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4E-FM installation and user guide	**Author:**	**DD**

SUMMARY

This document includes both the installation and user guides of the 4E-FM, the fireman microphone station for the Compact 500 Voice Evacuation System. It explains how the 4E-FM should be installed and configured. The installation instructions are addressed to trained technical personnel, such as installers, service technicians and commissioning engineers. User instructions explain how to operate the 4E-FM and how to interpret indications by the end users as well as technical personnel, such as service technicians.

REVISION AND APPROVAL

Rev.	Date	Nature of Changes	Approved By
01	31-07-2017	Original draft	DD
02	05-06-2020	Corrections	TvdH

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

4EVAC Compact 500 is all-in-one Voice Evacuation System box. The box contains a completely integrated Voice Evacuation System, capable of both standalone and network operation. 4EVAC Compact 500 is certified in accordance with EN54-16 and EN54-4, which are harmonized standards under Construction Products Regulation, mandatory in the European Union.

1. What is the 4E-FM?

4E-FM is a desktop or wall mounted emergency microphone station with high priority and fault surveillance.

It can address any zone or set of zones in the entire system, including all call, for highest priority voice emergency. The 4E-FM includes a handheld microphone and monitored PTT TALK button..

The 4E-FM is connected to the L-Net interface of the Compact 500 main unit and may be daisy-chained with more L-Net devices. 4E-FM is dedicated to emergency purposes and can be used by fire brigades, rescue teams and authorized security personnel. As an emergency microphone compliant with EN54-16, 4E-CMP features built-in surveillance of the microphone transducer, PTT button and network link monitoring. It also offers a redundant L-Net connection for installations with special security requirements.

2. Where do I start?

First, make sure that you are officially allowed to access the hardware of Compact 500 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 Voice Evacuation System.

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 malfunction, and therefore are strictly prohibited and void manufacturer's warranty.

3. Configuration settings

Settings for the 4E-FM are included in the configuration file located on the micro SD memory card installed in the Compact 500 main unit.

The configuration file includes user-defined settings, such as:

- Pre-defined set of zones for PTT button (unlimited)
- microphone volume level,
- device priority.

The configuration file should be prepared in the C500 Manager. C500 Manager is GUI software running on Windows OS. More information about the C500 Manager can be found in the software manual "C500 Manager guide".

NOTE: Please make sure that the configuration file is prepared with the version of the C500 Manager compatible with firmware of Compact 500.

The installation file of the latest 4EVAC Manager and the manual are available at our website www.4EVAC.com

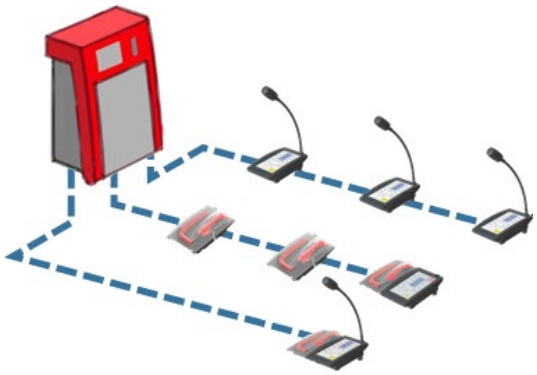
4. Hardware installation and settings

4.1. L-Net

4E-FM is a remote station connected to the L-Net port of the C500 main unit. Multiple 4E-FM stations may be used in the same L-Net, with following limitations:

- A maximum of 8 stations per L-Net port
- A maximum of 16 stations per single C500 main unit (total sum of all 3 L-net ports)

The microphone station may be also daisy-chained together with other L-Net devices



Compact 500 L-Net (local network)

4.1.1. Network ports

4E-FM offers 2 L-Net ports (RJ-45) for network connections to the C500 main unit and distributed parts of the 4EVAC Voice Evacuation System. Both L-Net ports are equal, therefore there is no difference which port is connected to which side of L-Net daisy-chain.

