trigger a Virtual General Purpose Input (VGPI) of the IP horn/amp. In the Alarm Task Script example below, it uses VCA task 1 (first rule) and VCA task 2 (second rule). If you are using another VCA task to trigger the IP horn/amp, make sure the VCA(1,x) is correctly defined.

The username and password for both the Alarm Task Editor Script (camera) and the API user account (IP horn/amp) must match. Also the IP address of the IP horn/amp needs to be adapted in the script below.

Example Script

In this example, the camera defines two areas, that in turn activate two different messages via VGPIs at the speaker/module.

```
HttpCommand sendHttpOn:={
Command("api/ext/v1/vgpis/1")SSL(true)Port(443)IP("192.168.1.94")
Password("pwd12345")UserName("API_username")Method(POST)ForceBasicAuth(true)
ContentType("application/json")
Payload("true")
Name("Http Command 1")
};
```

HttpCommand sendHttpOff:={
Command("api/ext/v1/vgpis/1")SSL(true)Port(443)IP("192.168.1.94")
Password("pwd12345")UserName("API_username")Method(POST)ForceBasicAuth(true)
ContentType("application/json")
Payload("false")
Name("Http Command 1")
};

```
HttpCommand sendHttp_2On:={
Command("api/ext/v1/vgpis/2")SSL(true)Port(443)IP("192.168.1.94")
Password("pwd12345")UserName("API_username")Method(POST)ForceBasicAuth(true)
ContentType("application/json")
Payload("true")
Name("Http Command 2")
};
```

```
HttpCommand sendHttp_2Off:={
Command("api/ext/v1/vgpis/2")SSL(true)Port(443)IP("192.168.1.94")
Password("pwd12345")UserName("API_username")Method(POST)ForceBasicAuth(true)
ContentType("application/json")
Payload("false")
Name("Http Command 2")
};
```

if(VCARule(1,1)) then sendHttpOn else sendHttpOff; if(VCARule(1,2)) then sendHttp_2On else sendHttp_2Off;

Notice!

The Alarm Task script will send an HTTP "On" command to the IP horn/amp when the VCA task is true. After a few seconds time delay, it will send an HTTP "Off" command to the IP horn/amp. Not sending the "OFF" command will result in the IP speaker continue to play the audio file in loop. This behavior can be adapted in the Action Settings of the Rule in the IP horn/amp.

Testing

- The message should play when the VCA task becomes active in the camera (e.g. somebody enters the defined area)
- It is also possible to trigger the VGPI in the IP horn/amp. It can be used to test the IP horn/amp part independent from the camera. You can find this option on the maintenance page under *General purpose inputs and outputs*. With the toggle switch you can set it on/off.

Bosch LHN15SIP-11A924 × +					- ø ×
	https://192.168.1.94/#/maintenance			☆ Q. Suchen	=
LHN15SIP- 11A924	Maintenance				Bosch
G Overview	Device tests				
Generic settings	Device test Loopback horn mic		✓ (Ď) Start test		
우 Users	Device test	Value	Be aware that tests can only	y be run if all other device rules are	
SIP	Loopback horn mic	Test not executed yet	inactive.		
笠 Audio	Edopolick north mile	Test not executed yet			
💬 Messages	Ethernet				
🛱 Rules	Power supply				
E Certificates					
Security	General purpose in	puts and outputs			
	Hardware GPIOs Virtu	al GPIs Virtual GPOs			
HE Logging	Virtual GPI 1	Virtual GPI 9	Virtual GPI 17	Virtual GPI 25	
🕒 Logout (admin)	Virtual GPI 2	Virtual GPI 10	Virtual GPI 18	Virtual GPI 26	
	Virtual GPI 3	Virtual GPI 11	Virtual GPI 19	Virtual GPI 27	
	Virtual GPI 4	Virtual GPI 12	Virtual GPI 20	Virtual GPI 28	
	Virtual GPI 5	Virtual GPI 13	Virtual GPI 21	Virtual GPI 29	
	Virtual GPI 6	Virtual GPI 14	Virtual GPI 22	Virtual GPI 30	
			Vietual CRI 02		
	Virtual GPI 7	Virtual GPI 15	Virtual GPI 23	Virtual GPI 31	

4.2. SIP

The Session Initiation Protocol (SIP) is a signaling protocol used to manage (initiate, maintain and terminate) communication sessions involving voice, video and messages. This application protocol can be used to transmit all types of digital media. So, it is a specific technology that can be used for VoIP (Voice over IP).

