Exigo PA/GA System
Technical Manual

Maritime & Energy Applications

Contents

1 Introduction

1.1 Document Scope

This document provides relevant information on the configuration, commissioning, and maintenance of the Exigo Public Address & General Alarm System.

System & Configuration Software:

Exigo Software Package version: EXIGO-1.7.3.2 or later
Exigo Device Software VSF-Turbine version: vsft-PA.6.5.3.4 or later

1.2 Publication Log

Revision	Date	Author	Comments	Status
1.0	4.2.2015	HKL	New document	Published
1.3.3	30.10.2017	HKL	Version 1.3 GA	Published
1.4	17.12.2018	HKL	ENA2100-AC, EMT 1.4	Published
1.4.1	20.2.2019	HKL	IP-LCM-A features	Published
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1.6	26.1.2022	HKL	ENA2200-AC2/ENA-2400-AC2, EMT 1.6	Published
1.7	24.8.2022	JS	1670 amplifier, new PSC, One Channel Mode, ENA-2x00-AC2 Backup web, Editorial	Published

1.3 Related Documentation

Doc. no.	Documentation
A100K11510	Exigo System Description
A100K11471	Exigo User Guide for Access Panels
A100K11959	FCDC3 Flowire Guidelines for Exigo
A100K12133	Exigo Ex Access Panels & Turbine Ex Intercoms V2 Installation & Maintenance
A100K11579	Exigo Industrial Access Panels Mounting Manual
A100K12140	Exigo Ex Access Panels V2 Mounting Manual
A100K11606	Replacing PSC on ESC1 System Controller
A100K11598	Replacing PSU on ESC1 System Controller
A100K11605	Replacing ENA2200/ENA2400-DC/ENA2400-AC Amplifier
A100K11599	Replacing PSU on ENA2200 Amplifier
A100K11607	Replacing Access Panel ECPIR
A100K11960	Replacing Flowire FCDC1/FCDC2 with Flowire FCDC3
A100K11671	EPIPR-6 Power Injector Installation Guide
A100K11592	Exigo EN54 Manual
A100K10805	AlphaCom XE Installation, Configuration & Operation
A100K11931	ICX-500 Getting Started Guide

1.4 Terminology

<u>**Acronyms**</u>

Acronym	Description
COM	Common. Used for common pole in a relay.
EMC	Electromagnetic Compatibility
ESD	Emergency Shut-Down
GA	General Alarm
NC	Normally Closed. Relay not activated. Com terminal connected to NC terminal.
NO	Normally Open. Relay activated. Com terminal connected to NO terminal.
PA/GA	Public Address / General Alarm
PSC	Primary System Controller
SSC	Secondary System Controller

<u>**Definitions**</u>

Term	Definition
Access Panel	Device used for interaction between operator and PA/GA system. Divided into subcategories *Alarm Panels* and *Call Panels*.
Alarm Panel	Access panel with no microphone input and one or more function keys. Keys can start alarms, select zones etc.
Call Panel	Access panel with microphone input and sometimes one or more function keys. Can be used to broadcast live speech.
Central Equipment	Equipment located centrally in the system, e.g. system controllers and amplifiers.
Field Equipment	Equipment located in the field, e.g. loudspeakers, access panels and signal lights.

2   System Overview

2.1   Components List

The Exigo system is specially designed to meet the demands of PA/GA for Energy, Offshore and Marine installations. The main components of the Exigo system are:

Equipment Type	Item Number	Item Name	Description
Central Equipment	102 3000 000	ESC1	Exigo System Controller
	100 2000 100	ICX-500	Processor for ESC1 / Primary System Controller (PSC)
	102 3102 100	ENA2100-AC	Exigo Network Amplifier, 2x100W
	102 3102 200	ENA2200	Exigo Network Amplifier, 2x200W
	102 3102 210	ENA2200-AC2	Exigo Network Amplifier, 2x200W
	102 3102 400	ENA2400-DC	Exigo Network Amplifier, 2x400W
	102 3102 410	ENA2400-AC	Exigo Network Amplifier, 2x400W
	102 3102 420	ENA2400-AC2	Exigo Network Amplifier, 2x400W
	234 0100 002	P-1670-Basic	Power Amplifier, 1x400W, 48VDC
	234 0100 003	P-1670-Line	Power Amplifier, 1x400W, 48VDC, incl. Line Card
	102 3910 000	EPMS100	Exigo System Controller Spare Power Supply
	102 3911 000	EPMA400	Exigo Amplifier ENA2200 Spare Power Supply
	102 3922 200	EAM-200	Exigo Amplifier Module, 2x200 Watt for ENA2200
Network Equipment *	100 8080 310	FCDC3	Flowire – Ethernet Converter, DC Voltage
	102 3697 006	EPIPR-6	Exigo Power Injector, 6 Ports
	222 0012 401	C1000-24/60945	Cisco 24 Port Ethernet Switch – IEC60945
	222 0012 234	IE-2000-8TC-G-E	Cisco 8 Port Ethernet Switch – Marine Approved
	222 0012 235	IE-2000-16TC-G-	Cisco 16 Port Ethernet Switch – Marine Approved
	222 0012 662	FPR1010	Cisco FirePower 1010 NGFW Appliance – IEC60945
Access Panels	102 3200 030	ECPIR-P	Exigo Call Panel, PTT Key, For Pluggable Mic
	102 3200 033	ECPIR-3P	Exigo Call Panel, PTT + 3 Keys, for Pluggable Mic
	102 3201 008	EAPIR-8	Exigo Alarm Panel, 8 Keys
	102 3253 008	EBMDR-8	Exigo Key Expansion Module, 8 Keys
	102 3201 201	EAPII-1	Exigo Industrial Access Panel, 1 Key
	102 3201 206	EAPII-6	Exigo Industrial Access Panel, 6 Keys
	102 3221 611	EAPFX-1-V2	Exigo Industrial Ex Access Panel, 1 Key
	102 3221 616	EAPFX-6-V2	Exigo Industrial Ex Access Panel, 6 Keys
	102 3595 010	EMBR-1	Exigo Desktop Mounting Box for 1 Indoor Access Panel
	102 3595 020	EMBR-2	Exigo Desktop Mounting Box for 2 Indoor Access Panels
Microphones	102 3533 012	PAM1H	Exigo Handheld Microphone with PTT Key for ECPIR
	300 5020 033	MB-30G	Gooseneck Microphone for ECPIR
	102 3533 312	EMMAI-2H	Exigo Handheld Industrial Microphone for EAPII
	102 3533 511	EMMAX-1H	Exigo Handheld Industrial Ex Microphone for EAPFX
	AK5850HS	AK5850HS	Ex-approved Headset for EAPFX
Accessories	102 3540 000	ELTSI-1	Line End Transponder
	100 8140 100	TA-10	Connection board with relays for Turbine/Exigo Industrial
	100 8132 020	TKIE-2	Turbine Kit IP Extended
	100 8095 201	IP-LCM-A	IP Line Connection Module with Inputs/Outputs
	100 8131 020	TKIS-2	VoIP Intercom Module for integration with passive speakers

Table 1: Exigo System Components

* The Exigo system is designed to run on any network equipment. If Exigo is part of a type-approved system, then consult the relevant certificate for approved network equipment that may differ from this list.

2.2 Marine & Offshore Codes, Standards & Type Approvals

The Exigo PAGA system is tested and certified in conformance with:

- **IMO: A.1021(26**), "Code on Alerts and Indicators"

- **IMO Resolution MSC.212(82)**: "Adoption of Amendments to the International Life Saving Appliance (LSA) Code"

- **LSA Code**: "Life Saving Appliance Code":
    - Chapters: 7.2.1 and 7.2.2

- **MSC/Circ.808 (1997)**: "Recommendation on Performance Standards for Public Address on Passenger Ships, Including Cabling"

- **SOLAS**: "International Convention for the Safety of Life at Sea"
    - Chapters: II-1, II-2 and III

- **MODU CODE (2010)**: "Code for the Construction and Equipment of Mobile Offshore Drilling Units"

- **IACS: UI SC145(1998)**: "International Association of Classifications Societies, Unified Interpretation of SOLAS"

- **ABS**: American Bureau of Shipping

- **IECEx**: International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres

- **DNV** Type Approval Programme

2.3   System Configurations

This section describes briefly the requirements for different types of installations. The requirements are from the class societies and concerns safety and reliability. Potential customer requirements shall not interfere with nor negate these requirements.

2.3.1   PA Systems for Conventional Vessels

Conventional vessels (e.g. cargo ships) built before 2005 are required to have a single PA system installed as a minimum. The GA system on these vessels is a separate system, with no integration or minimum integration to the PA system.
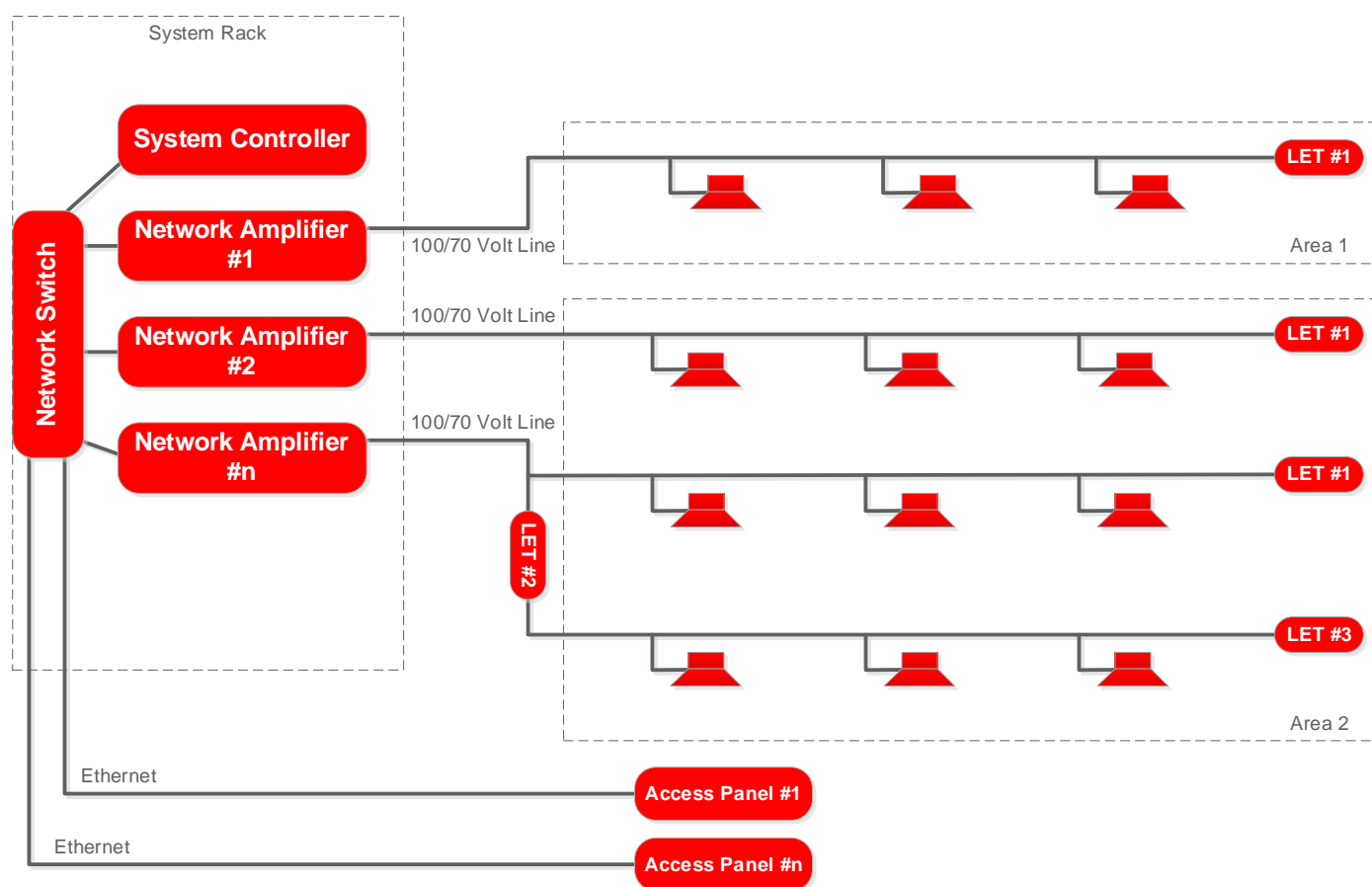
Figure 1: Single PA/GA System Configuration

The system rack in Figure 1 depicts a system with one system controller and several amplifiers.

The Exigo system supports several redundancy functions, allowing even a single system to become more redundant. Two network switches can be introduced to the network, and panels can be connected to both of these using separate cables. Backup amplifiers can be connected in a 1-to-6 manner, allowing 1 backup amplifier to be the standby for up to 6 other amplifiers. The system controller can also be duplicated (hot standby) to ensure full operation of the system in the event of a faulty system controller.

2.3.2 Integrated PA/GA System

For conventional vessels built after 2005, PA and GA systems shall both be duplicated. The PA and GA may be realized in a duplicated, integrated PA/GA, which in turn may be located in the same system rack, as depicted in Figure 2.
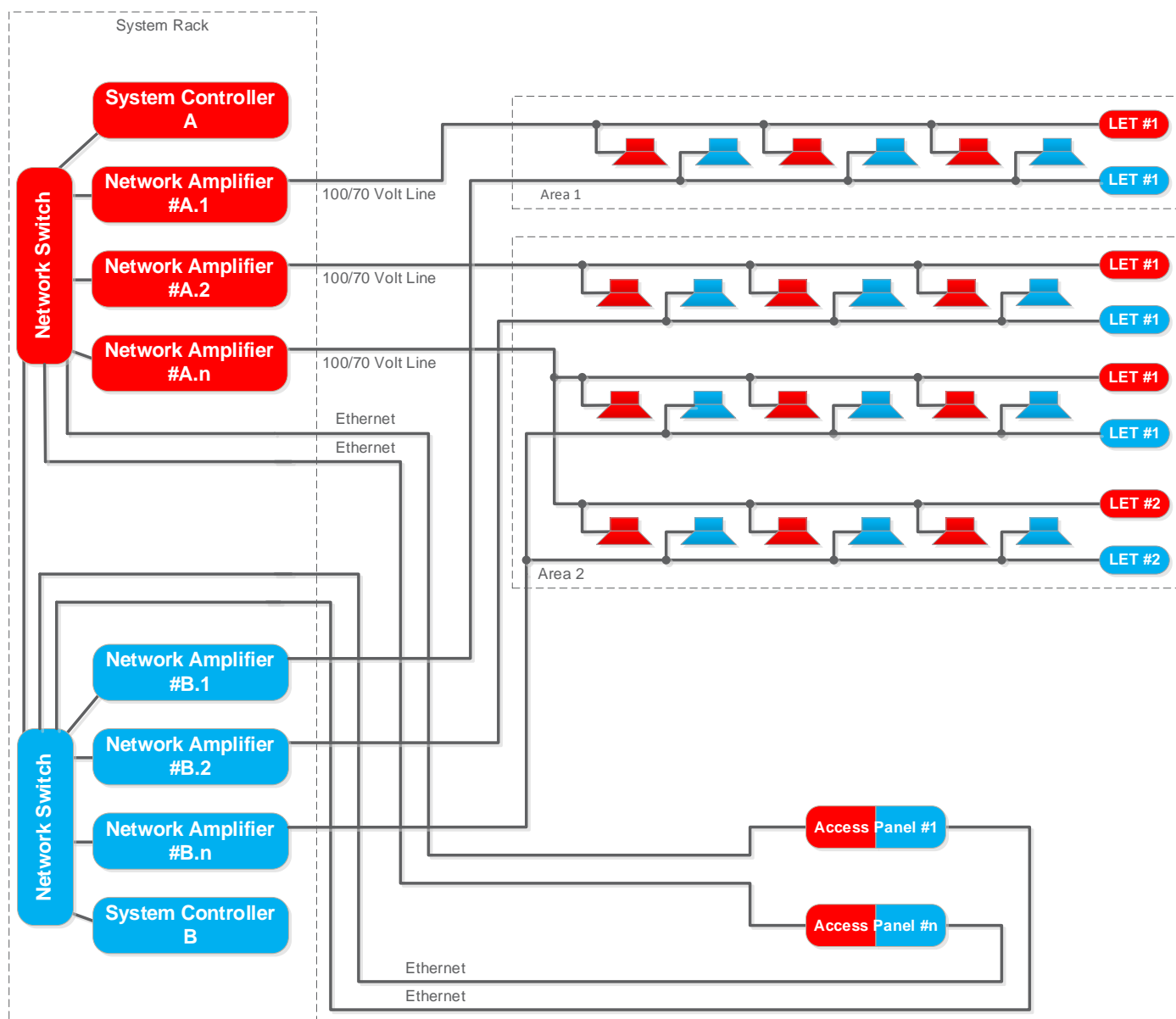
Figure 2: Integrated PA/GA System Configuration

The system rack in Figure 2 depicts an integrated PA/GA solution where all components are duplicated in a separate redundant system. Loudspeakers and access panels are connected to both systems, ensuring coverage even if one of the systems fails.

As for single systems, the redundancy of the system can be increased by adding standby amplifiers, etc.

2.3.3 PA/GA for Passenger Vessels & Offshore Installations

Passenger vessels (e.g. cruise ships, ROPAX) and offshore installations require a fully redundant PA/GA solution, where the two systems are located in different fire zones, as depicted in Figure 3.

Similar to the integrated PA/GA solution, Exigo can be set up as two redundant systems, often referred to as an A-B system. In this configuration, everything is duplicated in two systems, and they cover the same physical areas.

When set up as an A-B system, each access panel is physically connected to both systems, and exchanges control and status information with the two systems in parallel.
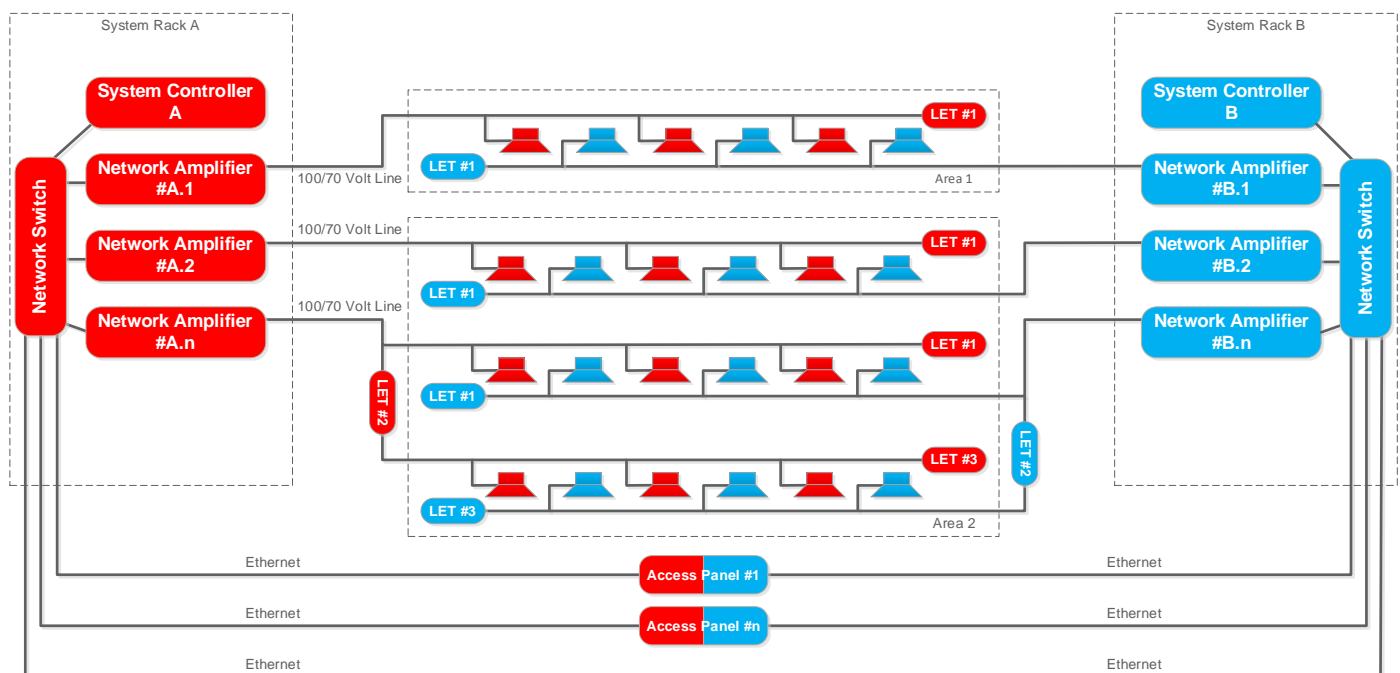
Figure 3: Dual (A-B) PA/GA System Configuration

2.3.4 PA/GA for Passenger Vessels & Offshore Installations with IP Speakers

Passenger vessels (e.g. cruise ships, ROPAX) and offshore installations require a fully redundant PA/GA solution, where the two systems are located in different fire zones, as depicted in Figure 4.

Exigo can be set up as two redundant systems, often referred to as an A-B system, with the use of IP speakers. In this configuration, IP speakers will be placed in an A-B configuration covering overlapping areas. IP speakers belonging to the A system are wired directly to the network switch in the A rack, and vice versa for the B system.

When set up as an A-B system, each access panel is physically connected to both systems, and exchanges control and status information with the two systems in parallel.
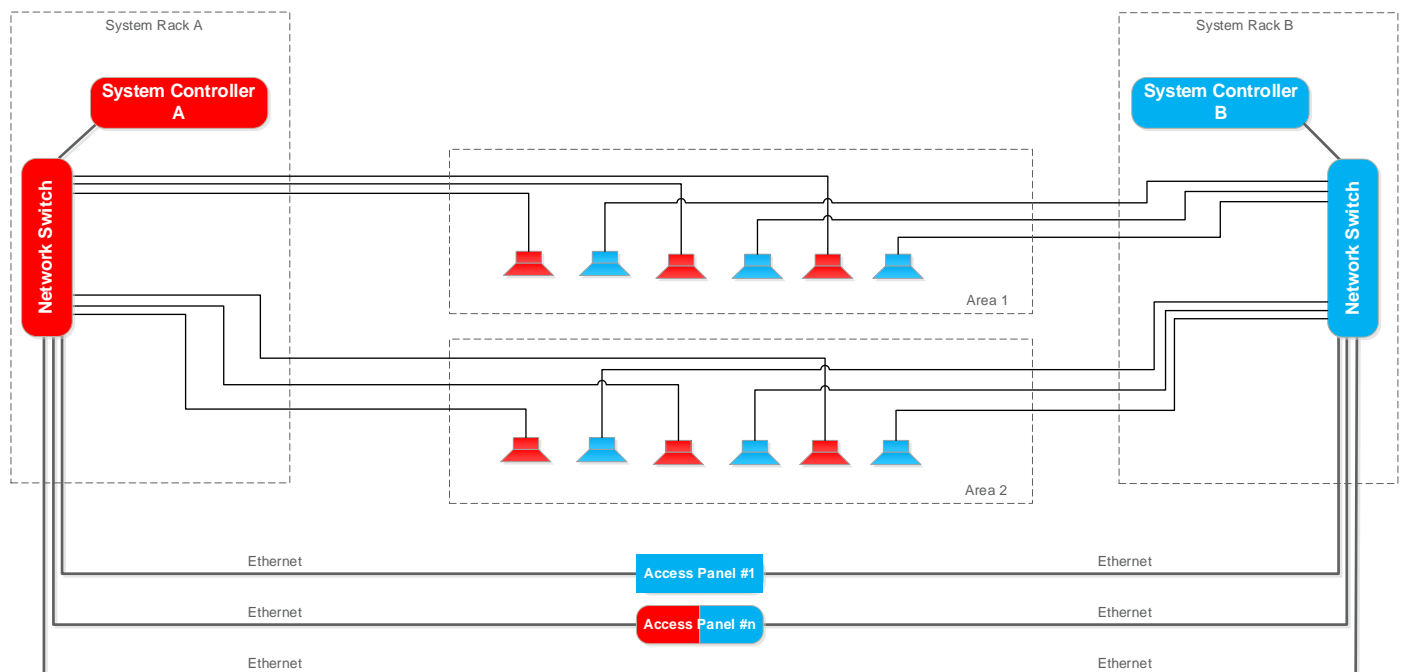
Figure 4: A-B System with IP Speakers

2.3.5 Integrated Communication Solution

In installations where intercom functionality is a requirement in addition to a redundant PA/GA system, the Exigo system can be connected to the ACM AlphaCom system. The Exigo system then acts as the A loop, while the ACM AlphaCom acts as the B loop and intercom provider. This arrangement is depicted in Figure 5. The redundancy internally in the two systems can be adapted to the required level.
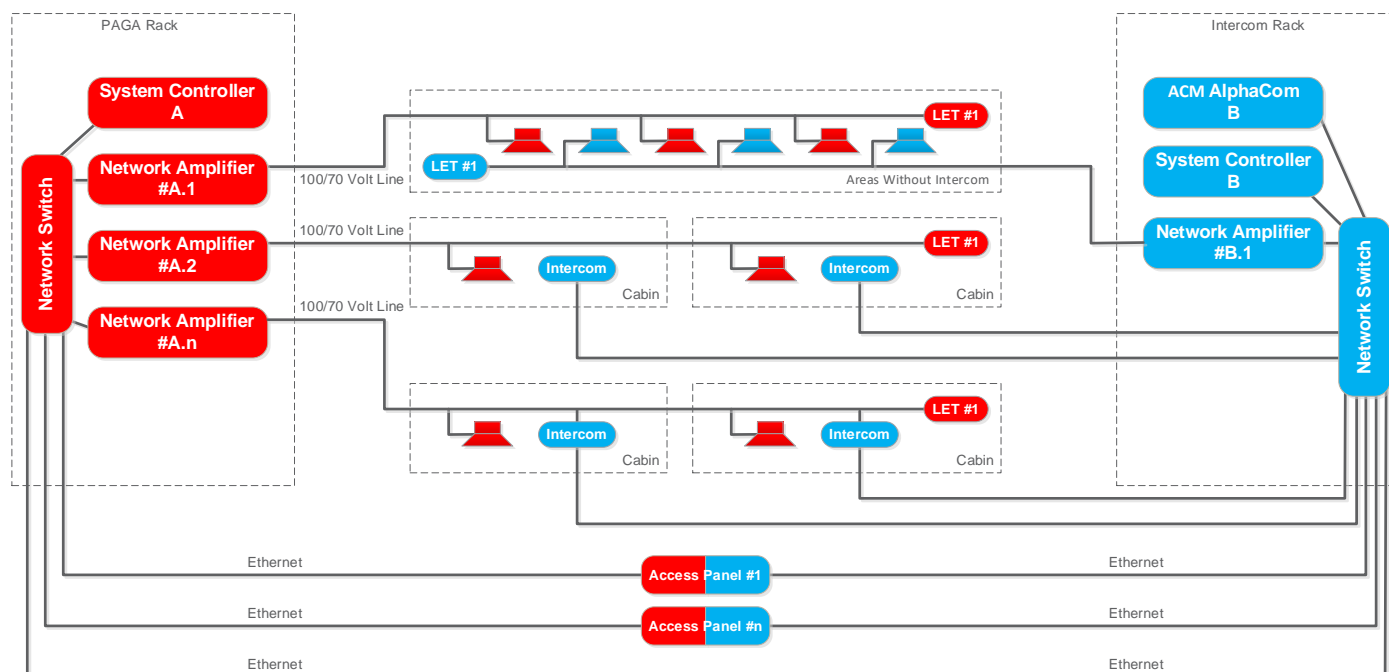
Figure 5: Combined Exigo & ACM AlphaCom System Configuration

3 System Functions

3.1 Safety & Emergency Applications

The table below provides an overview of the safety and emergency functions for PA/GA that are required at different locations onboard a marine vessel.

Explanations: N = "Nice to have" X = Class Requirements # = Alternative PA or GA	*Additional Class/Requirements to 1A1*			
	1A1 Always Required		Fishing Vessel	NAUT AW NAUT OC
Environments	**PA**	**GA**	**GA**	**PA**
Bridge & Control/Operation Rooms				
Engine control room	x	x	#	
Cargo control room	x	x	#	
DP Control Consoler	x	x	#	
Radio desk	N	N	#	
Bridge	x	x	#	
Bridge wings	N	N	#	
Operation room (i.e ROV / Seismic)	x	x	#	
Accommodations				
Crew Cabins	#	#	#	x
Engineer Cabins	#	#	#	x
Officer Cabins	#	#	#	x
Captain cabin	#	#	#	x
Chief Eng. Cabin	#	#	#	x
Bedrooms	#	#	#	x
Cabin bathrooms	#	#	#	x
Office	x	x	#	
Mess room	x	x	#	
Galley	x	x	#	
Conference room	x	x	#	
Corridors	x	x	#	
Staircase	x	x	#	
Gym	x	x	#	
Wardrobe	x	x	#	
Hospital	x	x	#	
Electrical workshop	x	x	#	
Dayrooms	x	x	#	
Elevator	x	x	#	
Fire Station	x	x	#	
Instrument room	x	x	#	
Switchboard rooms	x	x	#	
DP Control Center	x	x	#	
Engine rooms and other noisy areas				
Engine room	x	x	#	
Steering gir		x	#	
Bow thrust		x	#	
Emergency maneuvering stand		x	#	
Emergency generator room		x	#	
Engine work shop	x	x	#	
Moon pool	x	x	#	
Pump room		x	#	
Open deck area				
Deck workshop	x	x	#	
Mooring positions fwd / aft / mid ship		x	#	
Life boat stations / Embarcation	x	x	#	
Deck crane position	x	x	#	
Winch	x	x	#	
Muster station	x	x	#	
Side Opening on tweendeck				
Stern				
Other working positions	x	x		

Table 2: PA/GA Coverage

The following regulatory requirements are supported by Exigo:

- PA, GA and integrated PA/GA
- Access panel redundancy
- Priority on access panels and inputs
- Keys on access panels protected from unintentional use
- Volume override of local volume controllers during emergencies
- Visual indicators for alarms in noisy areas
- Muting of entertainment systems during emergencies
- Interface to external GA systems
- Muting of GA during PA announcements
- Management of acoustic feedback
- Power redundancy
- Redundant PA and GA infrastructure
- Emergency Shutdown (ESD)

3.1.1 PA, GA or Integrated PA/GA

PA and GA systems, or an integrated PA/GA system, shall provide coverage for safety and emergency functions as listed in Table 2. The Exigo system can be set up as a PA system, a GA system, or a combined PA/GA system. For most installations, a combined PA/GA system will provide the most cost-optimal solution.

