

# **EVAC** manual



Fire Communication www.safeline-group.com

Complies to EN81-28 and EN81-70 standards. PATENT 08163634.2

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## **Technical data**

#### Technical data main unit

Power:	24 VDC In standby: 40 mA Active: 120 mA	
Inputs:	4 x 24 VDC, max 200 mA in total, optically isolated	
Outputs:	3 x 24 VDC, max 200 mA	
Size:	Surface mounted: 418 x 116 x 40 mm (L x W x H) Flush mounted: 400 x 110 x 40 mm (L x W x H)	
Weight:	300 g - without frontplate	
IP code:	IP43	
Technical data Floor station/car station		
Power:	24 VDC In standby: 30 mA Active: 60 mA	
Inputs:	2 x 24 VDC, max 100 mA, optically isolated	
Outputs:	2 x 24 VDC, max 100 mA in total	
IP code:	IP43	

#### **Technical data LMS Unit**

Power:	230 VAC
Inputs:	2 x 24 VDC, max 200 mA in total, optically isolated
Relay outputs:	Max. 2 A/30 VDC, 0,5 A/125 VAC potential free relay contacts
PSU:	max. 4 A at 24 VDC

#### Technical data bus cable

Max cable length:

200 meters - using 0,5 mm2 twisted pairs, shielded (recommended).

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## General information

This unit was built with stateof-the-art technology and to generally recognised safety related technical standards currently applicable. These installation instructions are to be followed by all people working with the unit, in both installation and maintenance.

It is extremely important that these installation instructions are made available at all times to the relevant technicians, engineers or servicing and maintenance personnel. The basis prerequisite for safe handling and trouble free operation of this system is a sound knowledge of the basic and special safety regulations concerning conveyor technology, and elevators in particular. The unit may only be used for its intended purpose. Note in particular that, no unauthorised changes or additions may be made inside the unit or individual components.

#### Exclusion of liability

The manufacturer is not liable with respect to the buyer of this product or to third parties for damage, loss, costs or work incurred as a result of accidents, misuse of the product, incorrect installation or illegal changes, repairs or additions. Claims under warranty are likewise excluded in such cases. The technical data is the latest available. The manufacturer accepts no liability arising from printing errors, mistakes or changes.

#### Declaration of conformity

Download "The declaration of conformity" at our website: www.safeline-group.com

#### Safety Precautions!

- Only trained professionals, who are authorised to work on the equipment, should install and configure this product.

- This quality product is dedicated for the lift industry. It has been designed and manufactured to be used for its specified purpose only. If it is to be used for any other purpose, SafeLine must be contacted in advance.

- It should not be modified or altered in any way, and should only be installed and configured strictly following the procedures described in this manual.

- All applicable health and safety requirements and equipment standards should be considered and strictly adhered to when installing and configuring this product.

- After installation and configuration this product and the operation of the equipment should be fully tested to ensure correct operation before the equipment is returned to normal use.

Electrical and electronic products may contain materials, parts and units that can be dangerous for the environment and human health. Please inform yourself about the local rules and disposal collection system for electrical and electronic products. The correct disposal of your old product will help to prevent negative consequences for the environment and human health.

## **Overview**

## Mounting dimensions



LMS Unit



**Floor station** 



Car station



## Overview EVAC entrance station (ES)

The master unit of the system. All commands and logic is handled by the entrance station. There can only be one entrance station in an EVAC system. The engraved text on the entrance station is available in english, german and swedish.





## Overview EVAC floor station

There can be up to 98 floor stations in one system. The engraved text on the floor station is available in english, german and swedish.





## Overview EVAC car station

Note: Car station - adress 0,0 (Car 1) or 99 (Car 2)





## Overview connection board



System overview

#### LMS unit

Sends an LMS message through a SafeLine telephone. LMS messages are triggered by events defined in the entrance station. The EVAC system is powered by the LMS unit. For relay information, see "Setup menu structure".

#### **Entrance station**

The master unit of the system. All commands and logic is handled by the entrance station. There can only be one entrance station in an EVAC system.



