



TEMA TELECOMUNICAZIONI

"IP COMMUNICATION AND SECURITY COMPANY"

WWW.TEMATLC.IT

AD639SR

VoIP SIP PoE Call Repeater



Audio Over IP Network Series **"SipComStage"**

Products for VoIP SIP LAN networking Communications, Paging Amplifiers Systems and Audio Applications. Zone Announcements, Night Ringer, Multicast general call, Background music, Standard SIP call or Emergency call, SD memory with pre-recorded messages, Relays for LAN drives.

PRODUCT MANUAL

Version HW 1.0 - Version SW 1.1.7



Revision	Date	Revision reason	Prepared	Checked/Approved
1	07/07/2023	Update to 1.1.7 version	MM, DP	DP, FL



DICHIARAZIONE DI CONFORMITÀ CE

DECLARATION OF CONFORMITY CE

We, **TEMA TELECOMUNICAZIONI SRL Via C. Girardengo, 1/4 - 20161 MILANO**

declare under our sole responsibility that the product:

Product name **Altoparlante VoIP SIP PoE ripetitore di chiamata**

Trade name **TEMA TELECOMUNICAZIONI Srl**

Type or model **AD639SR**

and accessories --

to which this declaration relates is in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/EC, 2006/95/EC, 2004/108/EC).

The product is in conformity with the followings standards and/or other normative documents:

HEALT & SAFETY EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011

EMC EN 55022:2010, EN 55024:2010, EN 61000-3-2:2006
EN 61000-3-3 :2008

MILANO, 07 Jan 2021

TEMA TELECOMUNICAZIONI SRL
D. Pontillo

I. IMPORTANT INFORMATIONS REGARDING THE RECOVERY AND RECYCLING OF THIS ELECTRONIC DEVICE

The crossed-out wheeled bin symbol below indicates that this electronic equipment is intended to be disposed in a separate collection and not in an unsorted municipal waste, in order to provide for the treatment of WEEE (Waste Electrical and Electronic Equipment) using best available recovery and recycling techniques. Specific treatment for WEEE is indispensable in order to avoid the dispersion of pollutants and other hazardous substances into the waste stream, while recycling leads to reduction of disposal of waste and the negative impacts on environment and human health. That is, priority is given to reuse of WEEE in its components, subassemblies and consumables. As the final holder, the user has an important role in contributing to reuse, recycling and other forms of recovery of WEEE and is responsible to return this waste in the collection facilities set up by EC Member States and to fulfill other duties in compliance with Directive 2002/96/EC and local laws.



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UNI EN ISO 9001:2015

RECOMMENDATIONS

1. It is recommended to read this entire manual before proceeding to the installation of the device.
2. The installation and commissioning of the device can only be performed by specialized technicians.
3. The device is accurately manufactured and tested. In any case, the product is not recommended for use where an error of operations can cause property damage and/or injury to persons.
4. It is expressly not recommended maintenance inside the device which must be carried out by Tema Telecomunicazioni, the removal of the closures will invalidate the warranty and makes accessible internal parts with risk of electric shock.
5. Tema Telecomunicazioni accepts no responsibility for damage to property and/or persons resulting from incorrect use of the equipment or by procedures that do not comply with the instructions in this manual. Tema Telecomunicazioni reserves the right to make modification to the technical and functional specifications at any time and without any notice.
6. Products powered via PoE (Power over Ethernet) may only be connected with cables coming from the internal network company (inside the building), are not allowed connections LAN cables coming from outside the building.
7. Use for this device only and exclusively original spare parts and consumables supplied by Tema Telecomunicazioni. The company is not responsible for damage caused by the use of materials not supplied by the same.
8. Do not expose the unit to direct sunlight, protect from heat, dust, humidity and chemicals.
9. Tema Telecomunicazioni reserves the right to vary the product characteristics for improvement without prior notice. Check the WWW.TEMATLC.IT website for any updates to the latest firmware, manuals, and technical documentation.
10. This document is property of Tema Telecomunicazioni, It is forbidden any duplication and reproduction, even partial, as well as storage on any medium without written permission of Tema Telecomunicazioni.



This symbol in the descriptions indicates a general warning or a damage danger to equipment or people.



This symbol in the descriptions indicates useful information or a suggestion for the optimization of the device functionality.

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1. PRESENTATION

AD639SR is a IP SIP telephone call repeater which is registered on the VoIP PBX with its own telephone number and inserted in the night ringtone group or in any group where you want to repeat the phone call routed on that group. When an incoming call arrives, the system reproduces a warning sound from the powerful internal speaker. The system already has several call tones in memory that can be selected during the configuration, some of which show an increase in volume over time: they start with a low volume that increases progressively in case of no response. The default tone can be replaced by another by choosing from those supplied, or it can be freely registered by the user and loaded into the system via web browser with simple operations. The volume can be adjusted as desired.

AD639SR can be powered directly on the same LAN cable if it comes from a PoE switch, or from a PoE injector or 230Vac external power supply, both in the Tema catalog. Power supplies from PoE switches and external power supply can coexist. AD639SR incorporates an efficient 40W amplifier (with external power supply, 10W in PoE), in D-class.

The programming of the systems takes place remotely via LAN with few operations and in a few minutes:

- 1) Connect AD639SR in a LAN socket to a PoE switch with standard cat. 5/6 cable, or to a generic switch by powering it with an external power supply.
- 2) Connect with a browser and assign an IP address and the credentials of the LAN network.
- 3) Register into IP-PBX the number assigned to AD639SR in the space reserved for SIP account.
- 4) Enter the number assigned to AD639SR in the night group of the PBX, or divert incoming calls (in the absence of the PO) to the number assigned to AD639SR.

Some models of AD639SR can be supplied with a LED or FLASH Xenon optical indicator in different colors, to add a light signal to the acoustic signal. The luminous indicators are also available separately and can also be mounted later on outside the device, with the power supply available from the device itself and controlled by one of the 2 internal relays integrated in the system.

AD639SR is also equipped with an **External contact input** with multiple functions, for example: it provides for making a SIP call to a programmed IP address (peer2peer call) and informing the operator of the event with a specific voice message. The signal can be repeated a programmable number of times, the operator can interrupt the sequence with a code from the keyboard. Other examples of use will follow in this manual.

Multicast Audio Streaming for music and announcements broadcast. AD639SR handles 3 multicast channel in LAN for background music and announcements broadcasting. The generation of musical programs in streaming audio can be managed from a PC of the LAN/WAN network with the Tema "ADAM" management software or with the dedicated Tema Encoder AD615/S.

Total remote management via LAN, integrated Web Server. Programming, configuration, loading and listening to audio files, firmware release update, audio volume adjustment, backup and restore the configuration, device reboot.

AD639SR is part of the series of Audio over IP Tema "**SipComStage**" products tested and compatible with the most popular brands of PBX and Asterisk-based systems.

Other IP SIP Speakers from the "**SipComStage**" series



2. AVAILABLE MODELS AND ACCESSORIES



AD639SR

Without flashing light



AD639SR/LA

With orange LED flashing light



AD639SR/FT

With transparent Xenon FLASH flashing light



AD639SR/FR

With red Xenon FLASH flashing light



AD639SR/LM

Multicolor LED flashing light

Optional accessories



AD699/L10A

Flashing orange LED, for external connection



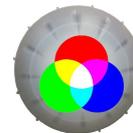
AD699/X10B

FLASH transparent Xenon flashing light, for external connection



AD699/X10B

Flashing red Xenon FLASH, for external connection



AD699/L10M

Multicolor RGB LED flashing light, external installation



AD699/RT

Adjustable support in horizontal and vertical, grey color, 5 kg capacity



AA-39P4

PoE injector 230Vac/48Vdc 0,5A.



AA-39E3

DIN Power Supply 220Vac/24Vdc-1,5A



AA-39E6V

DIN 220Vac/24Vdc-2,5° Power Supply

3. FEATURES AND PERFORMANCE

- 30W (10W PoE) IP wall speaker for indoor or outdoor installation with IP56 protection
- 40W power audio output
- 3 RX Multicast channel for Music/Announcements broadcast
- 1 TX Multicast channel for repeating current ring to other IP SIP devices
- 2 remote-controlled relays via LAN network or following the incoming telephone call
- 1 multi-function external contact input
- Possibility of broadcast a pre-recorded announcement, associated with the available input
- Alert service with dedicated messages following an external event
- Independent adjustment of audio volumes: multicast, ringtone
- Customizable audio files
- Great versatility combined with ease of use and programming
- P2P SIP Peer to Peer mode for alarm reporting
- Power supply via PoE (Power over Ethernet) 802.af with a single UTP cable for the connection or from an external power supply, even simultaneously
- Programming via integrated Web Server interface and password protection
- Possibility of software/firmware update via LAN
- Integration with local LAN, Ethernet LAN 100 BaseT port with RJ45 connector
- Possibility of issuing pre-recorded announcements at set times (up to 5 for each day of the week) or with annual calendar programming
- Possibility of issuing a daily pre-recorded announcement, at a set time or manually
- 8 accounts that can be registered in the PBX to have 8 different ringtones based on the user called
- Management via RS232 of the AD699/L10M multicolour flashing light to differentiate the colors and types of flashing
- Automatic adjustment of the emission volume based on the environment noise
- Ability to connect passive satellite speakers to dramatically increase volume and directivity

