

Hacousto Holland bv
Industrieweg 87
2651BC Berkel & Rodenrijs

4EVAC

IMPACT reference system manual (Typical)

Author:

DD

Design revision:

2.0



SUMMARY

This document is the general reference manual for 4EVAC Impact voice evacuation system.

REVISION AND APPROVAL

Rev.	Date	Nature of Changes	Approved By
03	20-04-2020	Parameters update	DD
04	08-06-2020	Corrections	TvdH
05	05-08-2021	Additional electrical information	DD
06	06-07-2022	Update on AMP-LINK DCA2500	AJH

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Thank you for choosing 4EVAC as your Voice Evacuation System solution.

4EVAC Impact is a 19" rack format, EN54-16 certified Voice Evacuation System, dedicated to medium to large installations. The impact system is capable of both standalone and network operation, with a wide selection of peripheral devices and remote extensions. The 4EVAC Impact is certified in accordance with EN54-16 and EN54-4, which are harmonized standards under the Construction Products Regulation, mandatory in the European Union.

The 4EVAC Impact system is fully compatible with the Compact 500 Voice Evacuation System. This means both systems can be connected into one network, running the same protocol in peer-to-peer architecture, operating within the same space of voice evacuation zones, sharing the same audio messages, BGM broadcasts, microphone consoles, I/O extensions and cabling infrastructure.

1. General information

The Impact Voice evacuation rack system comprises of 3 base components:

- Controller (system control unit)
- DCA2.500 (power amplifier / charger)
- 4E-SW6 (zone expander unit)

and optional rack components (depending on design-specific configuration):

- Expander (network port extender for local network devices, such as peripheral microphone stations)
- 4E-GPIO (input/output extender)
- Loopdrive LDB (short circuit isolator and loop surveillance control unit)
- 4E-FSC (optical fibre interface).

1.1. Controller



The 4EVAC Controller is the head unit of the 19" rack mounted Impact Voice Evacuation System. The controller covers complete EN54-16 certified functionality, as well as a variety of features essential to Public Address applications.

The 4EVAC Controller incorporates 16 monitored contact inputs, 8 GPO, 4 relay outputs, 2 analog audio inputs and 2 outputs, as well as local network interfaces for a max. of 16 local peripheral devices (e.g. mic consoles) and 2 global network ports for interconnecting multiple systems in a redundant ring topology.

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The Controller is dedicated to working with 4EVAC DCA2.500 power amplifiers over the 4EVAC proprietary AMP LINK protocol. The Controller can also be easily integrated with any third-party PA/VA power amplifier.

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1.2. DCA2.500 amplifier / charger



4EVAC DCA2.500 is a 2x500W transformer-less (Direct-drive) 100V power amplifier with an integrated power supply and 24V battery charger. Designed and certified in full compliance with EN54-4 and EN54-16, DCA2.500 is an ideal component of any voice evacuation system or public address installation, where high reliability and safety is required.

The primary application of the DCA2.500, using 4EVAC proprietary AMP LINK protocol, is to work as a native component of the 4EVAC Impact voice evacuation system. However, thanks to the I/O interface and built-in autonomous functions, the DCA2.500 can be easily integrated with any third-party PA/VA matrix controller, adding a complete, EN54-4 certified power supply equipment, with a charging capacity of 100Ah. DCA2.500 may also be used as a standalone power amplifier or battery charger, without any external control devices.

1.3. 4E-SW6 zone expander with line monitoring



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4E-SW6 is a DIN-rail mounted 100V audio matrix with 2 inputs and 6 outputs, dedicated to both 4EVAC Compact and Impact systems. The 4E-SW6 has two 100V audio inputs (CHA, CHB) which connect directly to amplifier outputs. The 4E-SW6 expands the number of independent loudspeaker lines with individual surveillance and short-circuit isolation. Each loudspeaker line can handle up to a 500 W load and can be assigned as a separate individual zone. One input can accept a maximum of 1000 W of power, which is also the limit for the total load of all 6 output lines together.

4E-SW6 is responsible for:

- zone routing: switching outputs between amplifier input A / input B / internal surveillance bus;
- loudspeaker line monitoring: real-time impedance measurement at 20kHz with EOL.
- backup amplifier: amplifier surveillance and automatic switch over to backup amplifier.

4E-SW6 is controlled by the Impact Controller via L-Net, receiving real-time routing information for each output line in order to connect to channel A, channel B or internal surveillance bus C.

Multiple 4E-SW6 modules can be fed in parallel by the same amplifier, splitting its power to more zone outputs.

1.4. Expander – network port extender for L-Net devices



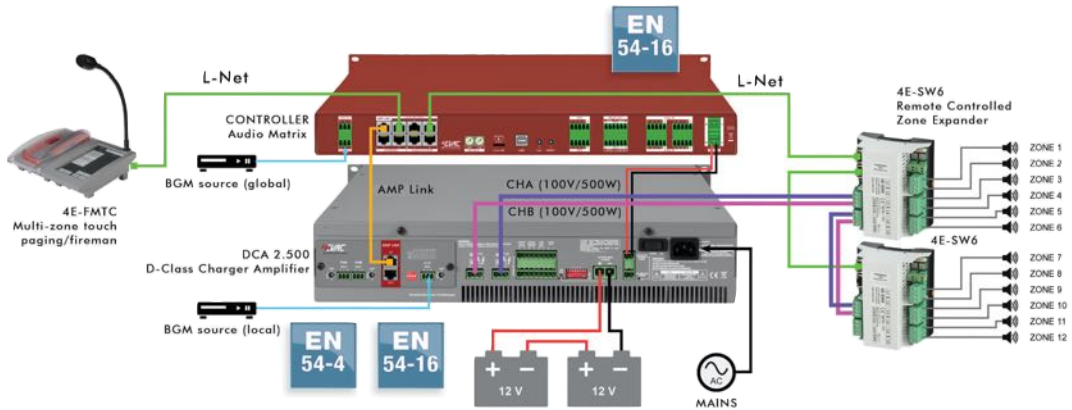
4EVAC Expander is an optional component of the 19" rack mounted Impact Voice Evacuation System. The Controller-Expander is identical to the Impact Controller with significant hardware and functional limitations.