Use the SIP accounts page of the IP horn/amp to provide information on the current existing accounts for this device. From this page, you can enable and disable existing SIP accounts and add, modify, or delete accounts.

You can create two types of accounts:

- P2P account applicable for direct SIP phone to SIP device (IP horn/amp) communication.
 To set up a P2P account, two parameters are mandatory:
 - Username (Label)
 - Transport protocol.
- Registrar account applicable if the device (IP horn/amp) connects to a SIP server.
 To set up a Registrar account:
 - The Username and Password need to match to the SIP server's dedicated account for the device.
 - You must select the Transport protocol.
 - You must assign an IP address of the SIP server in the Registrar.

Additional considerations when using SIP

- SIP audio codecs:

The IP horn/amp supports the audio codecs G.711 (u-law and a-law), G.722, Opus. Ensure, that at least one of these codecs is enabled in the settings of the SIP server or SIP phone.

- SIP account:

For each SIP Rule a separate SIP account is needed.

– Server certificate (optional):

Server certificates are digital authorizations that allow secure transmissions between the SIP server and the speaker/module. When you select the Verify server certification check box, the device verifies the SIP server is authorized to transmit and receive audio and data by checking the digital certificate. Select the proper certificate from the Certificate for this device drop down menu. Manage the available certificates on the *Certificates* page.

- Certificates (optional):

- Use the *Certificates* page to create and manage the certificates the device uses for secure transmissions within the system. Certificates are digital authorizations that allow devices to communicate with each other over secure communication lines.
- The CA certificate allows secure SIP communication (transport protocol TLS) between a SIP server and the speaker/module. Selection of this certificate is done from the SIP server when TLS is enabled as the transport protocol. For more information, see the SIP page. To add this certificate, select CA cert and upload the certificate file via the select file button.

- Advanced SIP configuration settings (optional):

Under SIP settings or SIP accounts, further configuration settings can be adapted to match the SIP server or SIP phone requirements.

Notice!

There is no possibility to initiate a SIP call from the IP horn/amp to another SIP device. The IP horn/amp is unable to establish a direct connection with an online SIP proxy. Use SIP trunking to connect to the public telephone network via a SIP provider.

4.2.1. Peer-to-Peer connection

In case of having only one source from a fixed location a Peer-to-Peer connection between a SIP phone and an IP horn/amp could be set up without using a PBX server. In this example we are using MicroSIP as SIP phone.

1. Go to "SIP" -> "SIP settings" and verify that SIP service is enabled.

Bosch LHN15SIP-11A924 × +			-	
→ C @ O A https://192.168.1.94/#/sip		숪 Q Suchen		
SIP settings			B	OS
SIP settings Active SIP accounts				
✓ SIP service enabled				
Verify server certificate				
Certificate for this device	\sim	Payload type for telephone-event 101	_	+
SIP port 5060 —	+	Min port for RTP listen sockets 32768		+
SIP TLS port	+	Max port for RTP listen sockets 57000	_	+

2. Go to "SIP" -> "SIP accounts" and create a SIP account by clicking the + or modifying an default one.

Bosch LHIN15SIP-11A924 × +							- 0 ×
\leftrightarrow \rightarrow C \textcircled{a}	https://192	2.168.1.94 ^{/#/sip}				☆ Q Suchen	=
LHN15SIP- 11A924	SIP set	ttings					BOSCH
☐ Overview		SIP settings (Active)	SIP accounts				
③ Generic settings 久 Users		Query	Q			+	
B SIP		Enabled	Label	Account type			
표 Audio 교 Messages			100@localhost	P2P		_∕ <u> </u>	
🛱 Rules							
Edit SIP acco Please enter details	unt for the SI	P account					×
Account type P2P			V Transport pr UDP	rotocol	\sim	Media encryption None	\checkmark
Username 100				Payloa 101	d type for telephone-e	went	- +
							Save Cancel

Notice!

The transfer protocol needs to be the same as in the SIP phone.