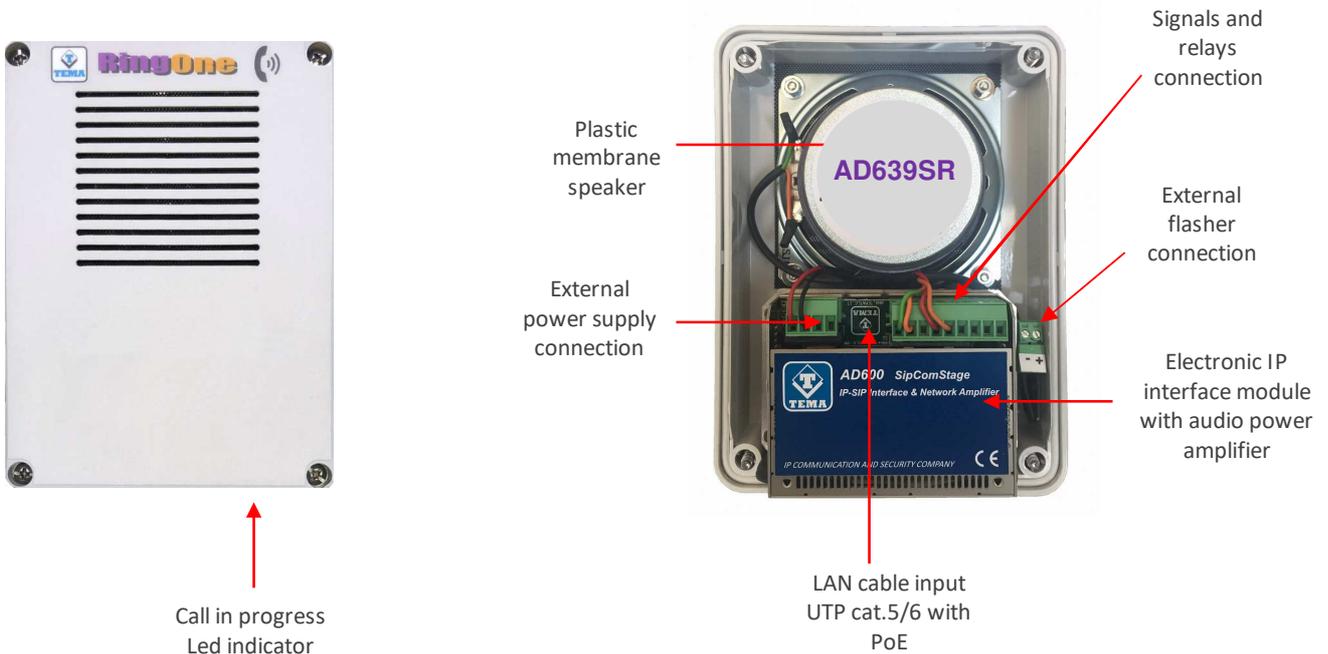
4. PACKING LIST

The systems are supplied with the parts included in the following list:

- One AD639SR device
- System documentation

5. TECHNICAL SPECIFICATIONS

LAN	TCP/IP Network 10/100BaseTx
Protocols	SIP 2.0, RFC 3261
RTP Multicast audio Streaming	G711 μ , G711a, G722, L16 from 16 to 44 kHz
Connection	SIP Server (IP-PBX) or P2P (Peer To Peer)
Power Supply	PoE, PoE Injector and/or external Ac/Dc power supply
PoE	802.3af class 0 12,95W
External Power Supply (Opt.)	230Vac / 12Vdc -1A, 24Vdc - 2A
Technology	580MHz MIPS CPU Microprocessor
Memory	128MB Ram, 32MB storage Flash
Programming	practical Web interface and password
Messagges/Sounds	prerecorded in the internal memory
Audio File Format	Windows .wav – 8K – 16 bit
Duration	60sec each
Bandwidth	350Hz – 6KHz
Power	D-Class Amplifier 40W on 4 Ohm
Acoustic pressure	100dB A (SPL)
Dispersion angle	110° @ 2KHz
Audio communication	Unidirectional
Inputs from buttons or external contacts	1 for alter/alarm
Integrated relais	2
Relays load capacity	Max 30Vdc – 1,5A
Signalings	Active Call Led
Installation	Wall mount, adjustable with optional accessory
Container material	Halogen free EN60754-2 Technopolymer
Storage temperature	From -20° to +65°C
Operating temperature	From -20° to +55°C
Relative humidity	Up to 90% non-condensing
Dimensions	119 x 70 x 59 mm (H x W x D)
Weight	1,8 Kg
Warranty	2 years, possibility of extension (Option)
Compatibility	CE, ROHS



6. OPERATION

In Stand-by and correctly configured, the system waits for incoming calls. When a call arrives, the device plays the programmed ring tone, at the set volume, without ever answering. The purpose is to repeat the warning of an incoming call (for example when the switchboard is in night mode or to repeat the signal in noisy environments).

On the PBX it is needed to create a call group that also contains the user number used for AD639SR. The activation of the ringer is also associated with the lighting of the front led and the flashing light (if provided).

During the call it is possible to configure the system to operate its own internal relays to which it is possible to connect an external flashing light that increases its warning effectiveness (AA-699xxx see Tema catalog).

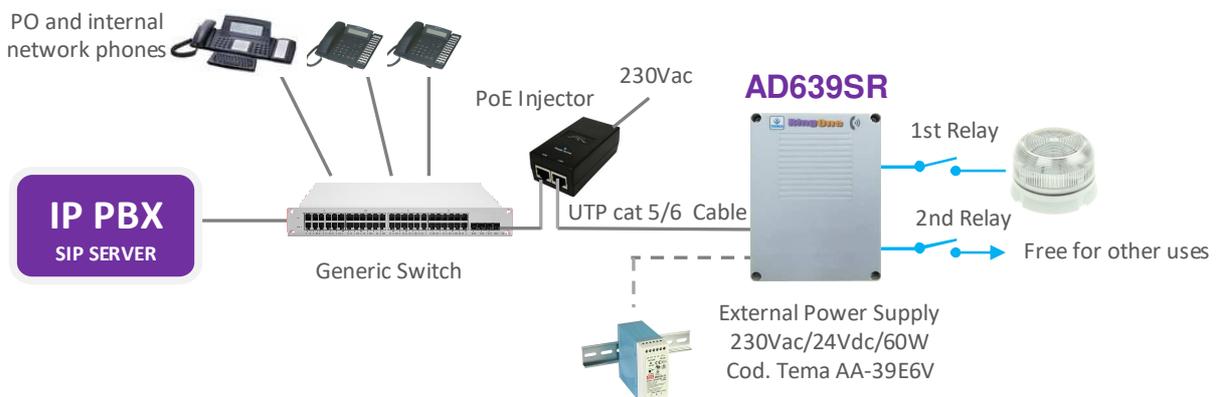
It is also possible to use the device for Multicast streaming sound broadcast. In this case the RTP audio broadcast on the network is reproduced amplified (to a different volume than that used for the ringer, useful for background music or warning messages).

Finally, the status change of an incoming alarm is always monitored, to which it is possible to associate a user to call and a message to be played to the answer of the called.

6.1. Device connection diagrams



• SIP telephone call repeater with PoE injector or external 230Vac power supply



Note: for other applications of AD639SR and insertion diagrams see the FAQ section in the Appendices at the end of this manual

7. OPERATING MODES

7.1. Calls to devices

The AD639SR device must be registered to a SIP PBX. It is normally inserted in the night ring group but can also be called directly with its number. In any case, however, it will never reply (the only purpose is the activation of the ringer and the eventual light signal).

Using the ADAM software or a microphone base and the AD615S encoder it is possible to broadcast an announcement in streaming (in unidirectional mode).

7.2. RELAY function

The internal relays can be used to connect any external flashers. In programming it is possible to decide whether they should be activated during the ringing of the incoming call and it is possible to choose also in which mode (flashing, steady, etc).

If they are not programmed to be activated during the call, they can only be controlled using the Tema ADAM software.

7.3. Calls generated from AD639SR for the acquisition of external contacts for special signalings

These are the calls that the system generates on the line connected to itself to warn after the trigger of the alarm input contact by the connected equipment (auxiliary devices or a button made available to users in the proximity of the device), for the details of the operation see paragraph 9.6.

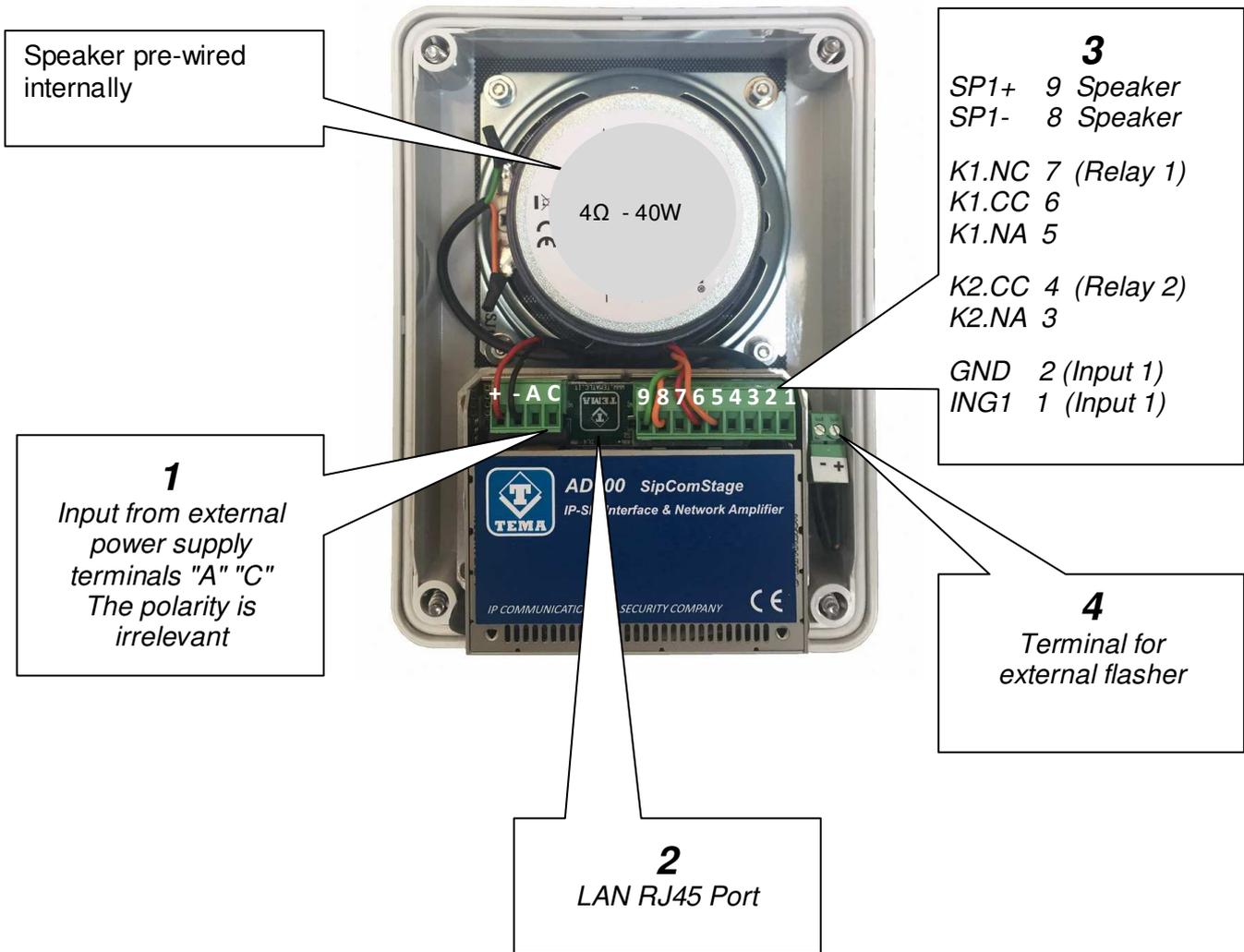
8. INSTALLATION OF THE DEVICE

8.1. Connecting the AD639SR internal module

Once the necessary equipment has been prepared for fixing the AD639SR device, it is first necessary to make the connections for its operation.