3.1.2 Access Panel Redundancy

Installations on ships carrying passengers and/or untrained personnel, and installations on oil rigs, floaters, jack-ups, etc., require that some, or all, access panels are provisioned with redundant cabling. The two cables must follow different routes, through different fire zones, to the different system racks.

It is also required that two or more access panels, located at different positions, can initiate the same safety and emergency functions as required for the class or installation.

3.1.3 Priority between Access Panels

The location of an access panel determines the panel's priority, e.g. a panel located at the bridge shall have priority over all other panels on a ship. In the Exigo system, priority is assigned to the input, e.g. the keys on panels and control inputs. The priority of keys initiating important functions, like general alarm, must be set to the highest levels.

3.1.4 Protection from Unintentional Use

It shall not be possible to start emergency functions by accident - hence a two-step procedure must be implemented. All access panels in the Exigo system are equipped, or can be equipped, with a key protection cover. This cover must be lifted before the key can be pressed. Keys initiating fire alarm, muster alarm, general alarm, etc. must be equipped with such a protection cover.

3.1.5 Volume Override of Volume Controllers

In areas where local volume controllers are installed (e.g. cabins), volume override must be implemented, allowing the Exigo system to set the volume controller to full volume during an emergency. Control outputs connected to the control relay of each volume controller shall be configured to do this.

3.1.6 PA & GA Broadcasts in Noisy Areas

In noisy areas (areas with more than 80 dB ambient noise), visual indicators must be installed in parallel with the audio system. Control outputs in the Exigo system shall control and activate rotating light, flashing light or light symbols according to the alarm/message being broadcasted.

3.1.7 Muting of Entertainment

PA/GA systems shall be able to override entertainment broadcasts during emergencies. Entertainment may be the background music distributed by the Exigo system, local music systems, discothèques or any other fixed audio installation capable of disturbing broadcasts from the PA/GA system.

The background music in the Exigo system will always be overridden by live speech and alarms, as its priority is lower. For external systems, Exigo shall mute these through control outputs set up to trigger at the different alarms.

3.1.8 Muting of Alarms during PA Announcements

The Exigo system shall, for certain privileged access panels, be able to override general alarms and other alarms in order to broadcast spoken messages during emergencies. This function is commonly referred to as **Emergency PA**.

Exigo access panels located in these strategic locations (e.g. Bridge, Engine Control Room) must be configured to have the **priority override function** or a dedicated PTT key for Emergency PA.

If the GA or other alarms are supplied by external systems (like signal bells), a control output from the Exigo system shall be configured to mute these systems during Emergency PA.

3.1.9 Interface from External Alarm Systems

External alarm systems, like fire detection systems, are usually a requirement on most marine and offshore installations. These systems can be interfaced with and give commands to Exigo through the Exigo system's control inputs. The input must be set up to activate the required function with the appropriate priority.

3.1.10 Interface to External Alarm Sounders

General Alarm on ships is commonly connected to the ship's typhoon/foghorn system. The Exigo system can interface foghorn systems through control outputs following the alarm tones, and hence control the foghorn during an alarm situation.

3.1.11 Management of Acoustic Feedback

In some situations, there may be problems with acoustic feedback between call panels and neighboring speakers. The Exigo system manages acoustic feedback by using either:

Selective Muting: The system uses relays to selectively mute loudspeakers located in the vicinity of the call panel doing the broadcast.

PA Recall: Recall is a special version of calls, where the operator will record the message before it is broadcasted. The operator will typically record the message, listen and then choose to broadcast, rerecord or cancel the call.

3.1.12 Power Redundancy

Most installations in the oil & gas, offshore and marine segments require that the PA/GA systems have two independent power sources.

The Exigo rack equipment (system controller and amplifier) can be connected to a primary AC power source and a secondary AC or DC* power source. The switchover between these power supplies is seamless and controlled by the units themselves.

*) Depending on equipment selected.

Exigo access panels shall receive power from both systems when used in an A-B system. This can be done in one of the following ways:

Spare-pair PoE: The panels are powered using spare-pair PoE from A and B systems. The power shall be injected on the spare pairs in the CAT cable using approved injectors and power supplies.

Separate power: PoE is delivered to the access panels from the A system. The panel will use this as the primary power. The secondary power shall be supplied from a separate cable from the B system.

Ⓘ Note that Ex access panels are Flowire devices and only require a separate power supply in each system in order to implement redundant powering.

3.1.13 Emergency Shutdown

For oil rigs, FPSOs and any other installations where explosive gas may occur in large quantities, emergency shutdown of non-Ex rated equipment shall be implemented. The emergency shutdown is controlled by a separate system, or key, and is activated if explosive gas is detected in areas classified as non-hazardous (e.g. in the technical equipment room).

Activation of emergency shutdown shall render any non-Ex equipment to be without power. For the PA/GA system, the following non-Ex equipment shall be shut down:

- Non-Ex loudspeakers

- Non-Ex access panels

- Non-Ex line end transponders

3.1.14 Loudspeaker Loops

As described in section 2.3, different classes and areas of installation have different requirements for redundancy of the PA/GA system. Most installations are, however, required to serve all public areas via two independent loudspeaker loops, the A-loop and the B-loop. The two loudspeaker loops shall be fed by independent PA/GA systems, so that in the event of a total failure of one system, coverage is not lost in any area.

3.2 Redundant PA/GA Infrastructures

3.2.1 Redundant Rack Equipment - Conventional Vessels

For conventional vessels, PA and GA may be realized in a duplicated, integrated PA/GA, which may be located in the same system rack.
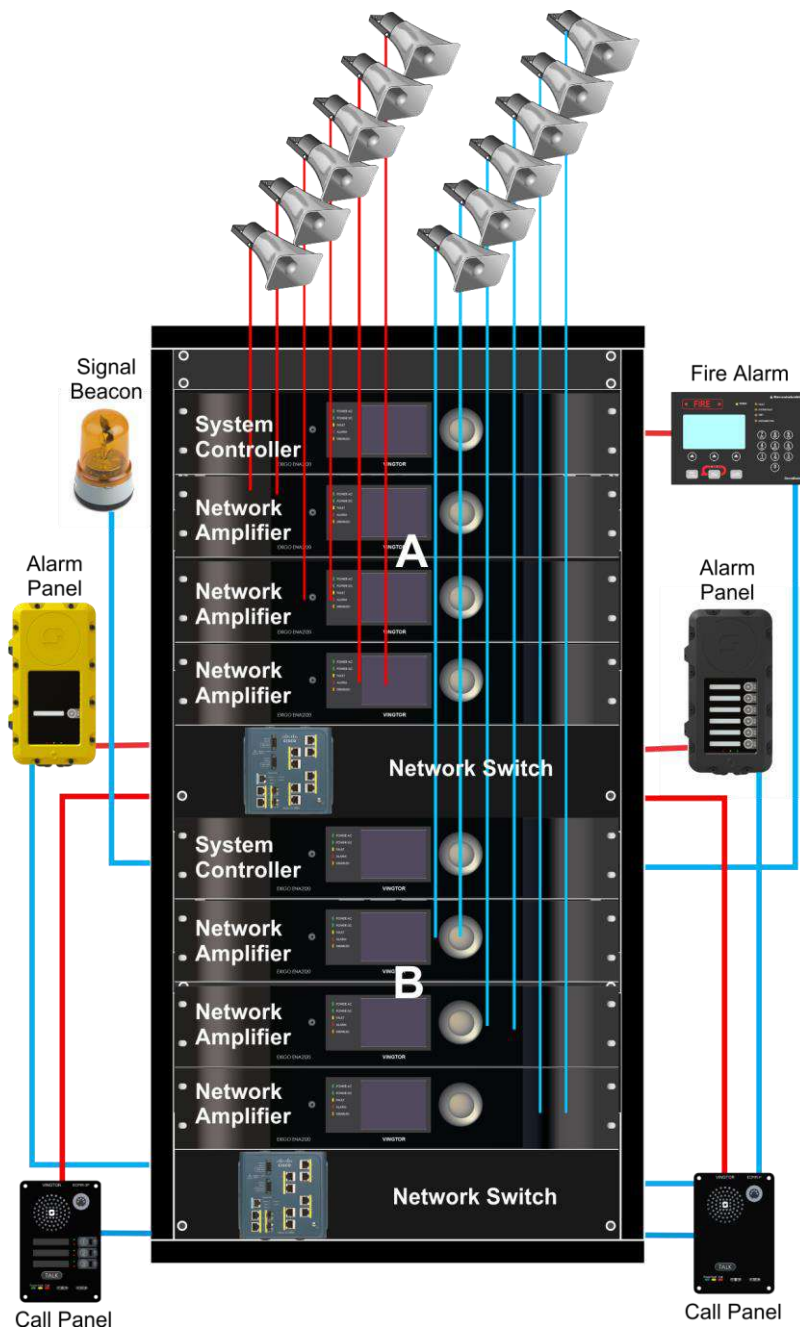
Figure 6: Redundant Rack Equipment - Conventional Vessels

3.2.2 Redundant Rack Equipment - Passenger Vessels

Passenger vessels require two PA/GA racks, each located in a different fire zone. The figure shows how the racks are duplicated by using a system rack in one fire zone and a second system rack in another.
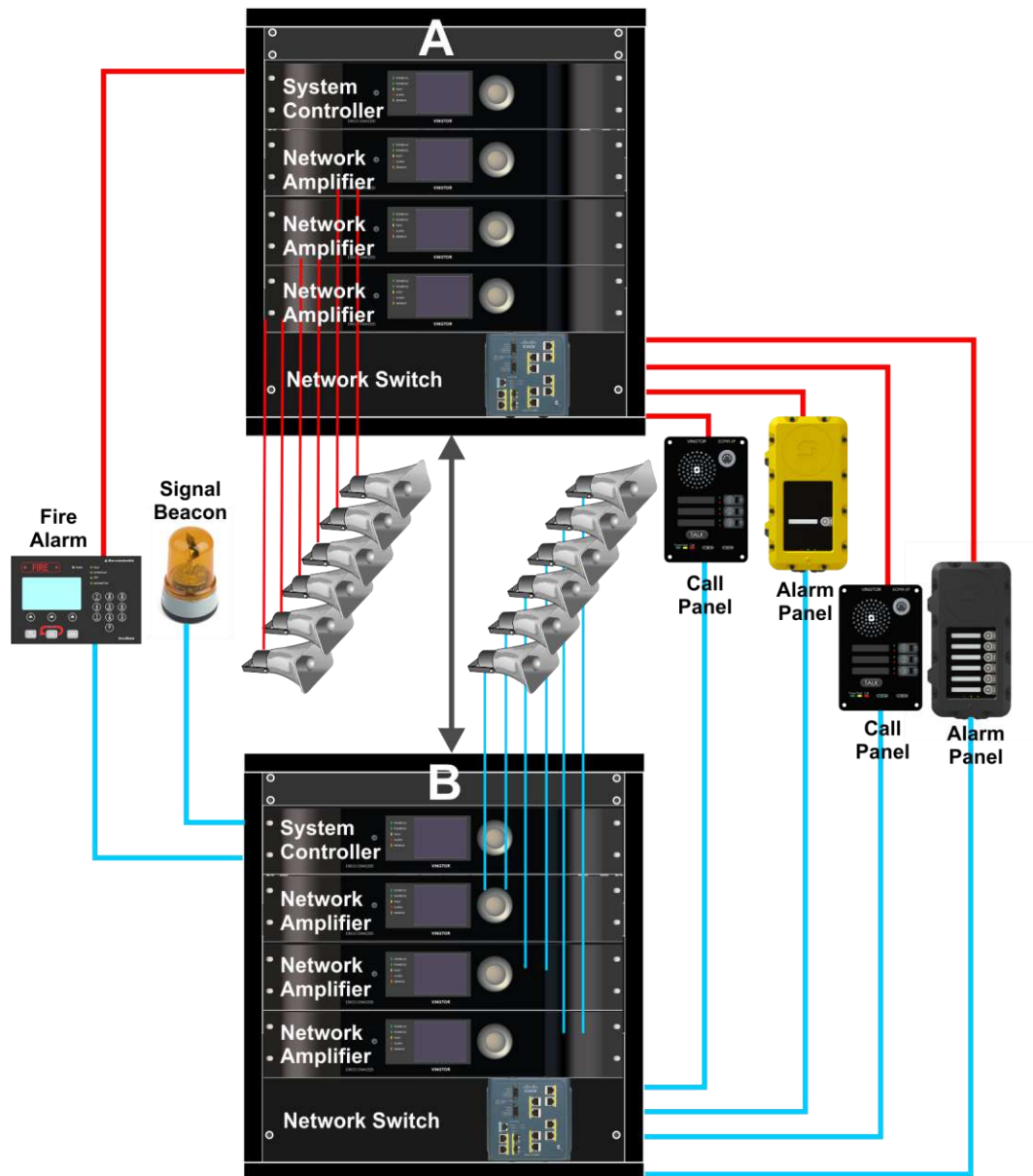
Figure 7: Redundant Rack Equipment - Passenger Vessels

3.2.3 PA & GA for Oil & Gas Vessels

The basic features are the same as for passenger vessels. Oil & Gas vessels require two identical separate racks in different fire zones. Both systems operate in parallel and if one system fails, the other should still work. There must be separate loudspeaker loops from each amplifier. The loops must have different physical routings.

- Two single interconnected alarm generators are required: each system controller has its own alarm generator.

- A minimum of two call and alarm panels are required. Each panel serves both systems. If one panel fails, the other should still work.

- Ex access panels are required.

- Emergency Shutdown (ESD) is required.
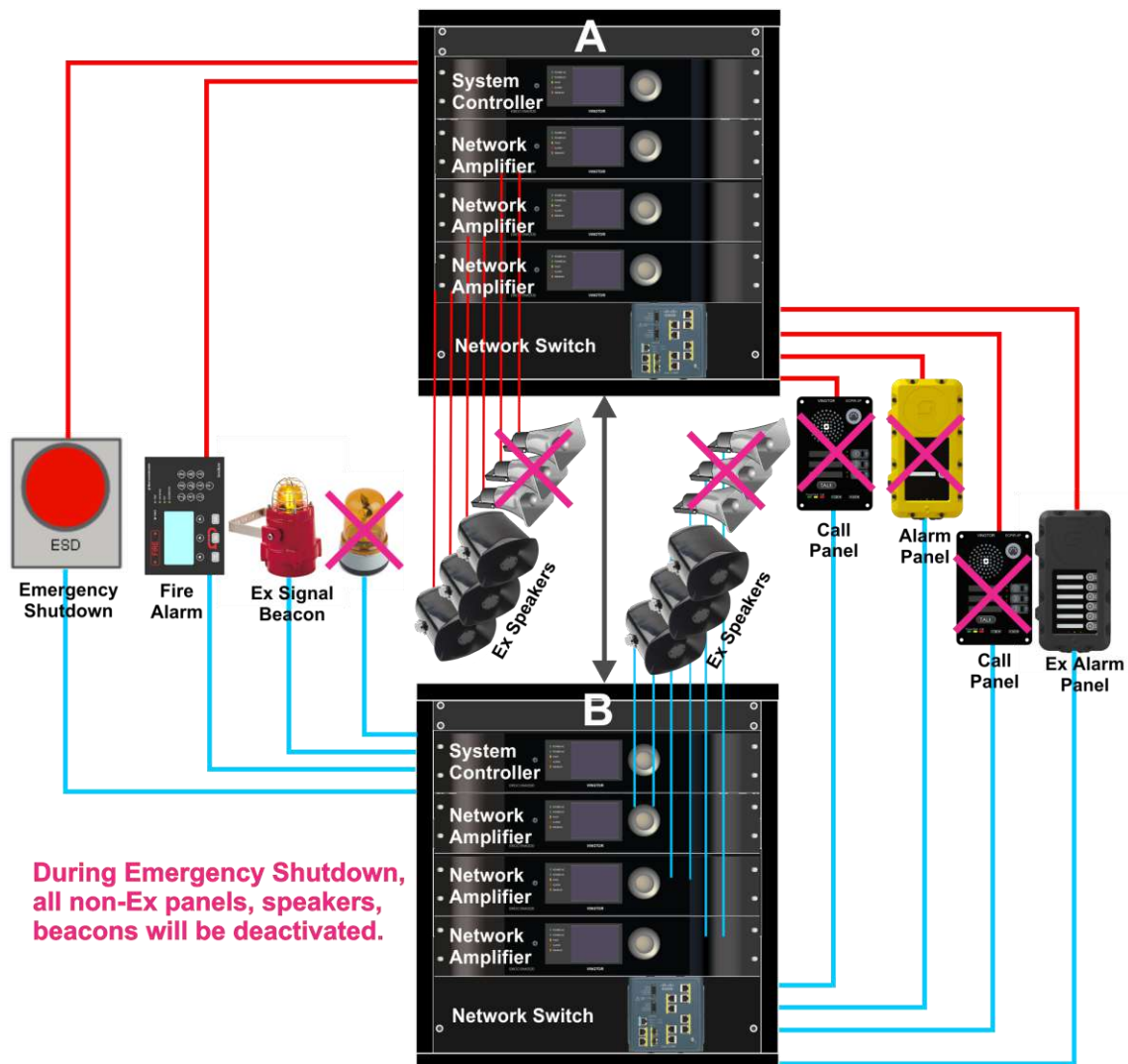
Figure 8: PA & GA for Oil & Gas Vessels

4 Central Equipment Installation

> **NOTE** *Refer to relevant datasheets and dimensional drawings of the central equipment for further details.*

4.1 Electrical Safety

The following electrical safety procedures should be followed for all the products mentioned in this section:

- Prior to switching on the product, always ensure that the nominal voltage rating of the product matches the nominal voltage of the supply network.
- Product may be operated from a TN/TT network or 24-48 VDC network
- Product uses IEC 60320-1 C13/C14 appliance coupler.
- Disconnecting device is a 2-pole line switch. To disconnect product running on DC power, unplug the DC cable.

4.2 Environmental Requirements

The Exigo central equipment has been tested and fulfills all requirements according to EN60945 and DNV 2.4 standards. The equipment shall be installed in protected areas, meaning that they shall be protected from weather and the elements.

4.2.1 Rack Equipment

Temperature range: -15°C to +55°C

Humidity: At 25°C <95% RH, at 55°C <93% RH

Compass safe distance: 325 cm

> **NOTE** *It is highly recommended to install the equipment rack in a ventilated, technical instrument room with temperatures between 18 °C and 25 °C as this will extend the system's lifespan.*

4.3 Rack Considerations

PA/GA systems shall be installed in proper equipment racks. As all Exigo equipment is certified standalone (without any special equipment rack) it can be installed in any 19" rack. It is however highly recommended to use a rack suitable for the installation environment.

> **NOTE** *The guidelines given in the following sections are advisory, and shall not overrule good practice and workmanship.*

4.3.1 Rack Ventilation

All rack equipment in the Exigo system can operate at maximum performance in ambient temperatures up to 55 °C. Even though the Exigo amplifiers utilize modern class D technology, some of the energy is converted to heat in the amplifier. This means that the amplifiers will gradually heat up the rack, and eventually lead to degradation of system performance if the rack is not ventilated.

The best solution is to install active ventilation in the rack, where the warm air is transported away from the rack's top, and cool air is forced in at the bottom.

As a minimum, the rack must be equipped with air vents at the bottom, and preferably fans blowing the warm air out at the top. Air filters should be included in the air vents in order to reduce the amount of dust entering the equipment space.

4.3.2 Rack Power

The rack must be provisioned with power inputs according to the class or type of installation. These power inputs shall be protected by fuses, and distributed internally in the rack using suitable terminal blocks and/or power sockets.

> **NOTE** *If contactors are used to supply the equipment's secondary power, they must be dimensioned for the load, and have a maximum switchover time of 50 ms.*

4.3.3 Rack Grounding

The equipment rack shall have a good connection to protective ground. It shall also be provisioned with a grounding strip for the equipment to connect to.

4.3.4 Access to Rack Equipment

For serviceability, it should be possible to access both the front and the rear of the equipment installed in the rack. This can best be realized by having doors at both the front and rear of the rack. If a rack with front and rear access is impractical, the equipment can be mounted in a swing frame.

> **NOTE** *When using swing frames, make sure that the swing frame is capable of holding the combined weight of the equipment.*

4.3.5 Terminal Blocks

It is good practice to use terminal blocks in the equipment rack. These terminal blocks serve as the interface between the cables internally in the rack, and the cables in the fixed installation. The terminals shall be labelled, mounted on DIN rails, grouped according to function and be suitable for the intended use (i.e. be dimensioned for the currents, etc.).

> **WARNING** ***Terminals used for field equipment installed in Ex areas shall be approved for such use, and clearly labelled that the terminal is for Ex equipment.***

4.4   Installing the ESC1 System Controller

4.4.1 ESC1 Overview

Figure 9: Front View – ESC1

1	Mounting Flange
2	Ventilation Inlet
3	Headphone Jack
4	Status Indicators
5	LCD Screen
6	Control Knob
7	Front Cover
8	Cover Screw
9	Integrated Handle

> **NOTE**   *See Appendix A for details on the menu structure in the user interface.*

Mounting Flanges:	The mounting flanges are used to mount the unit in 19" equipment racks.
Ventilation Inlets:	The ventilation inlets should be kept free of obstacles and dust. Fans control the airflow based on internal temperature.
Headphone Jack:	Headphones can be connected for listening to the different audio streams in the system.
Status Indicators:	The status indicators are used to display the status of important parameters such as power supplies and faults.
LCD Screen:	The LCD screen displays status and a graphical user interface.
Control Knob:	The control knob is used to select and execute menu items in the user interface. The control knob can be rotated and pressed.
Front Cover:	The front cover can be opened in order to gain access to the primary system controller board and the optional function board slot.
Cover Screw:	The two cover screws secure the front cover in place. To open the front cover, these two screws must be loosened and pulled out 1.5 – 2 cm. The screws can then be used as handles to pull out the front cover.
Integrated Handles:	These integrated handles make it easy to maneuver the unit, without adding to the installation depth.
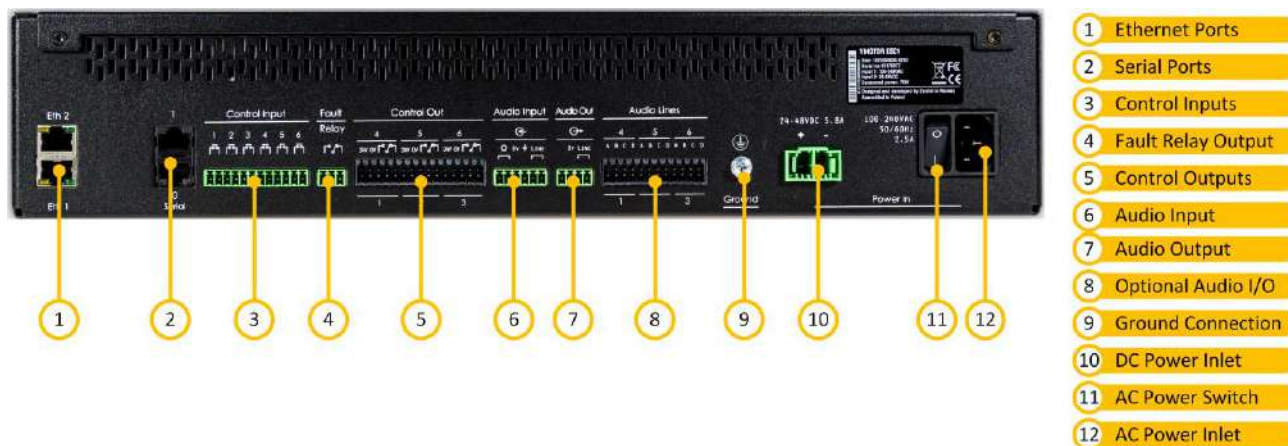
Figure 10: Rear View – ESC1

Ethernet Ports: Redundant Ethernet connections for audio and control data.

Serial Ports: RS-232 for console and RS-232/422/485 for integration with other equipment.

Control Inputs: Six configurable control inputs that can be optionally monitored. Each input is activated by closing the loop between the two terminals.

Fault Relay Output: A switching relay (NO, NC & COM) is used to indicate faults in the system.

Control Outputs: Six configurable control outputs. Each is made of a switching relay (NO, NC and COM) in parallel with a 24VDC signal. The 24VDC part of the control output can source max 200mA and has overcurrent protection.

Audio Inputs: Microphone and line-in audio inputs for microphones or external audio sources.

Audio Output: One configurable audio output which can be used for analog integration.

Optional Audio I/O: Audio inputs/outputs available in the system if the optional AGA board is inserted in the ESC1.

Ground Connection: Ground connection for grounding of the unit. This is connected in parallel with the ground connection in the AC power inlet.

DC Power Inlet: DC power inlet for 24 to 48 V_{DC}.

AC Power Switch: Power switch for AC power. This switch will not turn off the system controller if DC backup is connected.

AC Power Inlet: AC power inlet for 110 to 230 V_{AC}. The power inlet has a V-Lock mechanism for a secure connection.

1.1.1.1 ESC1 with AMC-IP as Primary System Controller

1	Feature Board Slot
2	PSC Board Slot
3	PSC Hotswap
4	PSC Eth0
5	Status Indicators
6	Hotswap
7	Primary System Controller
8	STIC
9	SSC Serial Connector
10	Battery
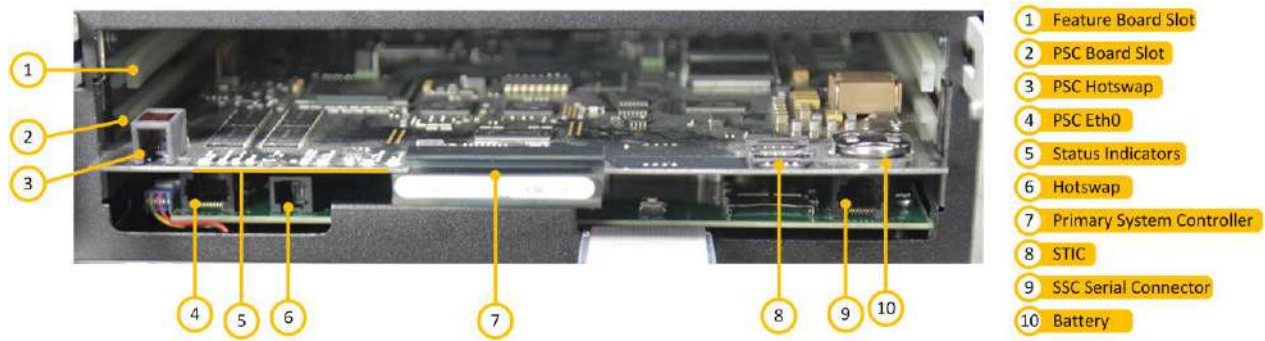
Figure 11: Internal View – ESC1 with AMC-IP

Feature Board Slot: Slot for an optional feature board like the AGA board for 12 additional audio inputs/outputs.

PSC Board Slot: Slot for the Primary System Controller board.

Status Indicators: Local status indicators for the Primary System Controller board.

Primary System Controller: Main processor board for the ESC1.

STIC: StenTofon Identity Card containing the ESC1's MAC address and basic settings.

Battery: Battery for the time clock.