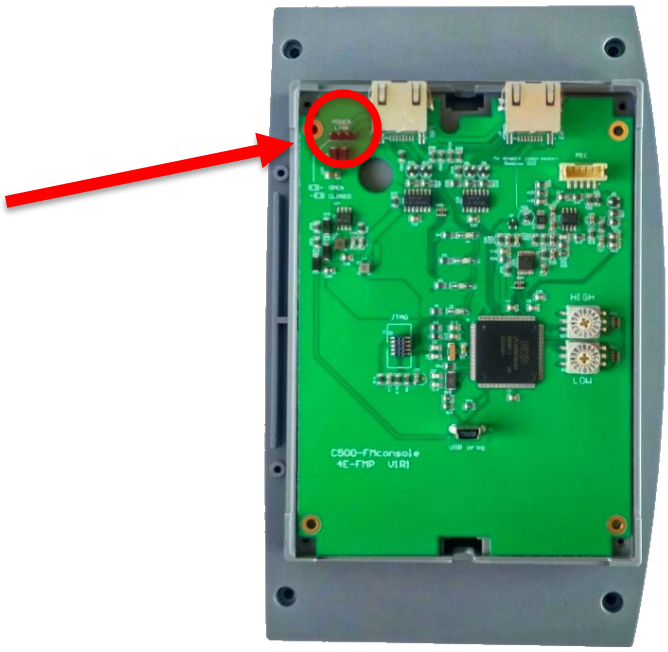
L-Net ports on the back side of 4E-FM

4.1.2. Redundant link

If you need to make a redundant L-Net connection to the Compact 500 main unit, connect both L-Net ports of the device to two L-Net ports on the C500 main unit. You can choose any L-Net port on the C500 main unit. This creates a double daisy-chain of the redundant A/B power and data link to the device and ensures fail-safe networking in case of single cable or port failure.

Both spurs of the redundant A/B link may be populated with other L-Net devices.

NOTE: The device is equipped with a power link jumper, which, by default, is in CLOSED position (pass-through L-Net power bus over daisy-chain). In order to create a redundant link, the jumper must be moved to the OPEN position. The device will be then immune to a single port short-circuit of the power bus.



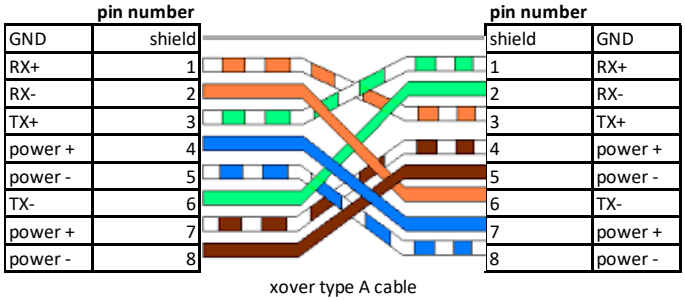
Location of power link jumper

4.1.3. Network cabling

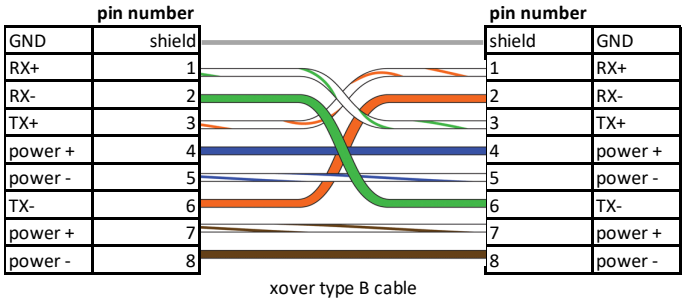
4EVAC network features a full duplex RS-422 data link and 24V DC power to remote devices.

If you're building a distributed system using the 4EVAC network, you should make physical links between devices using the right cables. The cabling should meet the following requirements:

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



xover type A cable



xover 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)

NOTE: If you use a straight cable, the device will power up but the Tx/Rx data terminals will not be properly connected. This will result in a communication fault between L-Net device and C500 main unit. The L-Net device will not be able to initialize, and thus will remain in its boot-sequence, not operational.

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

4.2. Device ID

The microphone station needs an ID setting in order to be properly recognized in the network and operate.

If the device ID is duplicated or set to a wrong value, the device will not receive the correct configuration settings from the master Compact 500 main unit. In this case the remote station will be stuck in its boot sequence and remain non-operational.

The device ID is set by means of two rotary switches, which define the two-digit hexadecimal value of the ID.

