

# VARES- 1500

## VOICE EVACUATION SYSTEM

**RCS**<sup>®</sup>  
AUDIO-SYSTEMS



## VOICE EVACUATION SYSTEM

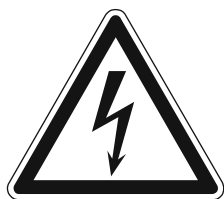
### »ONE-BOX-DESIGN«

EN 54-16 / EN 54-4 / VDE 0833-4 / EN50849 / VDE 0828

**OPERATING INSTRUCTIONS**

- ENGLISH

## CAUTION / ACHTUNG



**CAUTION:** TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE COVER (OR BACK) NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED PERSONNEL.

**ACHTUNG:** ZUR VERMEIDUNG VON STROMSCHLÄGEN GEHÄUSEAB-DECKUNG ODER RÜCKSEITE NICHT ENTFERNEN. KEINE VOM BENUTZER WARTENDEN TEILE IM INNEREN. WARTUNG NUR DURCH QUALIFIZIERTES PERSONAL.



## INSPECTION AND INVENTORY OF THE PRODUCT

Check unit carefully for damage which may have occurred during transport. Each RCS product is carefully inspected at the factory and packed in a special carton for safe transport. **Notify the freight carrier immediately if you observe any damage to the shipping carton or product!**

**Return:** Repack the unit in the carton and await inspection by the carrier's claim agent. Notify your dealer of the pending freight claim. Returning your unit for service or repairs. Should your unit require service, contact your dealer. If necessary, use our RMA form (only in german available) on our website [www.rcs-audio.com](http://www.rcs-audio.com).

## SAFETY INSTRUCTION

Please read all safety instructions before operating the VARES-1500.

### 1. Installation according to the following guidelines:

- The device should not be exposed to damp or wet surroundings. Please keep away from water.
- Please avoid using the device near heat sources, such as radiators or other devices which produce heat.

### 2. Keep in mind the following when connecting the device:

- Connect the device after reading the manuals.
- Never open the casing without having removed the power supply.

## AUSPACKEN UND KONTROLLE DES PRODUKTS

Bitte überprüfen Sie das Gerät sofort auf evtl. Transportschäden. Jedes RCS Produkt wird vor dem Verpacken sorgfältig überprüft und in einem speziell dafür vorgesehenen Karton geliefert.

**Alle Transportschäden müssen sofort bei der Transportfirma reklamiert werden!**

**Rücksendung:** Wenn es nötig sein sollte ein defektes Gerät zurückzusenden, nehmen Sie bitte Kontakt mit Ihrem Händler auf. Bitte versenden sie alle Rücksendungen in der Originalverpackung. Nutzen Sie unser RMA-Formular auf unserer Website [www.rcs-audio.com](http://www.rcs-audio.com).

## WICHTIGE SICHERHEITSHINWEISE

Bitte lesen Sie die Sicherheitsanweisungen, bevor Sie VARES-1500 in Betrieb nehmen.

### 1. Installation nach folgenden Richtlinien:

- Wählen Sie eine trockene Umgebung und vermeiden Sie Aufstellorte mit geringer Luftzufuhr.
- Vermeiden Sie die direkte Nähe zu Heizungen und anderen Hitzequellen.

### 2. Bitte beachten Sie folgendes, wenn Sie das Gerät anschließen:

- Um Bedienfehler zu vermeiden, lesen Sie bitte zuerst die Anleitung sorgfältig.
- Öffnen Sie niemals das Gehäuse, ohne vorher die Versorgungsspannung zu entfernen.



**Electromagnetic compatibility and low-voltage guidelines:** RCS leaves all devices and products, which are subject to the CE guidelines by certified test laboratories test. By the fact it is guaranteed that you may sell our devices in Germany and in the European Union domestic market without additional checks.

**Elektromagnetische Verträglichkeit und Niederspannungsrichtlinien:** RCS läßt alle Geräte und Produkte, die den CE-Richtlinien unterliegen durch zertifizierte Prüflabors testen. Dadurch ist sichergestellt, dass Sie unsere Geräte in Deutschland und im EU-Binnenmarkt ohne zusätzliche Prüfungen verkaufen dürfen.

**INTRODUCTION**

Thank you for choosing VARES-1500 as your solution for Voice Evacuation System.

VARES-1500 is all-in-one-box Voice Evacuation System. The box contains a completely integrated Voice Evacuation System, capable of both standalone and network operation. VARES-1500 is certified in accordance to EN54-16 and EN54-4, which are harmonized standards under Construction Products Regulation, mandatory in the European Union.

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## 1. WHAT'S IN THE BOX?

Inside the package you will find the main unit of VARES-1500 Voice Evacuation System, which includes:

- Wall-mounted IP33 housing;
- Integrated push-button panel and fireman microphone on the front; Mainboard with input and output ports (including screw terminal plugs);
- Memory card (microSD);
- DA200 dual-channel amplifier units incl. 100V step-up transformers (number of amplifier units depends on the hardware config you ordered);
- DIN-rail with 16A fused manual mains switch;
- Integrated EN54-4 power supply equipment with temperature- compensated charger;
- Battery leads, 20A battery fuse and battery terminal insulating caps;
- Jumpers for amplifier units (if you're planning to bridge amplifier outputs to 200W)
- Before shipping, the hardware is pre-configured in our factory according to your project-specific requirements. This includes:
  - Number of primary amplifier units (1, 2 or 3 units) Optional backup amplifier (0 or 1 unit)

## 2. WHAT ELSE DO I NEED TO MAKE IT RUN?

VARES-1500 needs additional items, which you are responsible to supply on your own.

The additional equipment includes:

- Battery, Mains cord,
- Wall mounting plugs (5 pieces, ø8mm),
- 10kΩ and 4.7kΩ resistors (for surveillance of EVAC triggering inputs, 1 pair per input);
- EOL boards for surveillance of loudspeaker lines (available at VARES-1500 in packs of 5 or 10 pieces); Network cabling (if you are building network system),
- Configuration file prepared in VARES-1500 Manager PC software (software and GUI manual available at VARES-1500/ RCS)

### 3. WHERE DO I START?

First, make sure that you are officially allowed to access the VARES-1500 hardware. This is usually the case if:

- you are an authorized representative of VARES-1500;
- you have been trained by VARES-1500 or its authorized representative for installation, service and commissioning of VARES-1500 Voice Evacuation System.

Unauthorized hardware and/or software modifications are against the law and outside of manufacturer's responsibility. If you have doubts about your status and access level permissions, please contact RCS main office.



#### Important note: Access level explanation

Opening VARES-1500 front door gives physical access to all interfaces, internal system connections and sensitive hardware settings that are of high importance to system operation mode, hardware reliability and safety (Access Level 3 according to EN 54-16, Annex A).

This access level (and higher) is strictly protected by the manufacturer and reserved only for service personnel who is trained, approved and officially certified by the manufacturer. Any actions carried out in Access Level 3 without manufacturer's explicit approval may lead to incorrect settings or hardware damage, causing serious system malfunction, and therefore are strictly prohibited and void manufacturer's warranty.



### 4. UNBOXING VARES-1500

Original shipping package includes a bottom foam protector that allows you to place the main unit in vertical position on the floor after unboxing.



**Caution!** Never put VARES-1500 in vertical position directly on the floor, table or any other hard horizontal surface. Doing this may deform or break bottom parts of the housing.

Optionally, the cabinet may be temporarily placed on its back, on a flat horizontal surface.

#### To safely unbox VARES-1500 main unit, follow these steps:



1. Carefully cut the two strapping tapes and remove them.

**Caution!** Strapping tapes may be under very high tension!

2. Carefully put the package upside-down.

3. Open the bottom side and unfold the bottom panels of the package so that the bottom foam protector is free from obstacles.

4. Carefully flip the package, first on its side and then right-side up.

5. Pull the carton package upwards and remove it.

6. Fold the protective foil down or remove it, leaving the VARES-1500 main unit resting in the foam protector until you're ready to hang it on the wall.

## 5. MOUNTING VARES-1500 ONTO A WALL

VARES-1500 main unit is meant to be mounted on vertical structures, such as concrete walls.



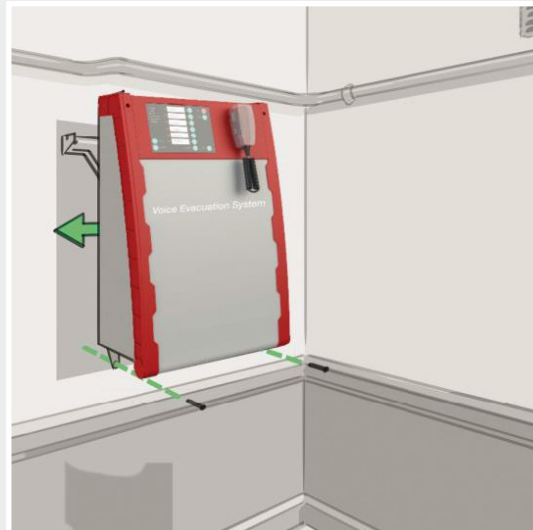
**NOTE:** To provide sufficient ventilation, keep at least 20 cm space on both sides of the cabinet. Keep ventilation grills free of obstacles!

At the back side of the VARES-1500 cabinet you will find wall-mount bracket provided with 3 fixing holes. Note two slots in the back plate of the cabinet, corresponding to the wall bracket hooks.

When the cabinet is mounted, there is 10 mm space between the cabinet and the wall. This space can be used for cables running from the floor to the top of cabinet.

### Prepare wall-plugs and follow these steps:

1. Place the bracket on the wall. Optimal height of the top is 170 cm above floor level.
2. Using wall plugs, fix the bracket in 3 points.
3. Optionally: in the space between left and right edge of the bracket place cables flat on the wall, vertically.
4. Lift VARES-1500 cabinet and place it flat against the wall:
  - a. top of the cabinet should be at least 20 cm above the bracket top edge,
  - b. side edges of the cabinet should be flat against the wall, hiding the bracket (and cables) behind.
5. Slide the cabinet down until it hangs on the bracket.
6. Check if position of the cabinet is straight and all edges at the back lay flat against the wall.
7. Check if the cabinet is placed firmly on the bracket and does not move in any direction.
8. Lock with two bottom wall plugs.