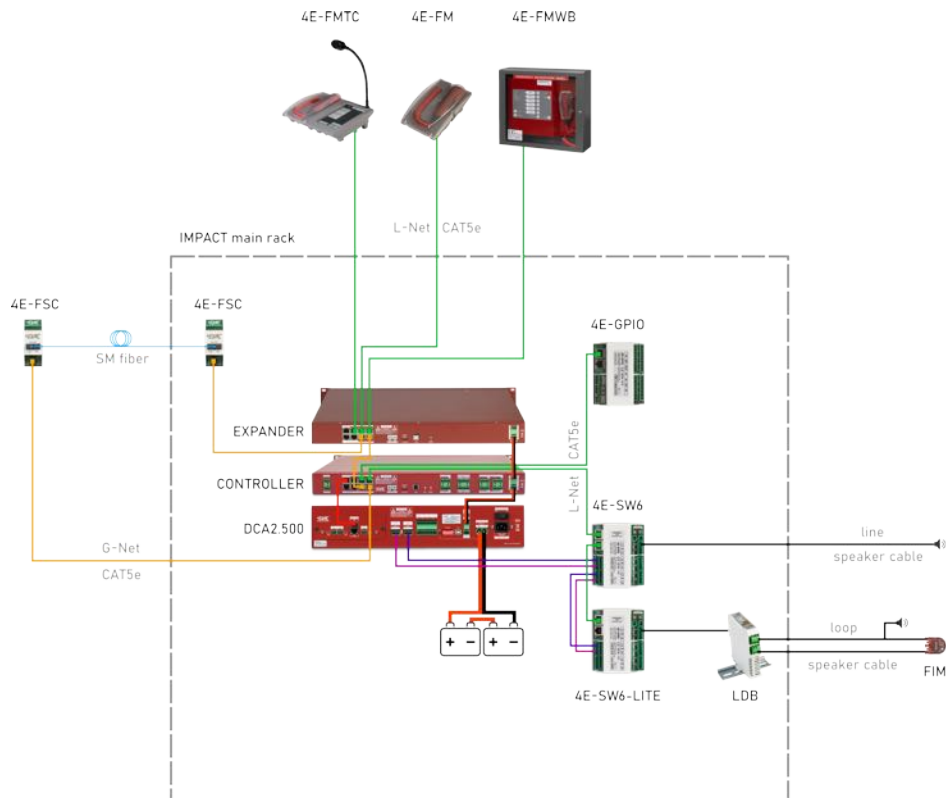
The Controller Expander cannot not be used alone as a standalone VACIE (Voice alarm control and indicating equipment), as it does not feature EN54-16 mandatory inputs / outputs. The Expander may be used in the system only as an additional interface, connected to the main network of 4EVAC VACIE main units.

Functionally, the 4EVAC Controller-Expander works as a network hub for additional L-Net devices, such as microphone stations. In terms of interfacing, the Controller-Expander only features a DC power input and network ports (Global Network and Local Network).

1.5. Examples of Impact system



Example diagram of 12-zone basic Impact system



Example diagram of Impact system including optional components

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2. Where do I start?

First, make sure that you are officially allowed to access the hardware of Compact 500 & Impact system devices.

This is usually the case if:

- you are an authorized representative of 4EVAC;
- you have been trained by 4EVAC or one of its authorized representatives for installation, service and commissioning of Compact 500 & Impact Voice Evacuation Systems.

Unauthorized hardware and/or software modifications are against the law and outside of the manufacturer's responsibility. If you have doubts about your status and access level permissions, please contact the 4EVAC main office.



Important note: Access level 3 explanation

Opening the device housing or tampering with network cabling is restricted. This gives 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 EN54-16, Annex A). This access level (and higher) is strictly protected by the manufacturer and reserved only for service personnel which is trained, approved and officially certified by the manufacturer. Any actions carried out in Access Level 3 without the manufacturer's explicit approval may lead to incorrect settings or hardware damage, causing serious system malfunctions, and therefore are strictly prohibited and void manufacturer's warranty.



3. Configuration settings

Settings for the Impact system are included in the configuration file located on the micro SD memory card installed in the Impact CONTROLLER unit. The configuration file includes user-defined settings, such as:

- a) Definition of system components connected to one network,
- b) Input / output surveillance settings,
- c) Zone settings
- d) Audio messages
- e) Events, etc.

The configuration file should be prepared in the 4EVAC Manager. 4EVAC Manager is GUI software running on Windows OS. All configuration settings are explained in the manual "4EVAC Manager guide".



NOTE: Please make sure that configuration file is prepared with the version of 4EVAC Manager compatible with current firmware of your Impact system.

The installation file of the latest 4EVAC Manager and the manual are available at our website [HTTPS://www.4evac.com](https://www.4evac.com)

4. Impact system build

4.1. Rack frame

In applications where compliance with EN54-16 is required, the following system components must always be installed inside a cabinet:

1. Controller,
2. DCA2.500 amplifier/charger,
3. SW6

The number of DCA2.500 amplifier/charger units in the Impact system is variable, depending on the required output power capacity of the system.

4EVAC Impact system rack may contain a maximum 16 of DCA2.500 amplifier/charger units.