#### 1. LED

Power indication Continuous Green = Power on Flashing Green = Sending LMS Flashing Red = LMS failure

**2. RS232-connection to SafeLine (telephone).** If used for LMS (Lift Monitoring System).

#### 3. USB for updating the firmware

#### 4. CAN LED

4-1. CAN 4-2. CAN ERR

#### 5. Termination switch

5-1. CAN2 - Shaft 5-2. CAN1 - Car

#### 6. Connectors for Communication

1. +24 V 2. 0 V 3. CAN2H - on the top terminal CAN1H - on the bottom terminal 4. CAN2L - on the top terminal CAN1L - on the bottom terminal 5. GND 6. Audio bus (A) 7. Audio bus (B)

#### 7. Inputs

7-1. +24 VDC (common) 7-2. Input 1 7-3. Input 2

- 8. Relay Output changeover contact 8-1. N/C 8-2. Common 8-3. N/O
- 9. Power Supply Unit (PSU) 230 VAC/24 VDC
  - 9-1. 230 VÁC N 9-2. 230 VÁC L
  - 9-3. Mainpower GND

## Installation

## Cutting the cable

Make sure that the modular plugs (RJ45) on the ends of the cable are facing the opposite way (see picture). The connection cable is used between the connection board (CB) and all floor station (ES and FS) in the shaft.



## Heartbeat message

The heartbeat is a message sent continuously by all units in an EVAC intercom system.

The message contains only the sending node's id. It is used by the system master (entrance station) to identify and keep track of the units in the system.

The master's heartbeat is used by all other units to make sure the system is working and that the bus is working properly. When the entrance station receives a heartbeat from a CAN-bus node for the first time, it sets the node to the current system mode, i.e. EVAC, FIRE or STANDBY. Any inactive CAN-bus node (parameter can be configured in the entrance station) is set to standby and is ignored by the system.

When a node finds the master's heartbeat, the CAN LED stops flashing and is turned on fully. A node that loses the master's heartbeat will enter into STANDBY mode and starts flashing the CAN-error LED. If the master loses any active unit, the unit is removed from the system and an error is logged.

## Address selection

#### **Unit address**

Each unit, except the LMS unit and the entrance station, needs a set address. The addresses on the CAN 1 bus start with the first car station which should be set to 00. If two car stations are used, the second car station should be set to 99.

The unit furthest from the LMS unit on the CAN 2 bus should be set to 01, the second furthest from the LMS unit to 02 and so on. The entrance station and the LMS unit does not have a set address.

#### **CAN** termination

The two CAN buses in the LMS unit must be terminated on the last units of each CAN bus.

The last unit on the bus (the unit furthest from the LMS unit) should have the TERM switch set to OFF. All other units between the last unit and the LMS unit should have TERM ON.

If the system has two car stations, the car station furthest from the LMS unit (car 1) should be set to TERM ON while the other car station (car 2) shoud be set to TERM OFF.

Inside the LMS unit, both CAN 1 and CAN 2 should be set to off.



Quick set-up guide	Left function key —
Enter the setup menu	To enter the menu, press the following keys on the Entrance station: left arrow, right arrow, enter, enter. When "CONNECT PIN" is displayed on the ES screen, press the right function key for 2 seconds until "SETUP PIN" is displayed. Enter the admin PIN (default is set to 0000) in order to access the setup menu.
Setting up unit volumes	Press the right arrow key until the option "Entrance station" is shown, press enter to select. Press the right arrow key until the option "Volume" is shown, press enter to select. Set the speaker volume by using the up and down arrow and then confirming with the return key. Press the left function key to return to the main menu. Press the right arrow key until the option "Car" is shown, press enter to select. Press the right arrow key until the option "Volume" is shown, press enter to select. Set the speaker volume by using the up and down arrow and then confirming with the return key.Press the left function key to return to the main menu. Press the right arrow key until the option "Nodes" is shown, press enter to select. Press the right arrow key until the option "Volume" is shown, press enter to select. Set the speaker volume by using the up and down arrow and then confirming with the return key.Press enter to select. Press the right arrow key until the option "Volume" is shown, press enter to select. Set the speaker volume by using the up and down arrow and then confirming with the return key.
Setting up node labels	While still in the menu "Nodes", press the right arrow key until the option "Label" is shown, press enter to select. Set how the node is shown by using the up and down arrow and then confirming with the return key. Press the left function key to return to the main menu.
Relay functions	Press the right arrow key until the option "LMS" is shown, press enter to select. Press the right arrow key until the option "Relay functions" is shown, press enter to select. Select the relay function by pressing the right arrow key until the correct function is shown, press the return key to select the function.
Exit setup	Press the left function key to return to the main menu. Press the left function key again to exit the setup menu. Make sure to press the key in order to save the changes.