Inside AD639SR there is an electronic module for managing the communication functions on the VoIP network and for amplifying the audio signal. The connection of the signal cables from the field must be carried out by qualified technical personnel, operate verifying that no cable is live, also strictly comply with the indications of the voltage and current values for the power supplies and other parts of the system.

Follow the instructions given in the block diagram for the correct electrical connection of the system. On the following page, the detail of each terminal will be shown.



1 Removable 4-pole terminal block (screw connector connected to the electronic module)

+Vout	Terminal from which it is possible to withdraw power, POSITIVE
- (GND)	Terminal from which it is possible to withdraw power, NEGATIVE
A	Terminal to power the system, polarity irrelevant
C	Terminal to power the system, polarity irrelevant



At the "+Vout" output there is a + 12Vdc voltage when the device is powered via PoE, otherwise, at this output the voltage will be the same as at the terminals A-C. The use of "+Vout" is permitted as long as it is not exceeded a maximum 200mA current consumption and the load has a protection on the input current. Improper use of this output will permanently damage the unit.

2 RJ45 LAN port (present on the electronic module)

AD639SR requires a LAN cable to connect to the LAN network. If the cable also carries PoE power supply, it will not be necessary to supply the module with other power sources (for max 10W power). For higher powers it will be necessary to power AD639SR with a 24Vdc 2A or max 18Vac 2.5A power source.

See also appendix 2 at the end of the manual for the correct wiring of the LAN cable to the RJ45 connector.



Devices powered via PoE (Power over Ethernet) may only be connected with cables coming from inside the building, they are not allowed connections to LAN cables coming from outside the building.

3 Removable 9-pole terminal block (screw connector connected to the electronic module)

9 SP1+	Output terminal 1st Class-D amplifier, connected to the internal loudspeaker, positive front
8 SP1-	Output terminal 1st Class-D amplifier, connected to the internal loudspeaker, negative front
7 K1.NC	K1 relay terminal – NC normally closed contact
6 K1.CC	K1 relay terminal – CC central contact (maximum contacts load max 30V 1.5A)
5 K1.NA	K1 relay terminal – NO normally open contact
4 K2.CC	K2 relay terminal – CC central contact (maximum contacts load max 30V 1.5A)
3 K2.NA	K2 relay terminal - NO normally open contact
2 GND	Terminal related to the system power supply negative, for the alarm contact
1 ING1	Terminal for detecting the alarm contact



To terminals 1 (ING1) and 2 (GND) must only be connected a relay contact or a button free from any voltage to prevent permanent damage to the device.



Relay K1 is pre-wired to supply power to terminal 4 which supplies an external flashing light, relay K2 is free for other uses by the user.

4 Removable 2-pole terminal block (connector connected to the cable leaving the module)

+	Connect here the positive of the flashlight or external device
- (GND)	Connect here the negative of the flashlight or external device



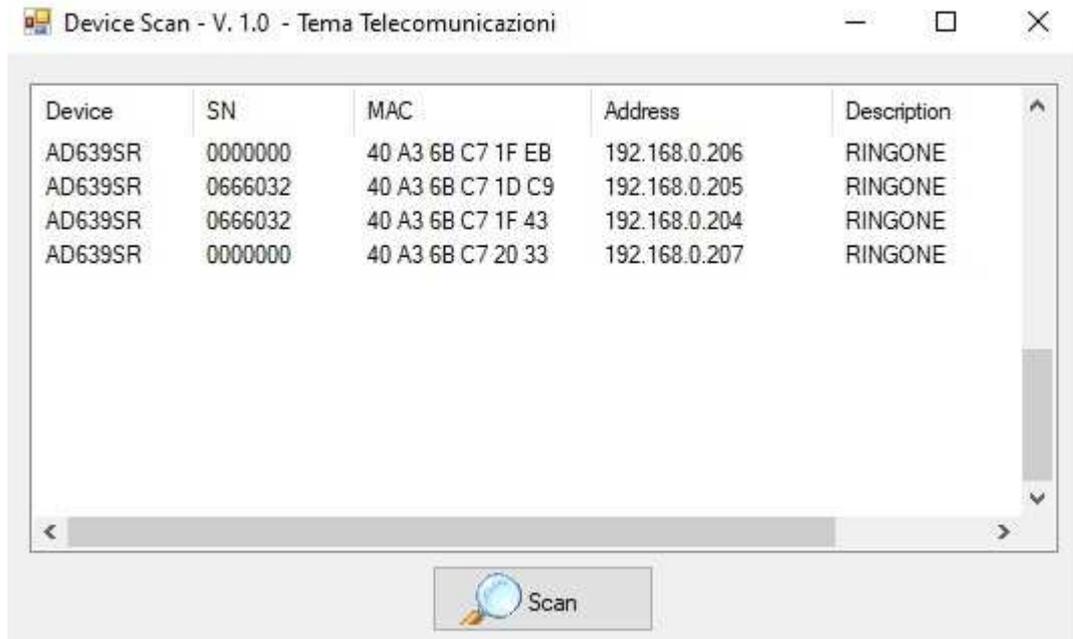
The power supplied by this terminal is protected and limited to 300mA maximum current, do not connect devices with a higher power consumption as internal protection would be activated.

9. PROGRAMMING

9.1. Preparation for the system parameters programming

Programming is done via the WEB interface. To gain access, simply connect an Ethernet cable from a PC or from a switch to the LAN port of AD639SR.

The system comes with active DHCP (dynamic setting of the network address) so the IP address is automatically assigned by the local DHCP server. To find out the assigned IP address use the appropriate TEMA network device scan program called "**devicescan-tema.exe**". The program can be downloaded from the website www.tematic.it section "Download/ Software".



This software will show all TEMA devices in the LAN network with their respective serial numbers, MAC address, IP address, description of the devices. By double clicking on the device it will be possible to manually change the IP address and the Netmask.



Please note that if the network setting is changed from Dynamic to Static, you will need to make sure you are using the same subnet configured on your computer.

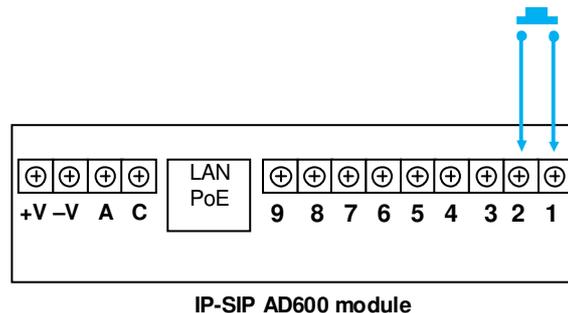
9.2. Lack of a DHCP Server

As already mentioned AD639SR is supplied configured in DHCP, if a DHCP server is not available the device will not have assigned any IP address and will therefore not be identifiable on the network by any scanning program, in this case proceed as follows:

- 1) Disconnect the power from the device, if powered in PoE, disconnect the network cable and reconnect it
- 2) Wait for the system to restart for about 1 minute, at the end you will notice a few flashes of the white LED at the bottom of the device
- 3) **Momentarily** short-circuit terminals 1-2 (alarm input)
- 4) The IP address of the system will be announced on the loudspeaker, in this case all "zeros" will be announced separated by the dot due to the absence of the DHCP server
- 5) Keep terminals 1-2 in short circuit for at least 3 seconds. With this operation the system automatically assigns the static IP address 192.168.1.10 with subnet 255.255.255.0 and will announce it on the speaker.
- 6) Remove the short circuit on terminals 1-2, switch the system off and on again
- 7) Now AD639SR will be reachable via web browser at the address 192.168.1.10 and identifiable by the "devicescan-tema.exe" program.

Note 1: this procedure is useful for knowing the IP address of the device (stopping at point 4)

Note 2: about 1 minute after the restart, you have a maximum of 2 minutes available to complete the procedure, after which the device returns to normal operating status and will activate the alarm input (terminals 1-2) and will no longer be possible to redo the above procedure. To repeat the procedure, it will be necessary to switch the system off and on again.



Still in the absence of a DHCP server, if you want to assign the static address 192.169.1.10 immediately, proceed as follows:

- 1) Disconnect the power from the device, if powered in PoE, disconnect the network cable and reconnect it
- 2) Wait for the system to restart for about 1 minute, at the end you will notice a few flashes of the white LED at the bottom of the device
- 3) **Permanently** short-circuit terminals 1-2 (alarm input)
- 4) The IP address of the system will be announced on the loudspeaker, in this case all "zeros" will be announced separated by the dot due to the absence of the DHCP server.
- 5) After a few seconds the system will automatically assign the static IP address 192.168.1.10 with subnet 255.255.255.0 and announce it on the speaker.
- 6) Remove the short circuit on terminals 1-2, switch the system off and on again
- 7) Now AD639SR will be reachable via web browser at the address 192.168.1.10 and identifiable by the "**devicescan-tema.exe**" program.