Rack cabinet should meet the following minimum requirements:

- Floor-mounted 19-inch rack in upright direction;
- Main frame must be of sturdy steel construction;
- Grounding point for a protective earth wire connection;
- Side walls, top and rear door made of solid steel, with galvanic connection to the main frame;
- IP30;
- Front door with solid transparent area (window), through which all indications are clearly visible and identifiable;
- Front and rear door (as well as removable top / side panels) must be equipped with access protection (e.g. key lock):
 - Key to front door (access level 2) must be different from the key to back door (access level 3);
 - Key to front door may be used to open only front door;
 - Key to back door may be used to open both rear and front door;
 - Both front and rear key must be removable to secure doors when locked.
- Opening for field wiring located on the top or bottom side;
- Reasonable clearance in front of the cabinet – front door must open freely;
- If multiple rack cabinets are used in the same location, they may be installed directly adjacent to each other.



4.2. DIN-rail enclosure for remote network devices

4EVAC Impact is capable of working as a distributed VACIE, by means of:

- multiple Impact Controllers and/or Compact 500 (main units) interconnected via G-Net (global network);
- L-Net devices connected to the main units via L-Net (local network).

DIN rail mounted L-Net devices, in order to provide sufficient access level protection and compliance with requirements of EN54-16, are required to be housed:

- a) inside the system rack (central location), according to specifications requirement in chapter "Rack frame";
- b) inside additional enclosure, external to the system rack (remote location).

This requirement applies to:

- 4E-FSC (multimode optical fiber interface)
- 4E-GPIO (input/output expander)
- 4E-SW6 (6-channel switching zone expander with EOL surveillance)

The external enclosure must meet the following minimum requirements in order to secure proper system operation and maintain compliance with EN54-16:

- The enclosure must be of sturdy steel construction;
- The enclosure must provide means of fixing it to the base structure e.g. mounting holes for wall plugs, anchors or bolts.
- The enclosure must be fixed to a firm base structure, preferably directly to the construction of the building, e.g. a concrete wall or ceiling, steel frame or pillar or other solid structures like steel cable trays or roof supporting framework;
- Top, side, and rear walls made of solid steel;
 - o Optionally, front wall / door may be provided with a viewing window made of solid glass or acrylic / polycarbonate;
- DIN rail firmly fixed to the inside of the enclosure, providing sufficient space for DIN rail mounted devices;
- IP30;
- All doors must be able to be closed and equipped with access protection for access level 3 (e.g. key lock or special tool):
 - o If a key is used, it must be removable to secure doors when locked.
- Opening for field wiring, equipped with cable glands;
- If multiple enclosures are used in the same location, they may be installed directly adjacent to each other.



Examples of external enclosure suitable for DIN-rail mounted system devices in remote locations.

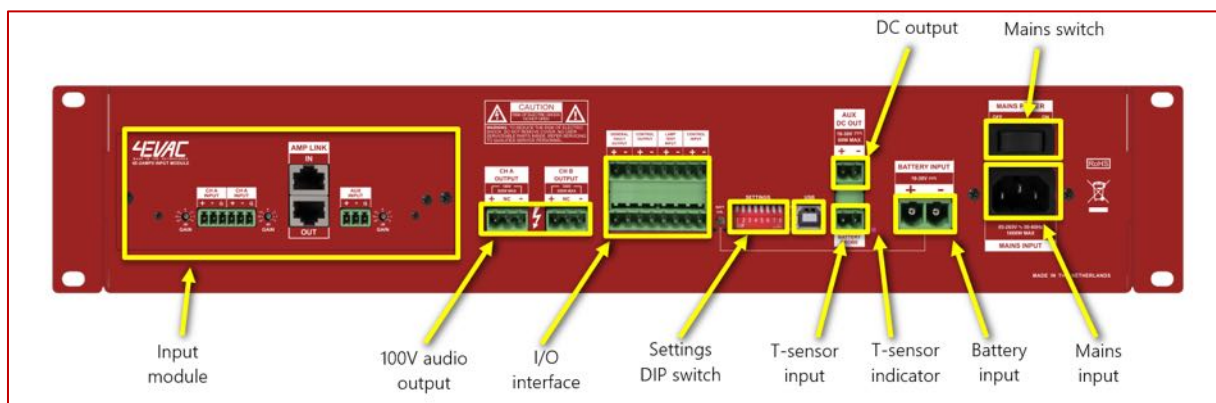
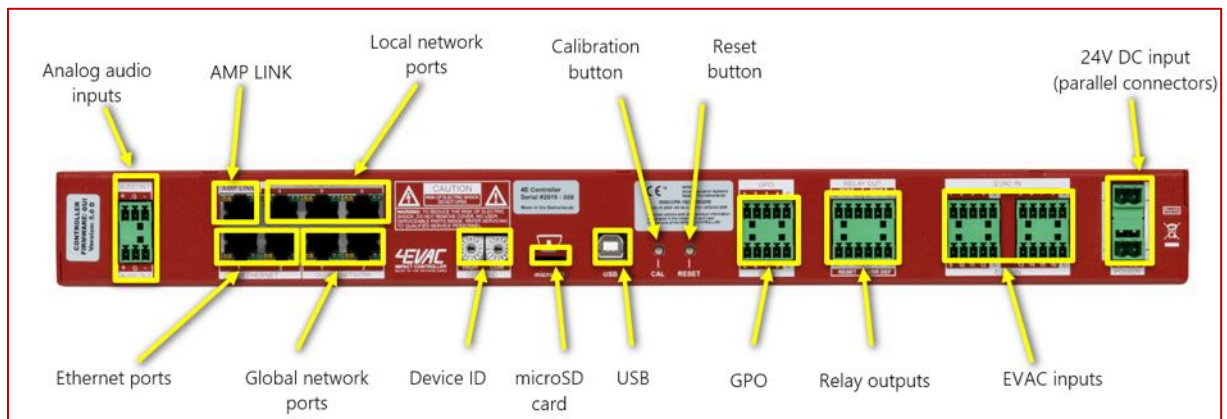
Recommended products meeting the requirements for external enclosure:

- Rittal Terminal Box KL series, model KL 1537.510
 - Rittal Small enclosure KX / Bus enclosure KX, model KX 1612.000
- or equivalent.