3. Go to "Rules" and click on the + to add a new rule.

 ⊕ Bosch LHN15SIP-11A924 × + 										~	- a ×
$\leftarrow \rightarrow$ C \textcircled{a} O \in	https://192.1	168.1.94/#/rules						☆ Q Suchen			=
LHN15SIP- ×	Rules										BOSCH
G Overview		Query		Q					+		
Generic settings				And the second							
옷 Users		Enabled	Label	Trigger	Schedule	Priority	Action				
SIP											
车 Audio											
💬 Messages											
🛗 Rules											
EØ Certificates											
() Security											
% Maintenance											
HE Logging											
§ Imprint											
🕒 Logout											

- 4. Make the following settings:
 - Trigger type: SIP
 - Select the P2P SIP account.
 - Action type: Route call

Bosch LHN155IP-11A924 × H	+	- ø ×
$\leftarrow \ \ \rightarrow \ \ C \ \ \ \ \ \ \ \ \ \ \$	○ & https://192.168.1.94/#/rules ☆ Q. Suchen	=
LHN15SIP- 11A924	X Edit rule	Bosch
Overview	< Edit rule	
Generic settings	label 💻	
옷 Users	P2P	
ê SIP	Priority - +	
끜 Audio		
💬 Messages	Trigger settings	
🛱 Rules	Trigger type	
🛱 Certificates		
Security	100 (P2P)	
Naintenance	Schedule type Always	
ી≣ Logging		
§ Imprint	Action settings	
🕒 Logout	Action type Route call	
	Audio mode Full duplex	
	GP0 action NONE	
	Save Cancel	

5. Open the configuration side of your SIP phone (in this example MicroSIP).

Click on the arrow in the top right corner to open the dropdown menu and click "Add Account...".

S Micro	SIP		_		×		
Phone Lo	gs Contacts				•	Add Account	
						Settings	Ctrl+P
				~		Shortcuts	Ctrl+S
	1	2 ARC	3 DEE			Always on Top	
	-	2,000	300			View Log File	
	4 GHI	5 JKL	6 MNO			Visit Website	Ctrl+W
	_					Help	Ver. 3.21.2
	7 PQRS	8 ^{TUV}	9 wxyz			Exit	Ctrl+Q
	*	0	#				
		-					
	R	+	С				
	(T)						
	<u> </u>	Call	Ę.				
	u(+			
	<u>.</u> –			+			
		DND A	A CONF	REC			
	IP						

6. Enter a Username and a Domain (IP address of the IP horn/amp), select the Transport protocol (UDP/TCP/TLS) and click Save.

Account		×
Account Name		
SIP Server		2
SIP Proxy		2
Licornama *	100	2
Username		1
Domain*	192.168.1.94	2
Login		2
Password		2
	display password	
Display Name		2
Voicemail Number		2
Dialing Prefix		2
Dial Plan		2
	Hide Caller ID	2
Media Encryption	Disabled \sim	2
Transport	UDP V	2
Public Address	Auto ~	2
Register Refresh	300 Keep-Alive 15	
	Publish Presence	2
	Allow IP Rewrite	2
	ICE	2
	Disable Session Timers	2
	Save Cancel	

7. You can use now the SIP phone (in this example MicroSIP) to start a call. Dial "Username" or "Username@IP_AddressOfHorn" and press the Call button. Press End Call to stop the call.

🕒 MicroS	iIP - 100		- 0	×		🕒 MicroSl	P - 100		- [I X
Phone Log	s Contacts			•		Phone Logs	s Contacts			•
	100@192	.168.1.94	~				100		~	
	1	2 ABC	3 DEF				1	2 ABC	3 DEF	
	4 GHI	5 JKL	6 MNO				4 GHI	5 JKL	6 MNO	
	7 PORS	8 TUV	9 WXYZ				7 PORS	8 TUV	9 WXYZ	
	*	0	#				*	0	#	
	<	+	С				<	+	С	
	٤	Call	Ģ				н	End Call	C-C	
	u(· -		+				u(· =		+	
	<u>.</u> –	1	+				<u>.</u> –	1	+	
						DND AA	CONF REC			
🖩 Idle				100	•	🕻 Calling 1	00			100

8. Very connectivity and rule activity:

In the SIP menu under SIP accounts you can check if the call is established.