9.3. Access to programming

To program the device, it is sufficient to use a standard browser such as Explorer, Firefox, Chrome or others. The user/password with which to connect are **master/master**. Once logged in, it is possible to change the administrative password for the maximum safety of your device, see par.9.13

The use is very simple and intuitive, it is always visible on the left the menu for selecting the functions to be programmed, while on the right is shown the configuration window that is currently active. Any change will be confirmed by pressing the **"Apply"** or **"Save"** buttons. **Closing the browser or changing the page without selecting those buttons will make lost any change.**

As soon as you access the device, a mask will be shown that summarizes the general status of the system:

The screenshot shows the web interface for the AD639SR device. On the left is a navigation menu with options: Home, Network, SIP settings, Day/night mode, Alarm, Multicast, Auto announcements, Log, Maintenance, and Manual. The main content area is titled 'IP SIP Ringer Audio Alerter' and includes a 'Logout' button. The 'GENERAL INFORMATION' section lists: Serial number: 0667409, MAC address: 40 A3 6B C7 21 0B, AD version: 1.1.7 (circled with a blue oval and labeled 'Firmware version'), RG version: 1.0.4, Mode: Day, and Ambient noise: 48 dB (circled with a blue oval and labeled 'Environment noise'). The 'LAN' section shows IP address: 172.16.90.200, Subnet mask: 255.255.0.0, and Gateway: 172.16.0.1. The 'SIP' section lists eight accounts: Account ringer #1 through #7 are 'REGISTERED' (green background), and Account ringer #8 is 'NOT REGISTERED' (red background). The 'RingOne' logo is visible at the bottom left of the interface.

Any changes do not require restarting the device (except the change of IP address, and the software update).

9.4. Network parameters

On this page it is possible to set the network parameters, such as IP address, netmask, etc.:

The screenshot shows the web interface for the AD639SR device. The page title is "IP SIP Ringer Audio Alerter". The left sidebar contains a navigation menu with items: Home, Network (selected), SIP settings, Day/night mode, Alarm, Multicast, Auto announcements, Log, and Maintenance. The main content area is titled "LAN" and contains the following configuration fields:

Connection type:	<input type="radio"/> Dynamic <input checked="" type="radio"/> Static
IP address:	172.16.100.112
Subnet mask:	255.255.0.0
Gateway:	172.16.0.1
Primary DNS:	8.8.8.8
Secondary DNS:	8.8.4.4
Time server:	ntp1.inrim.it
Test address (ping):	

Below the LAN section, there is a "DISPOSITIVO" section with a "Description" field containing "RINGONE ONION". A "Save" button is located at the bottom of the configuration area. The top right corner of the interface features a "Logout" button and a "TIME: 11:11" display. The bottom left corner of the interface shows the "RingOne" logo.

In case you choose the static network configuration, gateway and DNS are only needed if you want the device to have the ability to access the Internet (for example to get the current date / time, in the example from the site ntp1.inrim.it).

The changes to the network settings are taken over by the device until the next reboot. Once you have completed the configuration steps so be sure to reboot the system and if necessary, change the network segment of your computer so that it can connect to the new address.

- **Connection type:** indicate the type of connection, Dynamic (DHCP) or Static.
- **IP Address:** indicate the IP address you want to assign to AD639SR.
- **Subnet mask:** indicate the subnet mask you want to assign to AD639SR
- **Default gateway:** indicate the gateway that can allow AD639SR to connect to the internet.
- **Primary/Secondary DNS Server:** indicate the addresses of the two DNS servers to be used.
- **Time server:** indicate the address of the server you want to use to have the time synchronization of the device.
- **Test address (ping):** if entered, this address is used by the system to verify the correct functioning of the network connection. It is advisable to enter the address of your pbx, first checking that it responds to ping requests.
- **Device description:** text that will appear on the search mask of the Adam software.

9.5. SIP parameters

Once the network parameters have been set correctly, you must configure the connection with the VoIP SIP PBX:

The screenshot shows the configuration page for the AD639SR device. The main title is 'IP SIP Ringer Audio Alerter'. On the left is a navigation menu with options like Home, Network, SIP settings, Day/night mode, Alarm, Multicast, Auto announcements, Log, Maintenance, and Manual. The 'SIP settings' option is selected. The 'SERVER SIP' section contains the following fields:

- IP address: 172.16.0.88
- Port: 5060
- Domain: 172.16.0.88
- Outbound proxy: 172.16.0.88
- Local port: 5060
- Expiration: 900

The 'ACCOUNTS RINGER NUMBER' section features a grid with columns 1 through 8. Below the grid are the following fields:

- User: 911
- ID Auth: (empty)
- Password: (masked with dots)
- Ringer volume Day: 2, Night: 2
- For noise environment: (volume increment: +2 for normal noise, +4 for high noise)
- Ringer type: Ring default (dropdown), with buttons for Test Ring ON and Test Ring OFF
- Increasing volume:
- Relay activation 1: Burst (dropdown)
- Relay activation 2: Burst (dropdown)
- Flasher mode: Rapid flash + pause (dropdown)
- Flasher color: Green (dropdown)

A 'Save' button is located at the bottom of the configuration area. The top right corner shows a 'Logout' button and the time '22:33'.

- **SIP server address**: specify the IP address of the SIP PBX to which AD639SR should connect.
- **Port**: is the port number of the SIP PBX with which AD639SR must operate. Generally it is the 5060, but some stations use a different port.
- **Domain**: enter the domain to which register the system.
- **Outbound proxy**: some PBXs require that the extension number to call is followed by the proxy address. In most cases this field can be left empty.
- **Local port**: generally the 5060 port is used, but it is possible to specify a different number (i.e. for particular routing tables).
- **Expiration**: indicates how many seconds the device should check the correct registration of the client.
- **User/password**: credentials for the registration of the extension (which obviously must have been already created on the PBX).
- **ID Auth**: additional authentication field (if required by the pbx)
- **Day ringtone volume**: it is possible to set the volume used to reproduce the sound of Night Ringer. It is also the volume used to reproduce the prerecorded announcements.
- **Night ringtone volume**: it is possible to set a lower ringtone volume in the night time slots in order not to disturb any nearby homes during the night hours of company inactivity. The parameter will only be active if the times have been set on the "Day/Night Mode" programming page.
- **For noisy environments**: see further on par. 9.8.
- **Ringer type**: it is possible to choose up to 8 pre-programmed ring tones in the device plus a customizable one (that coincides with the default one). It is possible to change it in the maintenance page, see par.9.13

- Test Ring ON-Test Ring OFF: buttons that activate the ringer for the purpose of testing the sound emitted, for account 1 only.
- Increasing volume: with this option, the volume will start low and will increase, due to no response over time, until reaching the maximum volume set in "Ringtone volume".
- Relay 1-2 activation: it is possible to choose whether the 2 relays are to be activated during the call and in which mode.
- Flasher mode/Flasher colour: these settings are valid only in the AD639SR/LM model equipped with a Multicolor LED flasher internally driven via RS-232 serial port.

9.6. Multiaccount settings

In practice, the device can be registered on a SIP server with 8 different accounts in order to be inserted in 8 groups with associated SIP telephones. AD639SR changes the outgoing tone according to the extension number called.

Different tones (Audio Clips) are provided that the user can choose and associate with each account, or customize by himself with different audio contents for each group by creating audio files in 8KHz-16bit format and loading them via web browser on the device.

It is possible to configure up to 8 accounts with user number and authentication credentials, for each account it is possible to program all the parameters shown for account 1.

If the system is equipped with a light signal, relay 1 activates it in the presence of an active call, if a light signal is used that is not in self-flashing mode, it is thus possible to differentiate for each account called, in addition to the sound, also the flashing mode of the light signal.

Remember to save the configuration made with the "save" button.

9.7. Ringtone customization for each account

In the "Maintenance" section it is possible to upload a personalized ringtone audio file for each programmed account, if desired different from the default ringtones provided. Prepare the composed ringtone files in 8KHz-16bit .wav format and upload them to the respective account locations.

9.8. Automatic mode “For noisy environments”

Checking this parameter makes the device sensitive to ambient noise. The system continuously monitors the noise level present through the built-in microphone and stores the last value before a call to be repeated. The ambient noise decibel value is displayed on the "Home" page

For example, if the value 4 is set in the "Daytime ringtone volume" field and the ambient noise detected is lower than 56dB (typical noise of an office) the ringtone volume will be kept at 4 (no effect).

If the ambient noise detected is more than 56dB but less than 76dB (typical noise of a vacuum cleaner) the ringtone level will be adjusted by 2 steps upwards (equivalent to 6).

If the ambient noise detected is more than 76dB (typical noise of factory machinery in operation) the ringtone level will be adjusted by 4 steps (equivalent to 8).

Important Notes:

- 1) If this parameter is used, it is preferable NOT to activate the "Increasing volume" check as it is not useful.
- 2) With power supply from PoE switch, do not set the "Daytime ringtone volume" higher than the value of 4 to limit the power required from the switch for automatic volume increases in the event of maximum ambient noise. If necessary, power the device with the external 220Vac/24Vdc power supply cod. Tema AA-39E6V.

9.9. Day/Night mode

The system can activating the day/night operating mode automatically (as long as it is synchronized with a time server) or manually. The day/night mode, as you can see in the next paragraph, is used to differentiate the numbers to call in the event of an incoming alarm:

The screenshot shows the configuration page for the IP SIP Ringer Audio Alerter. The interface includes a sidebar menu on the left with options like Home, Network, SIP settings, Day/night mode (selected), Alarm, Multicast, Auto announcements, Log, and Maintenance. The main content area is titled 'IP SIP Ringer Audio Alerter' and features a 'MODE' section with radio buttons for 'Automatic' (selected), 'Day', and 'Night'. Below this is a 'NIGHT BANDS' table with columns for Day, from, to, from, to, from, to, from, to. The table is populated with data for Monday (23:59 to 08:30) and other days. A 'Save' button is located at the bottom of the table. The top right corner has a 'Logout' button and the current time '11:16'.

Day	from	to	from	to	from	to	from	to
Monday	23:59	08:30						
Thursday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								

It is possible to select the automatic mode (in this case the time bands set in the following table come into operation, outside the time bands set the system is in "day" mode) or manual and in this case the switch from day to night it takes place only through the programming web page.