## Wiring diagram

The 7 PIN connectors on the LMS board are located above/below each other. Screened/shielded/ twisted pair cables are recommended.

#### Machine room



Please note that the colours of wiring cables are only for illustration purposes. Actual colors of cables may be different.



#### SafeLine EVAC v.2.1.0 EN

## Operating

### **Entering menus**

You can only enter the "SETUP" and "CONNECT" menus when in STANDBY mode. The PIN-code is set to "0000" as the default value.

It is possible to change the default language (English) to German. Select: Setup Menu -> System -> Languages -> Deutsch To enter the menus, a "secret" key sequence is needed. The following keys need to be pressed in the following order: "Left

arrow, right arrow, enter, enter".

Then the "CONNECT PIN" access window appears. To enter the "CONNECT" menu enter the correct PIN.



To get to the setup menu:

- Press the "secret" key sequence.
- When the "CONNECT PIN" appears, press the right functionkey (the highlighted key in the illustration below) for 2 sec. until the "SETUP PIN" access window appears.
- Enter the ADMIN PIN to get to setup menu.



Connect menu	In the "CONNECT" menu it is possible to connect to the car station and all floor station registered in the system. Please note that it is not possible to connect nodes without a node ID or nodes that have been inactivated in the setup menu on the CAN-bus.
EVAC menu	In the EVAC menu, the alarms received are displayed with the current alarm floor name displayed and the current number of queued alarms. The number of queued alarms is updated as new alarms are received. The alarms are queued in the order they are received. To connect to an alarm, move to the alarm you want to connect to with the arrow up/down, and press "ENTER" to connect. When a connection to the alarm has been made, the alarm will be removed from the queue. It is always possible to connect to the car station in the EVAC menu by pressing the left function key.
Connect to a unit	There are two ways to connect to a unit. In STANDBY mode it is possible to connect to a unit by entering the connect menu. In EVAC mode it is always possible to connect to the car, the floor stations can only be connected to if an alarm has been registered from the unit. Connection can only be made between the entrance station and a floor/car station. By default the connected floor/car station will have the microphone activated and will transmit audio onto the audio bus. The entrance
	station receives audio and the speaker is activated. If the PTT input is activated on the entrance station, the microphone will be activated and the speaker inactivated. All other units' speakers are then activated and their microphones deactivated. This means that the entrance station has priority to speak at all times.
Setup menu	All parameters in the EVAC system can be setup in the entrance station's "SETUP" menu. All changes (apart from the real time clock) are only made in RAM. Only when exiting the setup menu and answering "YES" to saving the settings, the parameters will be saved into the unit.
	To exit the "SETUP" menu, press and hold the left functionkey.

## Operating EVAC

The system has three main modes; STANDBY, EVAC and FIRE. Which mode to be used are switched via inputs, usually connected and triggered by key switches.

#### STANDBY mode

STANDBY mode is the default mode, where the system is idle. This is used during most times and when turned off. On the entry station you can enter the setup menu and the connect menu.

#### EVAC mode

In case of emergency where there is need to evacuate persons from different locations (floor levels), the system can be used as an evacuation intercom by switching it into EVAC mode. The EVAC mode is normally triggered by the main key switch on the front of the entry station operation panel (but other set ups are possible). The key switch should be operated by trained personnel on location.

When in EVAC mode, persons needing rescue can call for assistance from the floor station by pushing the button. The call will then be connected (or put in queue) to the entry station where trained personnel can give instructions. All conversations will also be transmitted in the car station.