4.3. Additional electrical safety requirements for the housing

- The system housing must be equipped with at least one protective earth terminal with a permanent way of fixing, such as nut or bolt.
- All conductive parts of the rack housing must have direct electrical contact with the protective earth terminal;
- Protective earth (PE) terminal must be permanently connected to the building's protective earth potential by means of a PE lead with cross-section of at least 10mm².

4.4. Connections



4.4.1. Mains

Connect the mains power to the MAINS input of each DCA2.500 amplifier/charger. Keep the right polarity and connect the protective earth wire to the ground terminal.

- Mains connection must be connected in a permanent way to the mains network of the building;
- The external circuit feeding mains input of the Impact system must be equipped with an automatic overload protection and automatic earth-leakage protection.
- Mains circuit must include main rack circuit breaker of following rating:
 - No of DCA2.500 <10: 40A
 - No of DCA2.500 >10: 63A

Mains circuit breaker must be located in the circuit at the rack entry, before splitting to the DCA2.500 units;

Recommended mains circuit breaker type: ABB SD 202/63 or equivalent.



Caution! Be careful! Risk of electrical shock! Make sure that the mains cable is not connected to the electricity network during equipment installation.



4.4.2. Battery

Use only valve-regulated, sealed lead-acid maintenance-free batteries for stationary use. The Impact system is designed to operate with 24V battery (2 x 12V DC nominal voltage).

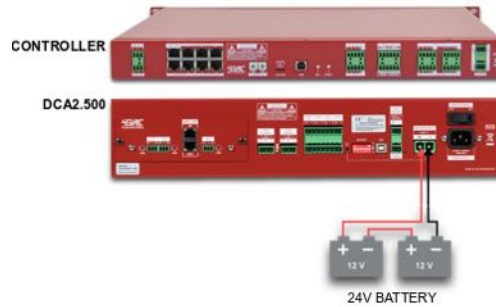
To safely and properly install the battery circuit, follow the instructions below:

1. Before installing the battery, measure the voltage of each battery separately. The open-circuit voltage of a well-functioning, healthy 12V battery should be in the 11,5 V – 13,5 V DC range. 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 position in the rack to make enough room for safe installation (preferably bottom of the cabinet).
3. The DCA2.500 is equipped with internal battery fuses. However, for extra safety and convenience, it is recommended to use an additional removable battery fuse for each DCA2.500 amplifier (40A, slow).



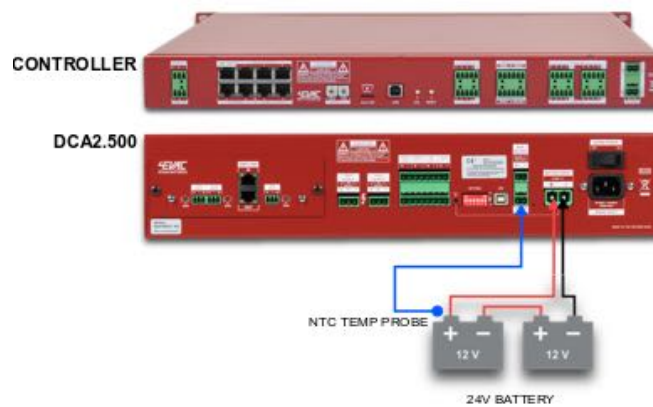
4. **Caution! Be careful! The negative pole of the battery connector is connected directly to the ground potential and the entire metal housing of the Compact 500. Dropping an unprotected battery lead on any part of the hardware, housing or battery brings a high risk of short-circuit and may damage the hardware and the battery. The high electrical current from the battery when short-circuiting may cause a 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 a potential risk to your health.**

5. Maximum battery capacity of single DCA2.500 is 100Ah.



4.4.3. Battery temperature probe

Connect the NTC thermal probe (included with DCA2.500) to the "Battery probe" input of the DCA2.500. Place the probe directly on the battery housing, preferably inside the protective cap on one of the battery terminals.



4.4.4. DC power output

The Impact Controller (including all devices powered by the controller via network ports) is powered only via DC power input from DCA2.500 DC output.

AUX DC OUT has a built-in current limit, maximum load is 60W (2A @30V).

Connect "AUX DC OUT" of the DCA2.500 to the "24V DC POWER" input of the Controller.

Check the polarity!



4.4.5. AMP LINK

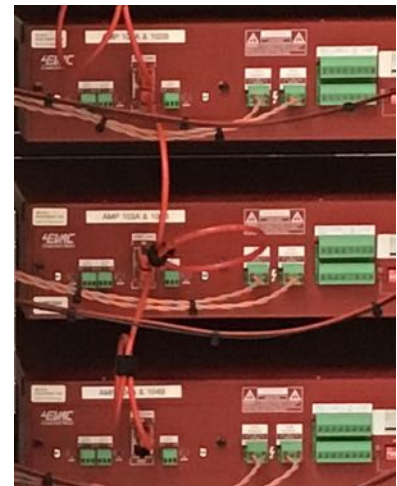
Connect the AMP LINK between the Controller and DCA2.500 amplifiers.

The AMP LINK (RED vertical connection cat5 cable) is the secured bus connecting the Impact Controller with up to 32 x DCA2.500 amplifiers. Based on RS485, this internal system bus provides:

- 2 balanced audio channels across the entire AMP LINK chain, monitored;
- Control and diagnostics data interface.

AMP LINK provides daisy-chain bus in two modes:

- To the IMPACT Controller, when the DCA2.500 is a part of the IMPACT system (all Impact amplifiers daisy-chained to the Controller).
- To other DCA2.500 amplifiers, without an Impact Controller, when the DCA2.500 belongs (with one or more other DCA2.500 units) to a **charging cluster** and shares the same battery pack (see chapter "Cluster charging") with the group: in this case the amplifier and the entire charging cluster is able to work without IMPACT Controller



NOTE: The DCA2.500 can also work as a standalone unit without any AMP LINK connected.