1.1.1.2 ESC1 with ICX-500 as Primary System Controller

1	Status Indicators
2	Ethernet Ports
3	N/A (RS232)
4	N/A (USB)
5	N/A (USB)
6	N/A (Relay)
7	N/A (SD Card)
8	Factory Reset
9	DC Power Inlet
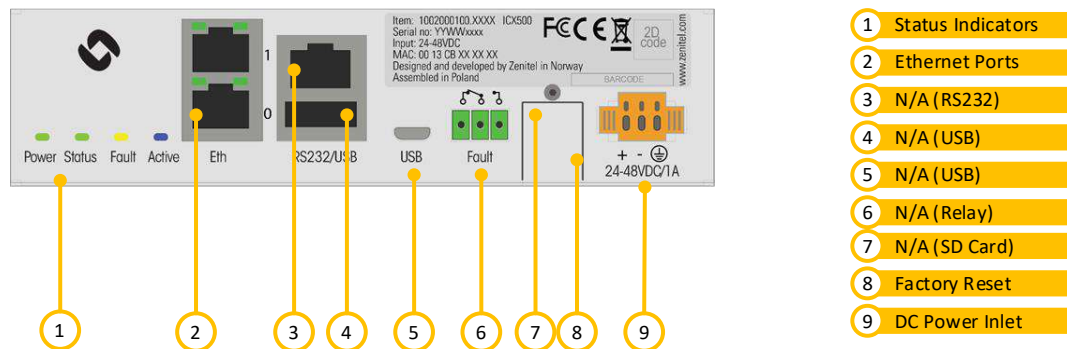
Figure 12: Rear View – ICX-500

Status Indicators: Local status indicators for the Primary System Controller.

Ethernet Port: ETH1 is used for connection to ESC1.

Factory Reset: Factory reset button behind lid.

PC Power Inlet: ICX-500 shall be connected to a 24-48VDC.

4.4.2 ESC1 Technical Specifications

Primary Power		Secondary Power	
Connector:	V-lock (IEC 60320-1 C14 compliant)	Connector:	Pluggable and lockable screw terminal
Input voltage*:	$V_{NOM} = 110 - 230\ V_{AC}$ $V_{MIN} = 90\ V_{AC}$ $V_{MAX} = 264\ V_{AC}$	Input voltage:	$V_{NOM} = 24 - 48\ V_{DC}$ $V_{MIN} = 20\ V_{DC}$ $V_{MAX} = 63\ V_{DC}$
Power consumption:	$P_{NOM} \leq 25\ W$ $P_{MAX} = 50\ W$	Power consumption:	$P_{STBY} \leq 2.4\ W$ $P_{NOM} \leq 25\ W$ $P_{MAX} = 50\ W$
Network		**Line Output**	
Ethernet:	10BASE-TX, 100BASE-TX, Auto negotiation, Auto MDIX	Connector:	Pluggable screw terminal
Connector:	2 x RJ45	Line Out:	600 Ω 0 dBm
Line Input		**Microphone Input**	
Connector:	Pluggable screw terminal	Connector:	Pluggable screw terminal
Frequency response:	80 Hz – 20 kHz	Frequency response:	80 Hz – 20 kHz
SNR:	80 dB	SNR:	80 dB
CMRR:	45 dB	CMRR:	45 dB
Nominal input level:	$100\ mV_{RMS} - 1\ V_{RMS}$	Nominal input level:	$1\ mV_{RMS} - 100\ mV_{RMS}$
Input impedance:	600 Ω / 5.6 kΩ software selectable	Input impedance:	600 Ω
		Phantom supply:	12 VDC ±10% @ 15 mA (IEC61938, P12)
Control Inputs		**Control Outputs**	
Connector:	Pluggable screw terminal	Connector:	Pluggable spring-loaded terminals
Type:	Closing contact, monitored	Type:	Relay (COM, NO, NC) in parallel with 24 V_{DC} output.
		Relay outputs:	Max 24 V_{DC}, 60 W Max 250 V_{AC}, 125 VA
		24 V_{DC} outputs:	24 V_{DC}, ±10%, 200 mA
Fault Relay		**Optional Feature Board**	
Connector:	Pluggable screw terminal	Connector:	Pluggable spring-loaded terminals
Type:	Relay (COM, NO, NC)	Supported features:	12 analog inputs/outputs (AGA)
Relay outputs:	Max 24 V_{DC}, 60 W Max 250 V_{AC}, 125 VA		

Table 3: Technical Data – ESC1

*) If ICX-500 is used as PSC a PSU with 48VDC output must be used.

4.4.3 Placement

The ESC1 can be located anywhere in the equipment rack. It is however advisable to install it at eye-level as this will make it easier to operate the user interface on the display.

Placement of ICX-500 can either be mounted below ESC1 in 1HU mounting shelf or placed inside of cabinet and saving HU in front.

4.4.4 Mounting

The ESC1's mechanical construction is rigid enough to be mounted using only the four holes in the mounting flange to secure it to the rack. It is however considered good practice to mount support rails if the system is installed in a moving environment.

4.4.5 Power Supply

The ESC1 shall be connected to the equipment rack's primary and secondary (emergency) source of power.

The requirements for the power rails are listed in Table 3. The cables used for power shall be dimensioned accordingly to the voltage and current consumption of the ESC1.

4.4.6 Grounding

It is always good practice to ground the cabinet of equipment installed in racks. This ensures safety and good EMC. If the unit is powered entirely through the DC power inlet, the ground connection is the only way to connect the ESC1 to ground. The grounding connection of the ESC1 should be connected to the equipment rack's ground strip using a ground wire of at least 0.75 mm² (AWG 19).

4.4.7 Installing Primary System Controller Board

1.1.1.3 AMC-IP

The primary system controller (PSC) or AMC-IP board must be inserted into the system controller. Before inserting the PSC board into the system controller, the SIM card containing the MAC address and basic settings must be inserted into the board. The SIM card shall be mounted in the socket located in the lower corner of the board (See Figure 11) by sliding the metal retention clip back and flipping the lid open (the lid itself comprises the socket). The SIM card itself shall then be inserted into the socket before closing it and the retention clip fastened.

To install the PSC board, the front cover must be opened by unscrewing the two front cover retention screws. Open the front cover by pulling it out (using the two loosened screws as handles) and flipping it down. The PSC board shall be inserted in the lowest position as depicted in Figure 11.

> **WARNING** *Disconnect all power from the ESC1 before installing or removing the PSC board.*

1.1.1.4 ICX-500

The primary system controller (PSC) when using the ICX-500 this is mounted next to the ESC1. The ICX-500 may either be installed in a 1HU shelf for ICX-500 or mounting bracket for ICX-500. The ICX-500 will be interconnected with the ESC1 via Ethernet cable. From ICX-500 Eth1 connects to ESC1 Eth2.

ICX-500 is powered separately with a 48VDC.
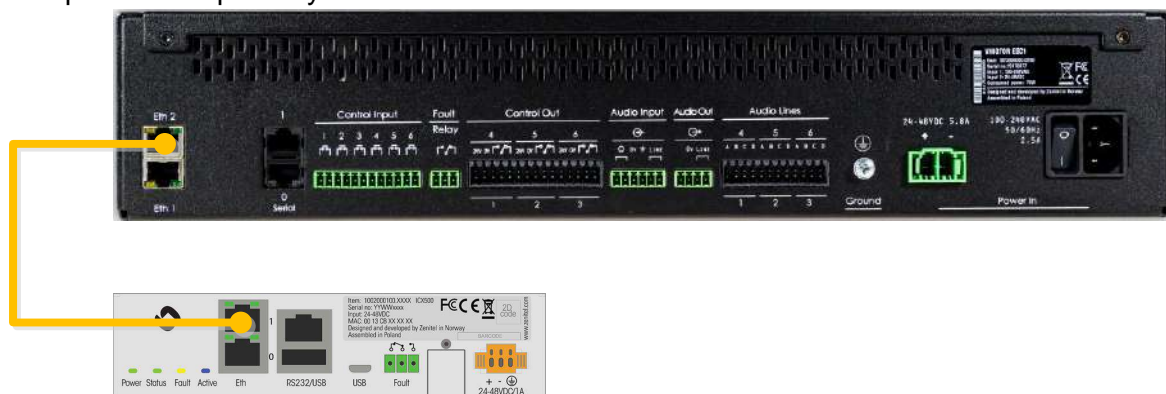
Figure 13: Interconnection between ESC1 & ICX-500
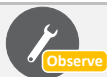
> *Configuration data for all units in the system is stored in non-volatile memory on the PSC board.*
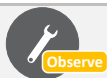
> *Important to use same type of PSC in AB systems.*

4.4.8 Ethernet Connections

The ESC1 shall be connected to the network using up to two Ethernet cables, depending on the system interconnection scheme. Note that this device does not support RSTP.

4.4.9 Fault Relay

The ESC1's fault relay will trigger whenever a fault is present in the system. The relay is kept in the NO position if there are no faults in the system. If any fault is generated, the relay will fall to the NC position. This ensures that the fault relay will fall to its fault position in case of a power failure. The connection to external equipment should be made according to the external equipment's requirements.

- No fault in system = Relay in NO position.
- Fault in system = Relay in NC position.

The fault relay should be routed from the ESC1 output to a terminal block in the equipment rack.

Note: Fault relay on back of ICX-500 will not be active and used when operating as PSC with ESC1

4.4.10 Control Inputs

The control inputs should be routed from the ESC1 screw terminal to terminal blocks in the equipment rack. The number of inputs used depends on the specific system. See section 4.11.1 for details on using control inputs.

4.4.11 Control Outputs

The control outputs on the ESC1 should be routed to terminal blocks in accordance with the specific system's needs. Cable diameter used and the number of connected outputs depend on the application.

4.4.12 Audio Inputs

The two audio inputs on the ESC1 can be used for background music, external alarms or local microphone. The audio inputs should be routed to terminal blocks in the equipment rack or local audio sources as required by the specific system. See section 4.11.3 for details on using audio inputs.

4.4.13 Optional Audio Inputs/Outputs

In systems where several analog audio inputs and/or outputs are required, the most cost optimal solution may be to use the AGA board in the ESC1. By adding this board, 12 configurable audio inputs/outputs become available on the ESC1. These I/Os can be used as inputs on the same line as the permanent line input, and as outputs to external systems (e.g. radio systems).

The AGA board must be installed in the optional feature board slot of the ESC1. This slot is accessed by opening the ESC1's front cover, and is located above the primary system controller board as shown in Figure 11.

> ⚠️ **WARNING** — *Disconnect all power from the ESC1 before installing or removing the AGA board.*

The input/output levels on the optional audio lines can be adjusted with the potentiometers at the front of the AGA board. These potentiometers are shown in Figure 14. There are 16 potentiometers, but only the first 12 (counting from left in the figure) are used.
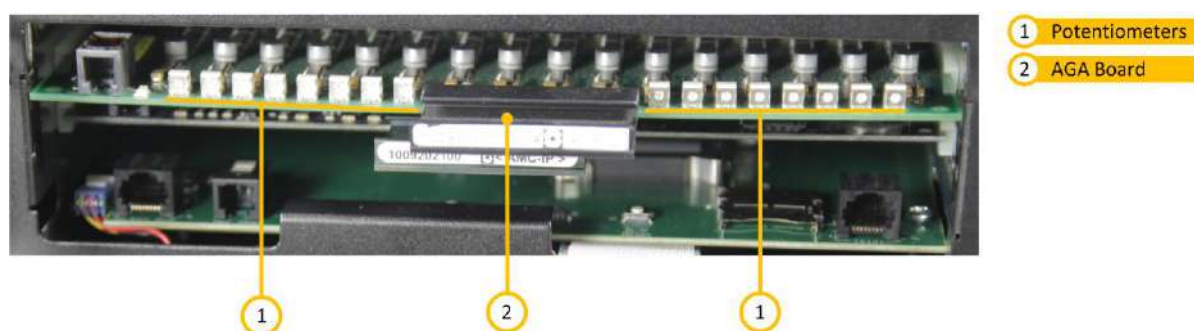
Figure 14: ESC1 with Optional AGA Installed
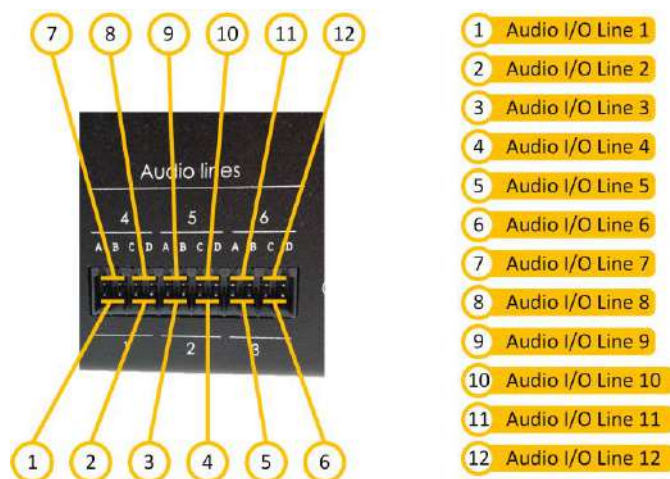
Figure 15: Optional Audio I/O Connections on ESC1

The different audio sources and/or destinations must be connected to the ESC1 according to Figure 15. The lines are transformer coupled and polarity is of no importance.
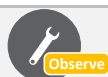
> 🔧 **Observe** — *The direction (input/output) of each individual audio line is configured from the Exigo Management Tool.*

4.5 Installing the ENA2200-x/ENA2400-x/ENA2100-AC and 1670 Amplifiers

4.5.1 ENA2200/ENA2400-DC/ENA2400-AC Amplifier Overview

Figure 16: ENA2200/ENA2400-DC/ENA2400-AC Front

> **NOTE** *See Appendix B for details on the menu structure in the user interface.*

Mounting Flanges: The mounting flanges are used to mount the unit in 19" equipment racks.

Ventilation Inlets: The ventilation inlets should be kept free of obstacles and dust. Fans control the airflow based on internal temperature.

Headphone Jack: The headphone connection can be used to listen to the different audio streams in the Amplifier.

Status Indicators: The status indicators are used to display the status of important parameters like power supplies and faults.

LCD Screen: The LCD screen displays status and a graphical user interface.

Control Knob: The control knob is used to select and execute menu items in the user interface. The control knob can be rotated and pressed.

Integrated Handles: These integrated handles make it easy to maneuver the unit without adding to the installation depth.

Figure 17: ENA2200 Rear

1	Ethernet Ports
2	Serial Console
3	Control Inputs
4	Fault Relay Output
5	Control Outputs
6	Audio Inputs
7	Speaker Outputs
8	Ground Connection
9	DC Power Inlet
10	AC Power Switch
11	AC Power Inlet
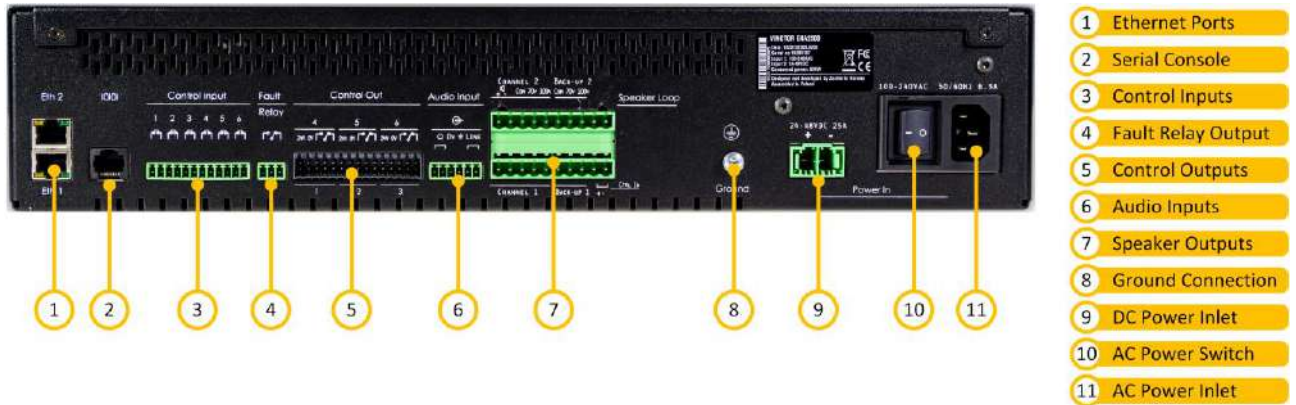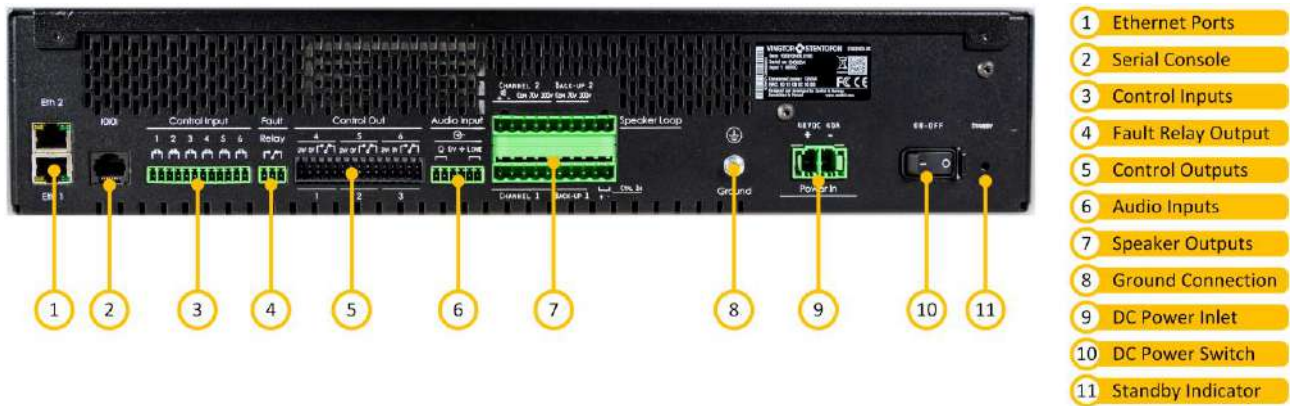
Figure 18: ENA2400-DC Rear

1	Ethernet Ports
2	Serial Console
3	Control Inputs
4	Fault Relay Output
5	Control Outputs
6	Audio Inputs
7	Speaker Outputs
8	Ground Connection
9	DC Power Inlet
10	DC Power Switch
11	Standby Indicator
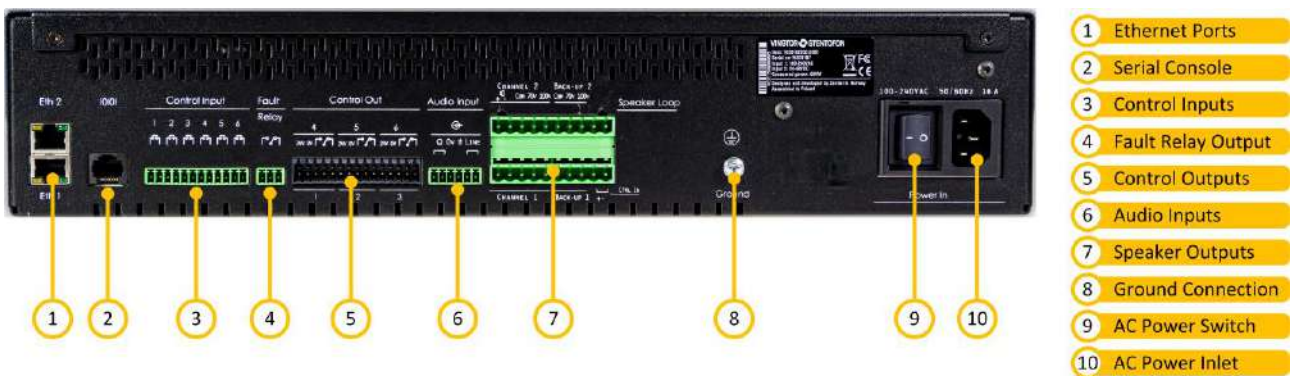
Figure 19: ENA2400-AC Rear

1	Ethernet Ports
2	Serial Console
3	Control Inputs
4	Fault Relay Output
5	Control Outputs
6	Audio Inputs
7	Speaker Outputs
8	Ground Connection
9	AC Power Switch
10	AC Power Inlet

Ethernet Ports: Redundant Ethernet connections for audio and control data.

Serial Console: Serial port connection for debugging and factory programming.

Control Inputs:	6 configurable control inputs. Each input is activated by closing the loop between the two terminals.
Fault Relay Output:	A switching relay (NO, NC & COM) kept in the active position between COM and NO as long as no faults are present in the device.
Control Outputs:	Six configurable control outputs. Each is made of a switching relay (NO, NC and COM) in parallel with a $24V_{DC}$ signal. The $24V_{DC}$ part of the control output can source max 200mA and has overcurrent protection.
Audio Inputs:	Microphone and line-in audio inputs for microphones or external audio sources.
Speaker Outputs:	100 and 70 volt outputs per channel. Each channel also has a low-power 8-ohm output for single speakers. Each channel is equipped with inputs for connection to a hot-standby backup amplifier.
Ground Connection:	Ground connection for grounding of the unit. This is connected in parallel with the ground connection in the AC power inlet.
DC Power Inlet:	24 to 48 V_{DC} in ENA2200. 48 V_{DC} in ENA2400-DC.
AC Power Switch:	Power switch for AC power. This switch will not turn off the amplifier if DC backup is connected. Available in ENA2200 and ENA2400-AC.
AC Power Inlet:	AC power inlet for 110 to 230 V_{AC}. The power inlet has a V-Lock mechanism for a secure connection. Available in ENA2200 and ENA2400-AC.
DC Power Switch:	Power switch for DC power. Available in ENA2400-DC.

4.5.2 ENA2200-AC2/ENA2400-AC2 Amplifier Overview

Figure 20: ENA2200-AC2/ENA2400-AC2 Front

Mounting Flanges:	The mounting flanges are used to mount the unit in 19" equipment racks.
Ventilation Inlets:	The ventilation inlets should be kept free of obstacles and dust. Fans control the airflow based on internal temperature.
Status Indicators:	The status indicators are used to display the status of important parameters like power supplies and faults.

Figure 21: ENA2200-AC2/ENA2400-AC2 Rear

Ethernet Ports: Redundant Ethernet connections for audio and control data.

Factory Reset Button: To reset the amplifier to factory default settings: Insert a straightened paper clip or similar device into the hole to press the reset button and hold for 7 to 8 seconds while powering up the amplifier.

Bypass Volume: Bypasses the volume.

Audio Input: 1 line-in audio input for external audio sources.

Control Inputs: 2 configurable control inputs. Each input is activated by closing the loop between the two terminals.

Control Outputs: 2 configurable control outputs, each consisting of a $24V_{DC}$ signal. The $24V_{DC}$ signal can source max 200mA and has overcurrent protection.

Fault Relay Output: A switching relay (NO, NC & COM) kept in the active position between COM and NO as long as no faults are present in the device.

Backup Enable: Enables backup.

Backup Inputs: 100 and 70 volts inputs per channel.

Audio Outputs: 100 and 70 volts outputs per channel. Supports One Channel Mode.

Ground Connection: Ground connection for grounding of the unit. This is connected in parallel with the ground connection in the AC power inlet.

AC Power Switch: Power switch for AC power.

AC Power Inlet: AC power inlet for 110 to 230 V_{AC}. The power inlet has a V-Lock mechanism for a secure connection.

4.5.3 ENA2100-AC Amplifier Overview

Figure 22: ENA2100-AC Front

1	Mounting Flange
2	Ventilation Inlets
3	Status Indicators
4	Ventilation Inlets
5	Mounting Flange

Mounting Flanges: The mounting flanges are used to mount the unit in 19" equipment racks with 2HU in double configuration.

Ventilation Inlets: The ventilation inlets should be kept free of obstacles and dust. Fans control the airflow based on internal temperature.

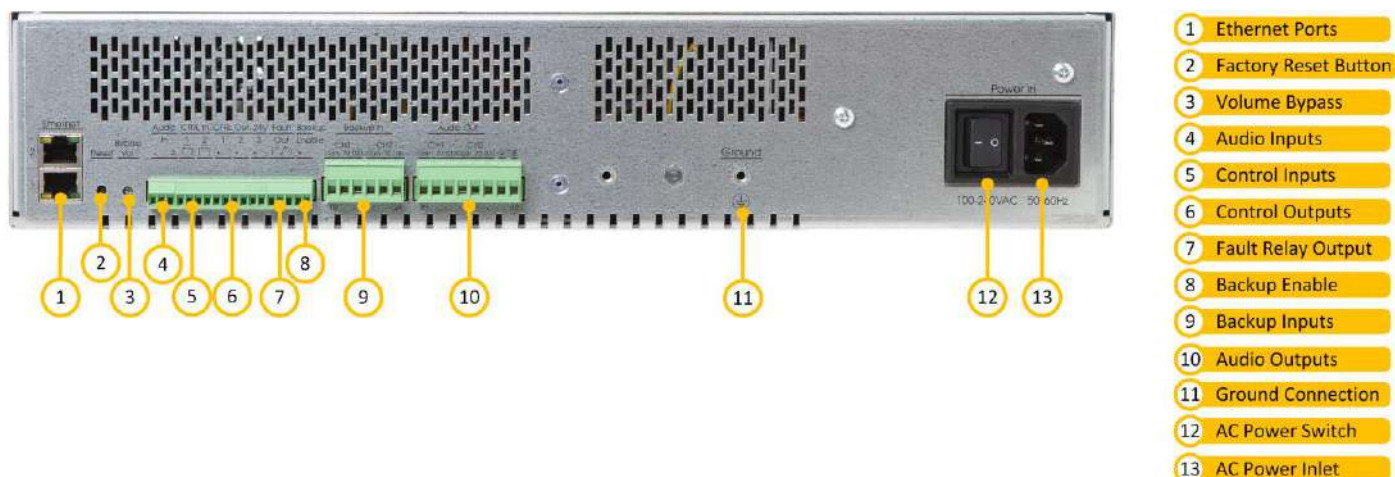Status Indicators: The status indicators are used to display the status of important parameters like power supply and faults. There is also a VU indicator for channel 1 and channel 2.

Figure 23: ENA2100-AC Rear

1	Ethernet Ports
2	Audio Inputs
3	Control Inputs
4	Control Outputs
5	Fault Relay Output
6	Speaker Outputs
7	Factory Reset Button
8	AC Power Switch
9	AC Power Inlet
10	Ground Connection

Ethernet Ports: Redundant Ethernet connections for audio and control data.

Audio Input: 1 line-in audio input for external audio sources.

Control Inputs: 2 configurable control inputs. Each input is activated by closing the loop between the two terminals.

Control Outputs: 2 configurable control outputs, each consisting of a $24V_{DC}$ signal. The $24V_{DC}$ signal can source max 200mA and has overcurrent protection.

Fault Relay Output:	A switching relay (NO, NC & COM) kept in the active position between COM and NO as long as no faults are present in the device.
Speaker Outputs:	100 and 70 volts outputs per channel. Supports One Channel Mode.
Factory Reset Button:	To reset the amplifier to factory default settings: Insert a straightened paper clip or similar device into the hole to press the reset button and hold for 7 to 8 seconds while powering up the amplifier.
AC Power Switch:	Power switch for AC power.
AC Power Inlet:	AC power inlet for 110 to 230 V_{AC}. The power inlet has a V-Lock mechanism for a secure connection.
Ground Connection:	Ground connection for grounding of the unit. This is connected in parallel with the ground connection in the AC power inlet.

4.5.4 Placement and Stacking

The ENA2200/ENA2200-AC2/ENA2400-DC/ENA2400-AC/ENA2400-AC2 amplifiers are designed to deliver full power at ambient temperatures up to 55 °C. As long as the equipment rack is well ventilated, the amplifiers can be stacked with no extra space between them. It is however recommended to add 1 HU between every group of 4 amplifiers. The ENA2100-AC is mounted in 19" equipment racks with 2HU in double configuration. 1670 amplifer is installed in mounting cabinet of 6HU for up to 6 x 1670 amplifiers.

4.5.5 Mounting

The amplifier's mechanical construction is rigid enough to be mounted using only the four holes in the mounting flanges to secure it to the rack. It is however considered good practice to mount support rails if the system is installed in a mobile environment.

4.5.6 Power Supply

The amplifier shall be connected to the equipment rack's primary and secondary (emergency) source of power.

> **NOTE**
> **Observe**
>
> *Only one power source may be connected if the power source itself is redundant (e.g. UPS) or if the class/installation permits a single source of power.*
> *Both power inputs are equipped with a lock, preventing the plug from falling out. Make sure that the plug is properly inserted, and that the lock is engaged.*

The cables used for the power shall be dimensioned accordingly to the voltage and current consumption of the amplifier.

4.5.7 Grounding

It is always good practice to ground the cabinet of equipment installed in racks. This ensures safety and good EMC. If the unit is powered entirely through the DC power inlet, the ground connection is the only way to connect the Amplifier to ground. The ground connection of the Amplifier should be connected to the equipment rack's ground strip using a ground wire of at least 0.75 mm² (AWG 19).

> **NOTE**
> *If the Amplifier isn't connected to ground, it will not be able to detect ground faults or short-circuits to ground.*

4.5.8 Ethernet Connections

The Amplifier shall be connected to the network using one or two Ethernet cables, depending on the system interconnection scheme.

4.5.9 Fault Relay

The Amplifier's fault relay will trigger whenever a fault occurs in the amplifier. This relay is actively kept closed by the Amplifier so it will trigger even if the entire amplifier loses power. The connection to external equipment should be made according to the external equipment's requirements. When no faults are present in the amplifier, an electrical connection is established between the COM and NO terminals of the fault relay. When a fault is detected, or the amplifier loses power, this connection is removed and a connection between COM and NC is established.

The fault relay should be routed from the Amplifier output to a terminal block in the equipment rack if required by the specific system.

> **NOTE**
> *The fault relay on the system controller will trigger in parallel with that of the amplifier. In most cases, it is sufficient to use only the fault relay on the system controller.*

4.5.10 Control Inputs
The control inputs should be routed from the Amplifier screw terminal to terminal blocks in the equipment rack. See section 4.11.1 for details on using control inputs.