**Please note:** The EVAC system can be configured to operate the lift in any way.

You can configure an input to trigger the EVAC mode in the setup menu. The system will be in EVAC mode as long as the input is set to a high value (16 to 30 V) and the FIRE mode is not activated. FIRE mode has a higher priority than EVAC mode. If the input is activated while the system is in EVAC mode, it will automatically switch to FIRE mode. When FIRE mode is deactivated, the system will return to EVAC mode if the input is set to "high".

#### FIRE mode

The FIRE mode is entered by activate an input, typically connected to a "fire fighters key" strategically placed in the building. This will turn the system into a "push to talk" type intercom between the entry station and the car station. It is also possible to add 2 more pre-defined floor stations to the intercom if needed. This makes it possible to have a constant communication with e.g. a fire fighter inside the lift car, and a team/rescue leader on the entry floor.

You can configure an input to trigger FIRE mode in the setup menu. As long as the input is active, the system will be in FIRE mode. Floor stations and car stations that are configured as fire units in the setup menu will switch into FIRE mode. All other units will remain in STANDBY mode, the default mode.

## Floor stations (FS)

The floor stations need to have a unique CAN-bus node ID. The ID is set with the address selector and can be set to a vaule between 1 and 99. Please see "EVAC wiring and address selection", on page 5-7, for the system setup.

NOTE: ID 0,0 is only used to specify a car station.

All inputs and outputs on a floor station are configurable through the setup menu of the entrance station. Floor stations are named using three characters, which must be either letters, a-z, or numbers, 0-9.

#### STANDBY mode

All outputs and inputs are disabled.

#### EVAC mode

Any output configured as "alarm button ack" flashes to indicate that the unit is in EVAC mode. Any input configured as "alarm button" will send an alarm to the entrance station when activated. When the entrance station has registered the alarm, the input is disabled and the outputs, that are configured as "alarm button ack", will change the LED flashing frequency.

Floor stations are set to EVAC mode as default if they are activated and have a lower CAN-bus node ID than the configured number of units in the system. All other floor stations are set in STANDBY mode.

#### **FIRE mode**

Two floor stations and the car station can be used as fire units. The car station is automatically a fire unit. The floor stations that should be fire units need to be configured in the setup menu.

When in FIRE mode, the car station is always connected to the audio bus and all sounds transmitted will be audible through the car station speaker. When a car station input is configured as "alarm button" the speaker will be deactivated, the microphone activate, and the unit will be transmitting sound onto the audio bus.

## Entrance station (ES)

The entrance station is the master of the EVAC system. All intelligence is located in the entrance station and all decisions are made by it. If the entrance station does not function properly, the system will not work.

#### **STANDBY mode**

In STANDBY mode the screen will display standby text while the backlight is turned off. Each input configured as EVAC or FIRE mode are active, whilst all other inputs are deactivated. If any of the active inputs are set to high the system will enter EVAC or FIRE mode. All outputs are deactivated.

#### EVAC mode

Each input configured as "PTT" (Push to talk) is activated. The EVAC menu is displayed. Outputs configured as "EVAC" or "PTT ack" are activated.

#### FIRE mode

When the FIRE mode screen is activated on the entrance station, the floor station will switch into FIRE mode. The floor station configured as a fire unit will be connected to the audio bus and any sound on the bus will be audible on the unit. If the PTT input is activated, the unit will transmit on the bus and the speaker will be turned off.

## Configuration

## Setup menu structure

#### System

**Max nodes** - Maximum number of nodes to be presented in the "CONNECT" or "EVAC" menus. To be displayed in the system, this should be set to the same number as the highest node ID (of the floor stations).

**Fire Mode** - Set the node ID of up to 2 floor stations which will act as FIRE mode intercom stations. This setting ignores "Number of nodes" and any individual node's state (active / inactive). Set the node ID to 0 if you do not want to use FIRE mode on any station. Press Up-key/Down-key to select the next position.

Admin PIN - Set PIN for entering the "SETUP" menu.

User PIN - Set PIN for entering the "CONNECT" menu.

**Broadcast** - Setup the broadcast sound files (5 sound files). Press Up-key/Down-key to select next broadcast sound file position.

- Label set the label of a sound file position.
- State (On/Off) set a sound file' state.

Test sound - Trigger a broadcast.

• Testing sound - Currently broadcasting.