In order to check or set the Device ID, you must access the rotary switches on the back side of the unit:

1. Remove the steel plate covering the back of the station
2. Identify the high-significant and low-significant rotary switches. The Device ID is a combination [HI LO] of those two digits.
3. Make sure the ID value exists in your configuration settings, relates to the right device type and is not duplicated to another device. Allowed values: 01-FE
4. Set the Device ID value according to the configuration settings of the Compact 500 system.
5. Plug-in the L-Net cable connecting the station with the C500 main unit.
6. Observe the boot sequence, after which the unit should automatically enter its normal operating state.
7. Assemble the back plate (and optionally the rubber feet).

4E-FM bottom view: Device ID setting

5. Front Panel

4E-FM front panel

Important note: Access level 2 explanation

Opening the front cover of the 4E-FM gives you physical access to the restricted area at access level 2 with high priority manual control. Using it will trigger EVAC mode and will result in the voice alarm state in the building. Control at access level 2 is strictly dedicated for emergency services, fire brigades, rescue teams and authorized building security personnel. 4E-FM should never be used for general purpose paging by unauthorized persons.

If you have doubts about the access level and your authorization to use the emergency microphone station, then you're probably **not authorized** to use it.

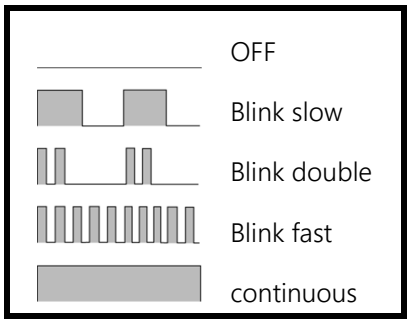
5.1. LED indicators

5.1.1. POWER

5.1.2.

Indicates the operating status of this station.

- Continuous: device is powered and ready
- Blinking fast: station is booting or not operational
    - Boot sequence



LED indication time chart

- No communication with the C500 main unit
- Wrong Device ID

5.1.3. EVAC

Indicates that the system is in Voice Alarm, where at least one zone in the system is occupied by an emergency audio signal, i.e. a pre-recorded EVAC MESSAGE or LIVE EVAC, when a fireman microphone is being used.

- Continuous: EVAC state

5.1.4. FAULT

Indicates that the system is in its FAULT state (general fault indicator), where at least one device in the system is reporting a fault.

- Continuous: when a local station fault is detected
  - Microphone short or open circuit
  - PTT button short or open circuit
  - Network link fault
- Blinking slow: when the local station is healthy and at least one remote device is reporting a fault state

5.1.5. BUSY – blue LED

Zone busy LED. Indicates current status of the pre-defined set of zones addressed by this station.

- Blinking fast: the set of zones is occupied by an audio signal, but is in SILENCE mode (triggered by SILENCE input or manual SILENCE button)
- Blinking slow: indicates that the set of zones are currently transmitting an audio signal (except BGM) from another device.
- Blinking double: indicates that the set of zones is currently transmitting an audio signal from this microphone station.

NOTE: BGM transmission is not indicated.

5.2. Manual controls

5.2.1. PTT

This button starts EVAC voice transmission to pre-defined zones. When activated, the entire Compact 500 system is in EVAC mode.

6. Technical specifications

4E-FM	
Number of zones	255 (global access, no restrictions)
Controls and indications	PTT button, POWER/FAULT/EVAC/BUSY LED indicators
Microphone	Integrated commercial purpose mic
Type	MEMS transducer, hand-held
Power consumption	
24V (L-Net)	max. 50mA
Audio	
Frequency response	100 Hz – 12 kHz
Digital audio format	24 kHz sampling, ADPCM compressed
Audio processing	Fixed BP filter, fixed dynamics compression
Local network interface	
Architecture	Master-slave, up to 16 slave devices per C500 main unit
Connection	RJ-45, powered daisy chain, digital audio & control data, redundant
Cabling	X-over FTP CAT5e (or higher)
Current rating via single link	max. 500 mA (up to 8 slave devices) via L-Net port,
Max. length of L-Net link	250 m
Mechanical	
Dimensions HxWxL)	8 x 13 x 21 cm
Weight	380 g
Housing material	Steel / ABS
IP rating	IP 30
Mounting	Desktop wedge / wall-mounted (incl. wall bracket)
Operating conditions	
Temperature	10–40°C
Relative humidity	max. 90% (non condensing)
Storage temperature	-40–70°C

4EVAC is a trade name of:

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www.4EVAC.com