4.5.11 Control Outputs

The control outputs on the Amplifier should be routed to terminal blocks in accordance with the specific system's requirements. Cable diameter used is max 0.25 mm^2 flexible.

4.5.12 Audio Inputs

The two audio inputs on the Amplifier can be used for background music, external alarms or local microphone. The audio inputs should be routed to terminal blocks in the equipment rack or local audio sources. See section 4.11.3 for details on using audio inputs.

4.5.13 Speaker Connections / Audio Out

The ENA2200/ENA2400-DC/ENA2400-AC amplifiers have three different options for loudspeaker connections: 8Ω, 70 volts and 100 volts. The 8Ω output is only intended for local monitoring of audio, and the power is therefore limited compared to the 70-volt and 100-volt lines.
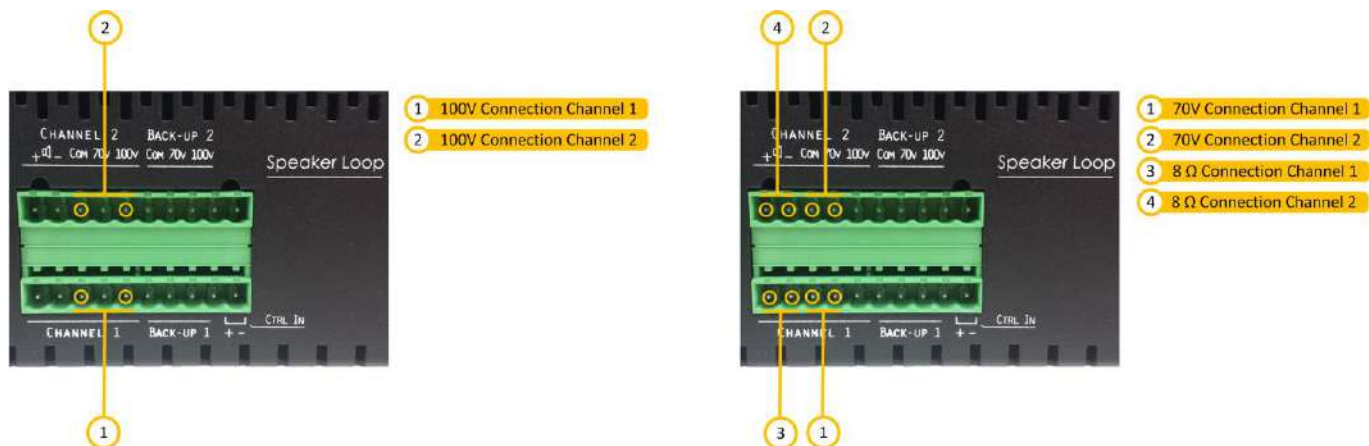
Figure 24: ENA2200/ENA2400-DC/ENA2400-AC Speaker Connections

The ENA2200-AC2/ENA2400-AC2 and ENA2100-AC amplifiers have two different options for speaker connections: 70 volts and 100 volts.
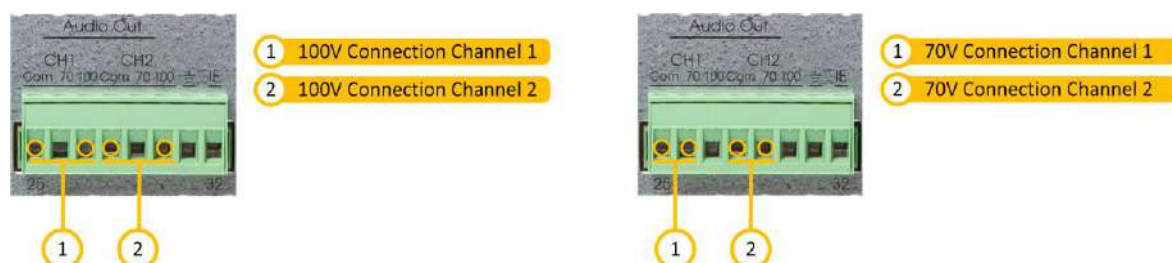
Figure 25: ENA2200-AC2/ENA2400-AC2 Speaker Connections
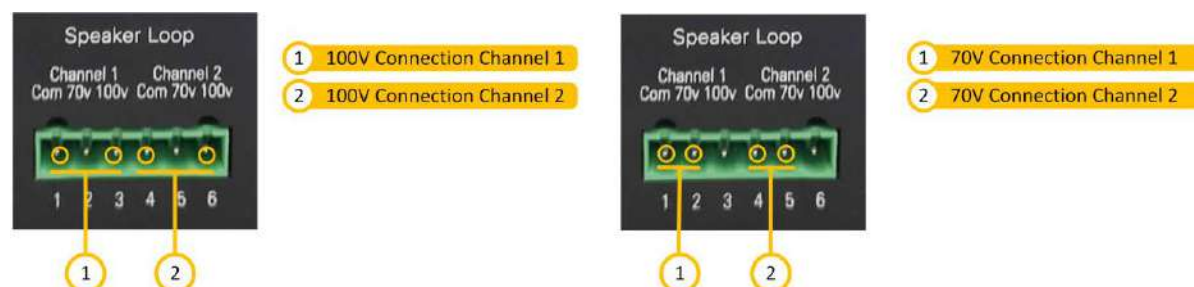
Figure 26: ENA2100-AC Speaker Connections

The speaker outputs from the amplifier should be routed to terminal blocks in the equipment rack according to system requirements.

1.1.1.5   One Channel Mode

For amplifiers supporting One Channel Mode this mode is to be selected and activated in EMT.
When One Channel Mode is activated the two loudspeaker channels (Ch1 & Ch2) will play identical audio and the audio will be in phase.
It is possible to have two separate loudspeaker loops, each supporting maximum load as giving by amplifiers specification or bridging the two channels to one supporting a load of the two channels combined. For bridging output physical on the amplifier the Audio Out channel 1 and channel 2 must be interconnecting as in below example.
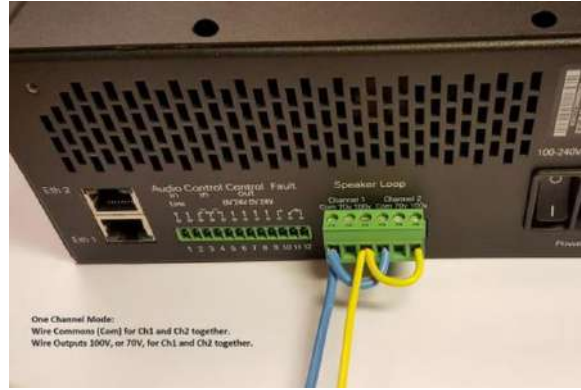
Figure 27: Bridged One Channel Mode

Wiring of bridged output:

- Short "Com"-terminal for Ch1 to "Com"-terminal for Ch2.
- Short "100V"-terminal for Ch1 to "100V"-terminal for Ch2.

4.5.14 1670 Power Amplifier in Exigo System

1	Mounting Flange
2	Power button
3	Trim potentiometers
4	Status Indicators
5	dB level meter
6	Ventilation Inlets
7	Line ext
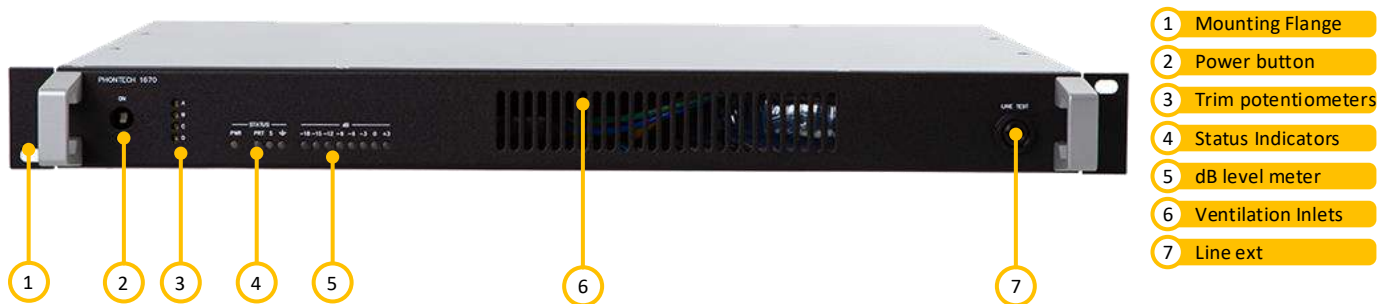
Figure 28: 1670 Front

The 1670 amplifier must be installed into a 6HU cabinet where up to 6 amplifiers can be installed. To enable this analog amplifier within the Exigo system, one TKIS-2 kit is connected to each amplifier. The I/O between the TKSI-2 and 1670 is "audio" and fault detections are: Line, GND, Amp. These are connected to PCBs on the back of the 6HU cabinet.

Figure 29: 1670 6HU cabinet Rear

The diagram includes the following callout legend:

1. 48VDC AMP1-3
2. 48VDC AMP4-6
3. Line Input AMP1-6
4. Output AMP1-6
5. Exigo/TKIS AMP1-3
6. Exigo/TKIS AMP4-6
7. Flat Cable
8. Daisy Chain
9. 24VDC
10. PE
11. Surveillance Test
12. PA Busy

Figure 30: TKIS-2 connection between 1670 & Exigo System

The TKIS-2 I/O is used as follows and should be part of the default setup when selecting the 1670 amplifier in EMT:

- PIN1: Output - Line Fault
- PIN2: Output - GND Fault
- PIN3: Output - Amp Fault
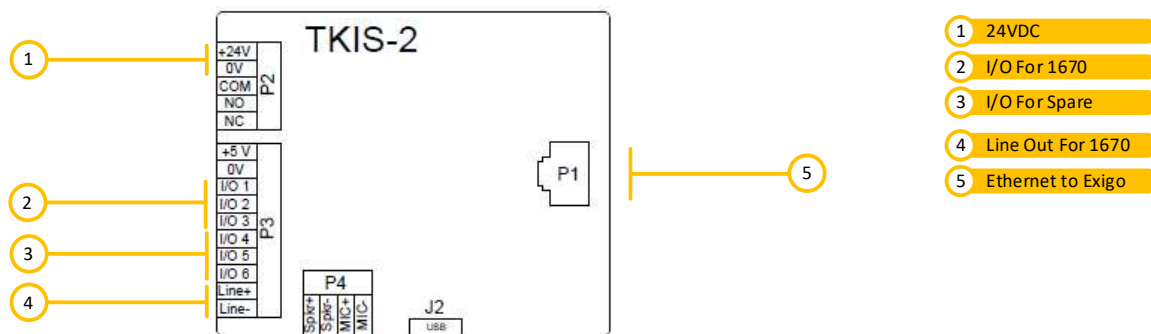
These faults should also be listed as SNMP traps.

For PIN4-6: These will appear as general-purpose I/Os as with the TKIS-2 kit.

4.5.15 Backup Amplifiers

The ENA2200/ENA2400-DC/ENA2400-AC can act as backup for up to 6 other amplifiers.

The ENA2200-AC2/ENA2400-AC2 can act as backup for up to 16 other amplifiers.

The backup amplifier will take over the output of the first faulty amplifier to maintain system integrity based on the configuration. See section 4.11.5 for details on connecting backup amplifiers.

Important: Do not mix different generation amplifiers in a backup system.

> **NOTE** ***The ENA2100-AC and 1670 cannot be used as backup amplifiers.***

4.6   Installing the FCDC3 Flowire Converter

The FCDC3 is used with Ex devices like the EAPFX access panels and has a PoE power-forwarding feature that can be enabled or disabled to allow for easier integration with central equipment and for avoiding ground-loop and ground fault issues without any proprietary equipment or modification of the device.

4.6.1 Flowire Converter Overview

1 Status Indicators
2 Ground Connection
3 PLC 2
4 PLC 1
5 Power Input
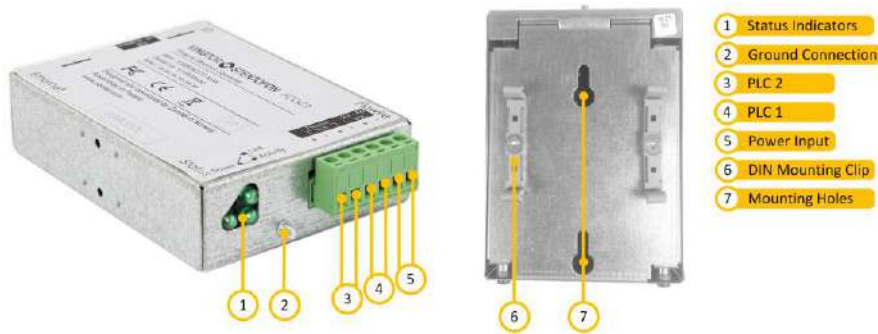6 DIN Mounting Clip
7 Mounting Holes

Figure 31: Front and Bottom View – Flowire Converter

DIN Mounting Clip: Plastic clip to mount the Flowire Converter box to a DIN rail.

Status Indicators: LED indicators for power, link and activity.

Ground Connection: Ground connection for grounding of the unit.

PLC/Power Input: Connections for power and Flowire network.

1 Password Reset Button
2 PoE On/Off Switch
3 Ethernet Port
4 Alternate DIN Clip Holes
5 DIN Mounting Clip
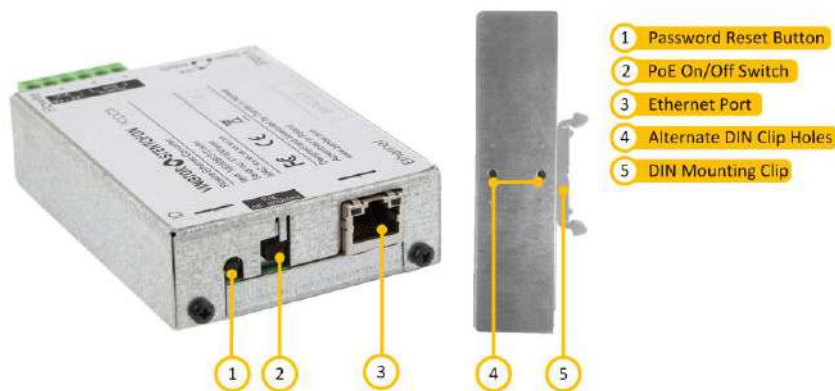
Figure 32: Rear and Side View – Flowire Converter

DIN Mounting Clip: Plastic clip to mount the Flowire Converter box to a DIN rail.

Password Reset Button: Button to reset the NMK password to default.

PoE On/Off Switch: Switch to enable or disable PoE.

Ethernet Port: Ethernet connection with power.

NOTE *To add Flowire units to the system via EMT, see section 6.12.*
To reset the Flowire unit, press and hold the Password Reset Button for more than 15 seconds.

4.6.2 Placement

When used in an equipment rack, the Flowire Converter can be placed at any accessible location.

> **NOTE** *When installing more than one Flowire network in the same equipment rack, precautions must be taken to reduce crosstalk between the networks.*

4.6.3 Mounting

The Flowire Converter is a DIN-rail mounted device, and hence requires a DIN rail. The DIN rail shall be mounted securely to the equipment rack, and properly stabilized. The DIN clips on the Flowire Converter can be placed on either the side or the bottom, thus giving different mounting options.

4.6.4 Grounding

It is always good practice to ground the cabinet of equipment installed in racks. This ensures safety and good EMC. The grounding connection of the Flowire Converter should be connected to the equipment rack's ground strip using a ground wire of at least 0.75 mm² (AWG 19).

4.6.5 Power Supply

The Flowire Converter can operate over a wide range of voltages. The voltage selected depends on the type of equipment connected to the Flowire network:

24 V$_{DC}$: The Flowire Converter shall be powered by the 24V$_{DC}$ power supply when used for the connection of Ex access panels.

48 V$_{DC}$: The Flowire Converter shall be powered by the 48V$_{DC}$ power supply when used for the connection of other Flowire Converter units.
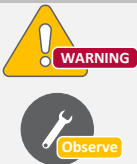
> **WARNING** **Other power supplies than the ones mentioned above shall not be used.**
>
> **Observe** *Connect the power supply to any one of the two Flowire/power ports of the Flowire Converter using wires with a thickness of at least 1.5 mm² (AWG 15) and a length of at least 1 m.*

4.6.6 Flowire Connection

The Flowire port shall be routed to a terminal block in the equipment rack. The Flowire connections shall be done in accordance with the Flowire manual *A100K11958 Flowire Converter Configuration*.

4.6.6.1 Use of Shielded Cable

When using shielded cable (for improved EMC when used in high-EMI areas) the shield should be attached to the chassis of the Flowire unit and the central rack.

4.6.6.2 Cabling in Ex Areas

The Ex access panels are connected to the central equipment rack using Ex certified 2-wire shielded cable. The Flowire Converter is used to extend the Ethernet connection and support power distribution on the 2-wire cabling infrastructure. To support the Flowire interface, the central equipment rack must be equipped with a Flowire Converter.
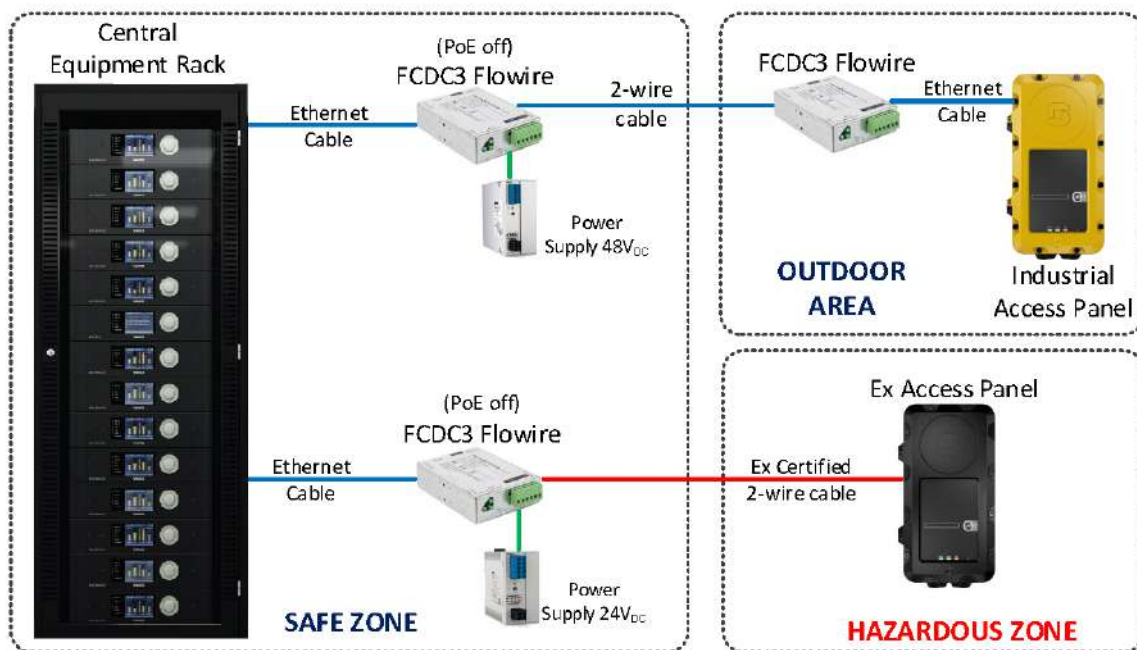
Figure 33: Cabling in Ex Zone using FCDC3 Flowire

4.7 EPIPR-6 Power Injector
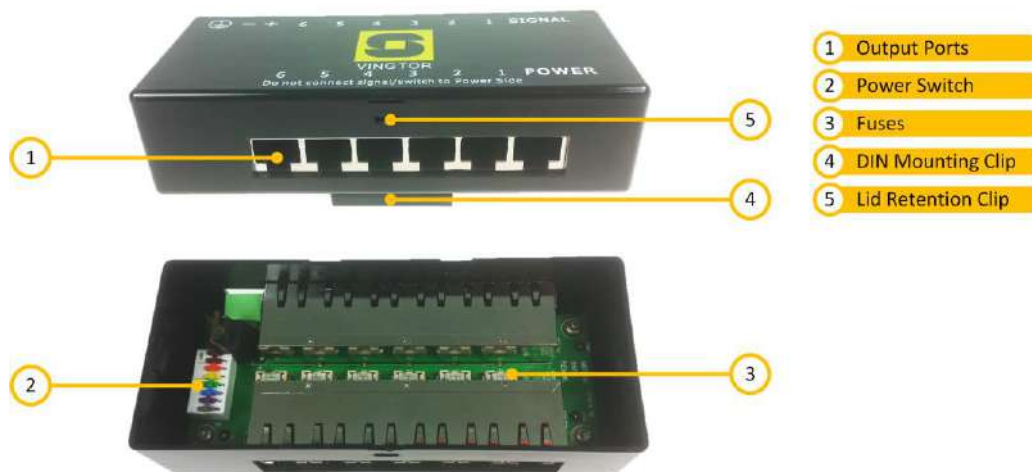
4.7.1 EPIPR-6 Overview

Figure 34: Front and Internal View – EPIPR-6

Output ports: Ethernet ports carrying data and power.

Power switch: Power switch to individually turn on/off spare pair PoE on the output ports.

Fuses: Replaceable fuse for each output port.

DIN mounting clip: Plastic clip to mount the EPIPR-6 unit to a DIN rail.

Lid retention clip: Small plastic clip which must be depressed to remove the top cover.

Figure 35: Rear View – EPIPR-6

Input ports: Ethernet port for connection to the central switch.

Mounting clip: Plastic clip to mount the EPIPR-6 unit to a DIN rail.

Power input: Power connection for power to the PoE devices.

> **NOTE** *For installation procedures, see the manual 'A100K11671 Installing the EPIPR-6 Power Injector'.*

4.8 Installing the TKIS-2 Turbine Kit
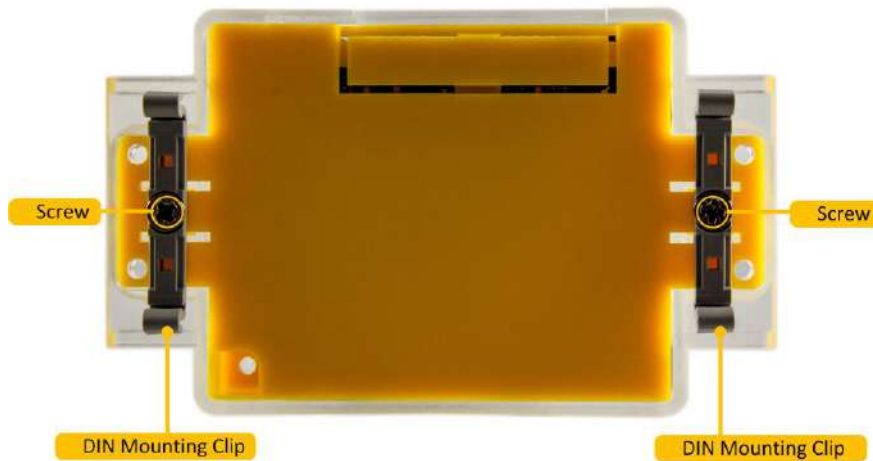
4.8.1 TKIS-2 Overview

Figure 36: TKIS-2 Overview

Figure 37: TKIS-2 Mounting Clips

Power/Relay Inputs:	Programmable relay. Max: 250VAC/220VDC, 2A, 60W
I/O interface:	Interface for control inputs, control outputs and analog audio.
External Audio:	Connection for microphone and optional external loudspeaker.
Ethernet Port:	Ethernet connection with Power over Ethernet.
DIN mounting clips:	Plastic clips for mounting the TKIS-2 to a DIN rail.

4.8.2 Placement

When used in an equipment rack, the TKIS-2 can be placed at any accessible location.

4.8.3 Mounting

The TKIS-2 is a DIN rail mounted device, and hence requires a DIN rail to attach to. The DIN mounting clips are attached to the bottom of the device with the screws provided (see Figure 37). The DIN rail shall be mounted securely to the equipment rack, and properly stabilized. Mount the device by snapping the mounting clips into place on the DIN rail.

4.8.4 Power Supply

The TKIS-2 shall be powered as dictated by the requirements for the class or installation using PoE or local power.

4.8.5 Ethernet

The TKIS-2 shall be connected to the central equipment as dictated by the requirements for the class or installation. TKIS-2 has only one network interface so if the class requires it, more than one unit should be used. In an A-B configuration, Ethernet shall be connected to both systems, through separate cables routed through separate fire zones.

4.8.6 Inputs and Outputs

The TKIS-2 is equipped with control inputs and control outputs. These 6 inputs/outputs can be used in the system in the same way as the control inputs/outputs on the central equipment. These inputs/outputs must be configured to be either an input or an output; hence there are in total 6 inputs, outputs or a combination of these. The inputs on the TKIS-2 are not monitored, and should therefore only be used for non-critical applications. The TKIS-2 also includes one separate relay which can be used for a multitude of applications, e.g. muting of local loudspeakers (see Figure 36).

4.8.7 Signal Relays

Two signal relays that are configurable as a control output from EMT. Relay inputs NO, NC, and COM are available.

4.9 Installing the TKIE-2 Turbine Kit

4.9.1 TKIE-2 Overview
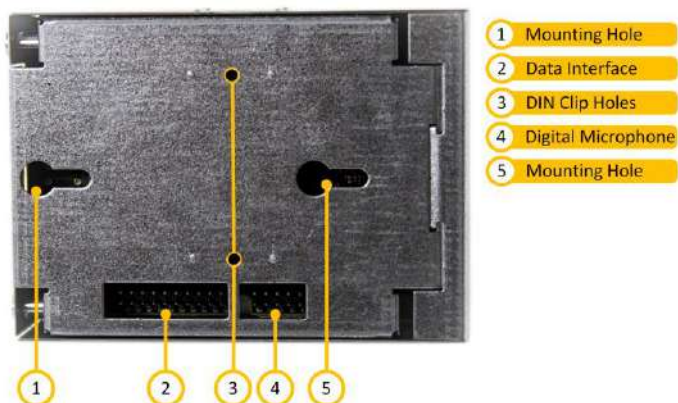

Figure 38: TKIE-2 Overview

Figure 39: TKIE-2 Bottom

Relay Inputs: Programmable relay inputs (NO+NC+COM). Max: 250VAC/220VDC, 2A, 60W

I/O interface: Interface for control inputs, control outputs and analog audio.

External Audio: Connection for microphone and optional external loudspeaker.

Secondary Power: Connector for secondary local power.

TA-10 Relay Interface: Connects to TA-10 Relay Module for high-power switching applications.

Ethernet/PoE Port: Ethernet connection with Power over Ethernet.

4.9.2 Placement

When used in an equipment rack, the TKIE-2 can be placed at any accessible location.

4.9.3 Mounting

The TKIE-2 is a DIN rail mounted device, and hence requires a DIN rail to attach to. The DIN mounting clips are attached to the bottom or side of the device with the screws provided. The DIN rail shall be mounted securely to the equipment rack, and properly stabilized. Mount the device by snapping the mounting clips into place on the DIN rail.

4.9.4 Power Supply

The TKIE-2 shall be powered as dictated by the requirements for the class or installation using PoE or local power.

4.9.5 Ethernet

The TKIE-2 shall be connected to the central equipment as dictated by the requirements for the class or installation. In an A-B configuration, Ethernet shall be connected to both systems, through separate cables routed through separate fire zones. Network equipment must support RSTP for A-B configuration. We recommend CISCO Catalyst series or other reputable switches with a standard SNMP and IGMP implementation.

4.9.6 Inputs and Outputs

The TKIE-2 is equipped with control inputs and control outputs. These 6 inputs/outputs can be used in the system in the same way as the control inputs/outputs on the central equipment. These inputs/outputs must be configured to be either an input or an output; hence there are in total 6 inputs, outputs or a combination of these. The inputs on the TKIE-2 are not monitored, and should therefore only be used for non-critical applications. The TKIE-2 also includes two separate relays, which can be used for a multitude of applications, e.g. muting of local loudspeakers. There is also an interface to the TA-10 Relay Module for high-power switching applications (see Figure 38).

4.9.7 Signal Relays

There are two signal relays that are configurable as a control output from EMT. Relay inputs NO, NC, and COM are available.

4.10 IP-LCM-A IP Line Connection Module

The IP-LCM-A IP Line Connection Module is a kit with robust connectors and additional inputs and outputs intended to expand the I/O options when building a rack for Exigo systems. The IP-LCM-A can also be located away from the system rack and work as an extended I/O module.

IP-LCM-A Features

- 1 network interface
- 1 small signal relay
- 8 high power relays
- 6 GPIO
- 8 robust control inputs
- Microphone input
- DIN mountable
- Powered via the TKIS-2 kit using PoE or local power

4.10.1 Audio

Output: Audio outputs can be part of any zone in the Exigo system. This is useful if the TKIS-2 kit is used as an interface to an external audio system.

Input: Audio program is used to route the audio inputs to any zones and can be controlled by I/O or buttons. This is typically used to route audio from an analog system into the Exigo system. Sensitivity adjustments and AGC is available on all audio inputs.