Bosch LHN15SIP-11A924 × +										- ø ×
) 🔓 https://192	.168.1.94/#/sip				☆	Q Suchen			=
LHN15SIP- 11A924	SIP set	tings								BOSCH
G Overview		SIP settings 🛵	SIP accounts							
Generic settings G	-								-	
옷 Users		Query	Q					+		
SIP		Enabled	Label	Account type						
车 Audio			100-1	202						
💬 Messages			localnost	P2P	Call established		1	8		
🛱 Rules										

In the rules menu you can check if the rule is running.

Bosch LHN155IP-11A924 × +														-	ø ×
$\leftarrow \rightarrow$ C \textcircled{a}	08	https://192	168.1.94/#/rules							☆	Q, Suchen				=
LHN15SIP-	×	Rules												₿	возсн
11A924															
Overview			Query		Q							+			
🚯 Generic settings						-									
A Users			Enabled	Label	Trigger	Schedule	Priority	Action					-		
i SIP				P2P	SIP	Always	1	Route call	Running		ſ	Ē			
车 Audio															
💬 Messages															
🛗 Rules															

Notice!

If you want to use two-way SIP communication, make sure that the microphone of the IP horn is activated.



4.2.2. SIP server connection

A 3rd party SIP PBX (Private Branch Exchange) Server is required for being able to call the IP horn/amp from multiple telephones.

The customer is responsible for the support and protection of the PBX against any security or fraud threats.

The IP horn/amp can subscribe as a SIP Client to the SIP PBX Server. It will have a phone number which can be called like any other VoIP client.

Notice!

Server configuration depends upon the brand and model of the SIP PBX Server. Please consult the server-side documentation for this. In this example we are using the miniSIPServer.

Shown below is a server configuration supposing that the IP horn/amp, the SIP phone and the SIP server are in the same local network, that all three are in the same network subnet and that the SIP server network address is 192.168.1.42.

1. Launch the miniSIPServer and click on System.

🕅 min	iSIPServer V39	9 (5 clients) bui	id 20220726	_	\times
File D	ata Dial Pla	n Services	Maintain Window Help		
۰.	2	۲	\rightarrow		
System	Local users	External lines	Analyze called number		

2. Change the Main address on the SIP tab to an address which is in the range of the IP horn/amp.

🕅 System		×
Basic SIP Ren	note database SMTP Call detail record STUN	
Main address (IPv4)*	192.168.1.42	
Main address (IPv6)*	fe80::215:5dff:fe70:9d96	
Additional address		
UDP port*	5060	
TCP port*	5060	
TLS port*	5061	
Realm	myvoipapp.com	
	V OK Scancel	

3. Click on local users...

1 miniSIPServer	39 (5 clients) bui	d 20220726	_	×
File Data Dial	lan Services	Maintain Window Help		
۵ 🐣	3	\rightarrow		
System Local user	s External lines	Analyze called number		

... and add two users or use the existing ones.

1 Local users					×
<mark> 🎸 </mark> 🙀 Add Edit Dele	ete				
User name	Description	Display name	Address	Other	
👗 101					
8 102					

User 101 is the MicroSIP phone (Username and Password = 101).

MSS Local us	ser				×
Basic	Basic call	Forwarding services	Follow Me service	Supplementary services	Advance ser 4
User nam	101				
User pas	sword 101				
Descriptio	on				
🗌 IP ad	ldress author	ization			
IP addres	SS				
Port	0				
				V OK	S Cancel

User 102 is the IP horn/amp (Username and Password = 102).

🕅 Loca	luser					×
Basic	Basic	call	Forwarding services	Follow Me service	Supplementary services	Advance ser 🗐 (🕨
User r	name	102				
User p	password	102				
Descr	iption					
IP	address a	authori	ization			
IP add	dress					
Port		0				
					🗸 ок	S Cancel

4. Logon to the IP horn/amp and go to "SIP" -> "SIP settings" and verify that SIP service is enabled.

Bosch LHN15SIP-11A924 × +				-	
← → C @ O & https://192.168.1.94/#/sip		☆	Q Suchen		≡
\equiv SIP settings				₿	BOSCH
SIP settings Active SIP accounts					
✓ SIP service enabled					
Verify server certificate					
Certificate for this device	\sim	Payload type for telephone-even 101	nt	_	- +
SIP port 5060	+	Min port for RTP listen sockets 32768		_	+
SIP TLS port 5061	+	Max port for RTP listen sockets 57000		_	- +
Save					