**NOTE:** The maximum weight of the main unit (without battery) is 29 kg. We strongly advise that the cabinet should be lifted and hung by at least two persons. Check your local safety requirements on the maximum allowed weight per person.



**Caution!** Never mount or un-mount the cabinet with battery inside!

## 6. INSTALLATION

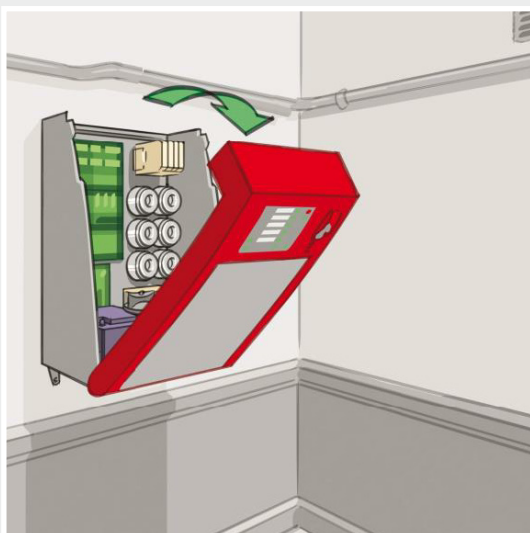


**Caution!** Risk of electric shock! Keep the mains switch OFF or unplugged from mains outlet during the entire installation process. Do not install or uninstall any parts of the system while mains voltage is on.

### 6.1 OPEN THE CABINET

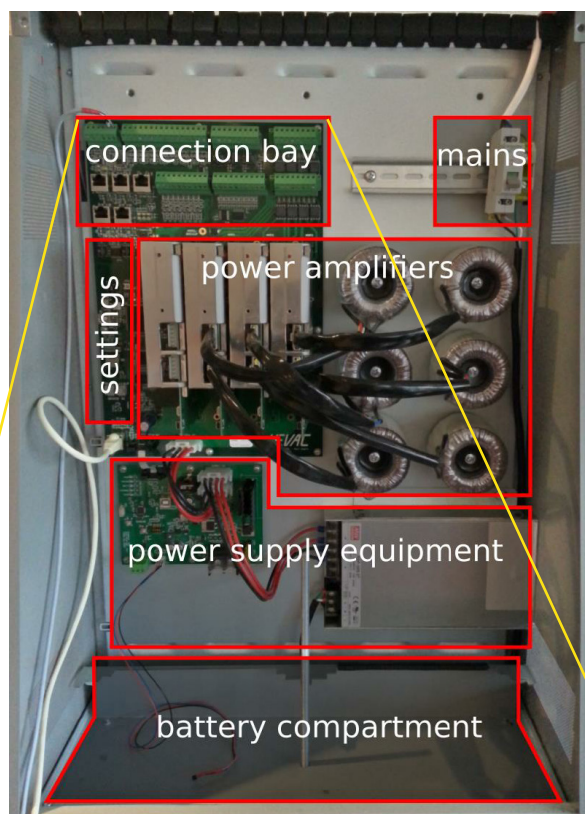
In order to open the cabinet follow steps below:

1. Find two round openings in the front top part of the cabinet, where fixing screws are placed.
2. Undo both screws using hex key (also known as Allen key or inbus).
3. Hold both left and right top corners of the front door.
4. Open the front door by pulling back the top of the front door. Try to pull both left and right side simultaneously with the same force.
5. Slowly keep opening the front door until it tilts 180°
6. Leave the front door hanging freely upside-down.
7. Inside the cabinet locate the hanging points on the left and right side of the backplate: Check if the cabinet hangs properly on the wall bracket.

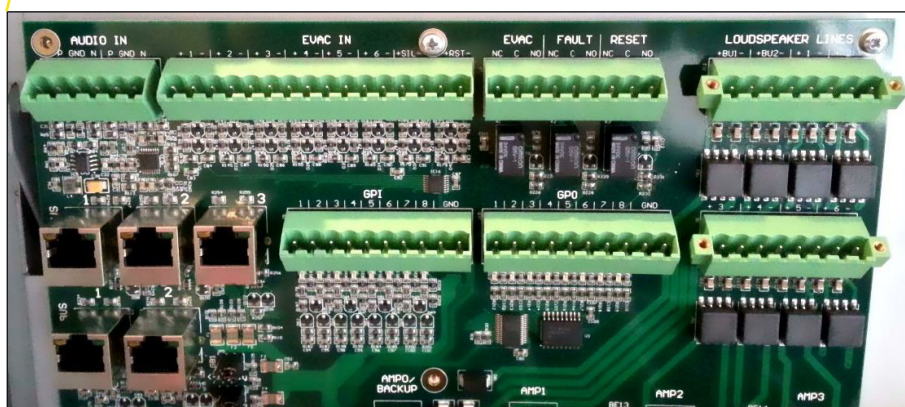




After opening VARES-1500 you should see following functional sections, as shown on picture below:



VARES-1500 - inside main unit



VARES-1500 - connection bay



## 6.2 MAINS

Connect the 110 ~230V AC mains cable to input of the switch on the DIN rail in the top-right area. Keep the right polarity and connect ground wire to the ground terminal.



**Caution!** Be careful! Make sure that the mains cable is during installation not connected to the electricity network.

## 6.3 BATTERY



**NOTE:** Place the battery only when the cabinet of VARES-1500 is firmly fixed to the wall. Install only sealed lead-acid batteries for stationary use. VARES-1500 is designed to operate with 2x 12V batteries, each of maximum dimension 230 x 138 x 207 mm (LxWxH).

**To safely and properly install the battery circuit, follow the instruction below:**

1. Before installing the battery measure voltage of each battery separately. Open-circuit voltage of a good functioning, healthy 12V battery should be in the range: 11,5 V – 13,5 V DC. If the open-circuit battery voltage is out of this range, replace the battery. Always use pairs of batteries with the same open-circuit voltage (as close as possible).
2. Adjust the battery bracket position to make enough room in the battery compartment (bottom of the cabinet).



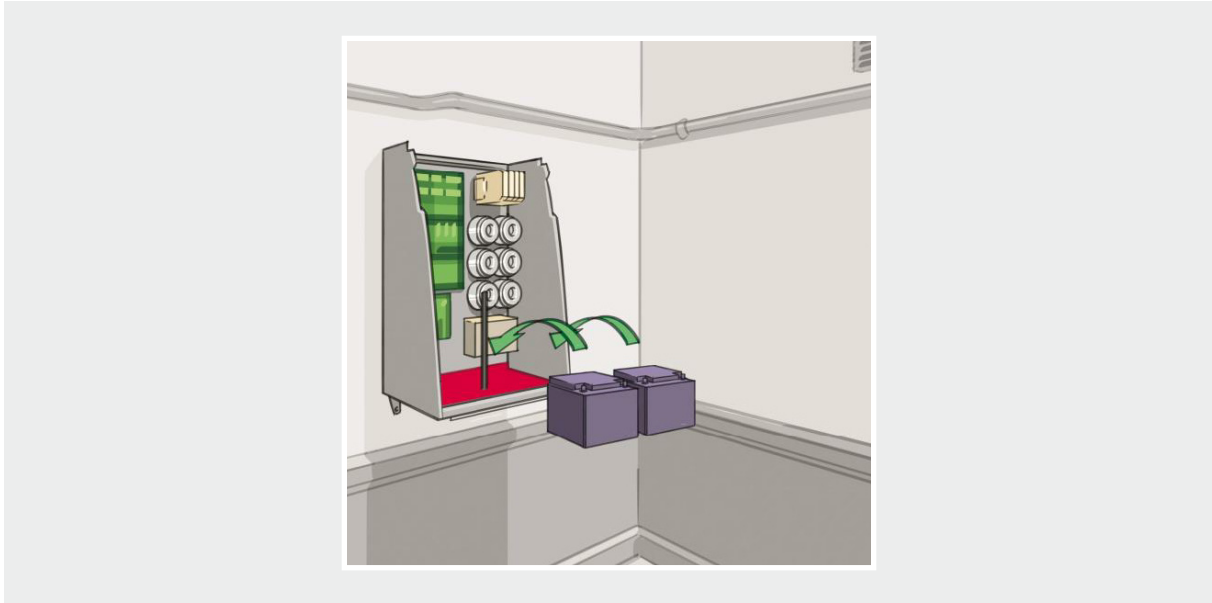
**NOTE:** If your batteries are large, it may be difficult to access the battery connector on the charger board. In this case it's best to connect battery leads to the connector on the charger board before putting the battery into the cabinet.

**Battery connector on the charger board.**

1. Take the battery fuse out of the socket on the charger board! You will plug the fuse later, when the system is running on mains supply.
2. Connect battery leads to the charger board.



- Put the battery in the battery compartment.

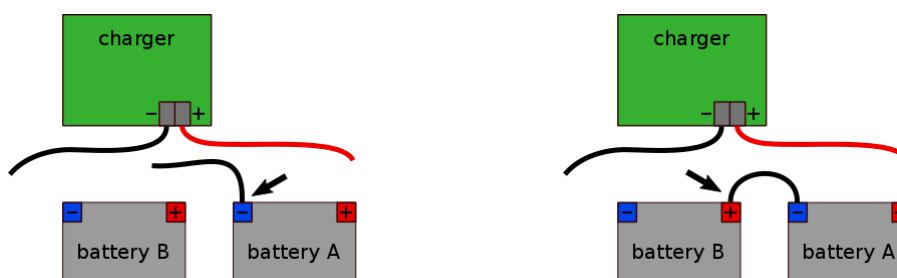


- Make sure that all battery leads are long enough and have rubber insulating caps on their ends.