4.10.2 I/O

All the inputs and outputs are global and fully programmable in the Exigo system. The general-purpose input/outputs can be set to either input or output. They are 5V signals that can be used to trigger small relays as outputs. If the GPIO is used as an input, it can be shorted to indicate a changing state. The eight high-power relays are capable of switching up to 2000V and 8A. This gives many options together with the connectors capable of connecting cables up to 16AWG / 1.5mm^2. Each of the eight robust control inputs can be triggered by a closing contact or a 24-48Vdc signal. Cables up to 16AWG / 1.5mm^2 can be connected.

4.10.3 Power

The IP-LCM-A can be powered by PoE or by a local 24-48 VDC power source.

4.10.4 Network

The network interface can be monitored and a fault will be reported if either of the network interfaces are disconnected.

4.11 Equipment Connections

4.11.1 Control Inputs

The control inputs on the central equipment can be connected as normal inputs without monitoring, or as monitored inputs. When monitoring isn't required, the input can be connected directly to the external switch/relay. If monitoring is a requirement, two resistors must be connected as close as possible to the external switch/relay, as depicted in Figure 40. The resistor connected in series with the external switch/relay shall have a value of 1 kΩ, while the resistor connected in parallel shall be 2.2 kΩ.
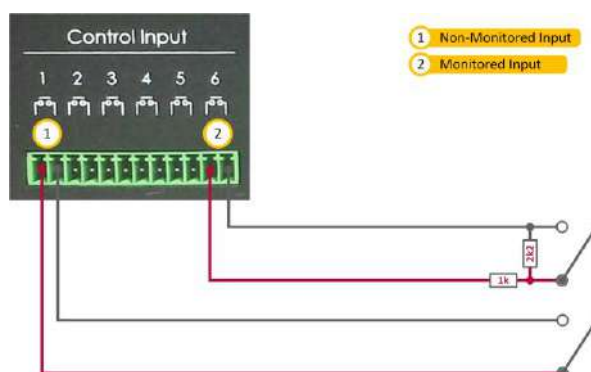
Figure 40: Control Input Connections

> **NOTE**
> *Monitoring of control inputs must be enabled from the Exigo Management Tool.*
> *Monitoring is done with a voltage and a small current*

4.11.2 Parallel-Wire Inputs

In an A-B system, it is required that signals from external systems such as fire detection are routed to both the A and B systems. The control inputs are connected using a dual or single pole switch.

4.11.2.1 Connection with Dual-Pole Switch

If the external system has two physical outputs, a dual-pole switch connection must be made between Exigo and the external system as shown in Figure 41. As the Exigo system uses a small current to detect the status of the external switch/relay, two inputs should not be directly connected together without due precautions.
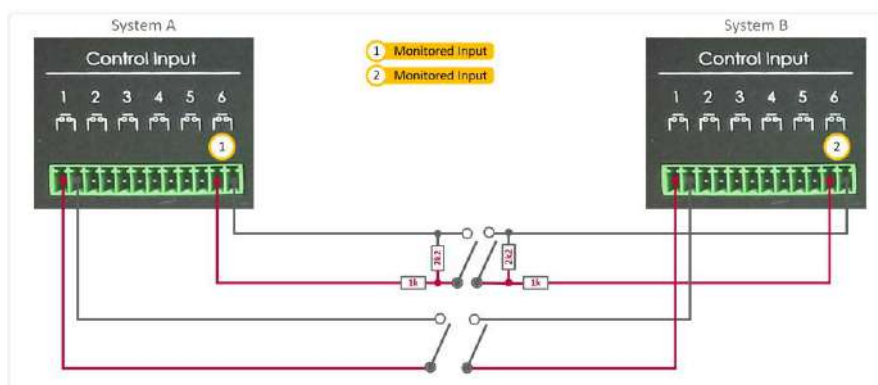

Figure 41: Parallel-Wire Inputs with Dual-Pole Switch Connections

4.11.3 Audio Inputs

The audio inputs on the central equipment can be used for background music sources or local microphones. When used for local microphones, a control input must also be used to control when the microphone shall broadcast the audio. Figure 42 shows an example where the microphone is connected to the microphone input, and the PTT switch is connected to control input 1. The example in Figure 43 shows the connection of two background music sources. The audio outputs from the audio sources are connected to the microphone and line inputs. When connecting audio sources, it is important to adjust the input level for the audio input and the output level of the source.
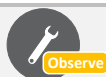
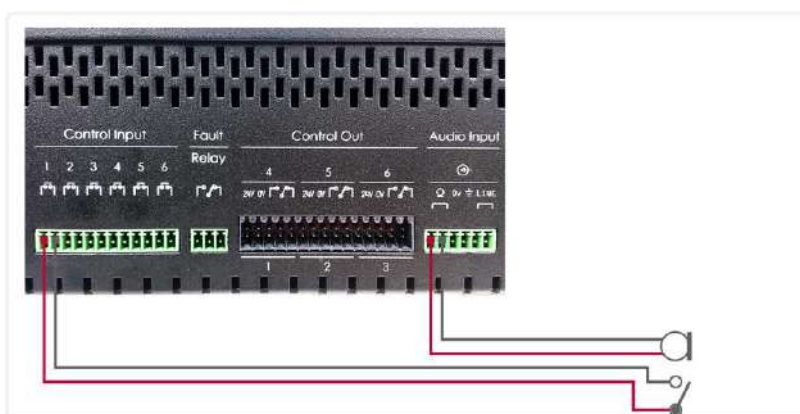> *Background music and local microphones must be configured in the system via the Exigo Management Tool.*

Figure 42: Local Microphone Connection Example

Figure 43: Music Source Connection Example

4.11.4 Audio Outputs

The audio outputs on the Exigo system controller can be used for integration with other systems.

Depending on the receiving system, additional signals may have to be used. One such example is shown in Figure 44 where Exigo is integrated with a radio system. Here one of the control outputs is used to signal the radio when there is audio to be sent to the radio. This control output will trigger when audio is sent to the zone which the audio output is assigned to. A similar setup can be used for analog PABX as well.

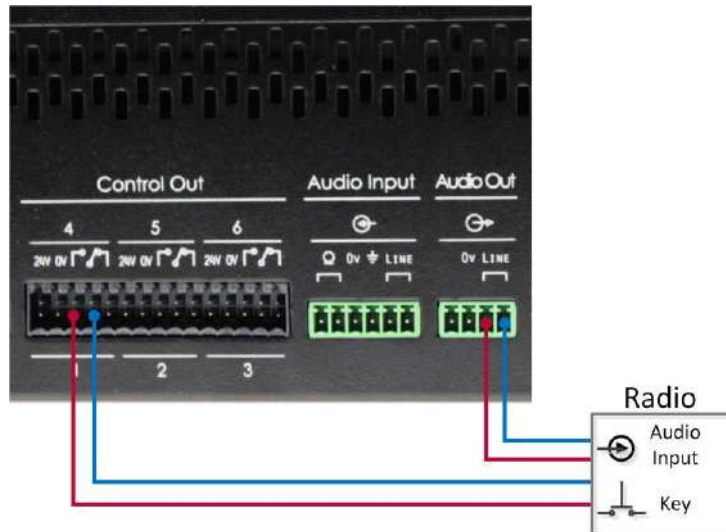The configuration of the audio outputs is done through EMT.

Figure 44: Radio Integration Example

4.11.5 Backup Amplifiers

> **NOTE** *The ENA2100-AC and 1670 cannot be used as a backup amplifiers.*

When setting up a backup amplifier, the audio outputs from the backup must be routed in a "bus manner" to the amplifiers it is backing up for. This bus must include the output lines used by all the amplifiers. Usually only the 70 or the 100 volts line is used, but it is also possible to have a mix of the two.

4.11.5.1 ENA2200/ENA2400-DC/ENA2400-AC as Backup Amplifier

> **NOTE** *The ENA2200/ENA2400-DC/ENA2400-AC can serve as backup for up to 6 amplifiers of the same type.*

In addition to the audio outputs, individual control signals must be routed between the backup amplifier's control outputs ($24V_{DC}$) and the other amplifiers' changeover relay inputs. As one control output per amplifier is required on the backup amplifier, one backup amplifier can act as backup for up to 6 other amplifiers of the same type. The control outputs can be used freely, i.e. control output 1 can be used to override backed up amplifier 1 to 6 etc. It is, however, recommended to use control output 1 for amplifier 1, control output 2 for amplifier 2 and so on.
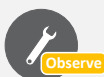
> **Observe** *Backup amplifiers shall be connected to the network in the same way as any other amplifier. The backup amplifier receives data and audio over the network, and stores the configuration of all amplifiers it is backing up for. If an amplifier fails, the backup will "masquerade" as the failed amplifier and connect to that amplifier's speaker loops.*

Figure 45 shows an example of a system where the backup amplifier is the standby for two other amplifiers. This example illustrates the concept and the required connections.
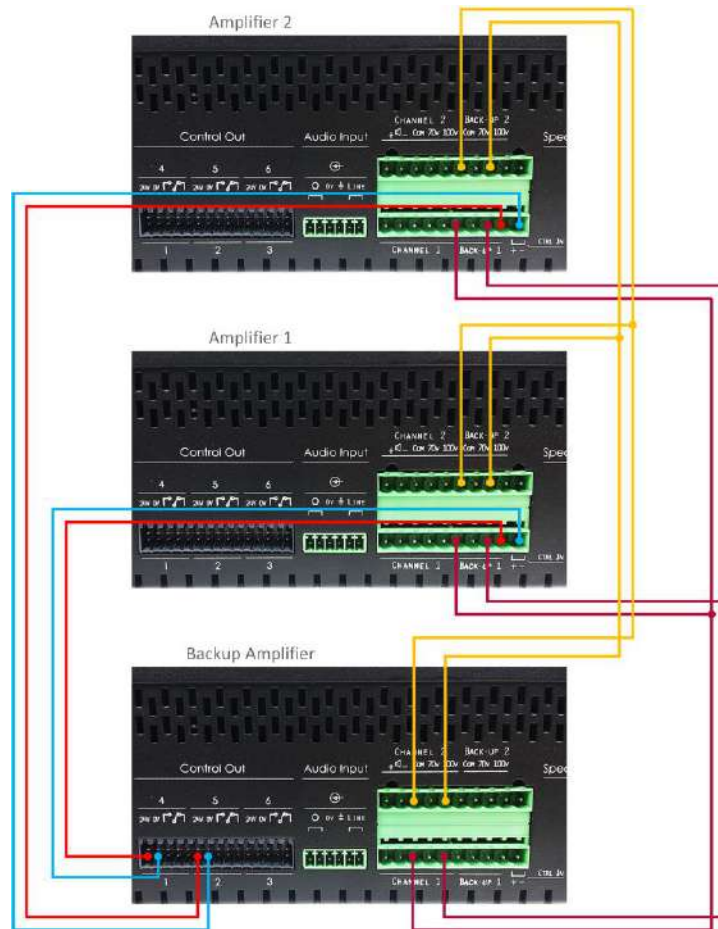
Figure 45: Backup Amplifier Example

> **Observe**
>
> *In addition to the electrical connections, the backup amplifier must also be configured as backup in the Exigo Management Tool. See section 6.9.4.*

4.11.5.2   ENA2200-AC2/ENA2400-AC2 as Backup Amplifier

> **NOTE**
>
> ***The ENA2200-AC2/ENA2400-AC2 can serve as backup for up to 16 amplifiers of the same type.***

The individual control signals must be routed between the backup amplifier's control outputs (24V$_{DC}$) and the other amplifiers' changeover relay inputs. One backup amplifier can act as backup for up to 16 other amplifiers of the same type. It is recommended to connect control output 1 to the Backup Enable connector of amplifier 1, control output 2 to the Backup Enable connector of amplifier 2 and so on.
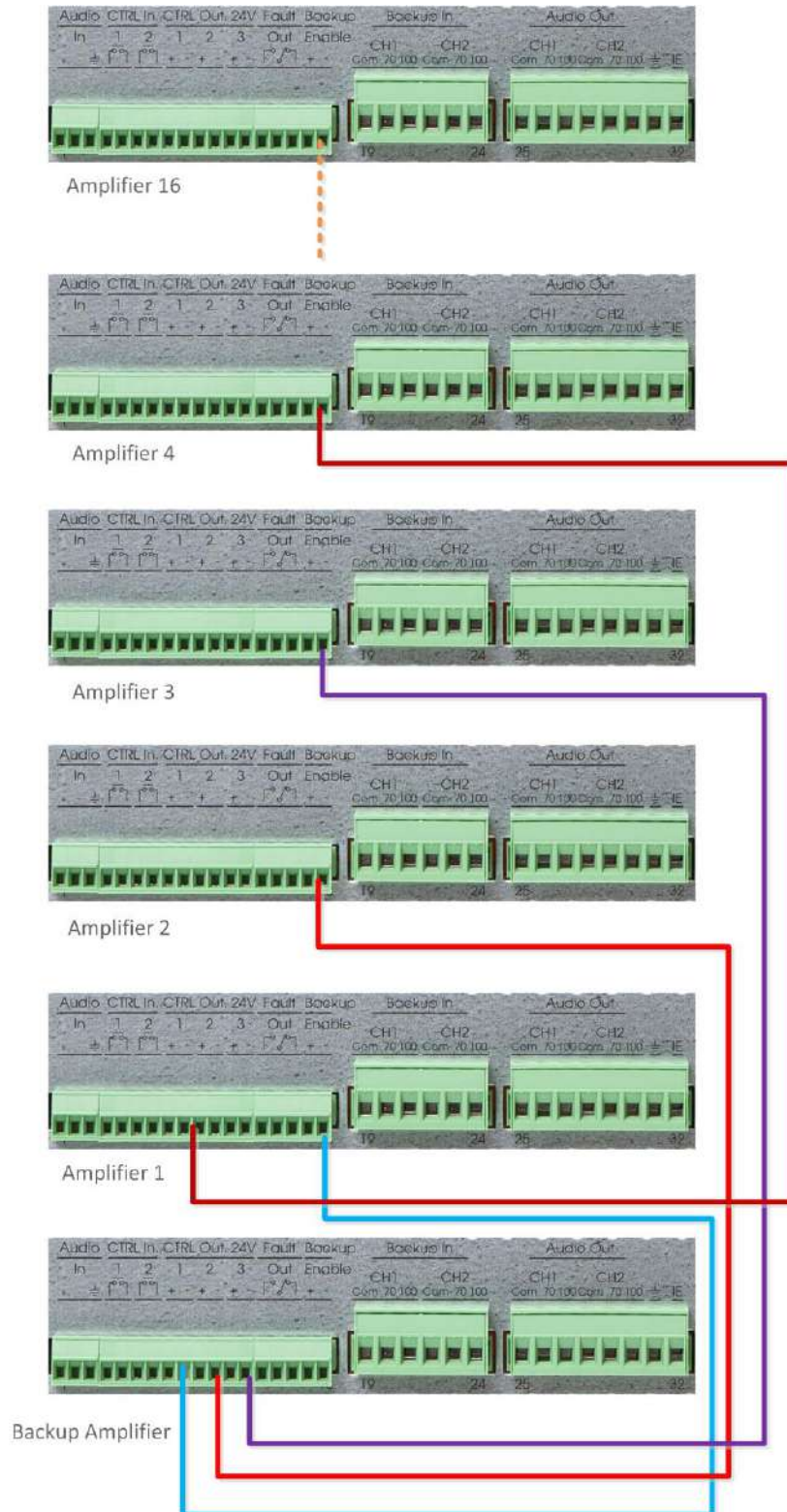
Figure 46: ENA2x00-AC2 Backup amplifier example

5 Field Equipment Installation

> **NOTE** *Refer to relevant datasheets and dimension drawings of the field equipment for further details.*

For information on the installation of Outdoor Access Panels, please refer to the manuals: *Exigo Industrial Access Panels Mounting Manual, Exigo Ex Access Panels & Turbine Ex Intercoms Installation & Maintenance, Exigo Ex Access Panels Mounting Manual.*

5.1 Environmental Requirements

The Exigo field equipment has been tested and fulfills all requirements according to EN60945, DNV 2.4 and IACS E10 standards.

Temperature range: -40/-20°C to +70°C

Humidity: At 25°C <95% RH, at 55°C <93% RH

Compass safe distance: 95 cm

5.2 Installing the Indoor ECPIR/EAPIR Access Panels

ECPIR-3P   **ECPIR-P**   **EAPIR-8**

5.2.1 ECPIR and EAPIR Overview

1. Loudspeaker
2. Label Insertion Slot
3. Label Window
4. Status Indicators
5. PTT Button
6. Backlight Control
7. Volume Control
8. Screw Hole
9. Button Protection
10. Function Indicators
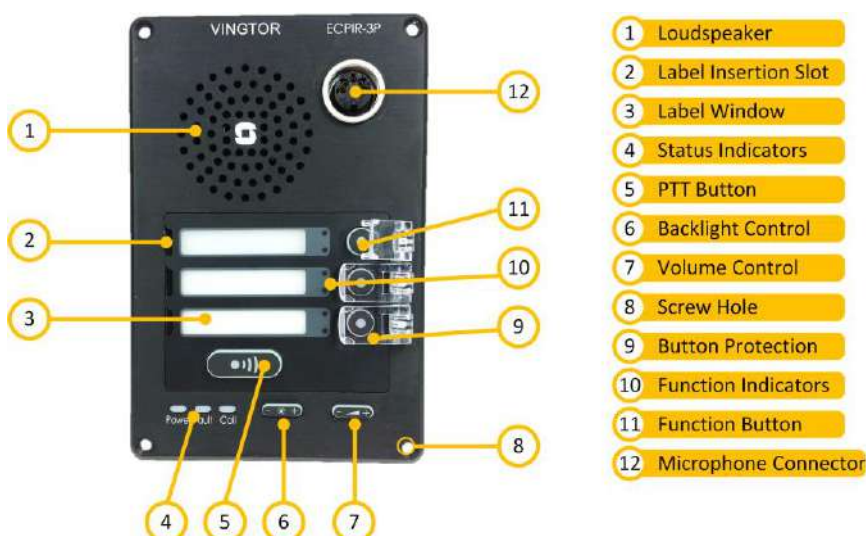11. Function Button
12. Microphone Connector

Figure 47: Front Side – ECPIR-3P

Loudspeaker:	Loudspeaker for listening to recorded messages before broadcast.
Status indicators:	Indicates status for power, system and activity.
PTT key:	Push-to-talk key.
Backlight control:	Key to adjust backlight of labels, keys and indicators.
Volume control:	Key to adjust volume of the internal loudspeaker.
Screw hole:	4 holes used to mount the panel.
Mic. connector:	DIN connection for gooseneck or handheld microphone.

1 I/O Interface
2 Ethernet Port 1
3 Ethernet Port 2
4 Expansion Port
5 Signal Relay
6 External Audio
7 Local Power 24VDC

Figure 48: Rear Side – ECPIR-3P

I/O interface:	Interface for control inputs, control outputs and analog audio.
Ethernet port 1:	Ethernet port number 1.
Ethernet port 2:	Ethernet port number 2.
Key expansion:	Connection for the first key expansion module, a white connector on top and an empty "slot" below.
External audio:	Connection for microphone and optional external loudspeaker.
Local power:	Local input for 24VDC power supply.
Signal relay:	Programmable relay. Max: 250VAC/220VDC, 2A, 60W

> **NOTE** *To add access panels to the system via EMT, see section 6.9.5.*

5.2.2 Placement

The ECPIR and EAPIR panels can be flush-mounted in a console or put into a back-box. The back-box can be placed on a surface or mounted on the wall.

> **NOTE** *The back-box is not part of the panel and must be ordered separately.*

5.2.3 Console Mounting

When mounted in a console, a cut-out must be made for the panel, or group of panels. Please refer to the panel's dimensional drawing for making cut-outs.

5.2.4 Back-Box Mounting

Two different back-box options are available for the ECPIR and EAPIR panels: EMBR-1 and EMBR-2. Please see section 5.4 for details on these back-boxes.

5.2.5 Power Supply

The access panels shall be powered as dictated by the requirements for the class or installation. In an A-B configuration, power shall be provided from both systems in one of the following arrangements.

5.2.5.1 PoE & Local Power

PoE is provided from one of the systems through the Ethernet connection. The other system must provide a DC current in a separate cable, in addition to the Ethernet cable. The DC current may also be provided locally, as long as this is provided by a different power connection than the PoE system. See Figure 48 for the location of the 24VDC local power inlet on the panel.

> **WARNING** ***PoE cannot be supplied from both systems as this will lead to a reset of the panel during a switchover.***

5.2.5.2 Spare-Pair Power

To provide redundant power to the panels, use spare-pair powering by utilizing the EPIPR-6 power injector as described in section 4.7. In this configuration, power is delivered from both systems continuously, through the two spare-pairs in the Ethernet connection. Please observe grounding considerations. PSUs in either rack should have floating supply to avoid ground loops.

5.2.6 Ethernet

The access panels shall be connected to the central equipment as dictated by the requirements for the class or installation. In an A-B configuration, Ethernet shall be connected to both systems, through separate cables routed through separate fire zones. Network equipment must support RSTP for A-B configuration. We recommend reputable switches with a standard SNMP and IGMP implementation.

5.2.7 Inputs & Outputs

The access panels are equipped with control inputs and control outputs. These 6 inputs/outputs can be used in the system in the same way as the control inputs/outputs on the central equipment. These inputs/outputs must be configured to be either an input or an output; hence, there are in total 6 inputs, outputs or a combination of these. The inputs on the access panels are not monitored and should therefore only be used for non-critical applications. The access panels also include two separate relays, which can be used for a multitude of applications, e.g. muting of local loudspeakers.

5.2.8 Signal Relays

There are two signal relays that are configurable as a control output from EMT. Relay inputs NO, NC, and COM are available.

5.2.9 Microphone

The call panels ECPIR-P and ECPIR-3P must be equipped with a microphone, either a gooseneck or a handheld one. Both microphone types plug directly into the 5-pin DIN connector at the front of the panel. See Figure 47.

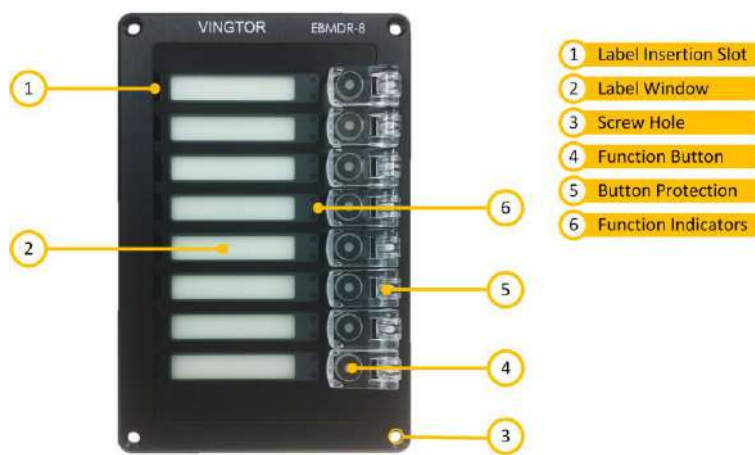## 5.3 Installing the EBMDR-8 Key Expansion Module

5.3.1 EBMDR-8 Overview

Figure 49: Front Side - EBMDR-8

Label insert slot: Opening for the insertion of label for the key.

Label window: The label window is equipped with backlight functionality.

Screw hole: 4 screw holes to mount the panel.

Key with cover: In total 8 keys with removable flip covers.
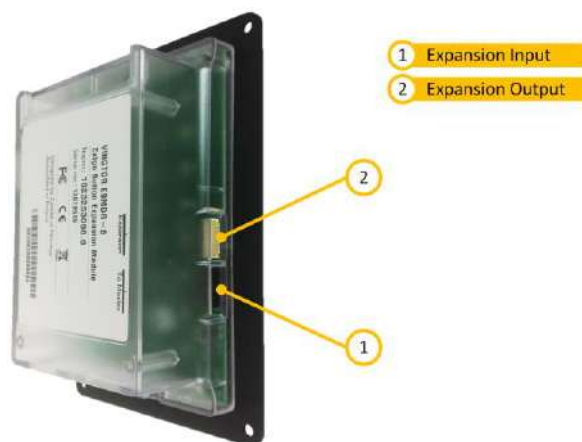
Figure 50: Rear View – EBMDR-8

5.3.2 Placement

The EBMDR-8 expansion module can be flush-mounted in a console or put into a back-box. The back-box can be placed on a surface or mounted on a wall.

> **NOTE** *The back-box is not part of the panel and must be ordered separately.*

5.3.3 Console Mounting

When mounted in a console, a cut-out must be made for the expansion module, or group of modules. Please refer to the module's dimensional drawings for making cut-outs.

5.3.4 Back-box Mounting

Two different back-box options are available for the EBMDR-8: EMBR-1 and EMBR-2. Please see section 5.4 for details on these back-boxes.

5.3.5 Connection

The EBMDR-8 expansion module is a slave unit for the ECPIR and EAPIR panels; hence it must always be mounted in conjunction with one of these master panels. The EBMDR-8 hence receives power from and communicates through its master panel.

> **NOTE** *Up to four EBMDR-8 panels may be daisy-chained to one master panel.*

1 EBMDR-8 Slave Panel
2 Black Connector
3 ECPIR Master Panel
4 Connection Cable
5 White Connector

Figure 51: EBMDR-8 Expansion Module Connection

1. Using the small connection cable supplied, connect the EBMDR-8 expansion module to its master panel or preceding module as shown in Figure 51.

2. To connect more than one EBMDR-8 to the same master, daisy-chain them together.

3. Connect the white connector on the cable to the corresponding white connector on the master panel or preceding EBMDR-8.

4. Connect the black connector on the cable to the corresponding black connector on the EBMDR-8.

5.4   Using the EMBR Mounting Boxes

Figure 52 and Figure 53 show the EMBR-1 back-box. The EMBR-2 back-box is identical, except it has room for two panels. If more than two panels are to be installed in the same back-box, the EMBR-6 kit can be used to join several boxes together.

1	Cable Entry Hole
2	Mounting Hole
3	Screw Hole for Panel
4	Side Wall Retention
5	Side Wall
6	Mounting Hole
7	Cable Entry Hole
8	Mounting Hole
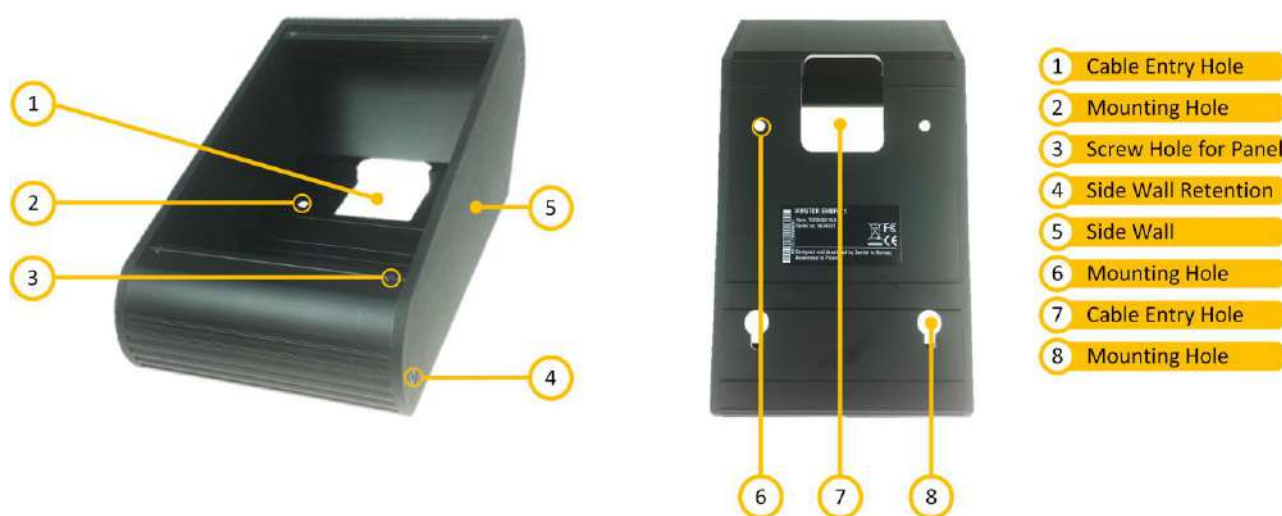
Figure 52: Front and rear view – EMBR-1

5.4.1   Desktop Mounting

When used for desktop mounting, the accompanying rubber feet should be mounted on the bottom of the mounting box. These will prevent the unit from sliding around.

The cable, or cables, to the central equipment rack(s) must be pulled into the mounting box and plugged into the access panel before the access panel is secured to the mounting box with the 4 accompanying screws.

5.4.2   On-wall Mounting

When used for wall mounting, the mounting box should be mounted to the wall using the holes at the bottom of the unit. The mounting box should be mounted with the thickest end down so that the access panel is inclined towards the operator. The box can also be mounted the other way around, if this is desired in the installation.

The cable, or cables, to the central equipment rack(s) must be pulled into the mounting box and plugged into the access panel before the access panel is secured to the mounting box with the 4 accompanying screws. The cable(s) shall either enter the box through a hole in the wall or through a proper cable duct.