5. Go to "SIP" -> "SIP accounts" and create a SIP account by clicking the + or modifying an existing one.

Bosch LHN15SIP-11A924 × +								- ø ×
$\leftarrow \rightarrow$ C \bigcirc () 🔒 https://192.	168.1.94/#/sip			ជ	Q, Suchen		=
LHN15SIP-	SIP set	tings						BOSCH
11A924								
Overview		SIP settings (Active)	SIP accounts					
Generic settings	-					_	-	
名 Users		Query	٩			+		
🛔 SIP		Enabled	Label	Account type				
车 Audio							-	
J Messages			TUU@localhost	P2P		./ 1		
🛱 Rules								

- 6. Do the following settings and click Save:
 - Account type: Registrar
 - Transport protocol: TCP, UDP, TLS
 - Username and Password: 102 (need to match the settings in the SIP server)
 - Registrar: IP address of the SIP server

		×
Add SIP account		
Please enter details for the SIP account		192.168.1.42
✓ Account enabled		
Account type V Registrar	Transport protocol V	Media encryption V
Username 102	Password ©	Registrar 172.24.112.1
Payload type for telephone-event - + 101	NAT traversal method Vone	Registration expiry 30 - +
Fallback registration expiry - +	Registration priority - +	Relative registration wait delay (%) — +
Proxy 1 IP	Proxy 1 username	Proxy 1 password
Proxy 2 IP	Proxy 2 username	Proxy 2 password
		Save

7. The IP horn/amp should show now "Account registered".

● Bosch LHN15SIP-11A924 × +					~	- o ×
← → C @ ○ A https://19	12.168.1.94 ^{/#/sip}		රු Q Suchen			=
LHN15SIP- × SIP se 11A924	ettings					BOSCH
G Overview	SIP settings Active SIP accounts					
Generic settings						
A Users	Query	6		+		
SIP	Enabled Label	Account type				
笠 Audio	102010210210	Durinture Common		· •		
💬 Messages	102@192.168.1.42	Registrar	-gistered No rule	_ ■		
🛗 Rules	100@localhost	P2P		_ ₿		
E9 Certificates						
() Security						
Naintenance						
+E Logging						
§ Imprint						
🕞 Logout						

8. Go to "Rules" and click on the + to add a new rule.

Bosch LHN15SIP-11A924 × +											- ø ×
$\leftarrow \rightarrow$ C \textcircled{a}	0 8	/#/rules						ŝ	Q Suchen		≡
LHN15SIP- 11A924	Rules										BOSCH
n Overview		Query		٩						+	
۞ Generic settings 옷 Users		Enabled	Label	Trigger	Schedule	Priority	Action				
â SIP			P2P	SIP	Always	1	Route call		_0	Ē	
缶 Audio											
💬 Messages											
🛗 Rules											

- 9. Make the following settings and click Save.
 - Trigger type: SIP
 - Select the Registrar SIP account.
 - Action type: Route call

C @ C @	
LHN15SIP- 11A91F Z © overview © Generic settings A Users Sipe 2 Sipe Audio Prenty	
Overview < Add rule	BOSCH
Cuberar Sattings Lake SipServer & Users SipServer § SIP Promty ± Audio - +	
SIP Priority - + ± Audio	
生 Audio	
Trigger settings	
Tregger type SIP Trigger end stops the action instantly	
SP account SIP account Security 102@192.168.1.42 (Registrar)	
Maintenance Schedule type Always ✓	
HE Logging	
G Legout Action settings	
Active Type Vone	
GP0 action NONE	
Save Cancel	

10. Open the configuration side of your SIP phone (in this example MicroSIP).

Click on the arrow in the top right corner to open the dropdown menu and click "Add Account...".