The current mode is visible on the main page (Home).

9.10. Alarm input settings

In this page it is possible to program the behavior of the acquisition input of the external contact (Terminal 1-2 of the 9-pole terminal block).

The screenshot shows the 'ALARM INPUT CONFIGURATION' page for the AD639SR device. The interface includes a sidebar with navigation options: Home, Network, SIP settings, Day/night mode, Alarm (selected), Multicast, Auto announcements, Log, Maintenance, and Manual. The main content area contains the following settings:

- Function active:
- IP address DAY: 172.16.90.118, NIGHT: []
- Call attempt time: 60
- Attempts: 2
- Separation: 10
- Delay: 0
- Alarm stop code: 43
- Input inversion:
- Announcement: Volume: 4

A 'Save' button is located at the bottom of the configuration area. The top right corner displays a 'Logout' button and the time '22:59'.

- **Function active:** indicates whether to monitor the status of the alarm input or not
- **DAY/NIGHT IP address:** IP address of the phone to contact in day or night mode when the alarm occurs. A P2P SIP call is made with customizable "Alarm" message customizable in "Maintenance" web page
- **Call attempt duration:** duration in seconds of the call attempt.
- **Separation:** separation, in seconds, between one call attempt and another (max 999).
- **Delay:** is the minimum time, in seconds, before the input status change is evaluated. It can be used, for example, to mask a door indicator left open after the visitor has entered. Assuming that the maximum time that the pedestrian entrance must remain open is 30 seconds, only at the end of this time a warning telephone call would be sent to the staff in charge.
- **Alarm stop code:** code to dial on the called telephone to accept and silence the alarm (max 3 digits).
- **Input inversion:** normally the contact is open and the alarm occurs when the contact is closed. Activating this flag it is possible to instruct the device to behave in the opposite way (the contact is normally closed and the alarm occurs at opening).
- **Announcement:** the activation of the input (of the contact connected to him) causes the broadcast of a pre-recorded message on the local speaker before the call to the IP set is made. The "Announcement" message can be customized on the "Maintenance" web page. The volume of the local announcement output can also be adjusted.

The system can generate a VoIP call to alert, after triggering the alarm input contact (from auxiliary devices or from a button made available in the vicinity) an appointed operator.

A prerecorded message is played back to the called party. It is possible to invert this logic, so the triggering of the signaling can occur following the opening of the contact connected to the input.

AD639SR continuously monitors the status of the contact and in the event of activation it will begin to call the person who will manage the situation detected on the programmed telephone number and reproduce the message associated with the event. It is possible to define an acquisition / acknowledgment code for the alarm signal that the person called must enter to inform the device of the taking of the alarm signal as notified. If the called number proves to be busy or does not answer or in any other case where AD639SR does not receive the acquisition / acknowledgment code anyway, at the end of each single call attempt it returns in stand-by and it is ready for a new alarm notification.

When the AD639SR receives the acknowledgment code, the alarm condition signaling stops and no further notification calls will be made. To be able to be triggered again the notification phase of an activation, the condition that had triggered the previous notification must return to stand-by. To Only following the occurrence of a new contact activation condition, the notification cycle with notification calls restarts. In practice: if a connected contact closes and its activation is detected, AD639SR starts making alert calls.

In the event that the person called by the system reply and correctly enters the acknowledgment code, the alert calls will be terminated. To trigger a new cycle, the contact must reopen and close again.

The alarm text message can be modified in the "Maintenance" page.

9.11. Multicast

In the multicast mode, AD639SR will listen to the specified address/port, and can reproduce on its speaker any received audio streaming. This function has a lower priority than the normal telephone operation of the system (outgoing or incoming calls will block or prevent the reproduction of the audio stream).

There are 3 multicast channels available for reception with different priorities, from the most priority (bottom) to the least priority (top). Normally the higher priority channel is used to receive service announcements and is set to a higher volume, the lower priority ones, which are muted in the presence of the higher priority channel, can be used to transmit low volume background music. Volumes are adjustable for each multicast channel.

Multicast transmissions can be performed from normal SIP telephones with this function, from the Tema AD696/CT4 or /CT8 console, from the Tema AD615 encoder with 2 channels and microphone base for launching announcements and music, finally from the Audio management Tema ADAM software.

The system also has an outgoing Multicast channel which can be used to repeat the active ringtone in audio stream to other receiving IP Tema loudspeakers to broadcast the call to other areas of the system.

TEMA TELECOMUNICAZIONI IP SIP Ringer Audio Alerter Logout

AD639SR TIME: 23:03

MULTICAST AUDIO RECEIVE

Function active: Enable Disable

IP address:	239.255.15.1	Port:	8001	Volume:	2	priority <
IP address:	239.255.20.1	Port:	8001	Volume:	5	
IP address:	239.255.25.1	Port:	8001	Volume:	5	priority >

REPLICATE RINGER IN STREAM

Function active: Enable Disable

IP address:	239.255.25.59	Port:	8001
-------------	---------------	-------	------

Save

RingOne

9.12. Automatic announcements

It is possible to schedule announcements at set times on the local speaker.

DAILY ANNOUNCE ACTIVATION

Start time : 15:10
 Repetitions : 2
 Separation : 10

Activate now **Stop**

MESSAGE VOLUME AND RELAYS ACTIVATION

Volume : 4
 Relè 1 : Blinking 1
 Relè 2 : Continuous

PERIODIC ANNOUNCE ACTIVATION

Function : Deactivated From table From file

ANNOUNCE TABLE

Day	time	time	time	time	time
Monday	21:20	21:21	21:22	21:23	21:24
Thursday	10:48	14:15	14:19		
Wednesday	23:57	22:08	22:09	20:00	22:11
Thursday	10:27	23:51	23:52	23:53	23:54
Friday			11:00		
Saturday					
Sunday				12:00	

Save

È possibile scegliere il volume che debba avere la riproduzione del messaggio nonché l'eventuale azionamento dei due relè interni e la modalità di funzionamento (Lampeggiante, a chiusura continua del contatto, ecc.).

Daily activation:

it is possible to automate the diffusion of a daily announcement (which will take place at the set time) for each day. It will be reproduced for the number of repetitions, with separation between a message and the other given by the number of seconds set. It is also possible to manually activate the message (with the "Activate now" button) or stop playback (with the "Stop" button). If the manual activation mode is only used, it is not necessary to indicate the start time.

The message can be modified in the "Maintenance" page. Audio files must be .wav 8KHz – 16 bit format.

Periodic activation from table:

if this function is activated it is possible to indicate in the table below, for each day of the week, up to five different times.

Periodic activation from file:

it is possible to upload a text file in "csv" format (easily editable with "Excel") that contains, for each day of the year, up to 5 times in which to make the announcement diffusion. To compile the file simply download the default one already present (and empty), modify it and re-upload it.

Notice: do not change the written months, are used by the device to index itself in the document.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
250		28													
251		29													
252		30													
253		31													
254	set														
255		1													
256		2													
257		3													
258		4													
259		5													
260		6													
261		7	09:00-1	12:30-2	17:30-3										
262		8													
263		9													
264		10													
265		11													
266		12													
267		13													
268		14													

In the example it was indicated that on September 7 (of each year) message 1 should be reproduced at 09:00, message 2 at 12:30 and message 3 at 17:30.

It is possible to program messages from 1 to 6, but the AD639SR system **only uses message number 1**.

NOTE:

since the device does not have its own internal clock, the automatic diffusion of messages can take place only if it is synchronized with a time server (which can be one into the local network or any other on the internet, see the "Network parameters").

9.13. Maintenance

On this page, you can change the alarm and announcement messages, set custom ringtones for each account, change the current firmware version, and backup/restore the system configuration:

Messages

In this window it is possible to change/listen to the messages. The "Alarm" message is the one reproduced during the activation of the alarm: when the callee answers, the message is reproduced several times until the stop code is entered or a timeout expires. "SIP Alert Call Button" function.

The "alarm announce" message is reproduced on the local loudspeaker when the relative option is active in the alarm programming screen (par. 9.6) and when the corresponding input is activated. The message is broadcasted before making a call to a telephone.

Finally the "Night Ringer" message is the one reproduced during the general night call (par. 9.4)

Configuration

You can back up the current configuration or restore a previously saved one. It is also possible to reset the configuration to the factory value.

Master user password

By default, the configuration page is accessible using as user/password master/master. The user cannot be changed while his password is. To be able to change it, you must enter the old password and the new password with confirmation..



Make a note of the new credentials introduced in order to be able to log back into the system later!

Firmware

Any new firmware or libraries can be loaded through this section. Any updates are released by Tema's technical laboratory to correct any malfunctions or to extend the services. To update, simply select the file to upload, upload it to the device and restart it. The restart key can be used even if you are not updating..

9.14. Diagnostic logs

To identify small configuration problems, it is possible to activate a diagnostic summary on the activity of the VoIP channel of the device.