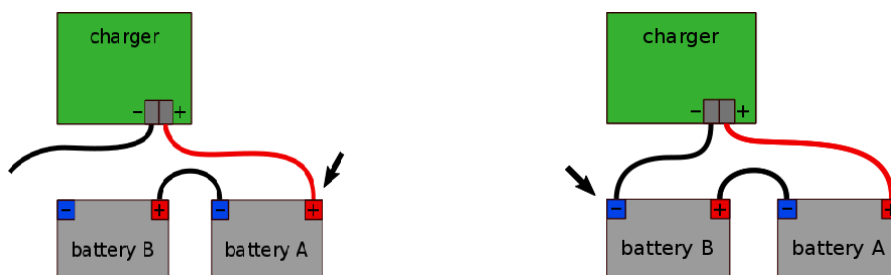


**Caution!** Be careful! Negative pole of the battery connector is connected directly to ground potential and the entire metal housing of VARES-1500. Dropping unprotected battery lead on any part of the hardware, housing or battery brings high risk of short-circuit and may damage the hardware and the battery. High electrical current from battery under short-circuit condition may cause rapid battery discharge and instant heat production. This may also destroy hardware components, cause serious battery capacity degradation or battery damage, cause fire and may be potentially risky to your health.

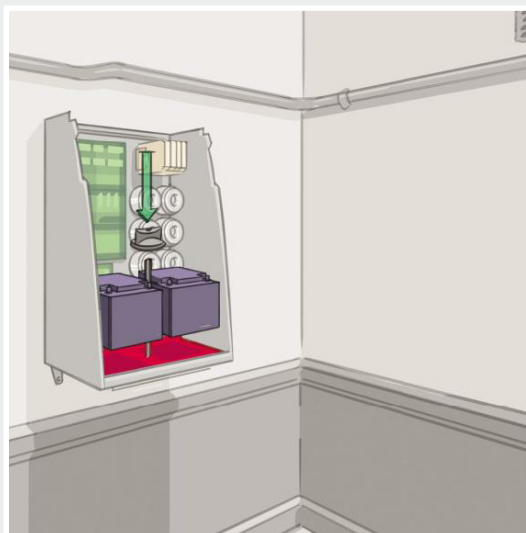
- Connect battery jumper (short black) between negative (-) pin of the battery A and the positive (+) pin of the battery B.



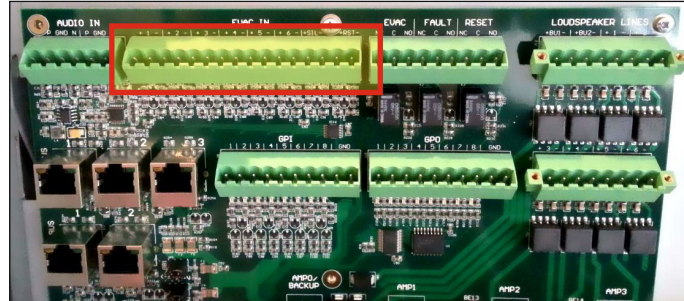
6. Connect battery leads in order FROM (+) TO (-), as follows:
- First connect the (+) lead (long red) to the positive (+) pin of the battery A;
  - Next connect the (-) lead (long black) to the negative (-) pin of the battery B;



7. Check again voltage of each battery separately and total voltage of both batteries .
8. Cover all battery terminals with insulating rubber caps.
9. Put the thermal sensor inside one of the rubber pads, so that it has good thermal contact with the battery terminal.
10. Fasten the thermal sensor to the battery lead with a tie-wrap.
11. Secure the battery mechanically:
- fix the bottom bracket,
  - twist tight the red plastic wing-nut.



## 6.4 EVAC / SILENCE / RESET INPUTS



There are 8 monitored inputs dedicated to triggering signals for evacuation, silence and reset instructions from external fire detection system.

- 6x EVAC in
- 1x SILENCE in
- 1x RESET in

Each of these 2-pin inputs has built-in DC monitoring which requires two resistors of  $4.7k\Omega + 10k\Omega$  in order to detect input active/inactive state as well as short and open fault. EOL resistors must be located directly at the triggering output inside of external device (i.e. fire detection system) to provide reliable surveillance of the entire link.

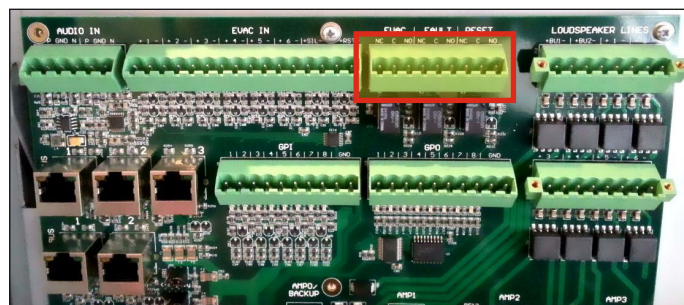
EVAC / SILENCE / RESET input

external switch / relay



EVAC / SILENCE / RESET inputs must receive activation signal of at least 100ms in order to trigger events. Pulses shorter than 100ms will be ignored.

## 6.5 SYSTEM STATUS RELAY OUTPUTS



3 potential-free relay outputs to external devices. Each output has individual 3 pins:

- normally open,
- normally closed,
- common.

### 6.5.1 EVAC OUT

Activated (closed) on EVAC mode, where at least one zone of the voice evacuation system is transmitting automatic EVAC message or LIVE EVAC signal from fireman microphone.

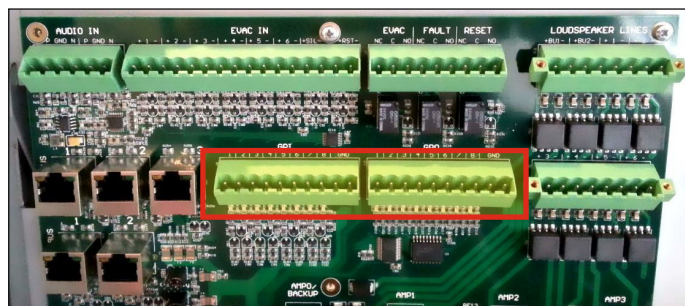
### 6.5.2 FAULT OUT

Activated (closed) while the fault status is reported by the voice evacuation system. Also activated when the VARES-1500 is not powered.

### 6.5.3 RESET OUT

Activated (closed) immediately after manual reboot of the VARES-1500 main unit. Active pulse length is configurable from 0 (disabled) to 5000ms in configuration settings.

### 6.6 GPI / GPO



8x general purpose input (pull-down), 8x general purpose output (open collector)

GPIs and GPOs are programmable in the configuration file. GPI and GPO can be linked to any system events to trigger or follow system events.

## 6.7 LOUDSPEAKER LINES



6 outputs to 100V loudspeaker lines (6x 100W)

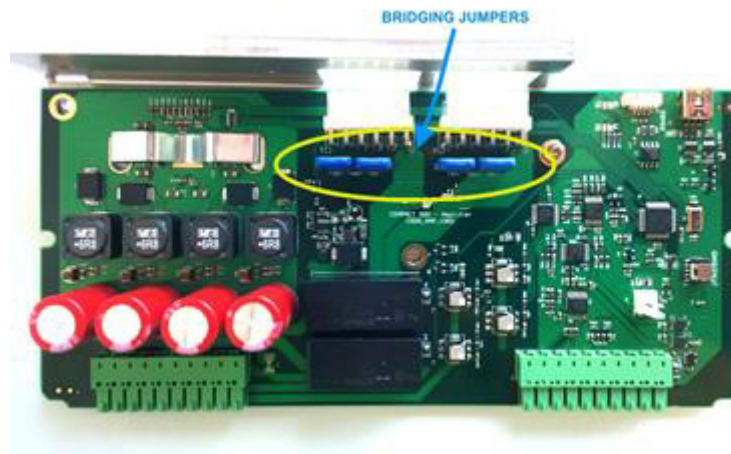


**NOTE:** Terminals BU1 and BU2 are not used.

### 6.7.1 BRIDGING TO 200 W

Each amplifier unit in VARES-1500 offers 2 audio channels, max. 100W each. By default both channels are working independent, each with 100V output.

Loads greater than 100W (up to 200W) are handled by bridging outputs of both channels of the amplifier unit into one 200W channel. This is done by lowering the output voltage of both channels to 50V by output voltage jumpers (bridging jumpers) and connecting two 50V output lines in series, at the loudspeaker line connector.



Location of jumpers on the amplifier module

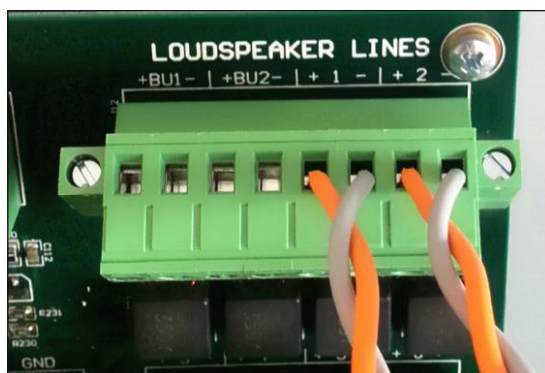


## 6.7.1.1 SINGLE CHANNEL

For single channel mode (2x100W) two jumpers on amplifier unit must be plugged in “100V” position (center position). One jumper per channel.



Jumper setting 100V per channel – amplifier unit



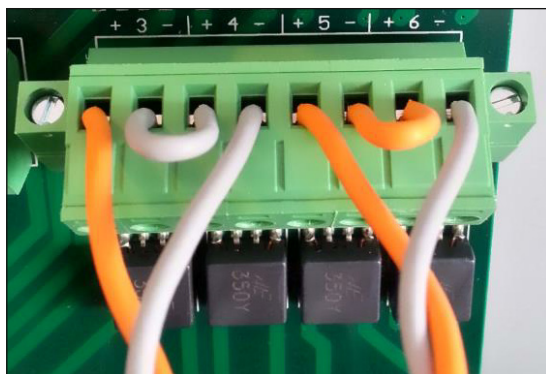
Single channel: line 1, line 2 – loudspeaker line output

## 6.7.1.2 BRIDGED

For bridged mode (1x200W) four jumpers must be plugged in “50V” position (left & right position). Two jumpers per channel.