NOTE: On customers request, DCA2.500 amplifier can be equipped with optional DUAL AUX input module. More information about DUAL AUX input module available at 4EVAC on request.

In an Impact system, connect the amplifiers to the AMP LINK into a daisy chain, starting from the Controller. Amplifiers will be addressed and managed by the Controller according to the connection order, i.e. the first amplifier connected directly to the Controller receives the address of Amp 1, next the address of Amp 2, etc.

Use a straight twisted pair CAT5 (or higher) cable with RJ45 plugs (included with DCA 2.500 amplifier). Any standard Ethernet patch cable may be used.

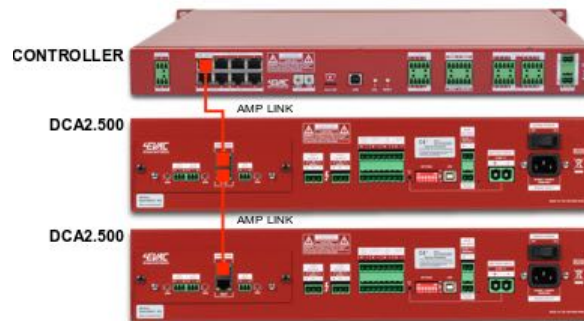


NOTE: Mind the connection order of the DCA2.500 amplifiers on the AMP LINK! The connection order determines the local AMP LINK address of the amplifier, according to software configuration settings for Impact amplifiers. Settings and commands will be applied by the controller according to that addressing.

Use a straight twisted pair CAT5 (or higher) cable with RJ45 plugs (included with DCA 2.500 amplifier). Any standard Ethernet patch cable may be used.



NOTE: The AMP LINK is a monitored main system bus providing audio and surveillance data. **The AMP LINK does not support redundancy** and therefore, in EN54 compliant applications, the AMP LINK cable must be located entirely inside the system cabinet. No part of it may be exposed to external access.



4.4.6. Network ports

The Impact controller offers 5 ports (RJ-45) for network connections between distributed parts of the 4EVAC Voice Evacuation System:

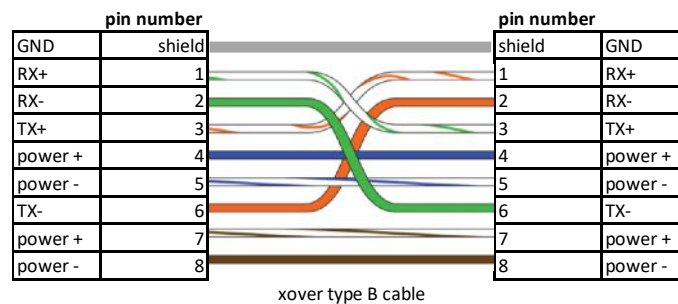
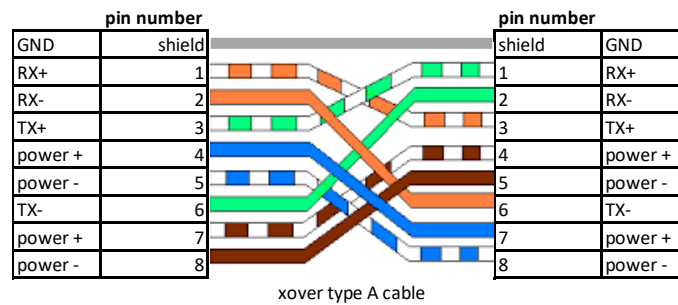
- 2 x G-Net ports (global network)
- 3 x L-Net ports (local network)

The 4EVAC network features a full duplex RS-422 data link and DC power to remote devices.

NOTE: 4EVAC network is not Ethernet!

If you are building a distributed system using a 4EVAC network, you should make physical links between devices using the correct type of cables. The cabling should meet following requirements:

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



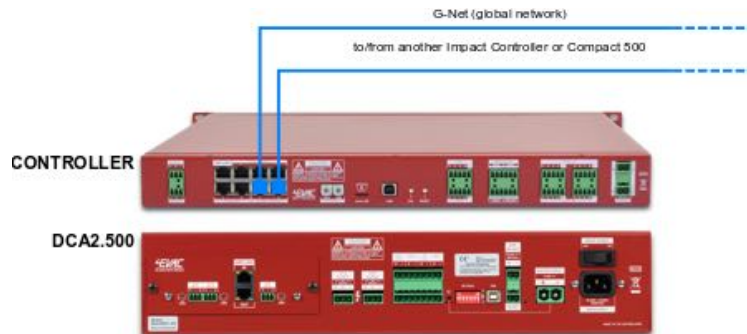
2. CAT5e or higher for a maximum distance of 250m.
3. Non-CAT / lower than CAT5e: 250m not guaranteed.
4. Shield required (at least FTP) for L-Net



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

4.4.6.1. G-Net (global network)

G-Net is a redundant network ring where multiple Controllers may be connected into one system. It is used to reliably synchronize data between all connected devices and for multi-channel live audio transmission with very low latency. The G-Net works as a redundant double ring between Controllers, which keeps the global system intact in case of single link failure.