The screenshot shows the web interface for the AD639SR device. The top header includes the TEMA logo and the title 'IP SIP Ringer Audio Alerter'. A 'Logout' button is in the top right. On the left is a navigation menu with 'Log' selected. The main content area is titled 'ACTIVITY LOG' and contains a scrollable list of system events. A 'Clear' button is located at the top right of the log area.

```
07/02/21 15:10:00 [-] M: emissione annuncio giornaliero
07/02/21 15:10:00 [-] M: setvol 50 (0-37)
07/02/21 15:10:00 [-] M: /www/ann1.wav
07/02/21 15:10:00 [-] M: ampli ON
07/02/21 15:10:00 [-] L: sip_hungup
07/02/21 15:10:02 [-] M: setvol 70 (0-37)
07/02/21 15:10:10 [-] M: ripetizione annuncio giornaliero
07/02/21 15:10:10 [-] M: setvol 50 (0-37)
07/02/21 15:10:10 [-] M: /www/ann1.wav
07/02/21 15:10:10 [-] L: sip_hungup
07/02/21 15:10:12 [-] M: setvol 70 (0-37)
07/02/21 15:10:20 [-] M: ampli OFF
07/02/21 15:10:42 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:12:43 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:14:44 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:16:45 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:18:46 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:20:47 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:22:48 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:24:49 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:26:50 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
07/02/21 15:28:51 RNG : status:Registration on sip:172.16.0.88:5060
failed: no response timeout
```

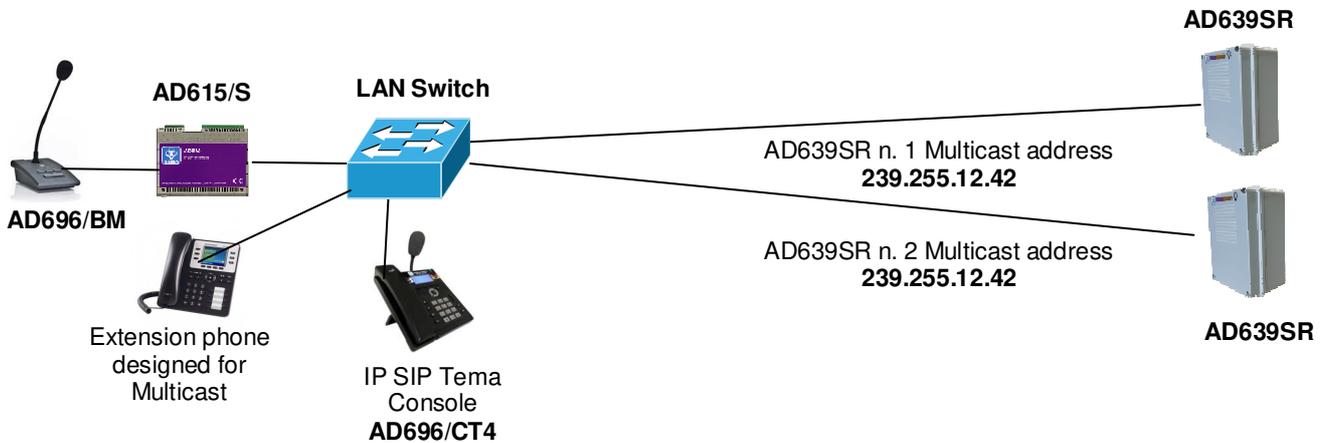
The system keep the history of activities, that will be deleted when it exceeds about 1 MB in size. To facilitate diagnostics, it is also possible to delete the entire log to start from scratch with the "Clean" button.

9.15. Multicast Audio Streaming for announcements

In a LAN, the Multicast term indicates the possibility of distributing information to a group of terminals. Multicast uses class D addresses ranging from 224.x.x.x to 239.x.x.x. In our case AD639SR is able to receive audio in Multicast and reproduce it amplified. The audio can be generated from a PC software application (for example Adam or VLC) or directly from an IP SIP phone. The received audio in streaming is useful for reproducing voice announcements, also called "Paging". Obviously the streaming is unidirectional, in the sense that the audio stream is sent from the source to the destination but not vice versa. Streaming audio can be sent to several terminals at the same time (all of which have the same Multicast address) or only to specific distinct terminals (each with its own Multicast address). Only one audio reception address can be programmed (unlike other Tema speakers which allow up to 16 multicast addresses), with its own playback volume. The audio supported by this mode is in the G.711 (aLaw or μ Law), G722 or linear 16 bit high quality format (proprietary format, spread through the AD615/S with an AD696/BM microphone base, a phone with function keys for multicast transmissions or an Intercom AA-540).

Example 1 General call announcement

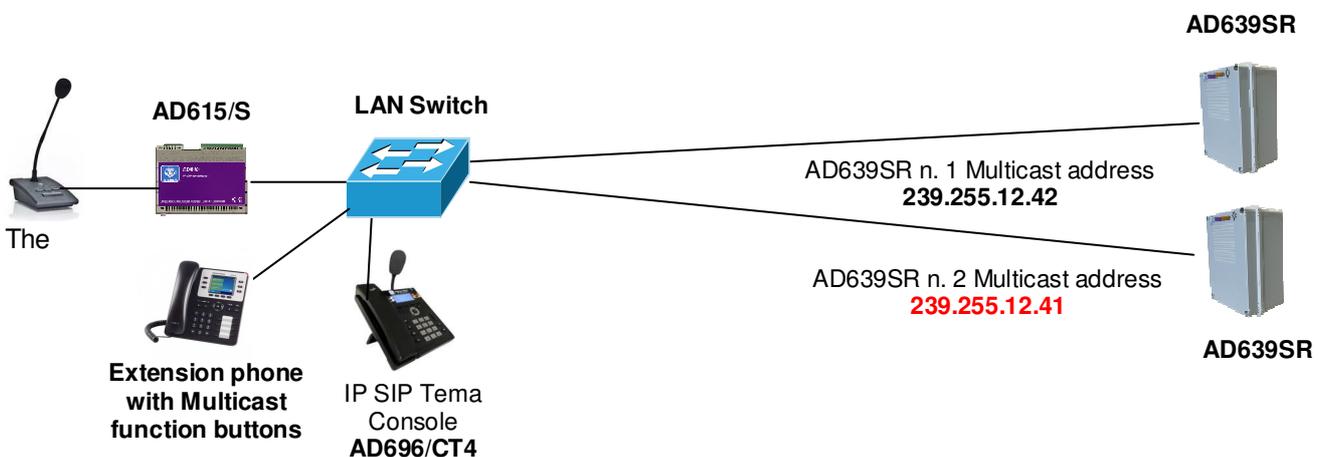
There are two systems in a plant connected to the same network switch. From a telephone, I make a voice announcement via Multicast at the address 239.255.12.42: both AD639SR systems will play the announcement audio message. Many more devices than those shown in the example can be connected, as there is no limit.



Both systems will play the announcement audio message. Many more devices than those given in the example can be connected, since there are no limits.

Example 2 Announcement on different devices

In the plant there are 2 systems with different Multicast addresses: the telephone, by selecting to send the Multicast voice to one or the other Multicast address, will decide which device should send the message in streaming.



10. APPENDIXES

10.1. FAQ Frequently Asked Questions

Can AD639SR be installed outdoor?

Yes, the enclosure is IP56 protected (if correctly installed) and operates in a temperature range from -20° to +55°C.

How can be AD639SR powered?

The AD639SR can be powered directly from the UTP LAN cable via a PoE switch, otherwise it can be powered at 230Vac with a PoE injector or an external power supply, both in the Tema catalog. Note: for maximum power the external 230Vac power supply is suggested.

AD639SR works with an Asterisk VoIP PBX?

Yes. AD639SR has also been tested with all the PBXs of the most prestigious brands such as: SIEMENS - AVAYA - ALCATEL – PANASONIC – SAMSUNG - NEC - 3CX - CISCO CUCM - LG - WILDIX - AASTRA - ASCOM - NITSUKO - SELTA – PHILIPS - MITEL and ASTERISK BASED SYSTEMS

How can be installed and put into service?

Few minutes:

- 1) Connect AD639SR in a LAN socket to a PoE switch with standard category 5/6 cable, or to a generic switch by powering it with the external power supply.
- 2) Connect with a browser and assign an IP address and the credentials of the LAN network.
- 3) Register in the IP-PBX the number assigned to AD639SR in the space reserved for the SIP account
- 4) Enter the number assigned to AD639SR in the PBX night group, or divert incoming calls (in the absence of the P.O.) to the number assigned to AD639SR.

Upon the arrival of an incoming telephone call to the PBC the same will be repeated at high volume by AD639SR with sounds freely chosen by the customer in the device. A luminous indicator or a "Flash" available in the catalog can be connected to the system to add a light signal in addition to the acoustic signal.

Is the sound played as a call repeater fixed?

No, it is possible to replace it at any time remotely via Web Browser between different supplied audio files. It is also possible to insert one customized by the customer in the 8KHz-16bit wav audio format as specified in the technical manual.

Can the file also be a part of a piece of music?

Of course, the ideal duration is 30-60 seconds, but if longer is needed, it is possible to get up to 8 minutes.

And if, despite the considerable power of the AD639SR, it is insufficient for large premises or warehouses?

It is possible to connect another AD639SR, or more systems, to another location to cover the entire area, it is sufficient only a LAN socket with PoE and the registration of additional devices in the specific group of the VoIP PBX. In this case it is preferable to program the same tone sound in all devices.

I can't get a UTP cable to the place where I need to install AD639SR, can I use a Wi-Fi link?

Yes, AD639SR is a normal LAN network terminal, in this case it is needed a client access point with the LAN RJ45 output to AD639SR and a power supply (for example model AA-39E3) connected to a 230Vac network socket in the immediate proximity.

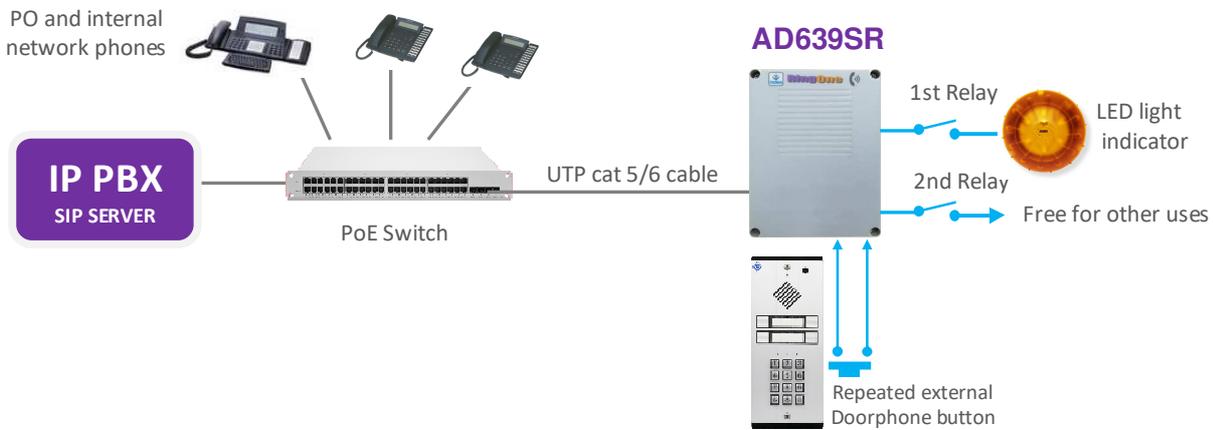
I do not want the sound at high volume, I am interested that when a phone call arrives only a light signal is activated, is it possible?