*Jumper setting 100V per channel – amplifier unit*



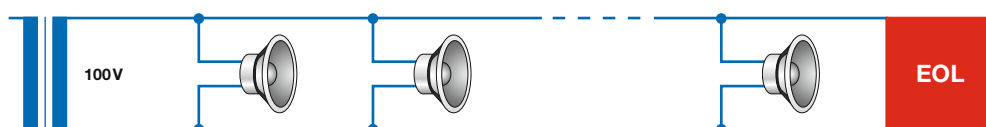
*Single channel: line 1, line 2 – loudspeaker line output*

## 6.7.2 EOL BOARD

EOL boards are not supplied with VARES-1500 main unit and are optionally available as separate product.

The VARES-1500 system supports surveillance of loudspeaker lines based on 20 kHz impedance measurement.

For reliable impedance monitoring of speakerline use EOL board. Connect EOL board to the end of the loudspeaker line in parallel, preferably inside the last loudspeaker on the line. EOL is not polarity-sensitive.



Loudspeaker line with EOL module



**NOTE:** EOL module features a 145°C thermal fuse, minimizing the risk of line short-circuit under fire conditions. Exposing EOL board to temperatures exceeding 145 °C will damage EOL circuit and cause open fault of the loudspeaker line.

The purpose of EOL is to create reference load at the monitoring frequency 20kHz. With EOL connected, monitoring of load impedance is more accurate and less sensitive to slow and long-term impedance drift of the loudspeakers due to aging and weather conditions. It also gives more reliable fault indication when a large number loudspeakers is placed on one long line.



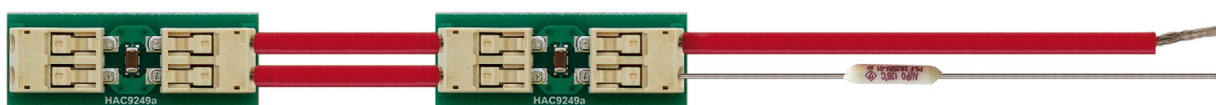
EOL board with thermal fuse



**NOTE:** It is required to use the EOL module on every monitored loudspeaker line, at the end of the line.

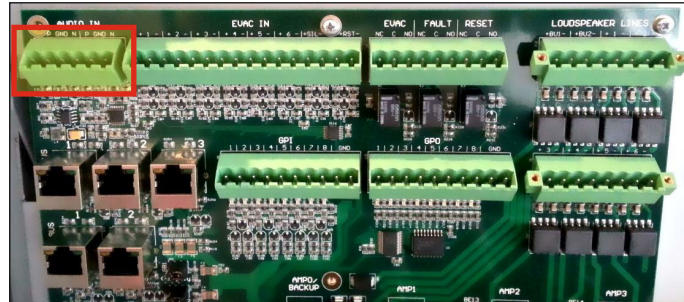
In some cases, in order to optimize the loudspeaker line impedance measurement, adjustment of the EOL impedance may be required. This is done by bridging TWO EOL's together using wires or LINKconnector (wires or bridge-connector are included). The load settings of EOL are described in the table below:

| EOL Setting                                       | IMPEDANCE @20 kHz |
|---------------------------------------------------|-------------------|
| single EOL board                                  | 260 Ω             |
| bridged EOL board (using wires or LINK-connector) | 130 Ω             |



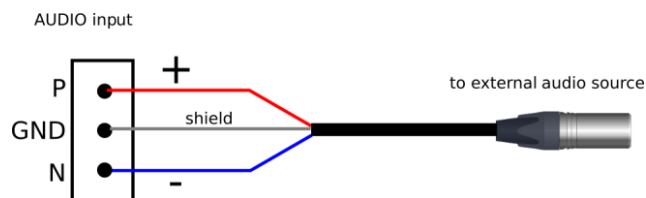
EOL board (bridged) with thermal fuse

## 6.8 ANALOG AUDIO INPUT (BGM)



Two analog audio inputs, balanced, line level.

Connect here your auxiliary audio source for background music or low priority external paging microphone.



**NOTE:** By default VARES-1500 includes integrated fireman microphone, which occupies analog audio input 1. If your system does not require integrated fireman microphone feature, you can disable it in the configuration settings and use analog audio input 2 as external audio input for background music.

## 6.9 NETWORK PORTS

VARES-1500 offers 5 ports (RJ-45) for network connections between distributed parts of the VARES-1500 Voice Evacuation System:

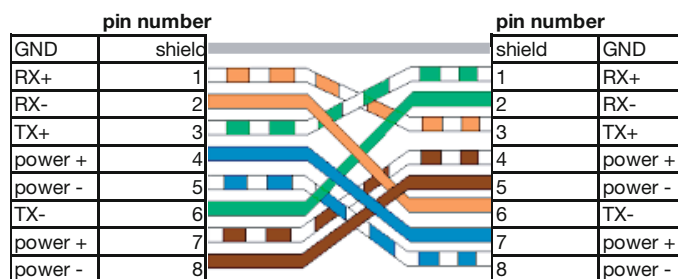
- 2x G-Net ports (global network)
- 3x L-Net ports (local network)

VARES-1500 network features full duplex RS-422 data link and 24V DC power to remote devices.

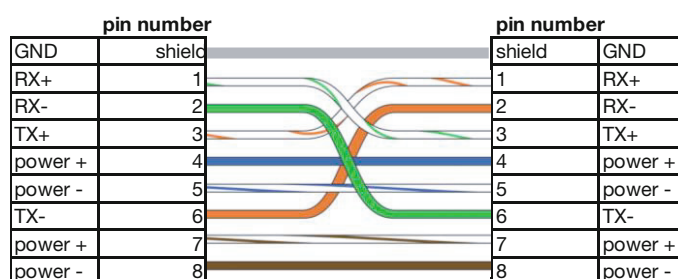
If you're building distributed system using VARES-1500 network, you should make physical links between devices using the right cables.

**Cabling should meet following requirements:**

1. Crossover twisted-pair cable (compatible with Ethernet crossover)



crossover type A cable



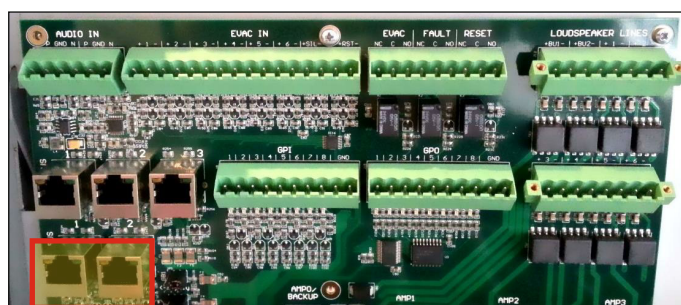
crossover type B cable

2. CAT5e or higher for maximum distance of 250m.
3. Non-CAT / lower than CAT5e: 250m not guaranteed.
4. Shield required (at least FTP)



**Caution!** Use only crossover cables and keep correct pinout! Connecting power pins to data pins will damage the network port.

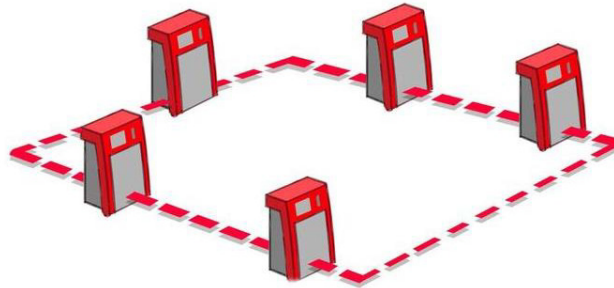
## 6.9.1 GLOBAL NETWORK (G-NET)



G-Net is working as redundant ring between VARES-1500 main units. It is dedicated to secure reliable system bus, which keeps the global system intact in case of single link failure.

To create redundant G-Net ring between multiple VARES-1500 main units, connect both G-Net ports between every unit in the network, so that you create closed ring.

## GLOBAL NETWORK (G-NET)

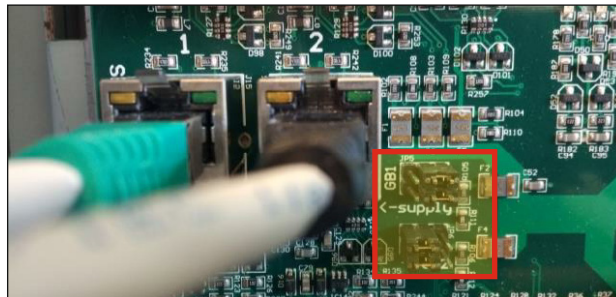


*G-Net redundant ring topology*

### Power over G-Net

Both G-Net ports have individual settings for 24V DC power over G-Net for remote G-Net devices. Power over G-Net is set by means of hardware jumpers located next to the G-Net port.

Power over G-Net is dedicated to supply devices connected to the G-net port, such as fiber transceivers.



*Location of G-Net 24V power jumpers*

By default power over G-Net is off.

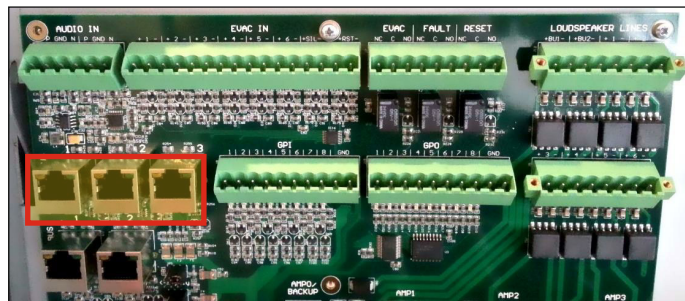
|                                               |                  |
|-----------------------------------------------|------------------|
| jumpers in the LEFT position:                 | 24V DC power ON  |
| jumpers in the RIGHT position (or no jumper): | 24V DC power OFF |



**NOTE:** If you connect G-Net directly between VARES-1500 main units, please leave the power jumpers in OFF position.



## 6.9.2 LOCAL NETWORK (L-NET)

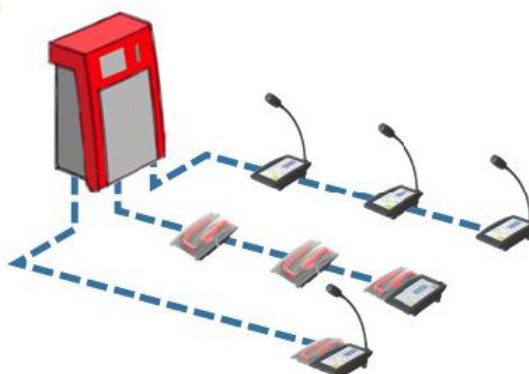


L-Net works as daisy-chain bus between VARES-1500 main unit and remote network devices, such as paging consoles. It is dedicated to provide powered bus to peripheral devices. Every L-Net port is powered with 24V DC and power over L-Net is always enabled.