5.4.3 Combining Boxes

Several mounting boxes can be joined using the EMBR-6 kit. This kit consists of two "spring rods", a metal joint and two screws. The side panels facing the box joint must be removed, and the "spring rods" and the metal joint must be inserted into one of the joining boxes, as shown in Figure 53. The second box is then inserted on the "spring rods" and metal joint. Finally the two screws are used to fasten the metal joint, securing the two boxes together.
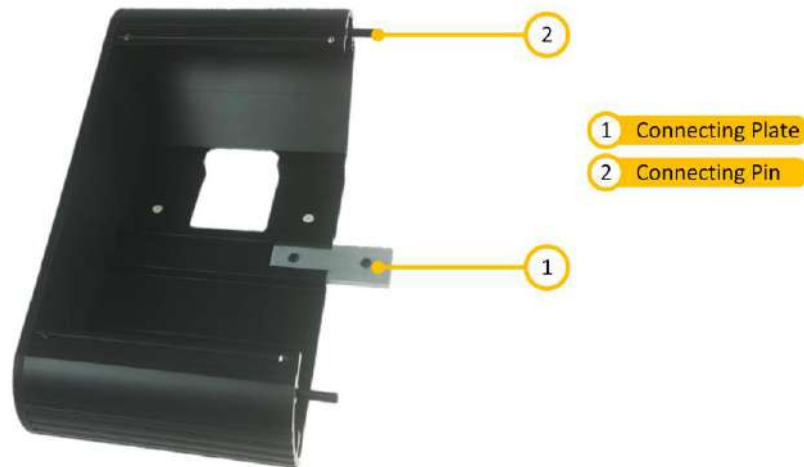
Figure 53: Expanding EMBR-1 using EMBR-6

1	Connecting Plate
2	Connecting Pin

> The "spring rods" are quite tight, and it may require some force to get them in place. A small hammer may be used for this purpose.

5.5   Installing the EAPII Access Panels

The EAPII access panels (EAPII-1 and EAPII-6) are rugged access panels, developed for use in harsh industrial environments. The plastic housing withstands corrosion from the most common corrosive gases and compounds found in these types of environments. The access panel features one (EAPII-1) or six (EAPII-6) programmable key/s, which can be used to manually initiate fire alarms, gas alarms or other actions in the Exigo PA/GA system.

> **NOTE**
>
> *For detailed installation and connection procedures for the EAPII access panels, please refer to the document A00K11579 Exigo Access Panel EAPII Mounting Manual.*

5.5.1   EAPII Overview

The EAPII-1 and EAPII-6 only differ by the number of keys which are available on the front panel.

1	Hinge
2	Button Label
3	Lid Retention Screw
4	Cable Glands
5	Internal Microphone
6	Status Indicators
7	Function Indicators
8	Function Button
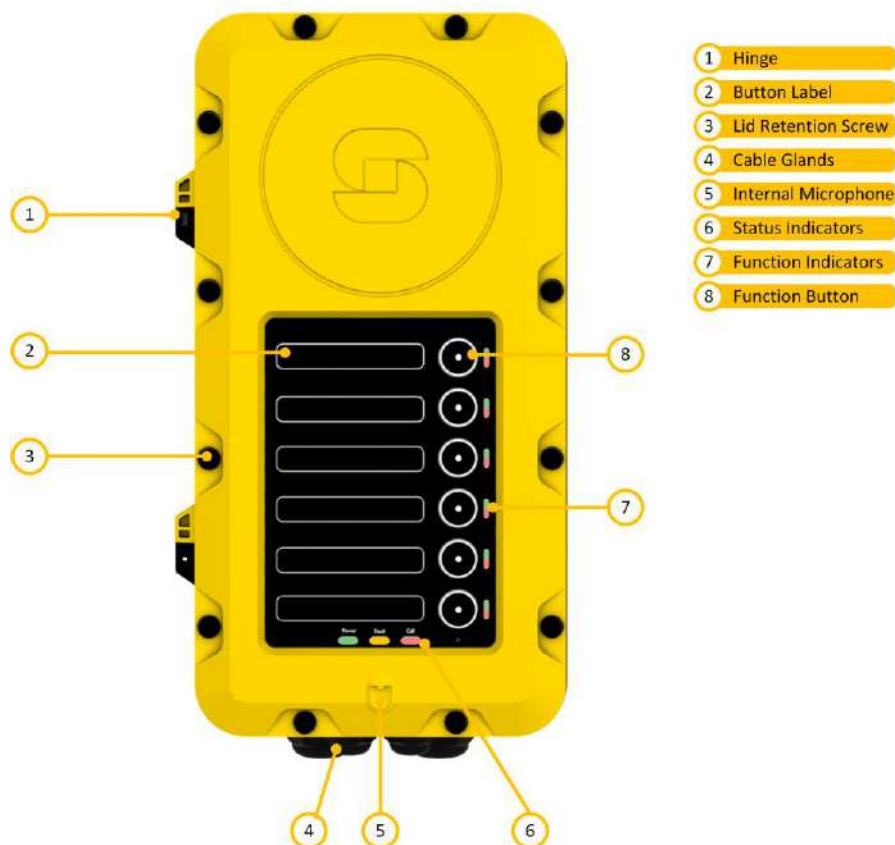
Figure 54: Front Side – EAPII-6

All connections are inside the unit. Cables enter the unit through glands at the bottom of the unit.

5.5.2 Power Supply

The EAPII can be powered in 2 ways: Power over Ethernet (PoE) or local power. When using PoE the EAPII is automatically supplied with backup power. Alternatively, the EAPII can be powered from a local power supply.

5.5.2.1 PoE and Local Power

PoE is provided from one of the systems through the Ethernet connection. The other system must provide a DC current in a separate cable, in addition to the Ethernet cable. The DC current may also be provided locally, as long as this is provided by a different power connection than the PoE system.

⚠️ WARNING	***PoE cannot be supplied from both systems as this will lead to a reset of the panel during a switchover.***

5.5.2.2 Spare-Pair Power

To provide redundant power to the panels, use spare-pair powering by utilizing the EPIPR-6 power injector as described in section 4.7. In this configuration, power is delivered from both systems continuously, through the two spare-pairs in the Ethernet connection. Please observe grounding considerations. PSUs in either rack should have floating supply to avoid ground loops.

5.5.3 Ethernet

The access panels shall be connected to the central equipment as dictated by the requirements for the class or installation. In an A-B configuration, Ethernet shall be connected to both systems, through separate cables routed through separate fire zones. Network equipment must support RSTP for A-B configuration.

5.5.4 Microphone

The EAPII panels can be equipped with the EMMAI-2H handheld microphone. The microphone is wired directly to a terminal strip inside the panel.

5.5.5 Inputs and Outputs

The EAPII is equipped with control inputs and control outputs. These 6 inputs/outputs can be used in the system in the same way as the control inputs/outputs on the central equipment. These inputs/outputs must be configured to be either an input or an output; hence there are in total 6 inputs, outputs or a combination of these. The inputs on the EAPII are not monitored, and should therefore only be used for non-critical applications. The EAPII also includes two separate relays, which can be used for a multitude of applications, e.g. muting of local loudspeakers. There is also an interface to the TA-10 Relay Module for high-power switching applications.

5.5.6 Signal Relays

There are two signal relays that are configurable as a control output from EMT. Relay inputs NO, NC, and COM are available.

5.6   Installing the ELTSI-1 Line End Transponder (LET)

5.6.1 ELTSI-1 Overview

1	Cable Gland
2	Lid Retention Screw
3	Transparent Lid
4	Status Indicator LED
5	Address Selector
6	Connection Terminals
7	Optional Cable Entry
8	Mounting Holes
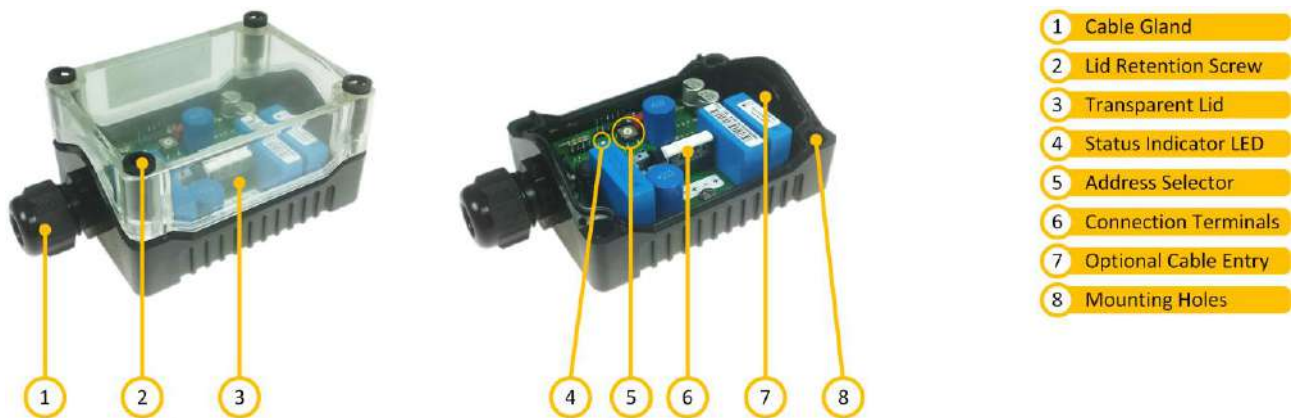
Figure 55: Top View – ELTSI-1

5.6.2 Placement

The ELTSI-1 Line End Transponder is a rugged device, intended for use in rugged environments. It can therefore be mounted in protected areas, or exposed areas with heavy rain and pollutants. The unit should be placed in such a way that the status indicator can be easily seen after installation. This will ease the maintenance of the system.

> ⚠ **WARNING**
>
> *The ELTSI-1 unit shall not be mounted in areas classified as Ex areas. If a line end transponder is required in such areas, it must be installed in a flame-proof enclosure (Ex d) according to IEC 60079.*

5.6.3 Setting the Address

The address of the unit should be set before mounting as this will make the operation easier. The address is set using the address selector shown in Figure 56.

1. Remove the lid by carefully unscrewing the four lid retention screws.

2. Use a small screwdriver to turn the address selector (small arrow on the wheel) to a number between 1 and 10. The address of the unit shall be set according to the system network plan.

> 🔧 Observe
>
> *Each LET on an amplifier must have a unique address to work.*

5.6.4 Connecting the Terminals
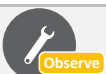
> 🔧 Observe
>
> *If the cable entry is still covered, screw in the cable gland body until it punches the cover out to make a hole for cable access.*

1. Thread the cable through the cable gland and cable entry of the unit.

2. Connect the loudspeaker line to either of the two spring loaded connection terminals as shown in Figure 56.

1	Cable Line
2	Cable Gland
3	Cable Entry
4	Address Selector
5	Connection Terminals
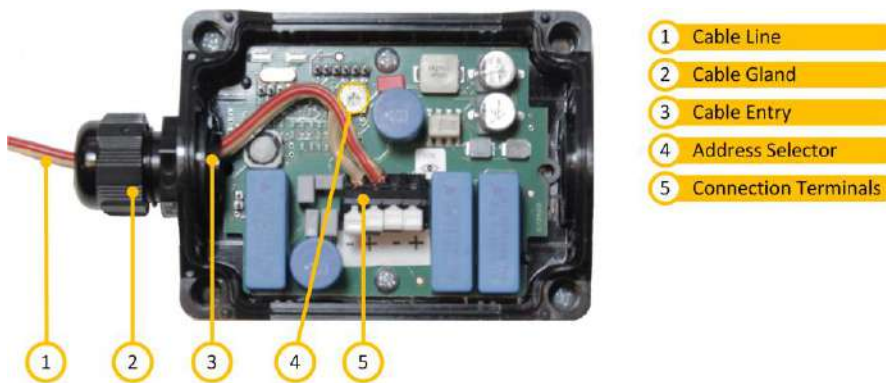
Figure 56: Terminal Connection

5.6.5 Mounting

- The ELTSI-1 unit must be mounted on a flat surface using the four screw holes. These holes are located under the lid retention screws.

- If the unit is mounted inline, an extra cable gland must be mounted for the extending cable. When mounting inline, make sure to be consistent when connecting the cable to the terminals.

- The screws used to mount the unit must be suitable for the purpose, and have a head diameter of not more than 6.6 mm. The diameter of the screw itself must be not be more than 4 mm. The ELTSI-1 box will "consume" 7 mm of the screw's length. Depending on the type of material on which the device is mounted, use an M3.5 socket/slotted screw or a pan head wood screw of diameter 3.5 mm.

- Complete the installation by securing the lid again, using the four lid retention screws.

> ⚠️ **WARNING** ***Do not use too much force when tightening the four lid retention screws. These are made of plastic and can be easily broken if powered screwdrivers are used.***

5.6.6 Status Indication LED

When the device is connected and properly powered from the amplifier, it will periodically signal its status via the small green LED indicator. The LED indicator can flash in various patterns as follows:

After Reset or Power-Up: 3 short flashes every 10 seconds (sequence is repeated 2 or 3 times) followed by 1 long flash plus the numerical address of the unit in short flashes, e.g. 5 short flashes indicate that the unit has address number 5. This is repeated until the ELTSI-1 receives a request from the amplifier.

After Contact with Amplifier: 1 short flash every 10 seconds. The amplifier will send a new request to the ELTSI-1 circa every 15 seconds. If the request from the amplifier is not received within 60-70 seconds, the LED will emit 2 short flashes every 10 seconds followed by 1 long flash plus the numerical address of the unit in short flashes. This is repeated until the ELTSI-1 receives a request from the amplifier.

> 🔧 **Observe** ***Use of LET units must be enabled in EMT (see section 6.9.3) on the amplifier before the ELTSI-1 becomes operational and the output must be calibrated successfully as described in Appendix B.5.2.***

6 Exigo System Configuration Using EMT

The system controller, network amplifiers and access panels need to be configured with unique IP addresses and directory numbers using the embedded web interface.

> **Observe** *Exigo devices that are replaced can be configured remotely in EMT. See section 9.4.*

6.1 Configuring the System Controller

The IP addresses used in this section are examples.

For the System Controller, the following two controller cards have to be configured:

1. Primary System Controller / Domain Controller (AMC-IP card or ICX-500)
2. Secondary System Controller (Turbine card)

Configuration is done via the system controller's web interface. After making sure that the system controller is connected to the same LAN and logical subnet as your PC, follow the procedure described below.

6.1.1 Primary System Controller

1. Open a web browser and enter the default IP address of port npe_eth0: **169.254.1.5**

2. Log in with username: **admin** and password: **alphaadmin**

3. Select **System Configuration** > **Interfaces**

4. Enter the appropriate **IP address** (obtained from system administrator) in the **npe_eth1** field

   o **The address entered here is the IP address in CIDR notation (constructed from an IP address, a slash '/' character, and a decimal number) of the system controller.**

Figure 57: npe_eth1 Ports at System Controller Rear

Figure 58: npe_eth0 Port Inside System Controller

6.1.1.1 Firewall Filter Settings

To be able to upload configuration data from the Exigo Management Tool, the Eth0 and Eth1 ports must be opened for certain protocols.

- Select **System Configuration** > **Filters**

Protocol	Port (Lo:HI)	Eth0	Eth1	Action
TCP				
AlphaNet Data	50000	☐	☐	Delete
AlphaPro	60001	☑	☐	Delete
AlphaVision	55010	☑	☐	Delete
DNS server fcp	53	☐	☐	Delete
HTTP (AlphaWeb)	80	☑	☐	
HTTPS (AlphaWeb)	443	☐	☐	
IP Devices	50001	☐	☑	Delete
Multimodule Data	50010	☐	☐	Delete
OPC Server 1	61112	☑	☐	Delete
OPC Server 2	61113	☐	☐	Delete
SSH	22	☐	☐	Delete
ZAP (Zenitel Applocation Protocol)	50004	☐	☑	Delete
ZAP web	8080	☐	☑	Delete
UDP				
DHCPv4 client	68	☐	☐	Delete
DHCPv4 server	67	☐	☐	Delete
DNS server udp	53	☐	☐	Delete
NTP server	123	☐	☑	Delete
SIP	5060	☐	☑	Delete
SNMP	161	☐	☐	Delete
VoIP Audio	61000:61150	☐	☑	Delete

Make sure that the **Eth1** ports for **IP Devices**, **ZAP**, **NTP server**, **SIP**, **VoIP Audio** are open by checking the relevant boxes.

6.1.2 Secondary System Controller

When the system controller is connected to the network, the IP address is automatically obtained in one of two ways:

1. An IP address is obtained from a DHCP server if there is one.

2. If there is no DHCP server, an IP address in the range 169.254.x.x will be assigned.

3. Turn the control knob on the system controller to select **Settings** > **Network** to see the IP address on the display.

To configure the IP address and directory number:

1. Open a web browser and enter IP address: **169.254.x.x**

2. Log in with Username: **admin** & Password: **alphaadmin**

3. Select **Station Main** > **Main Settings**

Set the following values:

- Station Mode: **Use Exigo**

- Registration Settings:

  o Domain Controller IP: **10.6.130.160** (IP address set in System Controller **npe_eth1**)

  o Directory Number: **013010** (corresponds to the **Directory Number** automatically assigned to the system controller in the Exigo Management Tool)

- IP Settings: **Static IP**

  o IP-address: **10.6.130.161** (example **IP address of Secondary System Controller** – allocated by system administrator)

  o Subnet-mask: **255.255.252.0** (example subnet mask)

  o Gateway: **10.6.128.1** (example Default Gateway address)

6.2   Configuring the Amplifier

Configuration is done via the amplifier's web interface. After making sure that the amplifier is connected to the same LAN and logical subnet as your PC, follow the procedure described below.

When the amplifier is connected to the network, the IP address is automatically obtained in one of two ways:

1. An IP address is obtained from a DHCP server if there is one.

2. If there is no DHCP server, an IP address in the range 169.254.x.x will be assigned.

3. Turn the control knob on the amplifier to select **Settings** > **Network** to see the IP address on the display.

To configure the IP address and directory number:

1. Open a web browser and enter IP address: **169.254.x.x**

2. Log in with username: **admin** and password: **alphaadmin**

3. Select **Station Main** > **Main Settings**

Set the following values:

- Station Mode: **Use Exigo**

- Registration Settings:
    - o Domain Controller IP: **10.6.130.160** (IP address set in System Controller **npe_eth1**)
    - o Directory Number: **012010** (corresponds to the **Directory Number** automatically assigned to the amplifier in the Exigo Management Tool)

- IP Settings: **Static IP**
    - o IP-address: **10.6.130.162** (example IP address of Amplifier)
    - o Subnet-mask: **255.255.252.0** (example subnet mask)
    - o Gateway: **10.6.128.1** (example Default Gateway address)

The directory numbers are set as digits that are incremented by 10, e.g. 012010, 012020, etc. for each additional amplifier. For example, directory number 012010 indicates Amplifier Number 1.

6.3 Configuring the Access Panel

Configuration is done via the access panel's web interface. After making sure that the access panel is connected to the same LAN and logical subnet as your PC, follow the procedure described below. When the amplifier is connected to the network, the IP address is automatically obtained in one of two ways:

- An IP address is assigned from a DHCP server if there is one.
- If there is no DHCP server, an IP address in the range 169.254.x.x will be assigned.

To find out which IP address has been assigned:

- Press any key on the access panel to make it speak its IP address.
  - for external access panels EAPII and EAFX, connect a headset

To configure the IP address and directory number:

1. Open a web browser and enter IP address: **169.254.x.x**
2. Login with username: **admin** and password: **alphaadmin**
3. Select **Station Main** > **Main Settings**

Set the following values:

- Station Mode: **Use Exigo**

- Registration Settings:
  - Domain Controller IP: **10.6.130.160** (IP address set in System Controller **npe_eth1**)
  - Directory Number: **011010** (corresponds to the **Directory Number** automatically assigned to the access panel in the Exigo Management Tool)

- IP Settings: **Static IP**
  - IP-address: **10.6.130.163** (example IP address of Access Panel)
  - Subnet-mask: **255.255.252.0** (example subnet mask)
  - Gateway: **10.6.128.1** (example Default Gateway address)

The directory numbers are set as digits that are increments of 10, e.g. 011010, 011020, etc. for each additional access panel. For example, directory number 011010 indicates Access Panel Number 1.

6.4 Installing the Exigo Management Tool

The Exigo Management Tool (EMT) is a tool for configuration of the Exigo system.

EMT version: **emt-1.7.x** or later

When a new Exigo project is configured, it is given default factory settings.

The Exigo Management Tool connects to the system via the IP network and can be used online or offline.

To install the Exigo Management Tool on your PC:

- Double-click the setup file for the program
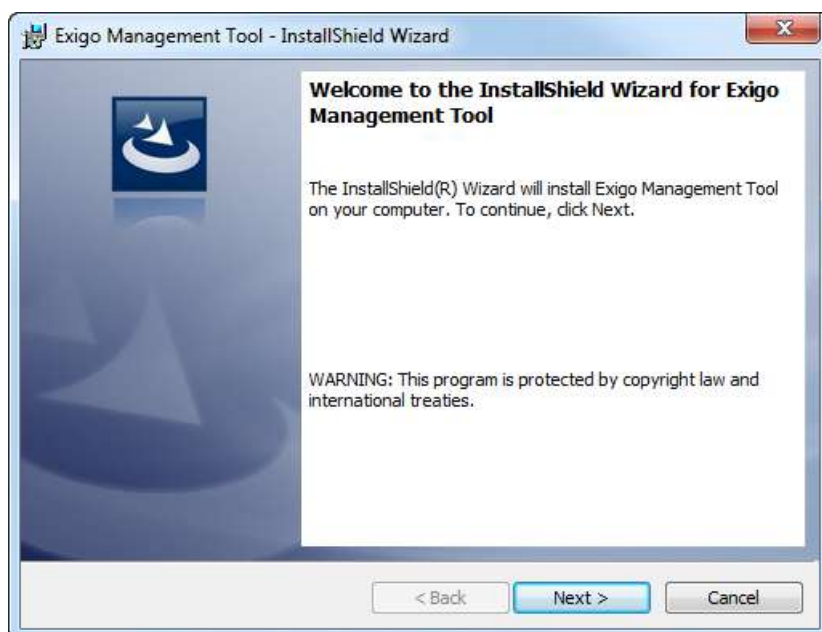
- Click **Next** and **Accept** the EULA

- Follow the instructions in the InstallShield wizard until completion

After installation, all project database files will be stored on the hard disk under:
/Documents/Exigo/1.7/Projects/.

6.5 Starting the Exigo Management Tool

The Exigo Management Tool (EMT) software must be installed on your PC.

- Click the program from the **Start** menu on your PC located in subfolder of Vingtor Stentofon.
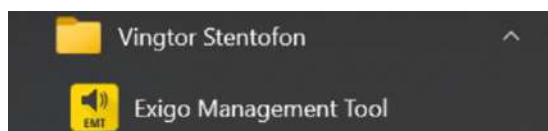
The following window will be displayed:

6.6 Setting up a New Project

To set up a new PA&GA project in Exigo:

- Click **Projects** at the lower-left of the window.
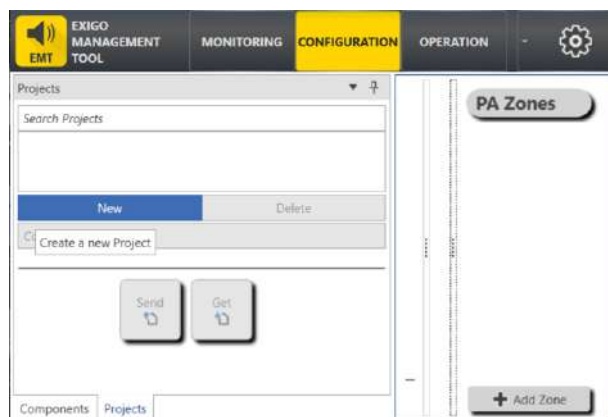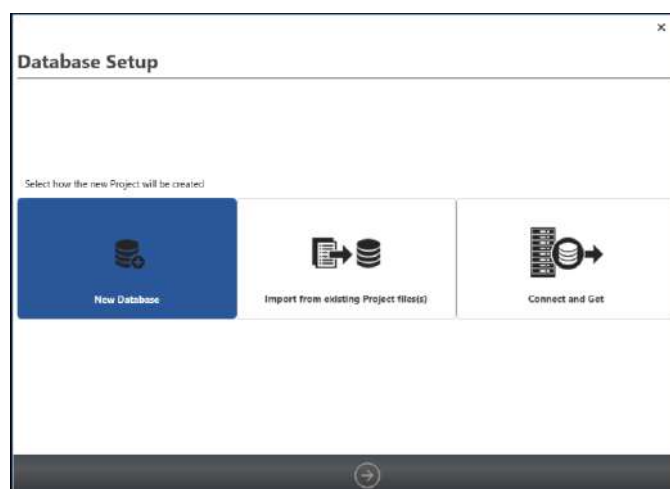
- Click **New**

- Click the **New Database** tab

- Click the **right-arrow icon** at the bottom of the window
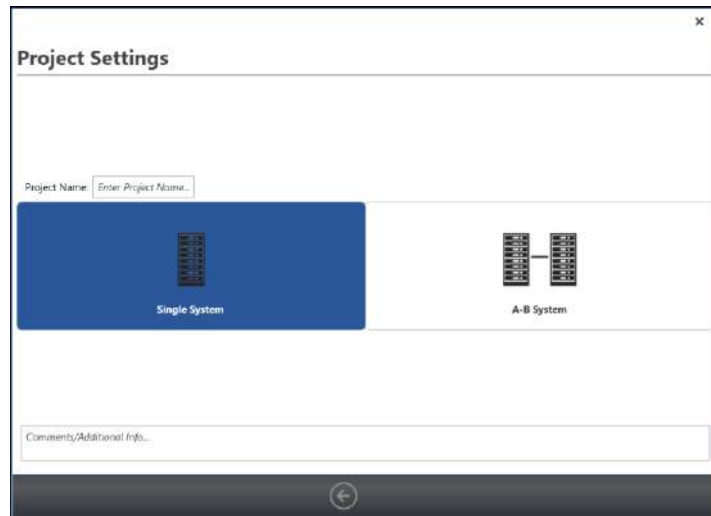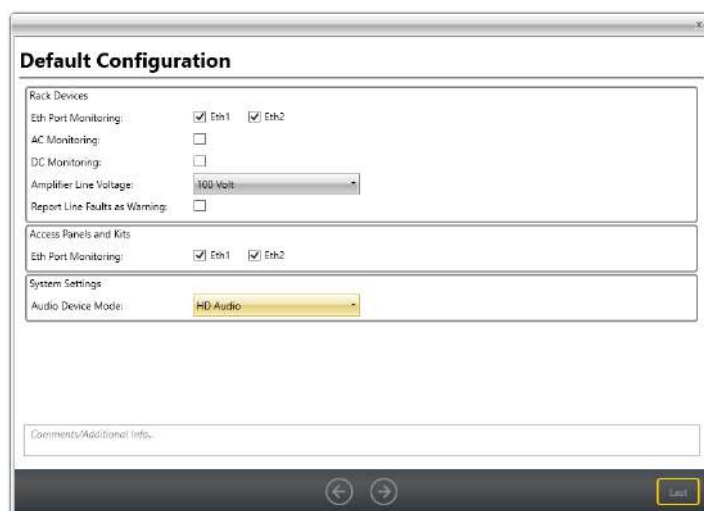
- Enter a project name in the **Project Name** field

- Select a **Single System** or **A-B System** by clicking the respective tabs

  - *A Single System is illustrated in the following configuration example.*

- Click the **right-arrow** icon at the bottom of the window
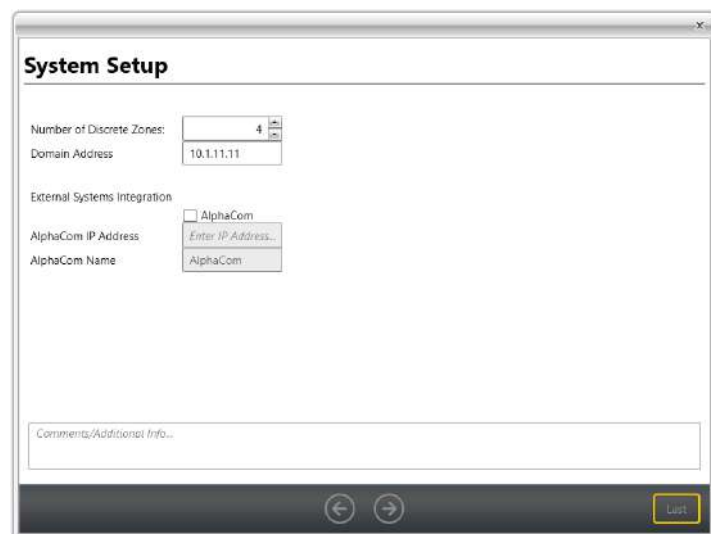
In the **System Setup** window, you can make the following settings:

- Set the **Number of Discrete Zones** (default = 1)
- Enter the appropriate IP address of the domain controller in the **Domain Address** field
- Click the **right-arrow** icon at the bottom of the window

You can make the following settings:

Rack Devices
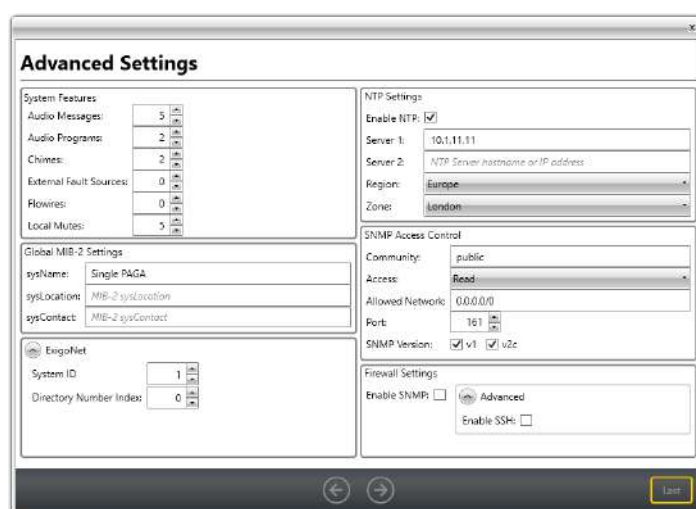
- **Eth Port Monitoring** (default = selected for **Eth1**, **Eth2**)
- **AC Monitoring** (default = not selected)
- **DC Monitoring** (default = not selected)
- **Amplifier Line Voltage** (**100 Volt** or **70 Volt**)
- **Report Line Faults as Warning** (default = not selected)

Access Panels and Kits

- **Eth Port Monitoring** (default = selected for **Eth1**, **Eth2**)

System Settings

- **Audio Device Mode** (**HD Audio** or **Voice**)
- Click the **right-arrow** icon at the bottom of the window

You can make the following settings:

System Features

- Set the number of **Audio Messages** (default = 5)
- Set the number of **Audio Programs** (default = 2)
- Set the number of **Chimes** (default = 2)
- Set the number of **External Fault Sources** (default = 0)
- Set the number of **Flowires** (default = 0)
- Set the number of **Local Mutes** (default = 5)

The above system features can be deleted or added after project setup – see section 6.7.