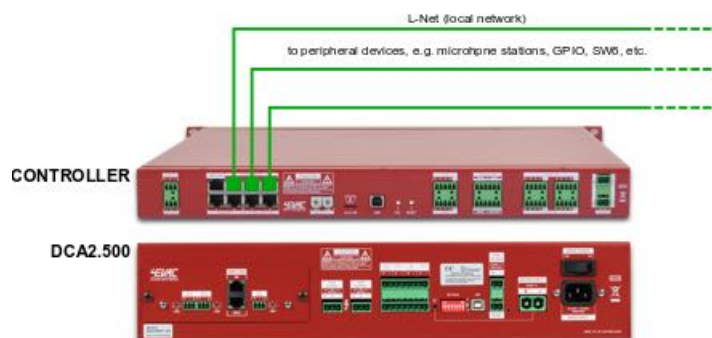


4.4.7. L-Net (local network)

L-Net daisy-chain topology is dedicated to peripheral devices of the Controller, such as remote microphone stations. The L-Net is used to expand functionality of the Impact system to remote locations.

Maximum capacity of L-Net is:

- Max. 500mA DC continuous power per port
- Max. 8 L-Net devices per port
- Max. 16 L-Net devices per Controller



4.4.8. EVAC inputs

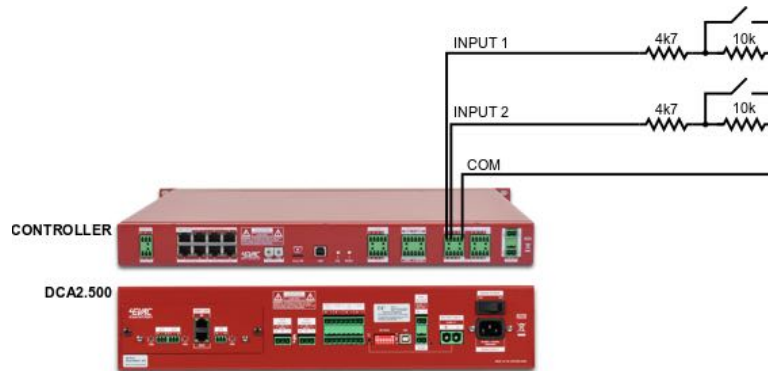
There are 18 monitored inputs dedicated to triggering signals for evacuation, silence, reset instructions and other events from an external fire detection system or another trigger source.

Each of these inputs has built-in DC monitoring which requires two series resistors of 4.7kΩ + 10kΩ in order to detect an input active/inactive state as well as short and open faults. The EOL resistors must be located

directly at the triggering output inside of the external device (i.e. fire detection system) to provide reliable surveillance of the entire link.



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

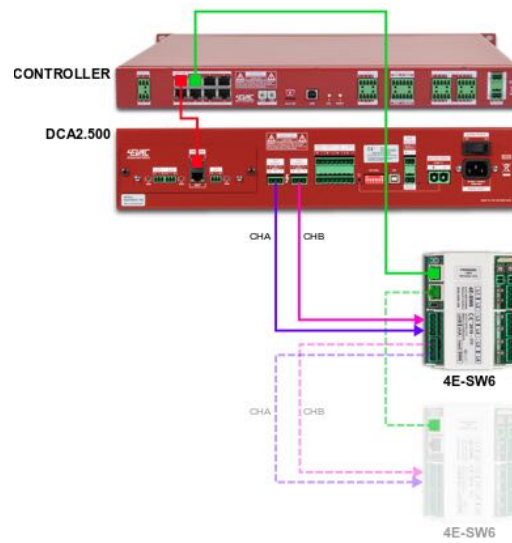


4.4.9. Amplifier 100V outputs

Connect 100V outputs of the power amplifier to inputs "chA / chB" of 4E-SW6.

In order to connect multiple 4E-SW6 to the same amplifier, use the parallel 100V connection port "next SW6" on the 4E-SW6.

More information on different connection modes can be found in the 4E-SW6 manual.



4.4.10. Loudspeaker lines

4EVAC Impact supports surveillance of loudspeaker lines based on 20 kHz impedance measurements.

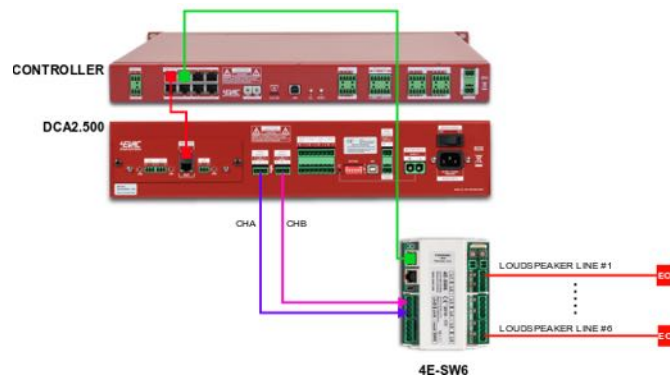
For reliable impedance monitoring of the loudspeaker line, an EOL board must be used. Connect the EOL board to the end of the loudspeaker line in parallel, preferably inside the last loudspeaker on the line. The EOL is not polarity-sensitive.

NOTE: EOL boards are not supplied with the Impact and are available at 4EVAC as separate products.



Loudspeaker line with EOL module

The purpose of the EOL board is to create a reference load at the monitoring frequency of 20kHz. With the EOL connected, the 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 a more reliable fault indication when a significant number of loudspeakers is placed on one long line.



4.4.11.