L-Net capacity of single VARES-1500 unit is limited to following figures:

- Maximum 8 devices per port,
- Maximum 16 devices per VARES-1500 main unit.

### LOCAL NETWORK (L-NET)



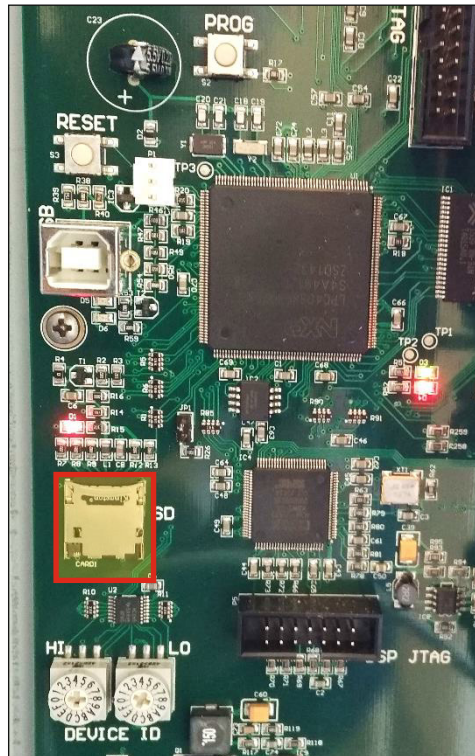
*L-Net daisy chain topology*

For more information about installation of remote network devices, please go to the network device installation manual.

## 6.10 MEMORY CARD

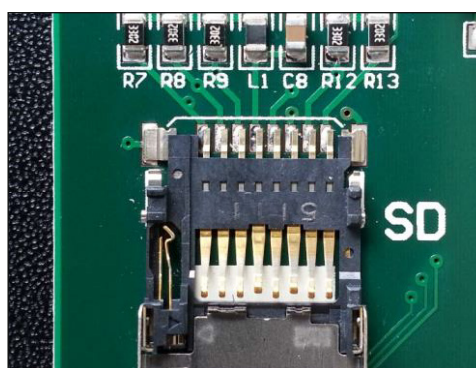
VARES-1500 is supplied with pre-installed micro SD memory card. Memory card contains complete VARES-1500 system configuration file, including audio messages.

Configuration file is prepared in VARES-1500 Manager - Windows GUI application. More information about creating configuration settings you will find in VARES-1500 Manager User Manual.



Location of memory card on the main board.

Memory card is under constant surveillance, as well as its content. When the memory card is removed, damaged or its content is corrupted, VARES-1500 will report system fault. During system fault caused by memory error VARES-1500 enters SAFE STATE, where system stops all functions and requires reboot. This state can be reset only by manual device reset



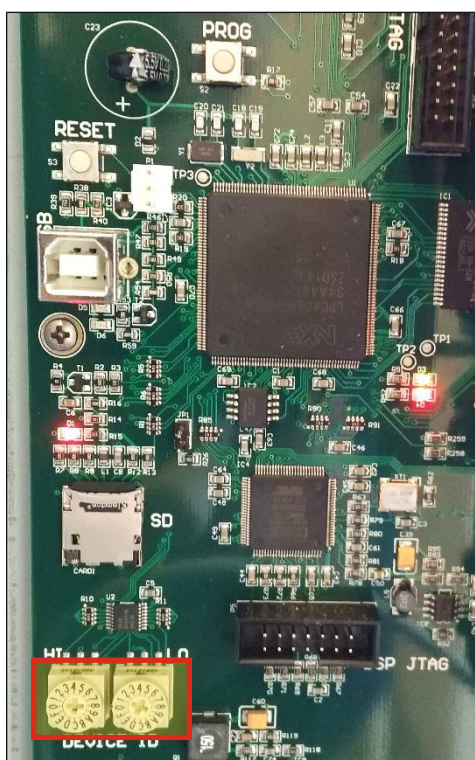
Close-up of memory card socket.

To modify system configuration settings, create new config file, move it to micro SD card and replace the memory card on VARES-1500 mainboard. Memory card may be removed and mounted during system runtime (hot plug). Mounting the memory card requires manual device reset afterwards.

## 6.11 DEVICE ID SETTING

VARES-1500 is equipped with rotary switch that determines the Device ID (or device address) in the network. Make sure that Device ID set on the rotary switch complies with the ID defined in configuration settings for this device.

Wrong ID setting will trigger system fault because of configuration error.



*Double rotary switch - Device ID*

## 7. STARTUP AND COMMISSIONING

Finally, all hardware is set up, all connections are made and system is ready to run. Time to power it up!

### 7.1 POWER-ON / POWER-OFF SEQUENCE



**NOTE:** To avoid unwanted sound and visual effects related to relatively high energy pulse at system inrush, always plug or unplug the battery fuse when the system is powered from mains supply.

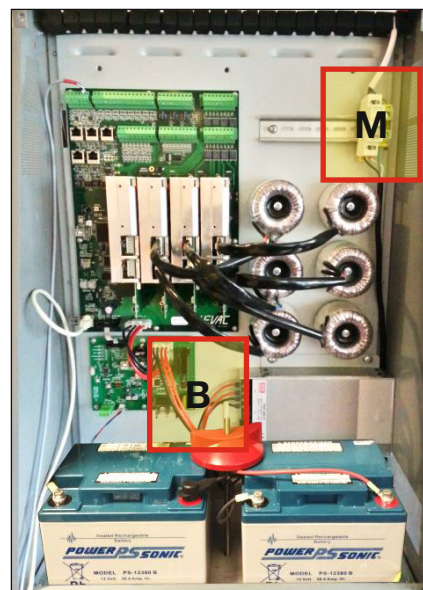
Power the system up and down according to following steps:

#### Power on sequence:

1. Turn on MAINS switch (M)
2. Plug in the battery fuse (B)

#### Power off sequence:

1. Unplug the battery fuse (B)
2. Turn off MAINS switch (M)



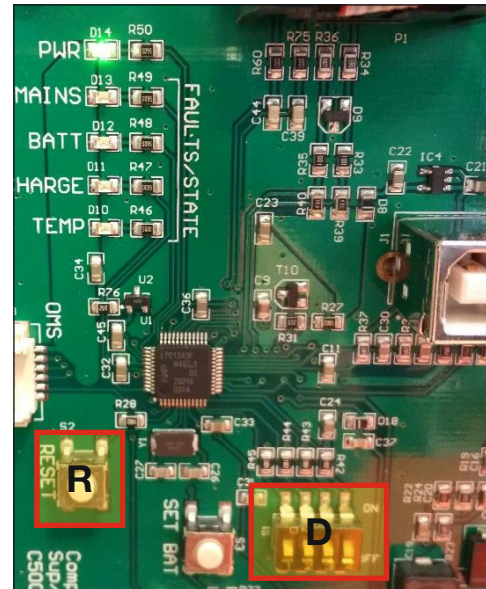
### 7.2 BATTERY SETTING

There is a DIP-switch located on the charger board (D). Two last bits (switches) on this 4-bit switch should be adjusted to the rated capacity of the battery, according to the table below.

| DIP SWITCH SETTING |   |   |   | RATED CAPACITY RANGE |
|--------------------|---|---|---|----------------------|
| 1                  | 2 | 3 | 4 |                      |
| 0                  | 0 | 0 | 0 | 10 – 19,5 Ah         |
| 0                  | 0 | 0 | 1 | 20 – 34,5 Ah         |
| 0                  | 0 | 1 | 0 | 35 – 49,5 Ah         |
| 0                  | 0 | 1 | 1 | 50 - 55 Ah           |

After changing battery setting you should reboot the charger board. Press the RESET button (R) on the charger board

**Why is it important?** Power supply equipment of VARES-1500 implements very precise voltage- and current- controlled charger with additional temperature compensation. It also keeps the battery under constant surveillance, including measurement of internal battery resistance in the order of milliohms, with accuracy of 1 mΩ. Battery capacity setting is necessary to cover whole range of different battery sizes and provide optimal charging parameters.





### 7.3 POWER SUPPLY EQUIPMENT INDICATIONS

On top-left area of the charger board you will find 5 LED indicators, where you can observe current status of power supply, battery and charger.

- PWR (green)  
Indicates that the PSE is supplying power.

|     |                             |
|-----|-----------------------------|
| ON  | Power is supplied to output |
| OFF | No power                    |

- MAINS fault (yellow)  
Indicates fault of main power supply

|                |                                                   |
|----------------|---------------------------------------------------|
| OFF            | Main power supply OK                              |
| Blink (single) | Main power supply output voltage low (<27.5 V DC) |
| Blink (double) | Main power supply output voltage high (>33 V DC)  |
| ON             | Main power supply not detected                    |

- BATT fault (yellow)  
Indicates battery fault:

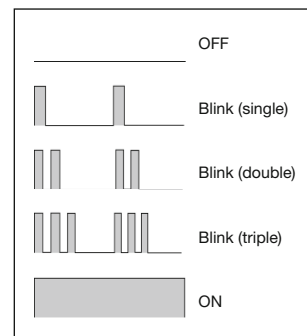
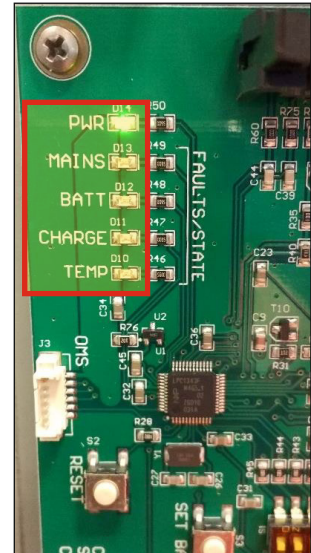
|                |                                   |
|----------------|-----------------------------------|
| OFF            | Battery OK                        |
| Blink (single) | Battery voltage low (<25.8 V DC)  |
| Blink (double) | Battery voltage high (>29.4 V DC) |
| Blink (triple) | Battery internal resistance high  |
| ON             | Battery not detected              |

- CHARGE (green)  
Indicates stage of charging process.

|                |                                   |
|----------------|-----------------------------------|
| OFF            | No charging                       |
| Blink (single) | Trickle mode (battery full)       |
| Blink (double) | Pre-charging mode (battery empty) |
| ON             | Charging                          |

- TEMP fault (yellow)  
Indicates temperature fault.

|                |                                                   |
|----------------|---------------------------------------------------|
| OFF            | Temperature OK                                    |
| Blink (single) | Temperature low ( $T < 0^{\circ}\text{C}$ )       |
| Blink (double) | Temperature high ( $T > 50^{\circ}\text{C}$ )     |
| ON             | Temperature critical ( $T > 70^{\circ}\text{C}$ ) |





## 7.4 LOUDSPEAKER LINE IMPEDANCE CALIBRATION

Once the loudspeaker lines are connected and EOL boards mounted at the end of every line, you can calibrate impedance measurement to currently detected value. As result of calibration the reference impedance value is saved for every line to the internal system memory,

**It is highly recommended to re-calibrate the impedance measurement:**

- After every modification of the loudspeaker line installation,
- After replacing power amplifier unit.