Global MIB-2 Settings

- **sysName** : Project Name
- **sysLocation** : MIB-2 system Location
- **sysContact** : MIB-2 system Contact

ExigoNet

- **System ID** : default = 1
- **Directory Number Index** : default = 0

NTP Settings

- **Enable NTP** : **enabled** by default
- **Server 1** : Domain IP Address
- **Server 2** : NTP Server Hostname or IP Address
- **Region** : Select region from dropdown list
- **Zone** : Select time zone from dropdown list

SNMP Access Control

- **Community** : default = public
- **Access** : Select **Read** or **Disabled** from dropdown list (default = Read)
- **Allowed Network** : 0.0.0.0/0 notation
- **Port** : Select Port Number (default = 161)
- **SNMP Version** : **v1** and **v2c**

Firewall Settings

- **Enable SNMP** : **disabled** by default (**Advanced** has **Enable SSH** option)

- Click the **right-arrow** icon at the bottom of the window

After setting all the above parameters, you will see a summary window, showing the chosen system configuration. As shown below, the single system example consists of 4 zones.

- Click **Finish** to complete the setup

> **NOTE**
> *All the parameter settings above may be changed at a later stage after the project has been set up. See section 6.7.*

After setting up the project, the EMT project window may look like this:
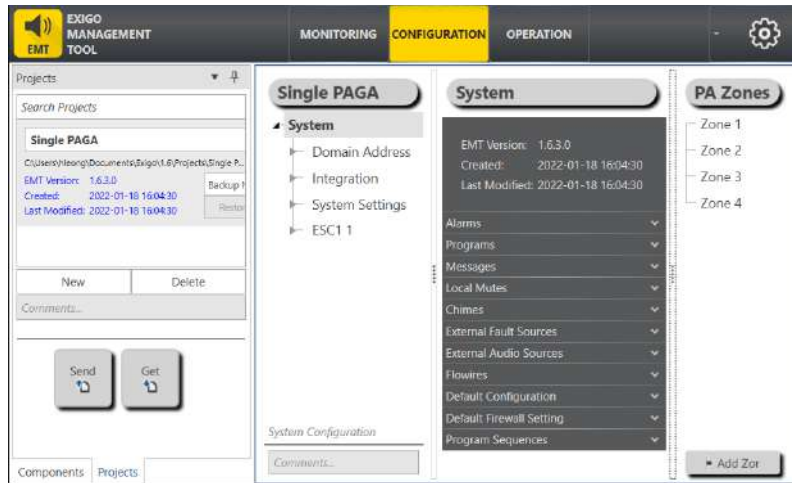

In the projects panel, it is possible to:

- Back up a project by clicking the **Backup Now** button
- Restore a project by clicking the **Restore** button

6.7   System Features

System features such as the type and number of Alarms, Programs, Messages, Chimes, Flowire, etc. can be added or changed.

- Click **System** to open the System Features panel

- Select the features to add or change

At the initial stage, the system will only display the system controller ESC1. Devices such as amplifiers and access panels can be added from **Components** > **Devices** and these will be displayed below ESC1.
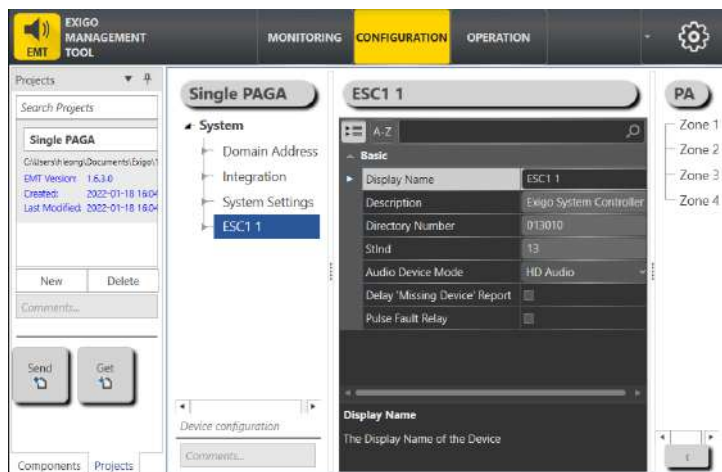
All devices are identified by an automatically generated Directory Number based on a structured numbering system, and in this example, you will see that system controller **ESC1 1** has been assigned **Directory Number 013010**.

6.7.1 SNMP Trap Settings

SNMP traps can be set under **System** > **System Settings** > **SNMP Settings**
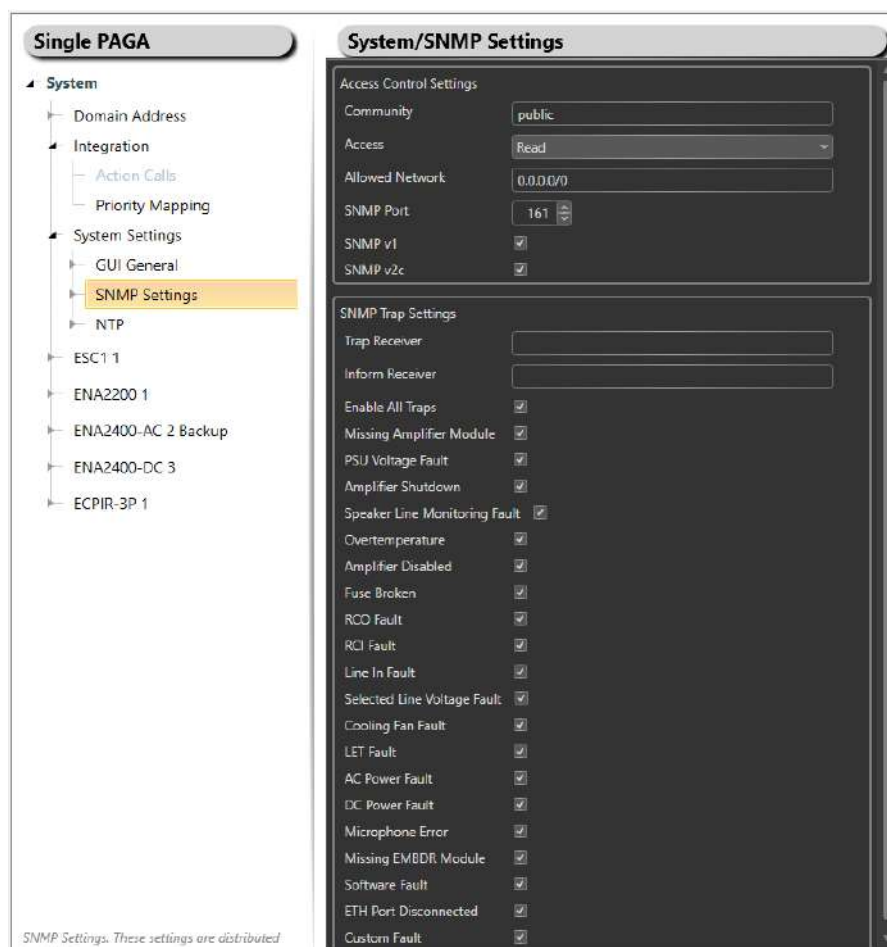
6.8 PA Zones

On the right-hand panel under PA Zones, you will see the 4 zones that were defined. A **Directory Number**, starting with **9001**, has been assigned to each Zone. Note that the directory number is used for configuration purposes and is invisible to the user.

The names of the zones can also be changed by selecting and entering another name in the **Display Name** field:
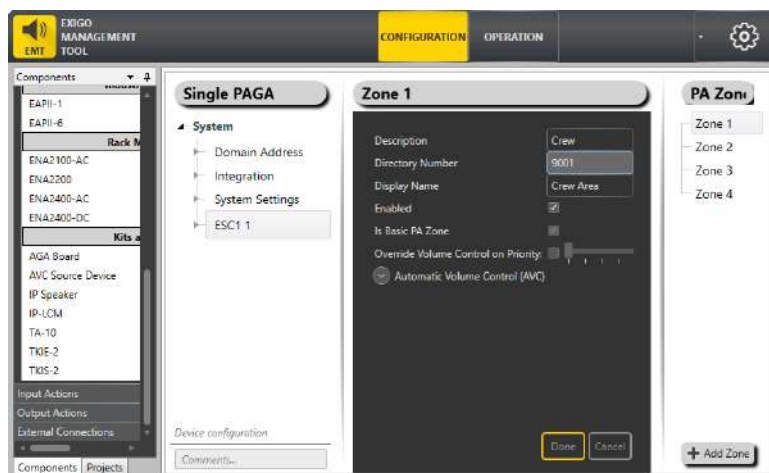
The next step is to assign the amplifier channels to the zones.

6.9 Adding Amplifiers

It is possible to add more amplifiers to the system after the project has been set up.

To add amplifiers:

- Select **Components** > **Devices**

- Under **Rack Mounted Devices** select **ENA2100-AC** / **ENA2200** / **ENA2400-AC** / **ENA2400-DC** / **ENA2200-AC2** / **ENA2400-AC2**
    - o Check the **Add Multiple devices** box if you need to add more than 1 amplifier at a time
- Drag-and-drop **ENA2100-AC** / **ENA2200** / **ENA2400-AC** / **ENA2400-DC** / **ENA2200-AC2** / **ENA2400-AC2** to **System**

A dialog-box is displayed:
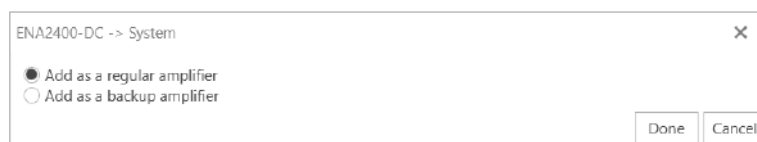
Select either:

- **Add as a regular amplifier**

or

- **Add as a backup amplifier**

- Click **Done**

6.9.1 Assigning Amplifier Channels to Zones

The amplifiers are given the names **ENA2100-AC** / **ENA2200** / **ENA2400-AC** / **ENA2400-DC** / **ENA2200-AC2** / **ENA2400-AC2** by default. This can be changed by selecting the amplifier under System and entering another name in the **Display Name** field.

Zones are built up from one or more amplifier output channels. To configure zones, follow the procedures below.
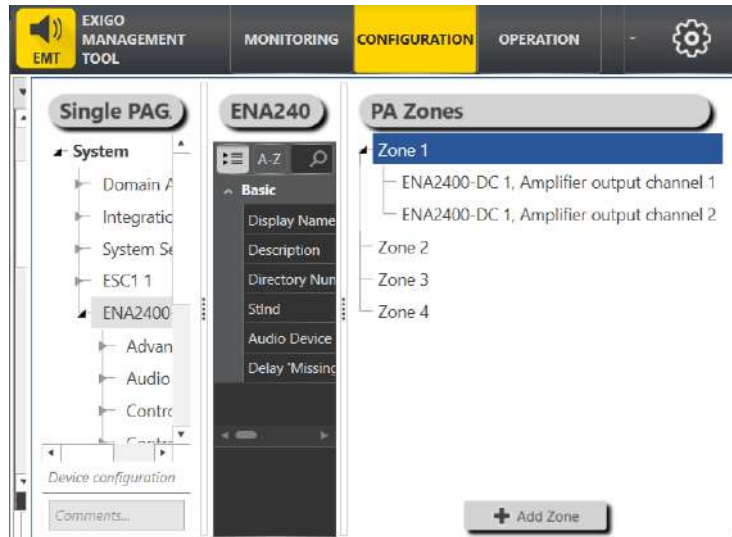
To assign all channels of an amplifier to a zone:

- Select the requisite amplifier in the system tree on the left and drag-and-drop the amplifier into the desired zone under **PA Zones** on the right.
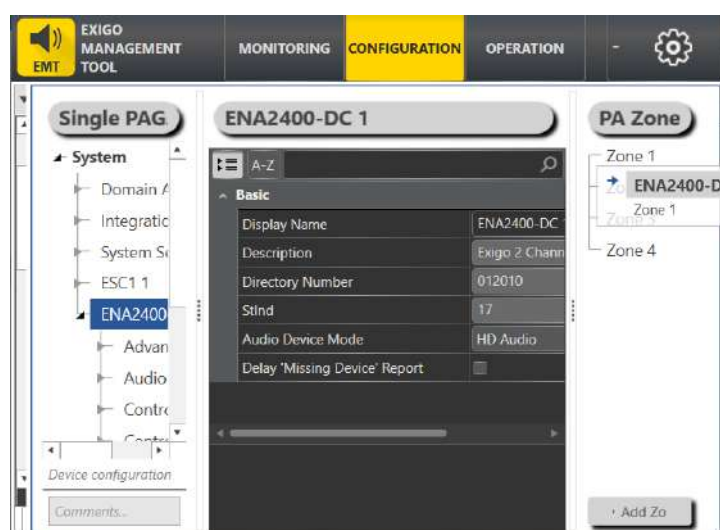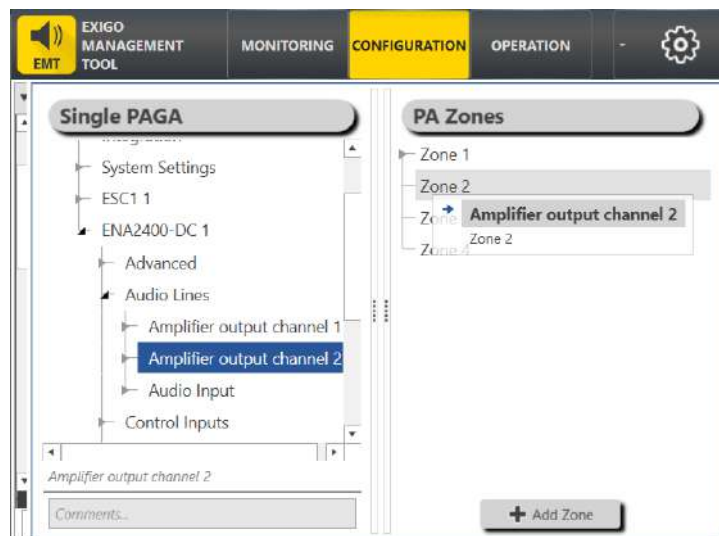

In this example, the amplifier has been assigned **Directory Number 012010**.

- Click the zone to see that both channels of the amplifier have been assigned.

To assign an individual channel on the amplifier to a zone:

- Select **ENA** > **Audio Lines** > **Amplifier output channel 1** / **2**

- Drag-and-drop **channel 1** or **channel 2** on the Zones under **PA Zones**

6.9.2 One Channel Mode

For amplifiers supporting One Channel Mode this mode is to be selected and activated.
When One Channel Mode is activated the two loudspeaker channels (Ch1 & Ch2) will play identical audio and the audio will be in phase.

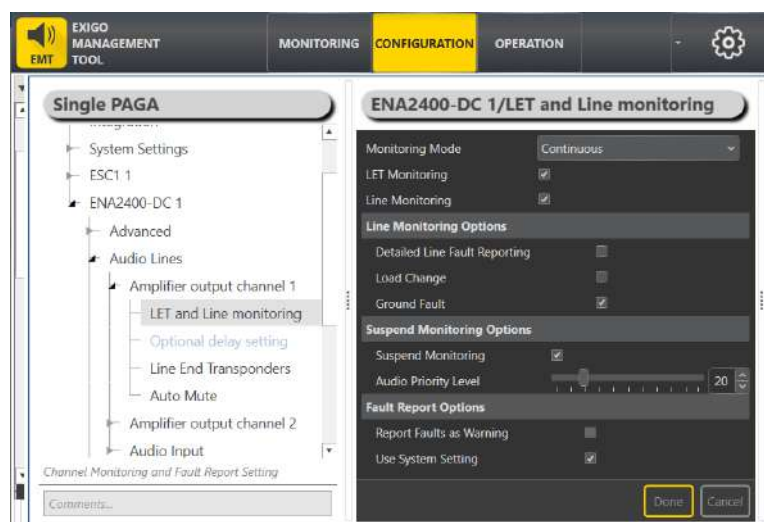To set up One Channel Mode:

- Select **Audio Lines**

6.9.3 LET and Line Monitoring

It is possible to monitor the LETs and audio lines on the amplifier output channels. The amplifier channels must be calibrated in the final installation.

To set up LET and Line Monitoring:

- Select **Audio Lines** > **Amplifier output channel 1 / 2** > **LET and Line Monitoring**

- Set **Monitoring Mode** to **Continuous**
- Check the **LET Monitoring** box
- Check the **Line Monitoring** box

LET Monitoring and **Line Monitoring** can be configured independently of each other.

Under **Line Monitoring Options**:

- Check the **Detailed Line Fault Reporting** box
- Check the **Load Change** box
- Check the **Ground Fault** box (default)

Under **Suspend Monitoring Options**:

- Check the **Suspend Monitoring** box (default)
- Set the **Audio Priority Level** (default=20)

Under **Fault Report Options**:

- Check the **Report Faults as Warning** box
- Check the **Use System Setting** box (default)

6.9.4 Configuring Backup Amplifier

> **!** NOTE
>
> *The ENA2200/ENA2400-DC/ENA2400-AC can serve as backup for up to 6 amplifiers of the same type.*
>
> *The ENA2200-AC2/ENA2400-AC2 can serve as backup for up to 16 amplifiers of the same type. ENA2400-AC2 can serve as backup amplifier for ENA2200-AC2.*

When an amplifier is added as a backup amplifier, it must be configured for the amplifiers it is backing up for. The Control Output should be connected to the backup input on the relevant amplifier.

- Click the Backup Amplifier under **System** – e.g. **ENA2400-DC 3 Backup**
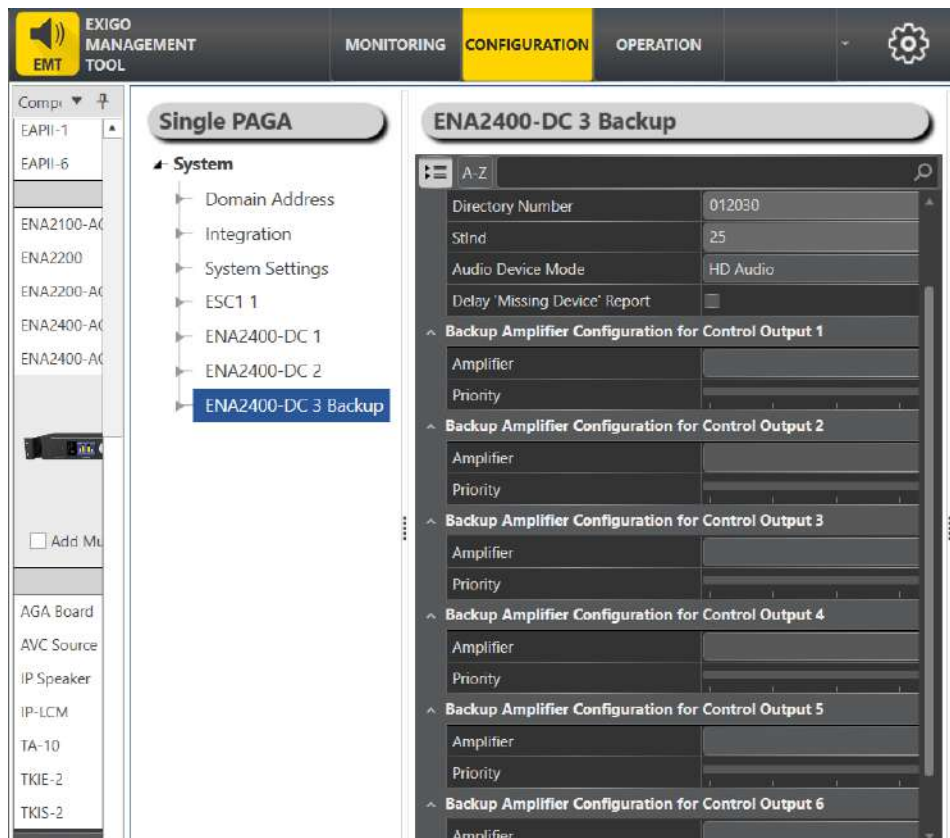
- Select the amplifiers to back up in **Control Outputs 1 – 6**
- Set the **Priority** for the amplifiers to back up

Priority is used to indicate which amplifier should be prioritized if multiple amplifiers fail. Priority 1 is highest. If multiple failing amplifiers have the same priority, the first amplifier to fail will be taken over.

After doing this, the **Backup Request** input action can be **optionally** set on the control input of the backup amplifier – see section 6.13.5. If Backup Request is used, the backup amplifier will take over faster from the faulty amplifier.

6.9.5 Audio Bypass

Audio bypass is set under:

System > **ENA2xxx** > **Audio Lines** > **Amplifier output channel 1/2** > **Bypass Mode**
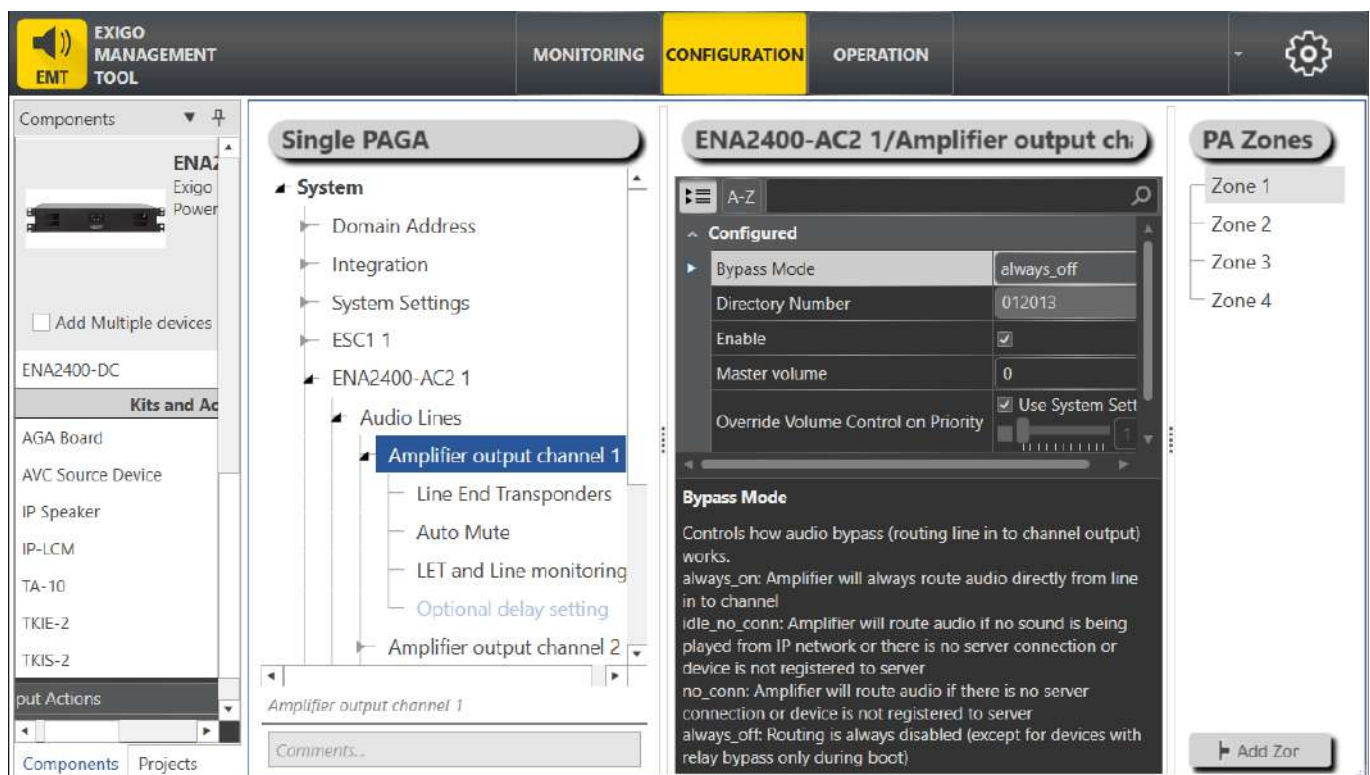
Bypass Mode will route audio directly from the line input to both audio output channels based on the following configuration parameter options:

always_on : The amplifier will always route audio directly from line in to the output channel, and allow it to operate in standalone mode without ESC1 or AlphaCom.

idle_no_conn : This allows the amplifier to have bypass activated when no digital audio is present (default for ENA2100-AC).

no_conn : This allows the amplifier to activate bypass if it loses connection to ESC1 or AlphaCom.

always_off : This is the default for Exigo amplifiers (except ENA2100-AC) and audio bypass will never be activated.

ENA2100-AC: Audio bypass is available for instant forwarding.

ENA2200/ENA2200-AC2/ENA2400-DC/ENA2400-AC/ENA2400-AC2: Audio bypass is available after software is up and running.

6.10 Adding Access Panels

Access panels such as ECPIR, EAPII, EAPFX can be found under: **Components** > **Devices**
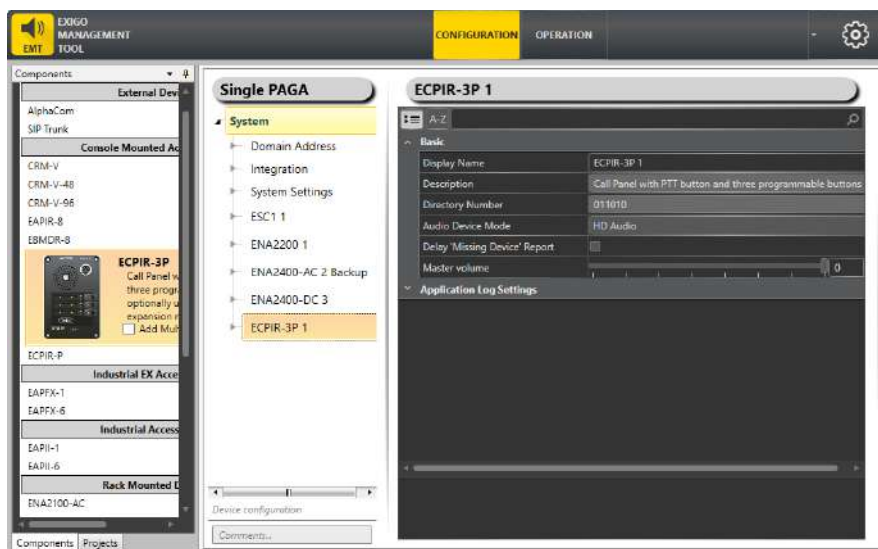
6.10.1 Access Panels

For example, to add the panel ECPIR-3P to the system:

- Select **Components** > **Devices**

- Under **Console Mounted Access Panels** select **ECPIR-3P**
  - Check the **Add Multiple devices** box if you need to add more than 1 access panel at a time

- Drag-and-drop **ECPIR-3P** on **System**
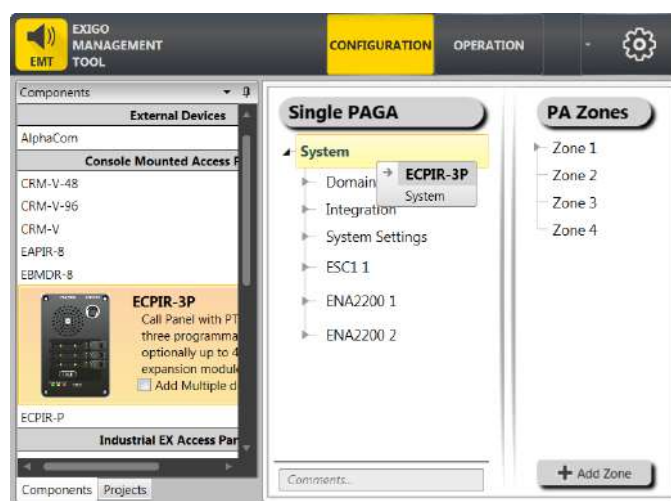
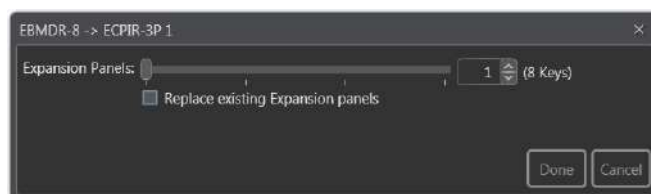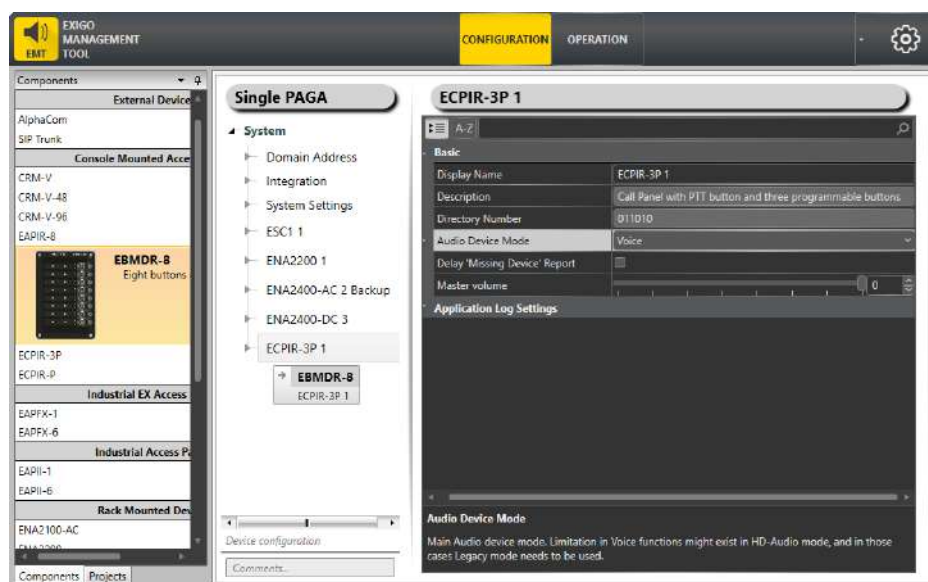The panel will now appear as **ECPIR-3P 1** in the device list under the system.