Of course, it is sufficient to program the volume of the internal amplifier to zero to cancel any sound on the arrival of a call and activate only the relay that activates the light signal which can be a classic LED or FLASH with white and red or other colors.



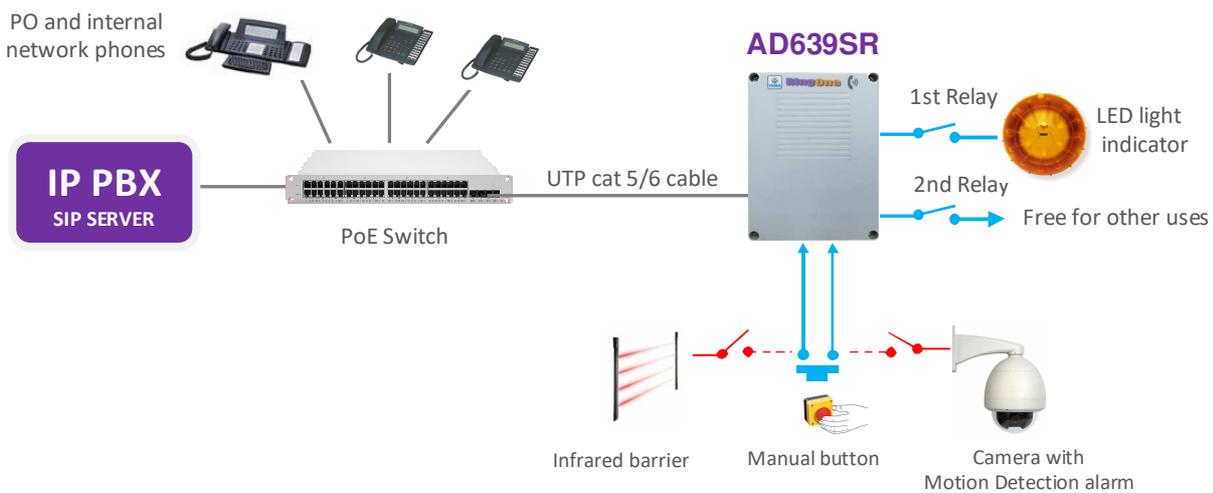
Can AD639SR be used simultaneously as a repeater of the doorphone call button at the entrance?

Yes, simultaneously with the function of repeater of telephone calls and with diversified tones.



... and as a deterrent and alarm signaling?

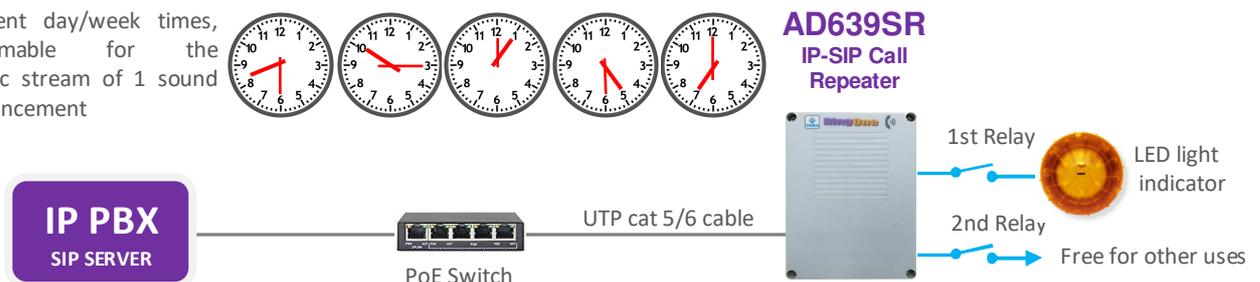
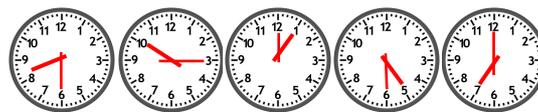
Yes, as an alternative to the function described above, AD639SR has an alarm input to activate a deterrent announcement locally, at the end it makes a phone call to a programmed number by sending a warning message.



What else can AD639SR do?

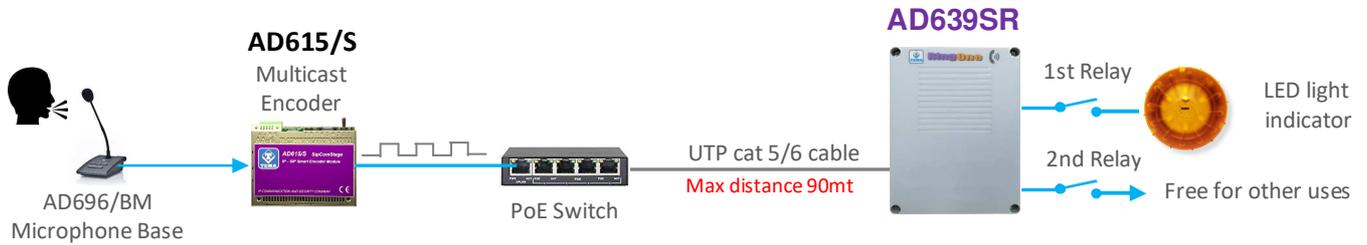
A further function of the system is that of being able to program up to 5 daily schedules in which to transmit a sound or an announcement of warning and information. For example in a school it can reproduce the sound of the bell for the beginning and the end of the lessons, in a factory the notice of beginning/end of the working time. It is possible to import a .csv/excel file for an annual programming.

5 different day/week times, programmable for the automatic stream of 1 sound or announcement

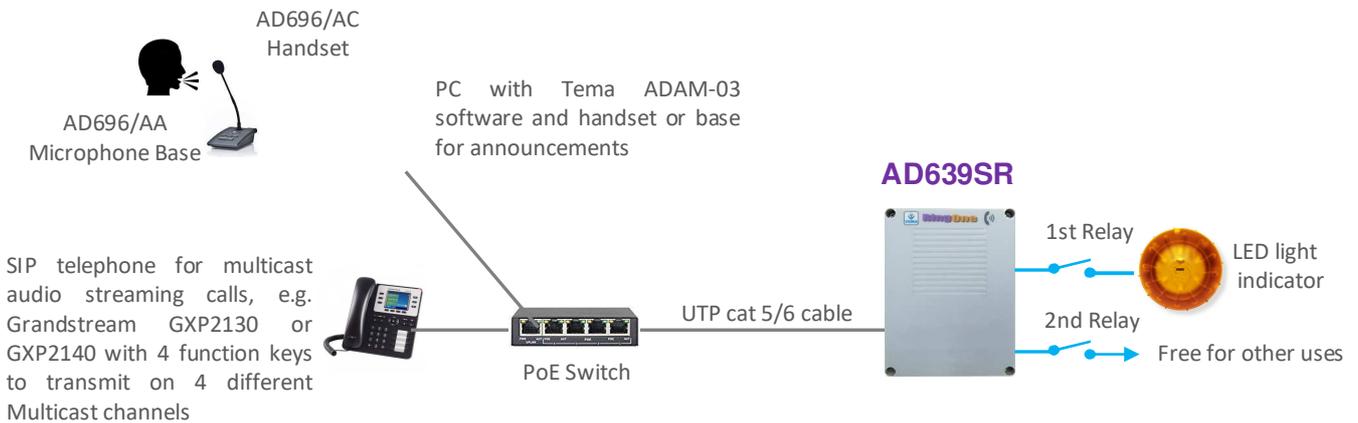


Is it possible to use AD 639R as a message announcer?

Of course, by connecting a microphone base and an Encoder in the Tema catalog it is possible to create an efficient and powerful audio system for announcements with Chime without laying additional cables since the system uses the existing LAN network.

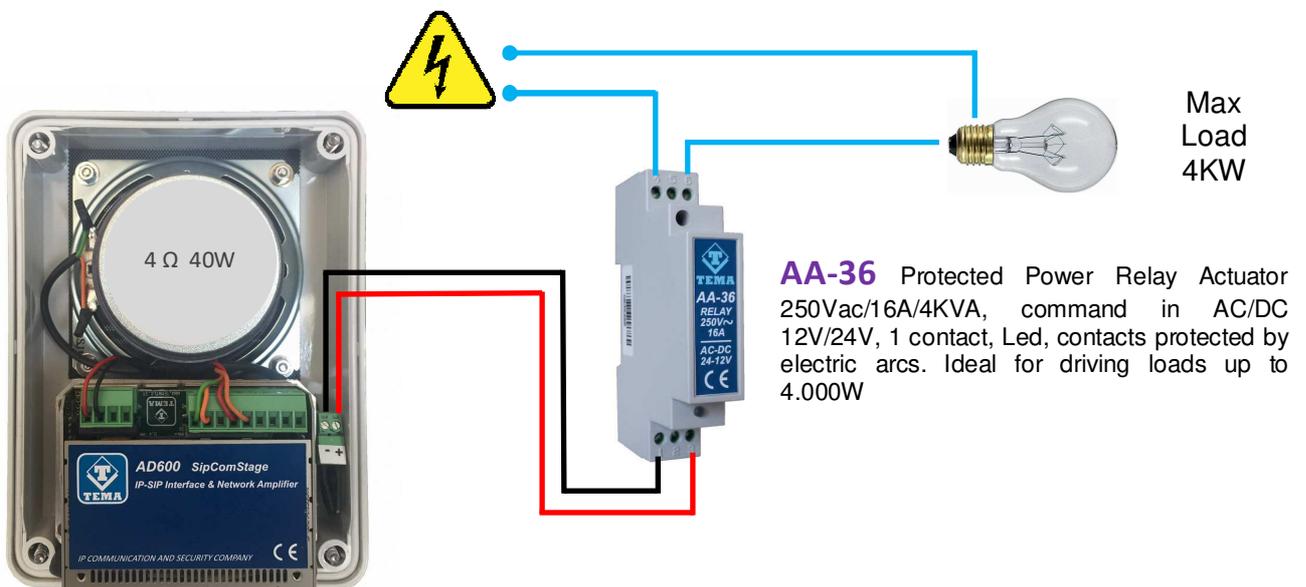


Or it is also possible to make announcements from the TEMA ADAM software or from phones that can manage Multicast transmissions.