**NOTE:** Before calibrating impedance please check the health state of every line with an impedance meter:

1. Check load: measure every loudspeaker line individually with impedance meter and check if the load is as expected. During measurement lines should be disconnected from VARES-1500 output.
2. Check EOL: make sure that EOL board is properly connected at the end of every loudspeaker line. Check if the impedance setting is correct on each EOL board.

Calibration is done manually, for all lines at once. If any line would not calibrate, it will stay in “not calibrated” state, which is indicated on the amplifier unit (see amplifier indications in next chapter). Other lines will calibrate independently.



**TIP:** If the buzzer on front panel is giving fault warning (beeping sound) you can mute it. In order to clearly hear the calibration feedback sound, press SILENCE button on the front panel of VARES-1500. This will mute the buzzer on the front panel.

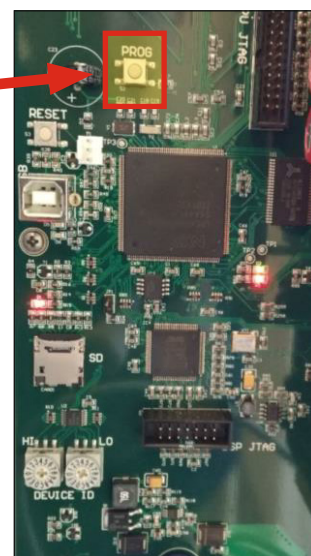
In order to start calibration, use PROG button located above the CPU on the mainboard.

1. Press and hold PROG button.  
You will hear a continuous beep sound from buzzer;
2. When the beep sound stops, release the PROG button and wait for another sound sequence of the buzzer;
3. System will give sound feedback with information about calibration result:
  - single beep: all lines are successfully calibrated;
  - double beep: at least one of the lines could not be calibrated;
  - triple beep: all lines could not be calibrated.

If the impedance of the line is within acceptable range, calibration should be successful. If line calibration is not successful, impedance of this line is not acceptable. This could be caused by one of following faults:

- line is overloaded,
- line is shorted,
- line is open,
- EOL is disconnected,
- EOL impedance setting is incorrect.

In case if one or more lines does not calibrate, follow indications on the amplifier units (next chapter) to identify the faulty line.



*Location of the  
PROG button*

### 7.5 AMPLIFIER UNIT INDICATIONS

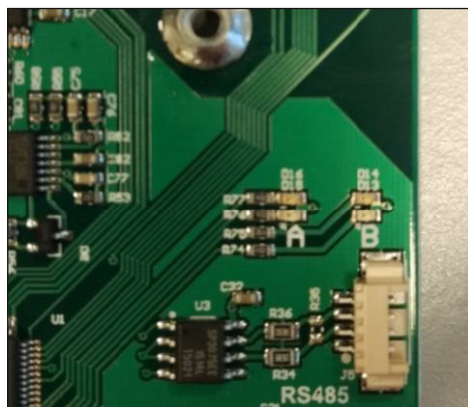
Each amplifier unit has LED indicators onboard.

There are 2 indicators per channel:

- GREEN LED: amplifier power-on/fault status;
- RED LED: impedance measurement



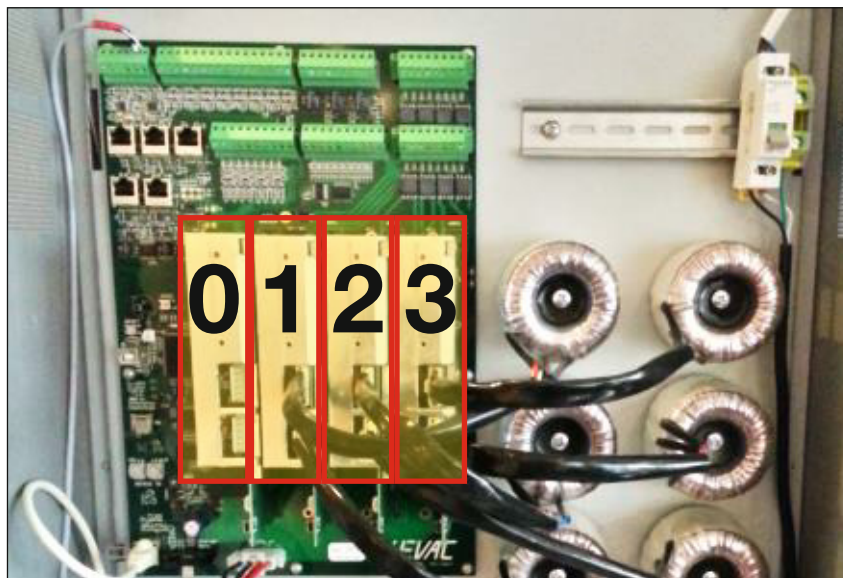
LED indicators on amplifier units



You can identify status of every channel and line according to the table below:

| LED           | VISUAL BLINKING SEQUENCE | GREEN (amplifier status) | RED (impedance Measurement) |
|---------------|--------------------------|--------------------------|-----------------------------|
| OFF           | —                        | Sleep mode               | Not calibrated              |
| Blink (short) |                          | —                        | Calibrated – impedance OK   |
| Blink (slow)  |                          | Amp fault                | Impedance high (line open)  |
| ON            |                          | Running                  | Impedance low (line short)  |

Every amplifier channel corresponds to loudspeaker line as follows



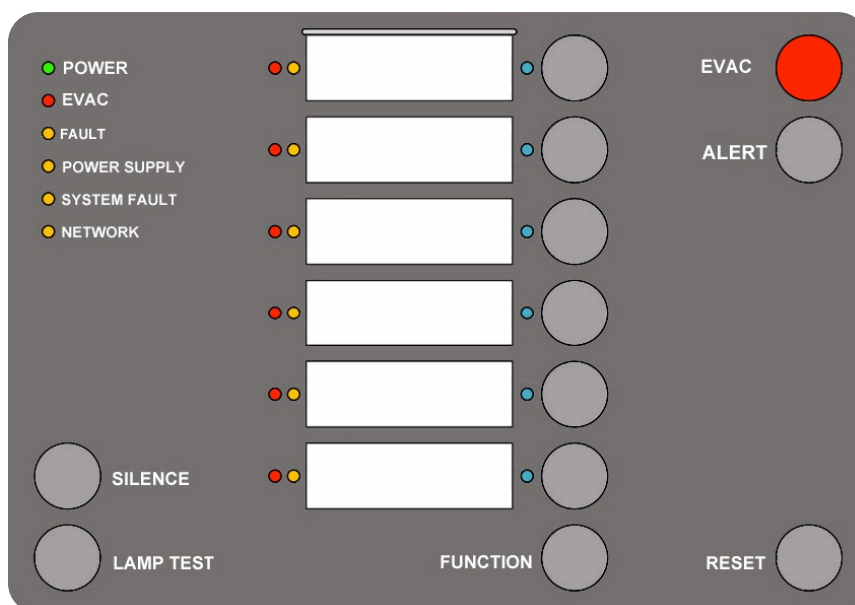
*Amplifier slots*

| AMP 0            | AMP 1  |        | AMP 2  |        | AMP 3  |        |
|------------------|--------|--------|--------|--------|--------|--------|
|                  | A      | B      | A      | B      | A      | B      |
| Backup amplifier | Line 1 | Line 2 | Line 3 | Line 4 | Line 5 | Line 6 |

## 8 CONNECTIONS AND RECOMMENDED CABLE TYPES

|                              | How many | Connector type                         | Signal type                                       | Additional information                       | Recommended cable (minimum)                                                                                                       | Max. length           |
|------------------------------|----------|----------------------------------------|---------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Analog audio in              | 2        | pluggable screw terminal block 5.08 mm | Analog balanced mono audio, 0dBu                  | n/a                                          | Balanced shielded microphone cable, typ. 2 x 0.25mm <sup>2</sup>                                                                  | 100m                  |
| EVAC / SILENCE / RESET input | 8        |                                        | Pull-down input with fault detection (open/short) | EOL resistors 10kΩ + 4.7kΩ in series         | Depends on length, typ. N x 0.75~1.5mm <sup>2</sup> (N – number of individual triggering signals from / to fire detection system) | 1000m                 |
| EVAC / FAULT/ RESET output   | 3        |                                        | Potential-free relay output                       | n/a                                          |                                                                                                                                   | 1000m                 |
| GPI                          | 8        |                                        | Pull-down input                                   | n/a                                          | Depends on length, typ. N x 0.75~1.5mm <sup>2</sup> (N – number of individual triggering signals from / to external devices)      | 1000m                 |
| GPO                          | 8        |                                        | Open collector output                             | n/a                                          |                                                                                                                                   | 1000m                 |
| Loudspeaker line             | 6        |                                        | 100V audio 100Hz – 12kHz                          | passive EOL module for 20kHz line monitoring | Depends on length and load, typ. 2 x 0.75~1.5mm <sup>2</sup>                                                                      | 1000m                 |
| G-Net port                   | 2        | RJ-45                                  | Full duplex RS- 422                               | Redundant ring with power delivery           | FTP CAT5e                                                                                                                         | 250m (to next device) |
| L-Net port                   | 3        |                                        |                                                   | Daisy chain with power delivery              |                                                                                                                                   | 250m (total length)   |
| Mains                        | 1        | screw terminal                         | 110-230V AC 50/60Hz                               | n/a                                          | 3 x 1.5mm <sup>2</sup>                                                                                                            | 50m                   |
| Battery                      | 1        | screw terminal                         | 24V DC                                            | optimal for spade (fork) cable termination   | 1 x 4 mm <sup>2</sup>                                                                                                             | 1 m (total length)    |

## 9. CONTROL PANEL



### 9.1 LED INDICATORS

#### 9.1.1. POWER

Displays the operational status of the VARES-1500.