Solution 🕲	IP		-		Х	_		
Phone Log	s Contacts				-		Add Account	N
							Settings	Ctrl+P
				~			Shortcuts	Ctrl+S
	1	2 ABC	3 DEF				Always on Top	
	-	_	<u> </u>				View Log File	
	4 GHI	5 JKL	6 MNO				Visit Website	Ctrl+W
	-	•	•				Help	Ver. 3.21.2
	PQRS	8 TUV	9 WXYZ				Exit	Ctrl+Q
	*	0	#					
	R	+	С					
	<u>e</u>	Call		5				
	-			+				
	<u> </u>	1		+				
		DND AA	CONF	REC				
MicroSIF)							

- 11. Enter the following and click Save.
 - Account Name
 - SIP Server: IP address of the SIP server
 - Username: 101 (Username of the SIP phone configured in the SIP server)
 - Password: 101 (Password of the SIP phone configured in the SIP server)

Account		\times
Account Name	miniSIP 10 1]
SIP Server	192.168.1.42	2
SIP Proxy		2
Username*	101	2
Domain*	192.168.1.42	2
Login		2
Password	***	2
Display Name	[] >
Voicemail Number] ÷
Dialing Prefix] 2
Dial Plan		2
	Hide Caller ID	2
Media Encryption	Disabled \checkmark	2
Transport	TCP ~	2
Public Address	Auto ~	2
Register Refresh	300 Keep-Alive 15	
	Publish Presence	2
		2
	Disable Session Timers	2
x	Save Cancel	

12. You can use now the SIP phone (in this example MicroSIP) to start a call. Dial "Username" or "Username@IP_AddressOfHorn" and press the Call button. Press End Call to stop the call.



S MicroSIP		×				
Phone Logs		•				
102			~			
1	2 ABC	3 DE	F			
4 GHI	5 JKL	6 MN	10			
7 PORS	8 TUV	9 wxyz				
*	0	#				
<	+	С				
н	End Call		(·(
n(· -						
<u> </u>						
	DND AA	CONF	REC			
Connected	0:01		101			

35 | **40**

- 13. Very connectivity and rule activity:
 - On the Local users page of the miniSIPServer you can check if both users are registered.

K Local users					×
🕹 🌌 🕴 Add Edit De	e lete				
User name	Description	Display name	Address	Other	
2 101			192.168.1.42:50940	MicroSIP/3.21.3	
a 102			192.168.1.94:47610	LHN15SIP-11A91F	

In the rules menu you can check if the rule is running.

● Bosch LHN15SIP-11A924 × +											~	-	σ	\times
← → C @ O & https://15	2.168.1.94/#/rules						ŵ	Q, Suchen		_	9	± 11	N UP	=
LHN15SIP- X Rules												₿	BOS	СН
G Overview	Query		Q							+				
G Generic settings	-													
A Users	Enabled	Label	Trigger	Schedule	Priority	Action								
SIP		SipServer	SIP	Always	1	Route call	Running		0	Ê				
车 Audio		P2P	SIP	Always	1	Route call			D	Ê				
💬 Messages														
🛗 Rules														
EØ Certificates														
() Security														
Naintenance														
HE Logging														
§ Imprint														
🕑 Logout														

Notice!

If you want to use two-way SIP communication, make sure that the microphone of the IP horn is activated.



4.3. Trigger message via noise (horn loudspeaker only)

Use the Noise trigger type when an action starts after an ambient noise reaches a specific level or the noise level exceeds a specified limit. You can combine this trigger type with a schedule via Schedule type, if applicable. Otherwise, keep the default setting of Always.

Configuration:

1. You can upload your own messages by using the + or you can use a factory message. Supported file formats are listed in the data sheet.



2. Create a Rule that leads Noise to start the action "Start message" and select the message you would like to play with the settings of repeat, abort/stop behavior.

Bosch LHN155IP-11A924 × +		– a ×
$\leftarrow \rightarrow$ C \textcircled{a}		* ≡
LHN15SIP- 11A924	X Edit rule	BOSCH
 Overview Generic settings 	< Add rule	
옷 Users 톏 SIP	Noise triggers message Enabled	1
压 Audio Messages	Trigger settings	
El Rules	Treger type V Treger end stops the action instantly Noise trigger	
Security	Sobrādie type Abways	
Maintenance I≝ Logging	Action settings	
§ Imprint	Action type Start message	
🕑 Logout	EVAC 1 EN V Guin (48) - + Repeat count - +	
	00 atton NONE	
	Save Cancel	

Notice!