5. 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 3.5 mm	Analog balanced mono audio, 0dBu	n/a	Balanced shielded microphone cable, typ. 2 x 0.25mm ²	100m
EVAC in	16		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 ² (N – number of individual triggering signals from / to fire detection system)	1000m
EVAC / FAULT/ RESET out	3		Potential-free relay output	n/a		1000m
GPO	8		Open collector output	n/a	Depends on length, typ. N x 0.75~1.5mm ² (N – number of individual triggering signals to external devices)	1000m
AMP LINK port	1	RJ-45	Line level analog audio + RS485 data		UTP CAT5e	10m
G-Net port	2		Full duplex RS-422	Redundant ring with power delivery	FTP CAT5e crossover	250m (to next device)
L-Net port	3			Daisy chain with power delivery		250m (total length)

DC Power in	1	Pluggable screw terminal block 5.08mm	20~30V DC	n/a	2 x 1.5mm ²	10m
MAINS input	1	Screw terminal (circuit breaker)	230V AC (single phase: live, neutral, protective earth)	Common cable to single system rack. In multi-rack system, each rack requires separate cable.	If system rack has: <ul style="list-style-type: none"> • < 10 x DCA2.500 3 x 4 mm² • > 10 x DCA2.500 3 x 10 mm² 	n/a
Protective earth	1	Bolt/nut terminal on the housing (ring termination)	n/a		10 mm ²	n/a

6. Maintenance information

The 4EVAC Impact must be subjected to periodical maintenance checks covering all mandatory functions of VACIE, according to the European Standards: EN54-16 (Voice Alarm Control and Indicating Equipment) and EN54-4 (Power Supply Equipment).

7. Additional RACK marking

For full compliance to the IEC62839, the following MARKING needs to be applied on a clearly visible section at the door / panel that provides access to the electrical connections of the rack.

Mark the applicable number of DCA2.500 amplifiers that are housed in the RACK and its associated electrical specifications at the ticker-box.

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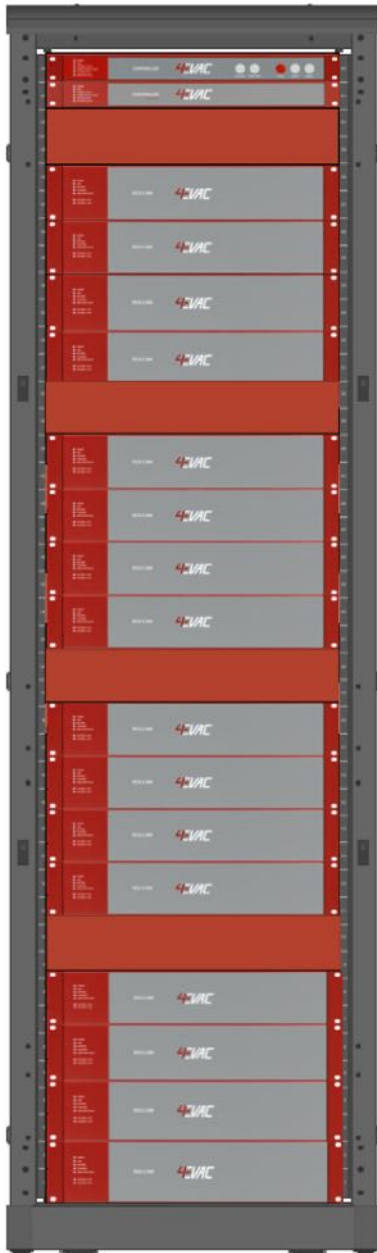
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4EVAC IMPACT

VOICE ALARM CONTROL AND INDICATING EQUIPMENT

AC INPUT: single phase 110-230V AC 50/60Hz

Class 1

DC INPUT: 18-30 V DC



(Ticker)	# of units DCA2.500	Rated power		Weight
		AC INPUT	DC INPUT	42U-RACK Frontdoor + Backdoor Controller + Expander
<input checked="" type="checkbox"/>				158kg +/- 10%
<input type="checkbox"/>	1	1.6 kW	1.08 kW	8.2 + 158 kg
<input type="checkbox"/>	2	3.2 kW	2.16 kW	16.4 + 158 kg
<input type="checkbox"/>	3	4.8 kW	3.24 kW	24.6 + 158 kg
<input type="checkbox"/>	4	6.4 kW	4.32 kW	32.8 + 158 kg
<input type="checkbox"/>	5	8.0 kW	5.40 kW	41 + 158 kg
<input type="checkbox"/>	6	9.6 kW	6.48 kW	49.2 + 158 kg
<input type="checkbox"/>	7	11.2 kW	7.56 kW	57.4 + 158 kg
<input type="checkbox"/>	8	12.8 kW	8.64 kW	65.6 + 158 kg
<input type="checkbox"/>	9	14.4 kW	9.72 kW	73.8 + 158 kg
<input type="checkbox"/>	10	16.0 kW	10.8 kW	90.2 + 158 kg
<input type="checkbox"/>	11	17.6 kW	11.88 kW	98.4 + 158 kg
<input type="checkbox"/>	12	19.2 kW	12.96 kW	106.6 + 158 kg
<input type="checkbox"/>	13	20.8 kW	14.04 kW	114.8 + 158 kg
<input type="checkbox"/>	14	22.4 kW	15.12 kW	123 + 158 kg
<input type="checkbox"/>	15	24.0 kW	16.20 kW	131.2 + 158 kg
<input type="checkbox"/>	16	25.6 kW	17.28 kW	139.4 + 158 kg

For each IMPACT VACIE the number of DCA2.500 should be marked, according to equipment configuration.

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8. Typical Technical and Electrical specifications.

Note: one RACK with following maximum configuration:

- 1x Controller
- 1x Expander
- 16x DCA2.500

(System can be expanded with additional RACKS that are coupled by a redundant G-NET cat-5 data-line)