- Permanently lit: System is powered and ready to use
- Flashes quickly: System starts up or is not ready for operation

#### 9.1.2. EVAC

Indicates that the system is in the voice alarm in which at least one zone of the system is populated with an emergency audio signal, i.e. a pre-recorded EVAC MESSAGE or LIVE EVAC when using a fireman microphone station.

- Permanently lit: EVAC status

#### 9.1.3. FAULT

Zeigt an, dass sich das System im FAULT-Zustand befindet (allgemeine Fehleranzeige), in dem mindestens ein Gerät im System einen Fehler meldet.

- Permanently lit: Local error detected
- Flashing slowly: When the local device is intact and at least one of the remote devices reports an error condition.

#### 9.1.4. POWER SUPPLY

Indicates a power failure of the local VARES-1500 unit, reporting at least one of the following errors:

- Permanently lit: Network failure
- Flashing slowly: Battery related error: battery loss
  - Loss of the charger
  - Battery resistance too high
  - Temperature error
  - Charger communication error

## 9.1.5. SYSTEM FAULT

Indicates a system error in the VARES-1500 central unit in which:

- the CPU or program execution has stopped or is malfunctioning,
- the storage medium with the configuration settings and the audio files has an error (SD card).
- The control panel does not communicate with the motherboard

If the system error is caused by a CPU or memory error, the VARES-1500 remains in „safe mode“. In this mode, critical functions (including audio transmission, response to control inputs, etc.) are stopped until the error is corrected.

- Permanently lit:
  - CPU / program error
  - Control panel failure
- Flashing slowly:
  - SD card error
  - Incompatible configuration file
  - Incorrect ID setting

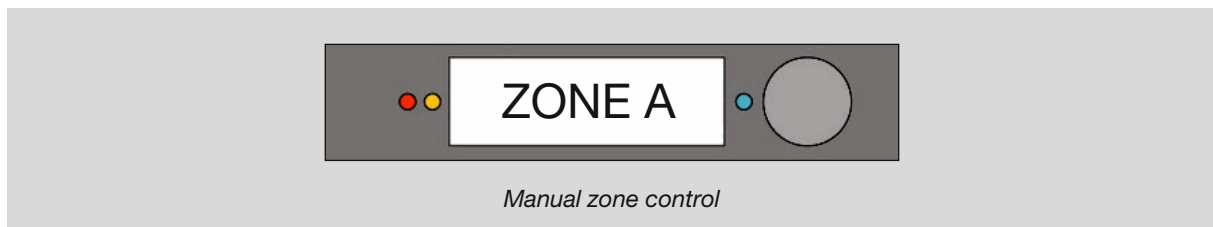
## 9.1.6. NETWORK

Indicates when a device or connection is missing on the network.

- Flashing slowly:
  - Global ring error (anywhere in the ring)
- Permanently lit: At least one device in the network is missing.

## 9.1.7. Zone displays

The zone displays relate exclusively to the associated zone key. If a button is not assigned to a zone, the zone displays for this button are deactivated.



### 9.1.7.1. Red

Indicates that the zone is in the EVAC state, and the zone is populated with one of the following audio signals:

- Permanently lit: LIVE EVAC
- Slow flashing: EVAC message.

### 9.1.7.2. Yellow

Indicates that the zone is transmitting an ALERT message and / or is in an error state

- Permanently lit: zone error  
(Error of any output or amplifier within this zone)
- Flashing slowly: Zone is transmitting an ALERT message.

### 9.1.7.3. Blue

Zone occupied / zone selection

- Permanently lit: Indicates that the zone was manually selected using the zone selection button on the local control panel.



- Flashes quickly: The zone is occupied by an audio signal, but is in SILENCE mode (triggered by entering SILENCE or manually using the SILENCE key)
- Flashing slowly: Indicates that the zone is currently an audio signal is transmitted (except BGM).)

## 9.2 MANUAL CONTROLS

### 9.2.1. SILENCE

Press this button to mute the buzzer sound throughout the system.

### 9.2.2. LAMP TEST

Press this button to check the visual (LEDs) and audible signals (buzzer) of the control panel on the local VARES-1500 system.

### 9.2.3. ZONE selection

Press to select a zone. Press again to cancel the selection.

NOTE: The zone selection is automatically canceled after a timeout, which is defined in the configuration settings.

### 9.2.4. RESET

Press to cancel the current zone selection.

### 9.2.5. Taste FUNCTION

Press and hold the FUNCTION key to activate access level 2. In access level 2, you can change the system status manually by triggering a voice alarm message or by resetting the system.

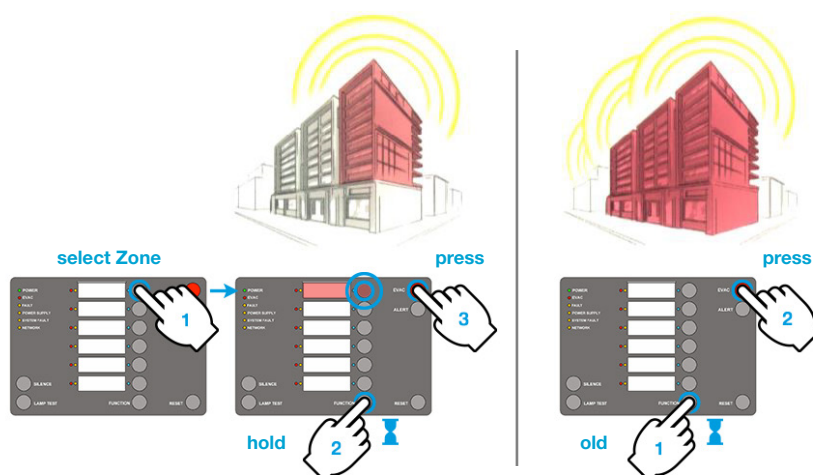


**NOTE:** First press and hold the FUNCTION button while pressing another button.

#### 9.2.5.1. FUNCTION + EVAC / FUNCTION + ALERT

Use this combination to trigger an EVAC or ALERT message in the previously selected zones.

If no zones have been selected, this triggers an EVAC or ALERT message in all zones that can be selected via the control panel.



Manual triggering of an EVAC message  
(single zones/all zones)

**9.2.5.2. FUNCTION + SILENCE**

Use this key combination to mute the previously selected zones. If no zones have been selected, all zones that can be selected via the control panel are muted.

NOTE: If an EVAC signal is active while manually muting a zone, the activation trigger will override SILENCE mode.

**9.2.5.3. FUNCTION + RESET**

Use this key combination to reset the VARES-1500 system. In a network system, this command resets the entire network. If the reset was triggered successfully, all local LED indicators should flash quickly during the restart.

**9.3 INTEGRATED FIREMAN MICROPHONE STATION**

---

The control panel of the VARES-1500 is equipped with a fireman microphone station. Take the handheld microphone, press the PTT button and activate LIVE EVAC signal transmission in all zones that can be selected via the control panel. This signal is an audio stream with the highest priority and supersedes any other types of audio signals in the system ineffective.

If one or more zones has been selected beforehand, the transfer takes place only in these zones.

**9.4 KEY SWITCH**

---

VARES-1500 can optionally be equipped with a safety key switch on the control panel.

The key switch activates and deactivates the FUNCTION button and the PTT button on the fireman microphone station. This ensures the access level with an additional step.

The key switch is monitored. In the event of an electrical or technical malfunction, an error is reported at the key switch.

## 10. INDEPENDENT OPERATION VS. NETWORK OPERATION

The VARES-1500 system can be operated both independently and in the network.

### 10.1 INDEPENDENT SYSTEM

An independent system composed of a single VARES-1500 central processing unit, which consists of the following parts:

- Mandatory displays and manual controls
- System status outputs: EVAC, FAULT, RESET
- 6 monitored EVAC inputs
- Monitored SILENCE and RESET input
- 8x GPI
- 8x GPO
- Up to 6 speaker connections with EOL monitoring
- Maximum output power 100 W or 200 W per connection
- 2 analog, balanced audio inputs
- Integrated fire microphone station with priority
- Access key to activate / deactivate the control panel functionality
- 6 programmable zone selection buttons
- Integrated power supply with battery

### 10.2 NETWORK SYSTEM

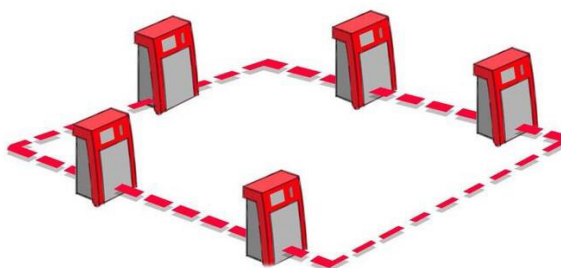
#### Global Network (G-Net)

G-Net is a redundant network ring in which several VARES-1500 central units are connected to one system. It is used to synchronize data to reliably between all connected devices and live audio webcast on multiple channels with very low latency.