If the checkbox **"Trigger-end stops the action instantly"** is enabled, the action will stop immediately the trigger finishes. If disabled, it allows an action to run its course completely depending on the settings, even when the trigger is no longer present. For instance, a message plays to the end or for a specified number of times as determined by the repeat count setting.

Application Note | Public Address | IP horn/amp - Getting Started - v1.2

- 3. There are two noise parameters necessary for operation. You can find these parameters on the Audio page:
 - Noise trigger threshold
 - Noise trigger RMS time

Bosch LHIN155IP-11A924 × +		- ø ×
$\leftarrow \rightarrow$ C \textcircled{a}	○ & https://192.168.1.94/#/audio	± ≡
LHN15SIP- 11A924	× Audio	BOSCH
G Overview	Audio User equalizer Microphone equalizer	
Generic settings		
名 Users	User level Line out level	
SIP		
	Current gain (dB) - + 0.0 - + 0.0 - +	
💬 Messages	·80 20 ·80 20	
🛱 Rules		
■第 Certificates	Mic talkback level	
Security	Current gain (dB) — + +	
Naintenance	-80 20	
4≝ Logging		
§ Imprint	Noise trigger	
🕞 Logout		
	Noise trigger threshold (dBF5) - + Noise trigger RMS time (ms) - + -20.0 - + 10 10 - +	
	-80 20	

4. To test the rule, make some noise and check if the rule shows the state Running and if the message is audible.

Bosch LHIN15SIP-11A924 × +													-	ø ×
$\leftarrow \rightarrow$ C \textcircled{a}	C 🗛 https://192	168.1.94/#/rule	5						☆	Q Suchen				± ≡
LHN15SIP- 11A924	Rules												ß	BOSCH
Overview		Query		٩								+		
A Users		Enabled	Label	Trigger	Schedule	Priority	Action							
₿ SIP			Noise triggers message	Noise trigger	Always	1	Start message	Running			I	Ē		
车 Audio														
💬 Messages														
🛱 Rules														
Ep Certificates														

Notice!

The integrated microphone is used for the ambient noise level trigger. So, make sure that the microphone of the IP horn is activated.



5. Test/Rest button

IP Horn loudspeaker



Test/Reset button

There is a physical button for test and reset purposes. This button will perform different actions depending on how long you press it:

- Press and hold for 1 5 seconds: the IP Horn loudspeaker will play a default message to test the loop between the speaker and the microphone. The IP Horn loudspeaker performs a check that the speaker is operating and therefore the microphone is used. When the microphone physical switch is On, the tone lasts around 2 seconds; when it is turned Off, you hear a brief beep (approximately ½ second).
- 2. Press and hold for 6 10 seconds: the IP address of the horn will reset to factory default (DHCP);
- 3. Press and hold for 11 20 seconds: the horn will reset to factory default.

Indication LED

The LED (2) next to the Test/Reset button serves as a time indicator of how long the Test/Reset button is pressed. Once you click the Test/Reset button once, the LED lights up every five seconds for as long as you keep the button pressed, and once more when you let go of the button to indicate the reset is applied.

The LED next to the test button flashes slowly (1 Hz) if the test is successful and quickly (4 Hz) when it is unsuccessful.

IP Amplifier module



Test/Reset button

There is a physical button for test and reset purposes (1). Use a paper clip or similar object to press and hold the Test/Reset button. This button will perform different actions depending on how long you press it:

- 1. Press and hold for 6 10 seconds: the IP address of the amplifier module will reset to factory default;
- 2. Press and hold for 11 20 seconds: the amplifier module will reset to factory default.

Indication LED

The LED (2) next to the Test/Reset button serves as a time indicator of how long the Test/Reset button is pressed. Once you click the Test/Reset button once, the LED lights up every five seconds for as long as you keep the button pressed, and once more when you let go of the button to indicate the reset is applied.

6. Document history

Release date	Documentation version	Reason				
2023-02	v1.0	1 st edition				
2023-05	v1.1	Layout updated				
2024-05	v1.2	Some parts have been updated to be compatible with IP horn/amp FW v2.1				

7. Notice of liability

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