Using the AD 639SR to drive loads at 230Vac up to 4KW

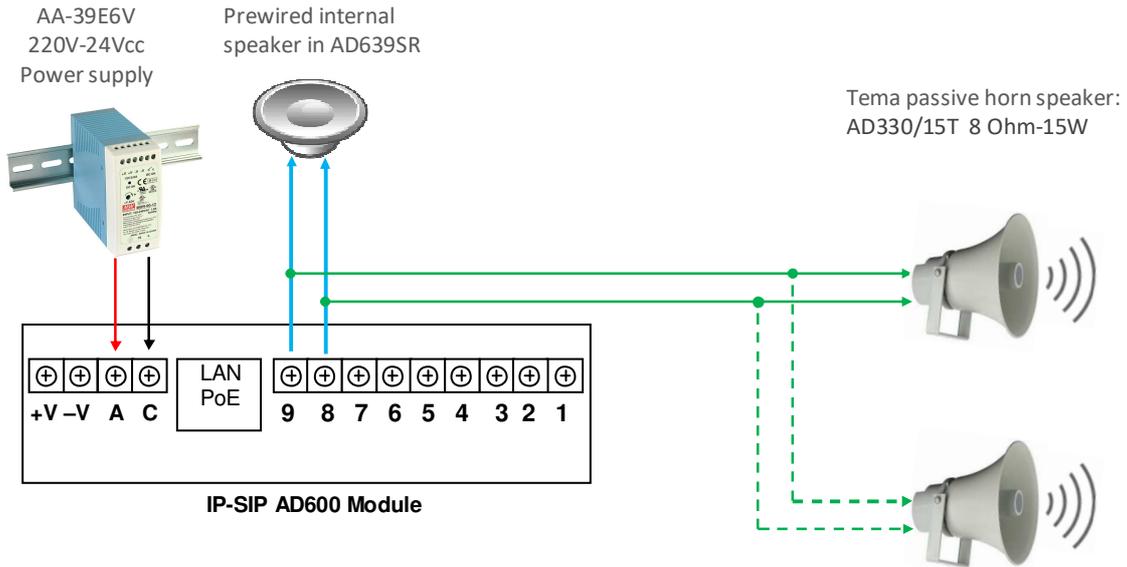
If you want to drive 230Vac loads with currents up to 16A, it is needed to connect a power repeater relay (Tema code AA-36) as shown in the diagram. For correct connection refer to the AA-36 technical manual.



10.2. Appendix 2: Connection of passive satellite speakers

AD639SR can directly drive another 2 passive satellite speakers with the aim of strengthening the sound, directing it towards a dark area or repeating it in an external area or in other rooms of the installation. To take advantage of this possibility, the AD639SR must be powered by the external 220Vac/24Vdc-2.5Amp power supply (Tema code AA-39E6V).

The additional satellite loudspeakers are connected directly in parallel to the amplifier module terminals 8-9, the distance of the loudspeakers from the AD639SR system can be up to 50mt using 2.5mmq electric cables. All loudspeakers with impedance not lower than 8 Ohm and power not lower than 15W are compatible.



10.3. Appendix 3: Use of the AUDACITY software for audio files recording

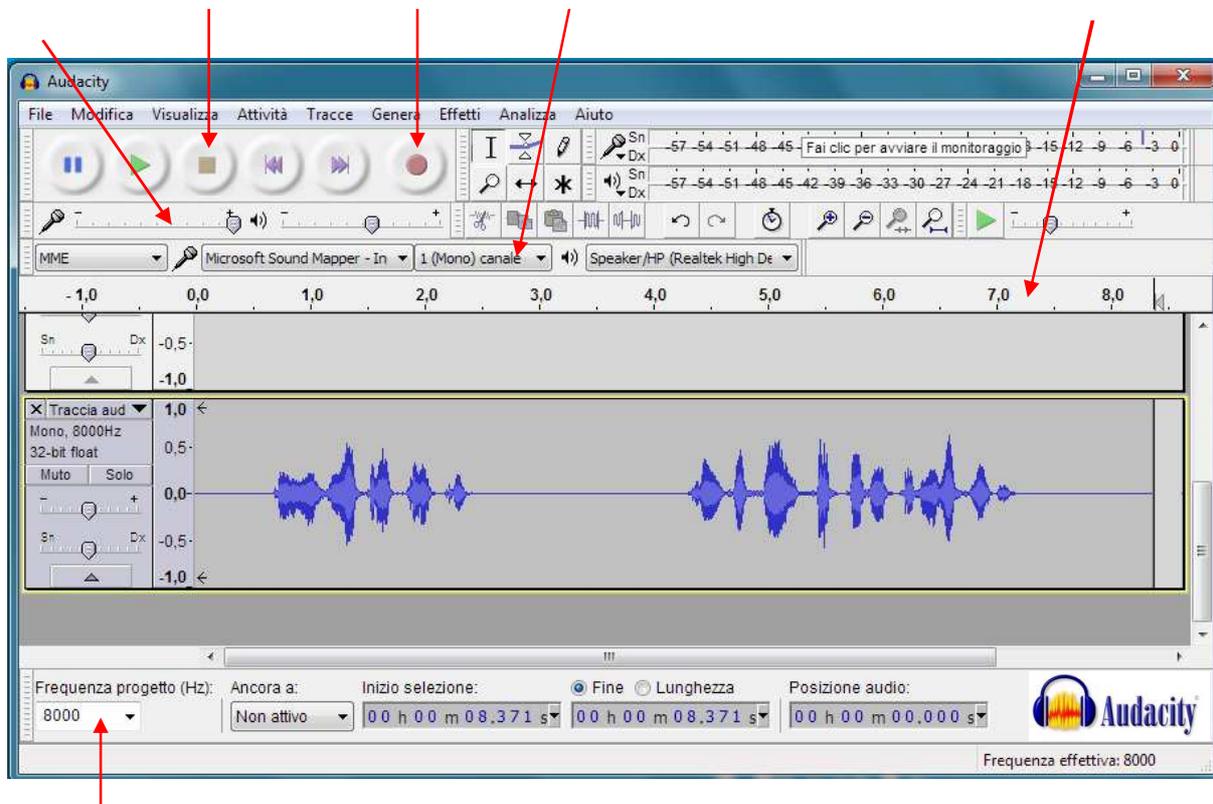
For recording your audio files, it is possible to use one of the free softwares such as AUDACITY downloadable for free from the link <http://www.audacityteam.org/> remembering to record and save audio files in .WAV format at 8KHz-16Bit Mono, other audio file formats will not work with the AD600 series devices. Below there are some informations about basic operations. For more information on the AUDACITY program, please refer to the manufacturer program guide.

Proceed as follows to record a message from the built-in microphone or connected to the PC.

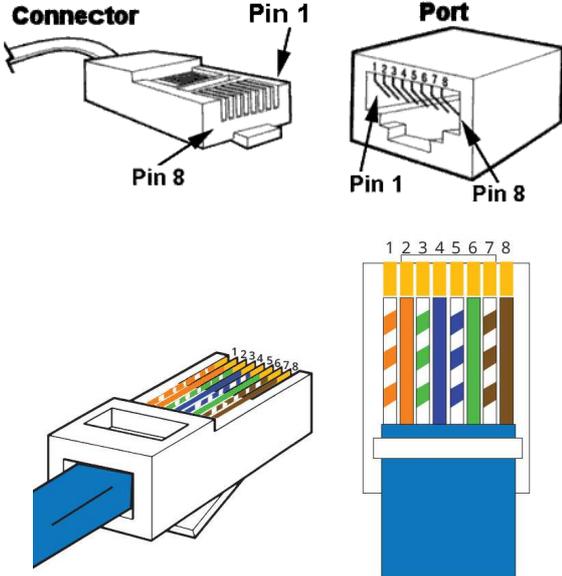
1. Select the 8,000Hz sampling rate, click Start Recording and start talking.
2. To end the recording, click on Stop recording, listen to the recorded audio, and then repeat recording if not optimal. To delete the previous recording, simply select the audio track (crawl from start to finish), press the "Delete" button and repeat the recording. With this procedure it is also possible to delete small parts of silence or sound inside the track.
3. To save the recording click on "File", "Export Audio", give a name and select in the "WAV (Microsoft) 16-bit PCM format" drop-down list. The saved file is ready to be used on all devices in the AD600 series or used with the VLC program (see previous appendix) to be sent as Multicast audio streaming.

The AUDACITY software allows a large number of audio signal processing such as: amplification/reduction of audio levels, duplication of track parts, elimination of silences, insertion of DTMF tones or tones, noise reduction, etc. For optimal use please refer to the product manual.

NOTE: TEMA provides you with its own internal recording studio for the creation of professional prompts with multilingual speakers from texts on customer specifications.



10.4. Appendix 4: Cabling of a UTP RJ45 network cable according to the standard EIA568B



Pin	Signal	Connector 1	Connector 2
1	TX+	White/Orange	White/Orange
2	TX-	Orange	Orange
3	RX+	White/Green	White/Green
4	PoE-	Blue	Blue
5	PoE-	White/Blue	White/Blue
6	RX-	Green	Green
7	PoE+	White/Brown	White/Brown
8	PoE+	Brown	Brown

NB: if the cable colors are different, the right matches must be maintained.

- Cut the sheath (about one centimeter) to discover the wires.
- To facilitate the process it is possible, by exploiting the elasticity of the sheath, to pull the wires some additional millimeter. (Hold with one hand the wires and with the other pull the smoothing sheath).
- Straighten the wires previously individually pair twisted.
- Compose the color sequence following the pattern.
- Level the length of the cables into place.
- Insert the tightened wires into RJ45 connector holding them between your fingers until they are channeled into the guides inside the connector itself.
- Push well until the wires will touch the bottom of the connector (check in transparency that all the wires are in place).
- Make sure that the sheath has penetrated into the connector for at least 8 mm so that it can also be crimped.
- Place the connector in the crimping tool and tighten all the way. Should be audible a click caused by the outer stop.
- Repeat exactly all the above steps to crimp the cable on the other side.

Notes