#### Local Network (L-Net)

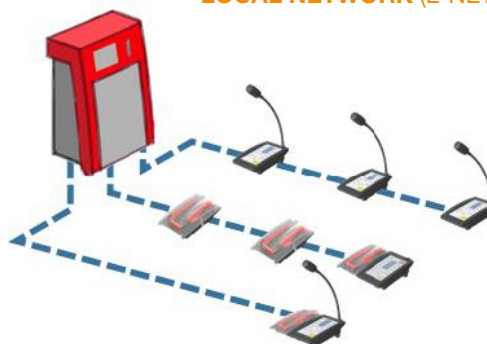
The L-Net daisy chain topology is intended for peripheral devices in the central unit, such as remote microphone stations. L-Net is used to extend the functionality of the VARES-1500 to remote locations.

#### GLOBAL NETWORK (G-NET)



**G-Net** redundant ring topologie

#### LOCAL NETWORK (L-NET)



**L-Net** daisy chain topologie

## 11 TECHNICAL SPECIFICATIONS

| STANDALONE SYSTEM              |                                                                                  |
|--------------------------------|----------------------------------------------------------------------------------|
| Number of zones                | max. 6 local zones                                                               |
| Maximum total loudspeaker load | 600 W RMS (420W RMS pure sinewave according to EN54-16)                          |
| Power amplifiers               | 6x 100 W, modular (2 channels per module), bridgeable up to 3x 200 W             |
| Standby power amplifiers       | 2x 100 W / 1x 200 W dedicated backup amplifiers                                  |
| Loudspeaker line monitoring    |                                                                                  |
| Built-in                       | 20kHz AC monitoring with EOL module, short/open/impedance deviation              |
| Loudspeaker type               | with 100V step-down transformer                                                  |
| Voice messages                 |                                                                                  |
| Storage                        | max. 22 audio files (max. 5 minutes each), micro-SD card with content monitoring |
| Message player                 | Max. 2 simultaneous local message playback                                       |
| Controls and indications       |                                                                                  |
| General controls / indications | Lamp test button, silence button, power, evac, general fault LED indicators      |
| Fault indications              | Power supply, system fault, network, zone fault                                  |
| Zone controls / indications    | 6x configurable zone selection button, zone EVAC/FAULT/BUSY LED indicators       |
| Evac manual control            | EVAC message, ALERT message, SILENCE, RESET, fireman mic with PTT button         |
| Fireman microphone             | Integrated Fireman Mic with priority and electrical monitoring                   |
| Power supply equipment         |                                                                                  |
| AC supply                      | 110 – 230 V AC, 50/60Hz                                                          |
| AC current consumption         | max. 5.3A @115V AC / 2.65A @230V AC                                              |
| Inrush current                 | 40A @115V AC, 20A @230V AC                                                       |
| Power supply protection        | Overload current limiting, over voltage shutdown, over temperature shutdown.     |
| Battery requirements           |                                                                                  |
| Type                           | Sealed, rechargeable lead-acid battery for stationary use                        |
| Capacity                       | 10 – 55 Ah                                                                       |
| Charging time (80% capacity)   | < 24 h                                                                           |
| Rated voltage (DC)             | 24 V DC (2x 12V)                                                                 |
| Battery dimensions             | 2 batteries, each of max. 230 x 138 x 207 mm (LxWxH)                             |
| Battery weight                 | max. total 32.6 kg                                                               |

## TECHNICAL SPECIFICATIONS

### STANDALONE SYSTEM

#### Inputs

|                                        |                                                                                    |
|----------------------------------------|------------------------------------------------------------------------------------|
| 2x BGM                                 | 2x independent balanced analogue in, line-level mono, 22k $\Omega$ input impedance |
| 6x EVAC in, 1x SILENCE in, 1x RESET in | monitored logic inputs, 4.7k $\Omega$ +10k $\Omega$ EOL resistors                  |
| 8x GPI                                 | unmonitored logic inputs (pull-down, configurable active low/hi)                   |

#### Outputs

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| EVAC out, FAULT out | Potential-free relay output (configurable NO/NC)          |
| GPO                 | 8x Open collector output (configurable NO/NC)             |
| Loudspeaker out     | 6x 100V transformer output, 20 kHz AC monitoring with EOL |

#### Amplifiers

|                   |                                                                             |
|-------------------|-----------------------------------------------------------------------------|
| Type              | Class D                                                                     |
| Protection        | over load shutdown, over temperature shutdown                               |
| Backup amplifiers | 2 dedicated backup channels, auto backup at end stage failure, auto restore |
| Efficiency        | 80% @ rated power                                                           |
| Output voltage    | max. 100V RMS                                                               |
| Rated power       | 100W per channel, 200W bridged                                              |
| Output bandwidth  | 50 Hz – 20 kHz                                                              |
| SNR               | >80 dB                                                                      |
| THD + N           | 0.1% @ rated power                                                          |

#### Audio

##### Frequency response

|                              |                                               |
|------------------------------|-----------------------------------------------|
| Local BGM                    | 50 Hz – 20 kHz                                |
| Messages, network streaming  | 100 Hz – 12 kHz                               |
| Analog input- output latency | < 10 ms (stand-alone system)                  |
| Network audio stream format  | 24 kHz sampling, ADPCM compressed             |
| Message file input format    | 24 kHz, 16 bit, mono WAV                      |
| DSP features                 | HP/LP filter, multipoint parametric EQ, delay |

#### Mechanical

|                    |                                        |
|--------------------|----------------------------------------|
| Dimensions (HxWxD) | 800 mm x 520 mm x 280 mm               |
| Weight             | 29 kg (full config, without batteries) |
| Housing material   | Steel / ABS                            |
| IP rating          | IP 30                                  |
| Mounting           | Wall-mounted box                       |

## 11 TECHNICAL SPECIFICATIONS

| NETWORK SYSTEM                                |                                                                            |
|-----------------------------------------------|----------------------------------------------------------------------------|
| Max. number of devices in the network         | 255                                                                        |
| Max. number of zones                          | 255                                                                        |
| Max. total system output power                | 102 kW                                                                     |
| Number of simultaneous network audio channels | 2                                                                          |
| Network audio transmission latency            | 0.3 ms per device                                                          |
| <b>Local network</b>                          |                                                                            |
| Architecture                                  | Master-slave, up to 16 slave devices per main unit                         |
| Connection                                    | 3x L-Net port, RJ-45, powered daisy chain, digital audio & control data    |
| Cabling                                       | X-over FTP CAT5e (or higher)                                               |
| Current consumption                           | max. 500 mA (up to 8 slave devices) per L-Net port,                        |
| Max. length of local bus                      |                                                                            |
| default                                       | 250 m (device to device)                                                   |
| with twisted-pair extender                    | 500 m                                                                      |
| <b>Global network</b>                         |                                                                            |
| Architecture                                  | Peer-to-peer, up to 255 main units                                         |
| Connection                                    | 2x G-Net port, RJ-45, powered redundant ring, digital audio & control data |
| Cabling                                       | X-over FTP CAT5e (or higher) / multimode optical fiber                     |
| Current consumption                           | max. 500 mA per port, reserved only for network extenders                  |
| Max. distance between devices                 |                                                                            |
| default                                       | 250 m (device to device)                                                   |
| with copper extenders                         | 750 m                                                                      |
| with fiber extenders                          | 2500 m                                                                     |





## EU-CONFORMITY-DECLARATION

**NAME OF MANUFACTURER OR IMPORTER:****RCS AUDIO-SYSTEMS GmbH**

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D-83043 Bad Aibling (Germany)

Phone: +49 8061 3501-0

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**COMPACT VOICE ALARM SYSTEM VARES-1500****NOTE: Conditions of use, Suitable für Indoor applications**

Product is in compliance with the Directive 89/106/EEC of the council of European Communities of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to the construction products (Construction Products Directive – CPD), amended by the Regulation (EU) No 305/2011 of the European Parliament and Council of March 2011.

**EN54-4:1999+A1+A2****EN54-16:2008****Power supply equipment****Voice alarm control and indicating equipment for fire detection and fire alarm system for buildings****ESSENTIAL REQUIREMENTS**

EN54-4 Mandatory functions

EN54-16 Mandatory functions

**Option with requirements:**

Audible warning

Phased evacuation

Manual silence of the voice alarm condition

Manual reset of the voice alarm condition

Voice alarm condition output

Indication of faults related to the voice alarm zones

Voice alarm manual control

Emergency microphone(s)

Redundant power amplifiers

**DECLARED PERFORMANCE**

PASS

PASS

PASS

PASS

PASS

PASS

PASS

PASS

PASS

PASS

PASS

**HARMONISED STANDARDS**

EN54-4:1999+A1:2003/A2:2006

54-16:2008

54-16:2008, 7.3

54-16:2008, 7.5

54-16:2008, 7.6.2

54-16:2008, 7.7.2

54-16:2008, 7.9

54-16:2008, 8.4

54-16:2008, 10

54-16:2008, 12

54-16:2008, 13.14

**Ancillary Functions:**

Multiple background music/audio channels and zone paging

Included (Not mandatory)

**Notified body (Test and Certification):**

Telefication bv

Edisonstraat 12A, 6902 PK Zevenaar, The Netherlands

Notified body number: 0560

**Issued:**

05.03.2017

**First placed on the marked by:**

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**Authorised Representative:**

Stefan Eisenhut (Technical Director)

## Summary

This document is the quick guide for installation and initial setup of VARES-1500 Voice Evacuation System. It explains how the hardware of Vares 1500 should be installed and configured. Quick guide is addressed to the trained technical personnel, such as installers, service technicians and commissioning engineers.

## Revision and Approval

| REV | DATE       | NATURE OF CHANGES                 | APPROVED BY |
|-----|------------|-----------------------------------|-------------|
| 01  | 28-03-2017 | Original draft                    | DD          |
| 02  | 29-03-2017 | Addad battery setting, formating  | DD          |
| 03  | 22-09-2017 | Corrected audio performance specs | DD          |
| 04  | 25-03-2020 | General Update                    | AJH         |
| 05  | 04-06-2020 | Corrections                       | TvdH        |
| 06  | 15-09-2020 | EOL Update und Layout corrections | MS          |
| 07  | 20-05-2021 | Corrections and grafic updates    | SB/MS       |

## Hardware and Software specifications subject to change without notice.

All information in this document is subject to change without notice. RCS can also make improvements and / or changes to the products described in this manual at any time and without notice.