**Date** - Set the current date for the RTC (Used by the LOG handler and self-test).

**Time** - Set the current time for the RTC (Used by the LOG handler and self-test).

Self-test - Settings for the self-test.

- Time Specifies when on the day a self-test will be triggered.
- Interval Specifies the interval (in days) between tests.
- Start self-test Activate the self-test.

Read config from SD - Reads configuraton from the SD card.

**Factory reset** - Reset all parameters (not RTC) to factory default. The reset is only in RAM, so to store the settings in flash you also need to exit the setup menu.

**Languages -** set the language to be used on the unit. Choose between German or English.

- Deutsch (German)
- English

### Setup menu structure

#### **Entrance station**

**Backlight** - Set the background light intensity of the entrance station.

**Volume -** Set the speaker volume of the entrance station.

**Inputs -** When in the input functions. Press Up-key/Down-key to select another input.

- Input function Set which functions to be triggered for the inputs.
  - PTT (push to talk)
  - FIRE
  - EVAC
  - OFF

**Outputs** - When in the output functions. Press Up-key/Down-key to select another output.

- Output function Set which functions to be triggered for the outputs.
  - OFF
  - PTT\_ACK (push to talk acknowleged)
  - FIRE
  - EVAC

Hardware version - Information about the hardware. Software version - Information about the software.

#### Car

Volume - Set speaker volume for the node.

Hardware version - Information about the hardware.

**Software version -** Information about the software.

Mic Level - Set microphone level.

**Inputs** - When in the input functions. Press Up-key/Down-key to select another input.

- Input function Set which functions to be triggered for the inputs.
  - Off
  - Alarm button

**Outputs -** When in the output functions. Press Up-key/Down-key to select another output.

- Output function Set which functions to be triggered for the outputs.
  - Off
  - Alarm button ACK

### Setup menu structure

#### Nodes

Select target node by pressing up/down. There is also an option to select all nodes.

**State (active/inactive)** - Set if the node is active/inactive for EVAC/ connect mode.

**Label** - Set how the node is shown in EVAC/connect mode. **Inputs** - When in the input functions. Press Up-key/Down-key to select another input.

- Input function Set which functions to be triggered for the inputs.
  - Off
  - Alarm button

**Outputs -** When in the output functions. Press Up-key/Down-key to select another output.

- Output function Set which functions to be triggered for the outputs.
  - Off
  - Alarm button acknowledged.

Volume - Set speaker volume for the node.

**SoundFiles -** When in the sound files. Press Up-key/Down-key to select another sound file.

- Mode Mode for the sound files (Off, On, Repeat).
- Repeat Delay time [s] between repeats.

Indicate - Select node to indicate.

• Indicating - Indicate selected node.

Hardware version - Information about the hardware. Software version - Information about the software.

### Setup menu structure

#### Log

Read the log (stored in the SD card of the entrance station).

#### Errors

Read the current errors.

**LMS** - When in the LMS menu. Press Up-key/Down-key to select another LMS trigger.

- Activate Trigger Set if the selected trigger is active or inactive.
- Send test message Test send the selected LMS.
- Relay Function Set selected function.
  - OFF
  - FIRE + EVAC Low (relay deactivated when triggered)
  - FIRE + EVAC High (relay activated when triggered)
  - FIRE Low (relay deactivated when triggered)
  - FIRE High (relay activated when triggered)
  - EVAC Low (relay deactivated when triggered)
  - EVAC High (relay activated when triggered)

Hardware version - Information about the hardware. Software version - Information about the software. Code - What LMS code to be sent upon a trig.

## Configuring EVAC

#### SD card

On the entrance station the SD-card is only used for holding the log file and mirroring the configuration of the unit. On the floor station the SD-card is used for storing sound files to be

On the floor station the SD-card is used for storing sound files to be played and broadcast.

The file structure must be exactly as specified for the unit to be able to play the file. The sound file has to be a .wav (wave) file, it can have any name. The first .wav file in a folder is played. There is a limit of maximum 35 characters in the names for the Soundfiles.

#### Sound file triggers

All floor stations have the possibility to play sound files. This is done by either manually triggering broadcast sound file in the EVAC menu, the play test sound in the setup menu under system. Or it is done automatically by activating the unit sound triggers in the setup menu in nodes.