Standalone system (single controller)	
Number of individual ALARM zones	96
Number of network CONTROLLER	1
Number of network EXPANDER	1
Number of SW6	16
Number of power amplifiers DCA2.500	16
Max. speaker load	32 x 500W (16 x DCA2.500)
Standby power amplifiers	500W per backup channel (configurable from 0 to 16 backup channels)
Loudspeaker line monitoring	
SW6	20kHz AC monitoring with EOL module, short/open/impedance deviation
SW6-LITE	LDB loop technology monitoring with short-circuit isolators, short/open/earth leakage, EN54-17 certified
CONTROLLER	
Voice messages	
Storage	max. 22 audio files x 5 minute each, micro-SD card with content monitoring
Message player	Max. 2 simultaneous local message playback, priority control
Controls and indications	
General controls / indications	Lamp test button, silence button, power, evac, general fault LED indicators
Fault indications	Power supply, system fault, network
Evac manual control	EVAC message, ALERT message, SILENCE, RESET
Local network	
Architecture	Master-slave, up to 16 slave devices per Controller
Connection	3 x L-Net port, RJ-45, powered daisy chain, digital audio & control data
Cabling	X-over FTP CAT5e (or higher)
Current consumption	max. 500 mA per L-Net port
Max. length of local link (node-to-node)	
default	250 m
with twisted-pair extenders	500 m
with MM fiber extenders	2500 m
Global network	
Architecture	Peer-to-peer, up to 255 Controllers
Connection	2 x 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
with twisted-pair extender	500 m
with fiber extenders	2500 m

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Inputs	
2 x BGM	2 x balanced analogue audio mono input, 0dBu, input impedance 15kΩ
16x EVAC in	monitored analogue inputs, 4.7kΩ +10kΩ EOL resistors
Outputs	
EVAC out, FAULT out, RESET out	Potential-free relay output (configurable NO/NC) max. 1A
GPO	8 x Open collector output (configurable NO/NC) max. 24V / 110mA
Amp-link	
Amplifiers (on AMP-LINK bus)	16 x DCA2.500
Power supply	
DC supply input	24 – 30V DC (from DCA2.500)
Power consumption	140 mA @24V DC
Mechanical	
Dimensions (HxWxD)	4.4 x 44 x 34 cm (1U)
Weight	4 kg
Housing material	Steel
IP rating	IP 30
Mounting	19" rack mounting
Operating conditions	
Temperature (Ambient)	-5 ~ 40°C
Max. Temperature (Device)	65°C
Relative humidity	max. 90% (non condensing)
Storage temperature	-40 ~ 70°C
EXPANDER	
Controls and indications	
General controls / indications	Lamp test button, silence button, power, evac, general fault LED indicators
Fault indications	Power supply, system fault, network
Local network	
Architecture	Master-slave, up to 16 slave devices per Controller
Connection	3 x L-Net port, RJ-45, powered daisy chain, digital audio & control data
Cabling	X-over FTP CAT5e (or higher)
Current consumption	max. 500 mA per L-Net port
Max. length of local link (node-to-node)	
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default	250 m
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with fiber extenders	2500 m
Power supply	
DC supply input	24 – 30V DC (from DCA2.500)
Power consumption	140 mA @24V DC
Mechanical	

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Housing material	Steel
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Mounting	19" rack mounting
Operating conditions	
Temperature (Ambient)	-5 ~ 40°C
Max. Temperature (Device)	65°C
Relative humidity	max. 90% (non condensing)
Storage temperature	-40 ~ 70°C
DCA2.500	
Mains AC input	110 - 230 V AC, 50/60 Hz, selection by input fuse rating
Mains power consumption	max. 1600 W max. 12 A @ 110 V AC / 6A @ 230 V AC
Inrush current	40A @110V AC, 20A @230V AC, 10ms
DC input voltage	18 – 30 V DC (nominal 24 V DC)
DC current consumption	max. 45 A @ 24 V
Idle AC power consumption	24 W / 1 W (all channels on / standby)
Idle DC current consumption	34 mA (0.9 W) (all channels standby)
Power efficiency @ rated load	89% @ 230V AC / 93% @ 24V DC
DC output	18 – 30 V DC (max. 60W / 2A @30 V DC nominal)
Charging voltage	max. 27.9V DC, temperature compensated
Charging current max.	depending on battery capacity settings
Single charger	4 A
Cluster charger	N x 4 A (cluster of N chargers), max. 64 A
Battery requirements	rechargeable sealed lead-acid battery for stationary use (EU EN54-4) in case of IEC62638 compliance type IEC61056-1 & 61056-2 compliant
Capacity (54-4) single charger	max. 100 Ah (measured @ 80% of battery capacity after 24h of charging)
Capacity (54-4) cluster charger	N x 100Ah (cluster of N chargers), max. 1600Ah
Charging time (80% of max. capacity)	< 24 h
Rated voltage	24 V DC
Battery cut-off voltage	20 V DC
Battery circuit max. internal resistance	Depending on battery capacity settings: 80/120/160/200 mΩ (total, incl. leads, connectors, fuses, etc.)
Mechanical	
Dimensions (HxWxD)	88.5 x 44 x 34 cm (1U)
Weight	8.2 kg
Housing material	Steel
IP rating	IP 30
Mounting	19" rack mounting
Operating conditions	
Temperature (Ambient)	-5 ~ 40°C
Max. Temperature (Device)	65°C
Relative humidity	max. 90% (non condensing)
Storage temperature	-40 ~ 70°C
AUDIO	
Frequency response	

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Local BGM	50 Hz – 20 kHz (AMP-LINK) uncompressed
Messages, network streaming	100 Hz – 12 kHz (G-NET) compressed
Analog input- output latency	< 10 ms (stand-alone system)
Network audio stream format	24 kHz sampling, ADPCM compressed
Message file input format	16 bit WAV, max. 5 minutes
DSP features	HP/LP filter, multipoint parametric EQ, input / output level
No. of output audio channels (AMP-LINK)	2

NETWORK

Max. number of devices in the network	254
Max. number of zones	254
Number of simultaneous network audio channels	2
Network audio transmission latency	0.3 ms per device
Global network	
Architecture	Peer-to-peer, up to 254 Controllers
Connection	2 x 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
with twisted-pair extender	500 m
with MM fiber extenders	2500 m

All information provided in this document is subject to change without notice. 4EVAC may also make improvements and/or changes in the products described in this information at any time without notice.

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Hacousto Holland bv
Industrieweg 87
2651BC Berkel & Rodenrijs
The Netherlands
www.4EVAC.com