By activating a trigger a sound file from the correct node is played at an event. Activating repeat will play the file continuously until the event is ended. The unit will pause between each sequence of playing a file. The pause time is set in the repeat delay menu.

## Configuring EVAC



## Log file

The log file is created in a folder called 'LOG' on the entrance station's SD card.

The log file is a .txt file and can be opened in any text editor.

#### Each log entry consists of:

ENTRY - Serial number starting on 1. TIME - Time stamp parsed from the real time clock. CODE - Log code. DATA - Any data connected to the log code and a describing text.

A log entry with a code above 128 characters is not described and will be used for internal errors.

#### Current log codes in hex:

1 = BOOTUP $2 = ENTER_IDLE_MODE$ 3 = ENTER\_EVAC\_MODE  $4 = ENTER_FIRE_MODE$ 5 = NODE\_CONNECTED 6 = NODE\_FAILED\_CONNECT 7 = NODE\_DISCONNECTED 8 = NODE\_ACTIVE\_FOUND 9 = NODE OUTSIDE MAX FOUND 10 = NODE\_INACTIVATED\_FOUND 11 = ERROR\_SD\_CARD\_CONNECT\_FAILED 12 = ERROR\_MIC\_SPEAKER\_FAILED 13 = ERROR\_SD\_CARD\_TEST\_FAILED 14 = NODE LOST 15 = SELF\_TEST\_RESULT 16 = SELF\_TEST\_MISSING\_RESPONSES 17 = SELF\_TEST\_MISSING\_SD\_CARD 18 = ERROR\_CAN\_BUS\_ERROR 19 = ERROR\_SD\_CARD\_FAILED\_TO\_PLAY\_FILE 20 = NODE\_MISSING\_AT\_BOOTUP 21 = EVAC\_ALARM\_RECIEVED 22 = SELF\_TEST\_STARTED 23 = SD\_CARD\_CONNECTED 24 = LMS\_UNIT\_FOUND 25 = LMS\_UNIT\_LOST 26 = NODE\_SD\_CARD\_CONNECTED 27 = NODE\_SD\_CARD\_DISCONNECTED

## Service

## **Error list**

If an error is registered, a small "i" symbol will flash in the display. An error generated internally or received from a node will be registered in the error list. The list is viewed in the "SETUP" menu.

#### Error codes:

- 000 = SD-card connection failed
- 002 = SD-card play file failed
- 003 = Incorrect settings
- 004 = CAN bus error
- 005 = Mic speaker test failed
- 006 = SD-card test failed
- 008 = Lost node
- 009 = LMS com error
- 010 = Internal LMS error
- 011 = Missing self-test response
- 012 = Expected node/floor station missing

#### Nodes:

- 001 099 = Floor station
- 100 = Car station
- 125 = LMS unit
- 126 = Entrance station

#### Error example:

- 012:002 (Error code:Node ID)
- 012 (Error code) = Expected node missing.
- 002 (Node ID) = Error code applies to node: floor station no. 2.





### EU Declaration of Conformity

Product:	Evacuation communication system
Type / model:	EVAC
Article no:	EVAC-CB, EVAC-CS0000, EVAC-CS0100, EVAC-ES0101, , EVAC-ES0201, EVAC-ES0301, EVAC- FS0001, EVAC-FS0101, EVAC-FS0201, EVAC-FS0301, EVAC-LMS
Manufacturer:	SafeLine Sweden AB
Year:	2017

We herewith declare under our sole responsibility as manufacturer that the products referred to above complies with the following EC Directives:

Directives		
Electro Magnetic Compatibility:	2014/30/EU	
RoHS 2:	2011/65/EU	
Standards applied		
EN 12015:2014	EMC: Emission, Electromagnetic compatibility	
EN 12016:2013	EMC/Lifts: Immunity, Electromagnetic compatibility	
EN 50581:2012	RoHS: Technical doc. for assessment of restriction of RoHS.	
CEN/TS 81-76	Lift: Evacuation of disabled persons using lifts (Not harmonized yet)	

Tyresö, 2017-04-07

Sun

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