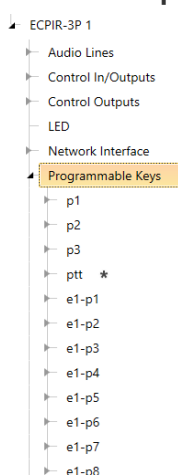In this example, the access panel has been assigned **Directory Number 011010**.

- Set **Audio Device Mode** to **HD Audio** (default) or **Voice**

6.10.2 EBMDR-8 Expansion Module

- Select **Components** > **Devices** > **EBMDR-8**

  - Drag-and-drop **EBMDR-8** on the Access Panel that should have an extension module.

- Check the **Replace existing Expansion panels** box to delete existing ones

- Select the number of expansion modules
- Click **Done**

Since this is a 8-key expansion module, 8 extra keys will be added to the ECPIR-3P panel under **ECPIR-3P 1** > **Programmable Keys**

A maximum of 4 expansion modules can be assigned to one access panel.

Note that e**1**-p**x** indicates key **x** on expansion panel **1**.

6.11 Automatic Volume Control (AVC) Configuration

To set up and configure Automatic Gain Control (AGC) in an Exigo system, follow the procedures below.

6.11.1 Add AVC Source Device to the System

To add an AVC Source Device to the system:

1. Select **Components** > **Devices**
2. Under **Kits and Accessories** select **AVC Source Device**
3. Drag-and-drop **AVC Source Device** to **System** in the device tree
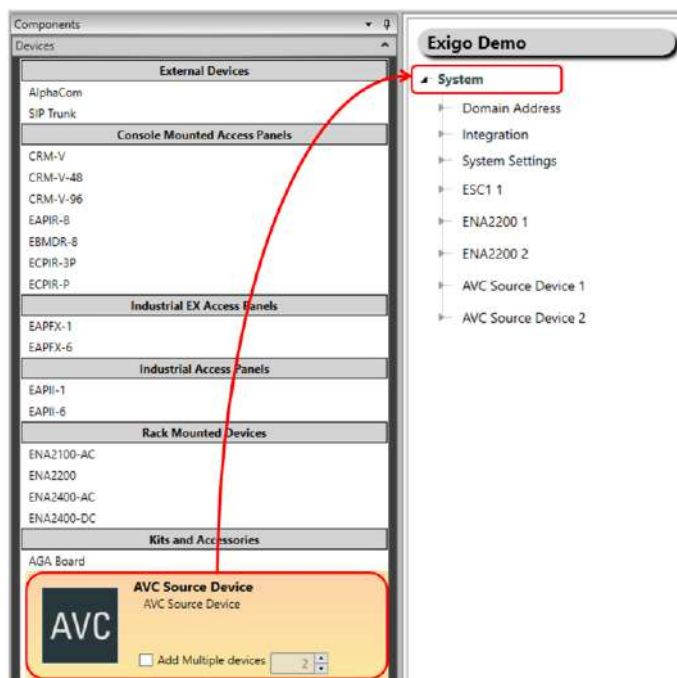
6.11.2 Add the AVC Source Device to the Zone

To add the AVC Source Device to the zone:

1. Locate the **AVC Source Device** in the device tree
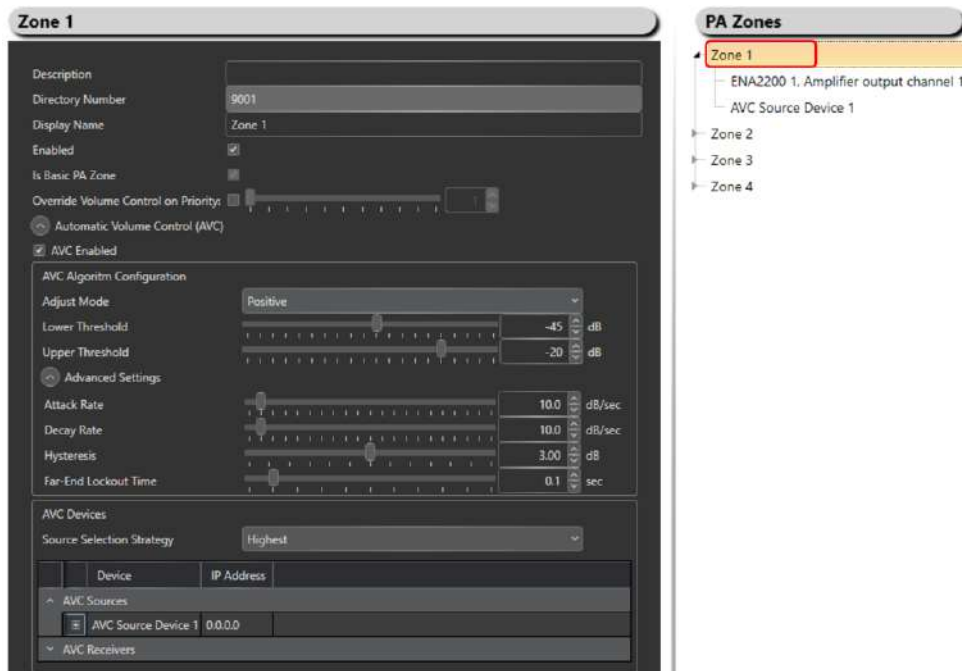2. Drag-and-drop the **AVC Source Device** to the **Zone**

6.11.3 Adjust the Settings for the AVC Source Device

To adjust the settings for the AVC device in a zone:

- ▪ Select the designated **Zone** (top level)

This opens up a panel where the necessary parameters can be set.

AVC Enabled: Enable/Disable the Automatic Volume Control (AVC)

AVC Algorithm Configuration

Adjust Mode: Positive or Negative mode

- ▪ **Positive**: Gain adjustment is from zero at AVC threshold and adjusted with positive gain. Audio Receiver should have a low base gain.
- ▪ **Negative**: Gain adjustment is from zero at AVC max level and adjusted with negative gain downwards. Audio Receiver should have a high base gain.

Lower Threshold: Mic signal level where AVC starts to work. Below this level, no adjustment is done and AVC Receiver should work on default base gain.

- ▪ Default value at -45 dB is empirically measured using default mic sensitivity of 5, and target ambient audio SPL level at 65 dBA.

   Example: Threshold = -40 dB

   When AVC Device measurement < -40 dB: No AVC adjustment

   When AVC Device measurement > -40 dB: AVC adjust gain on Players 1 dB per dB above threshold

Upper Threshold: Mic signal level where AVC stops to work. Above this level no adjustment is done.

- ▪ The difference between upper and lower threshold also defines the working range for AVC gain adjustments.
- ▪ In negative AVC mode this also defines the ambient level where configured base output gain is reached (offset adjustment is zero).

Advanced Settings

Attack Rate (dB/sec): This determines how quickly the AVC adjusts gain on rising ambient audio level.

Decay Rate (dB/sec): This determines how quickly the AVC adjusts gain on falling ambient audio level.

Hysteresis (dB): Hysteresis around previous set ambient audio level before doing adjustments.

Far-End Lockout Time (sec): When playing audio in AVC Zone (far-end signal) all AVC adjustments are locked. When far-end signal ends, adjustments commence after this lockout-time. Lower values allow more adjustments in pauses of signal played.

AVC Devices

Source Selection Strategy: The AVC Receiver will receive ambient audio levels or Gain adjust values from a number of AVC Sources. This configures the selection strategy for final gain adjustments on the AVC Receiver. The different settings are: **Highest**, **Average**, **Average Mid**. Average and Average Mid require at least four AVC devices.

AVC is reliant on the IP address of each device in order to work. This requires that the IP address of each device is configured in EMT. This is done in two ways:

- Do a **Get** from system controller: When performing a **Get** from the system controller, the IP addresses of all endpoints are written to the database and automatically entered in the AVC configuration. See section 6.19.

- Manually enter device IP address: It is also possible to manually enter the IP address of each device into the AVC configuration

6.12 Adding Flowire Converters

This is optional and is only required if Flowire converters are to be monitored. Flowire converters can be used even if they are not added.

To add Flowire converters to the system:

1. Select **Projects** > **System**

2. Under the panel **System** select **Flowires**

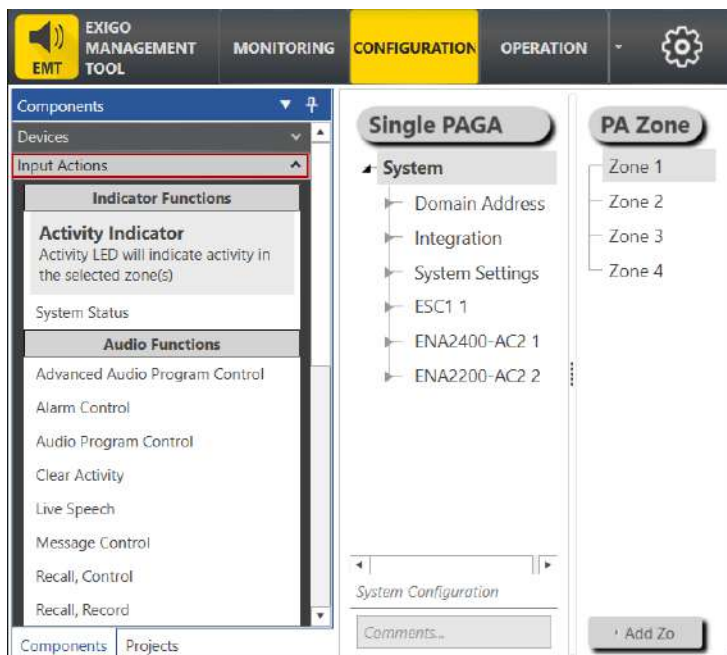3. Click the **Add** icon (next to trash icon)

4. Click **Done**

6.13 Configuring Input Actions

Inputs are configured by defining one or more actions to be triggered on an input event. The various input functions available are listed below.

To display the available input actions:

- Click **Components** at the lower-left of the window.

- Click **Input Actions**

Available input actions are listed under various Function categories:

Indicator Functions

- System Status

Audio Functions
- Advanced Audio Program Control
- Alarm Control
- Audio Program Control
- Clear Activity
- Live Speech
- Message Control
- Recall Control
- Recall Record

External Functions
- Backup Request
- External Fault

**Escalation Functions**
- Call Escalation

Zone Functions
- Disable AVC
- Local Mute Control
- Volume Control
- Zone Selection

Test Functions
- Line Measurement
- Microphone Test
- Panel Lamp Test
- Tick Tone Control

Input actions can be assigned to either a key or a control input depending on system requirements. These can be configured by dragging-and-dropping the different functions to either **Control Inputs** on Amplifiers or **Programmable Keys** on Access Panels, e.g.:

- Drag-and-drop **Input Actions** to **Access Panel** > **Programmable Keys** > **p1-px**
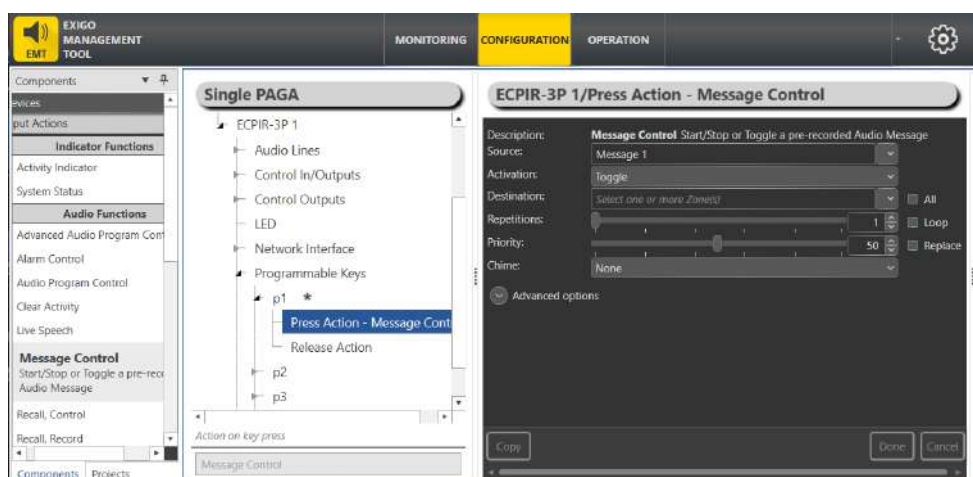
- o **press_action** will be automatically configured to **Start** the activity

- o **release_action** will be automatically configured to **Stop** the activity

Activation

Start: This will start the broadcast in the selected zone/s and run for the number of repetitions configured or until it is stopped.

Stop: This will stop the selected broadcast if it has a higher priority than the active broadcast in the selected zone.

Toggle: This works as a start/stop function. If the broadcast is not active in the selected zone, it will work as a start function. If the selected broadcast is active in the zone, it will work as a stop function.

or

- Drag-and-drop **Input Actions** to **Amplifier** > **Control Inputs** > **CI_1-CI_6**
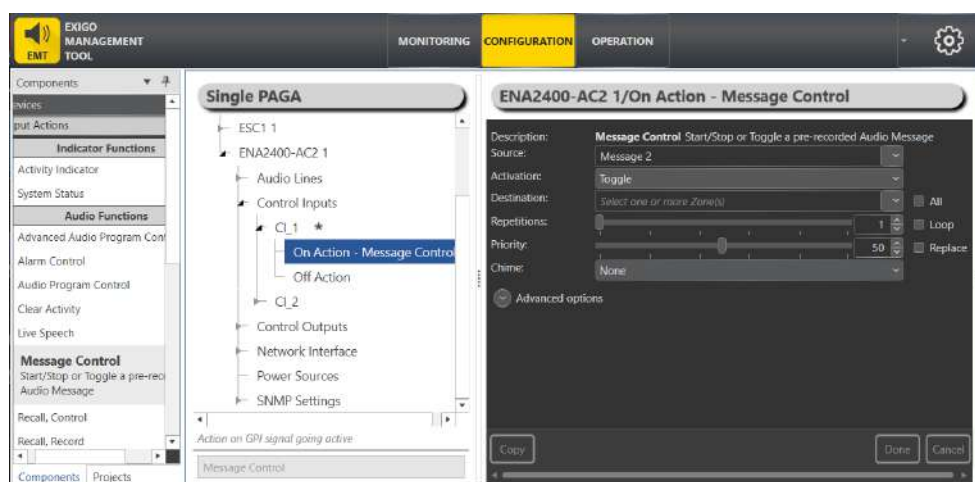
- o **on_action** will be automatically configured to **Start** the activity

- o **off_action** will be automatically configured to **Stop** the activity
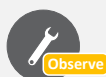
> *Programmable Keys press_action/release_action and Control Inputs on_action/off_action have to be individually configured for Input Actions: Activity Indicator, Backup Request, Clear Activity, System Status, Zone Selection.*

6.13.1 Common Parameters for Input Actions

All Input Actions have some or all of the following parameters:

Destination
The zone(s) that will be included in the broadcast. This may be left blank if access panel keys are used for zone selection.

Repetitions
Set the number of times the input action should be repeated.

- Check the **Loop** box to make the repetition go in a loop.

Priority
The priority of the broadcast.

- Check the **Replace** box to make this broadcast replace other broadcasts with the same Priority.

This is usually used for Programs. If the box is not checked, other broadcasts with the same priority will be regarded as busy. Events with higher priority will get the zones for the broadcast, while events with lower priority will be queued by default. The lower the number, the higher the priority.

Chime
Select the chime that will sound before the audio broadcast.

Advanced options

Use Default Parameters: Enable this to use default values for the parameters

Is Alarm: This will currently affect the alarm LED on the ESC1 system controller and local mute function.

Volume
The Volume range is from -40 to +6 decibels.

Override pre-selected Zones by Zone Select
If this is selected, then any "zone selections" made with pre- selected zone buttons will be used instead of the static zones selected.

<u>On Busy</u>
When one or more destination zones are busy with higher priority broadcasts, the following options are available:
Reject - Reject the broadcast
Go Partial - Run the broadcast now on free zones
Queue - Put the broadcast in queue and run when all zones are free

If no value is chosen, a default value is used.
For input actions Program Activation, Message, the default value is Go Partial.
For input action Live Speech, the default value is Reject.

<u>On Interrupt</u>
When a broadcast is interrupted by a higher priority broadcast, the following options are available:
Cancel - Cancel the broadcast
Mute - Mute the broadcast in interrupted zones while a higher priority broadcast is running
- For input actions such as Program Activation, Message, Live Speech, default value is Mute.

<u>Release Delay</u>
Time in seconds before the zones and resources are released after the broadcast has ended.

<u>Audio Codec</u>
The audio codec for the broadcast, e.g. G.722.

<u>Escalation ID</u>
This is the ID of the input action Call Escalation which is used to escalate the call priority of a function. For example, a key can be programmed with Live Speech function with priority 10 and Escalation ID #1. Another key can be programmed with Call Escalation function with priority 1 and the same Escalation ID #1. When the Call Escalation key is pressed before the Live Speech key, its call priority will be escalated from 10 to 1.

6.13.2 Activity Indicator

Activity Indicator is used to program, for example, a DAK key so that the Activity LED will indicate activity in the selected zone(s) specified under Destination, provided the activity is within the selected Priority Range. Pressing the key will not cause anything to happen.

- Drag-and-drop **Activity Indicator** to:

Access Panel > **Programmable Keys** > **p1-px** > **press_action/release_action**
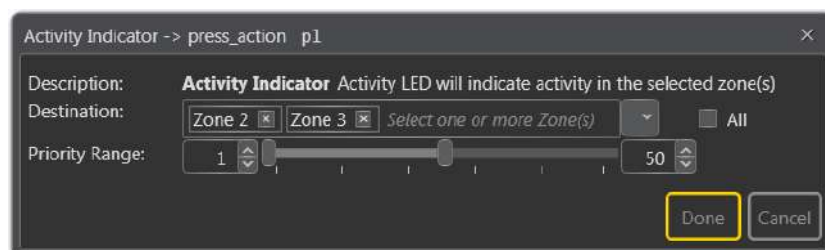
Destination
Zones in which activity will be indicated.

Priority Range
Activity which corresponds to the priority range will be indicated.
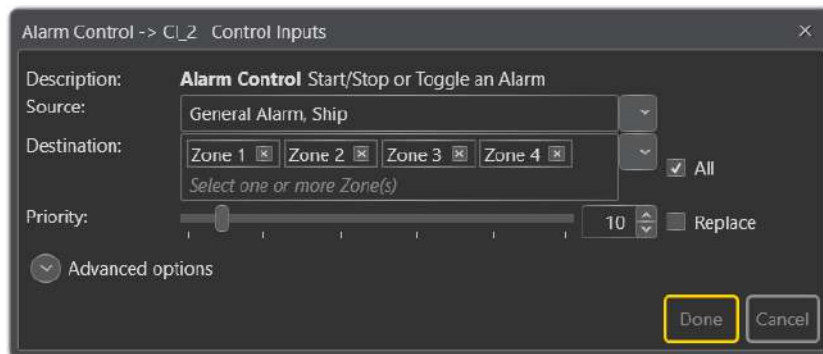
6.13.3 Alarm Control

Alarm Control is used to control the alarm generator. This concerns programmed alarms that can be used if a control output should toggle in accordance with the actual alarm.

- Drag-and-drop **Alarm Control** to:

Amplifier > **Control Inputs** > **CI_1-CI_6**
or
Access Panel > **Programmable Keys** > **p1-px**

Source
The Alarm source that should be controlled.

Destination
Zones in which Alarm will be broadcast. Alarm broadcasts usually go to all zones. This field can be left blank if access panel keys are used for zone selection.

Priority
In this example for General Alarm, the priority should be set high, with only Emergency PA as a higher priority in the system. The highest priority is 1 and the lowest is 100. Default Priority = 10.

6.13.4 Audio Program Control

Audio Program Control controls the various programs you can use. It will start/stop/toggle the selected audio program which can be used to source audio from a line/mic input into the system. This is commonly used for background music programs.

- Drag-and-drop **Audio Program Control** to:

Amplifier > **Control Inputs** > **CI_1-CI_6**
or
Access Panel > **Programmable Keys** > **p1-px**

Source

The program that will be used.

Destination

The Zone(s) that will receive the broadcast. This may be left blank if access panel keys are used for zone selection.

Priority

The priority of the broadcast. Check the **Replace** box to make this broadcast replace other broadcasts with the same priority. If the box is not checked, broadcasts with the same priority will be shown as busy.

Chime

The chime sound that will be played before the broadcast starts.

6.13.5 Backup Request

Backup Request is used to configure a control input on a backup amplifier to be able to replace the functions of the chosen failed amplifier. See section 6.9.4 for information on adding and configuring a backup amplifier.

- Drag-and-drop **Backup Request** to:

Backup Amplifier > **Control Inputs** > **CI_1-CI_6** > **on_action/off_action**

Amplifier

- Select the amplifier to back up

6.13.6 Call Escalation

Call Escalation is a special input function that can be used to modify (escalate) call parameters, for example, to raise the priority of a Live Speech, Audio Program Control, or Message Control function. Call Escalation is local to the access panel so it is not possible to escalate across different panels. This function is typically used for Live Speech to escalate normal PTT to that of 'important PA'.

- Drag-and-drop **Call Escalation** to:

Access Panel > **Programmable Keys** > **p1-px**
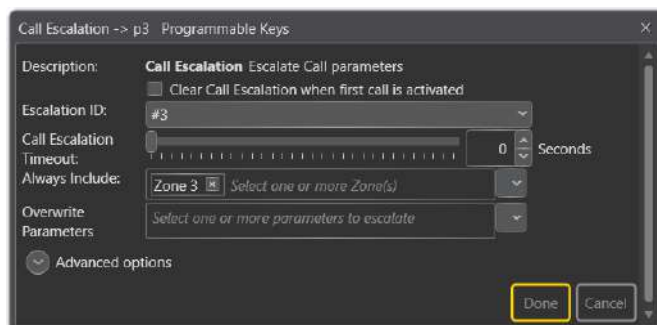
The **Escalation ID** parameter on the Call Escalation function must correspond to the Escalation ID parameter on the input action that will be escalated. When this is triggered, the function with the corresponding ID will get the new priority.

Clear Call Escalation when first call is activated
If the box is checked, the escalation state will be cleared when the call starts. If the box is unchecked, the escalation state will toggle.

Escalation ID
Identifies which calls will be modified by the escalation function.

Call Escalation Timeout
The time in seconds in which the call escalation function is active before it times out.

Overwrite Parameters
This replaces the selected value in the broadcasts. Options are:
- Destination
- Priority
- Chime

6.13.7 Clear Activity

Clear Activity is used to clear the specified activity in the specified zones.

- Drag-and-drop **Clear Activity** to:
Amplifier > Control Inputs > **CI_1-CI_6** > **on_action**/**off_action**
or
Access Panel > **Programmable Keys** > **p1-px** > **press_action/release_action**
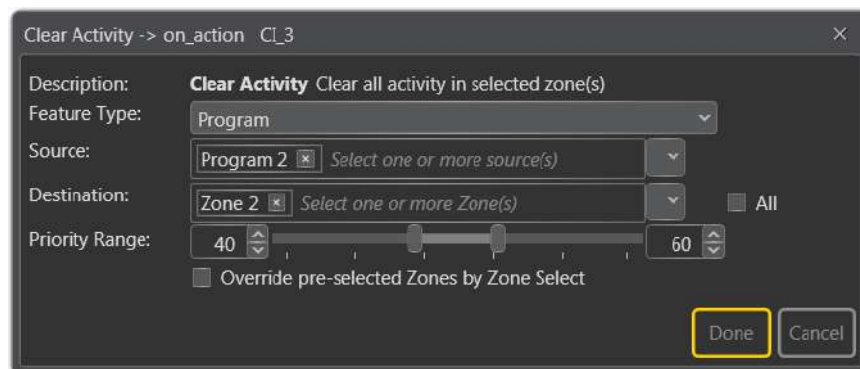
Feature Type
The types of broadcasts that should be cleared from the system.

- **All** – clears all activities in all zones
- **Zone** - clears all activities in selected zone(s)
- **Program** - clears selected Programs in selected zone(s)
- **Message** - clears selected Messages in selected zone(s)
- **Alarm** - clears selected Alarms in selected zone(s)
- **Local Mute** - clears selected Local Mutes in selected zone(s)
- **Custom Selection** - clears custom combination of specific Programs, Messages, Alarms and/or Local Mutes in selected zone(s)

Depending on the Feature Type selected, more parameters will be displayed:

Source
Audio source

Destination
Zones in which Audio activity will be cleared. Can be left blank if access panel keys are used for zone selection.

Priority Range
Audio activity which corresponds to priority range will be cleared. Default Range = 40 – 60.

Override pre-selected Zones by Zone Select
Use dynamic destinations. This will also override static destinations if defined.
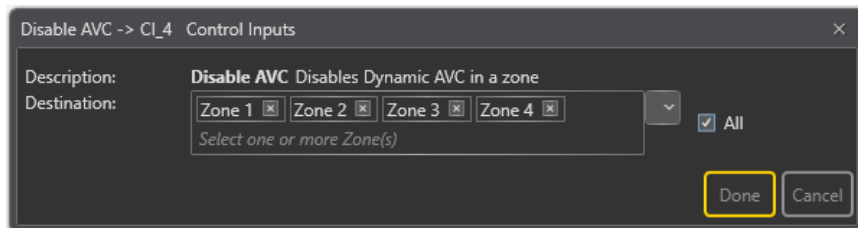
6.13.8 Disable AVC

Disable AVC is used to disable Automatic Volume Control (AVC) in the specified zones.

- Drag-and-drop **Disable AVC** to:

Amplifier > Control Inputs > **CI_1-CI_6** > **on_action**/**off_action**
or
Access Panel > **Programmable Keys** > **p1-px** > **press_action/release_action**

Feature Type
The types of broadcasts that should be cleared from the system.

6.13.9 External Fault

External Fault is used to generate a custom fault or warning in the system.

- Drag-and-drop **External Fault** to:

Amplifier > Control Inputs > **CI_1-CI_6**

or

Access Panel > **Programmable Keys** > **p1-px**
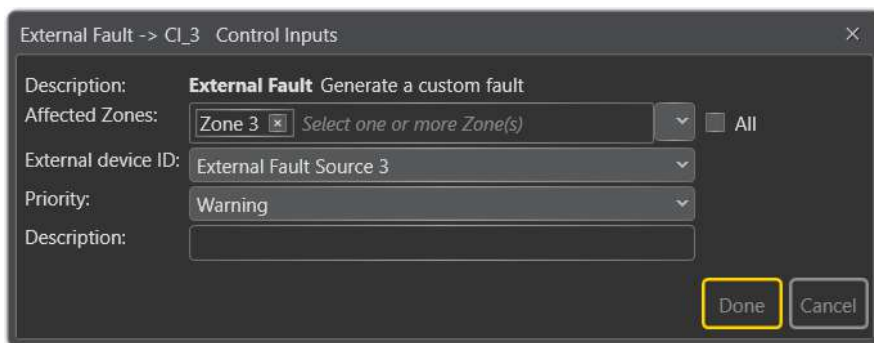
Affected Zones
The external fault will be activated and marked that it affects the selected zones.

External device ID
This is the fault ID which corresponds to the external fault type.

Priority
The priority type of the reported fault: Warning (default), Emergency, Alert, Critical, Error.

Description
The description of the fault that will be part of the fault presentation and logs.
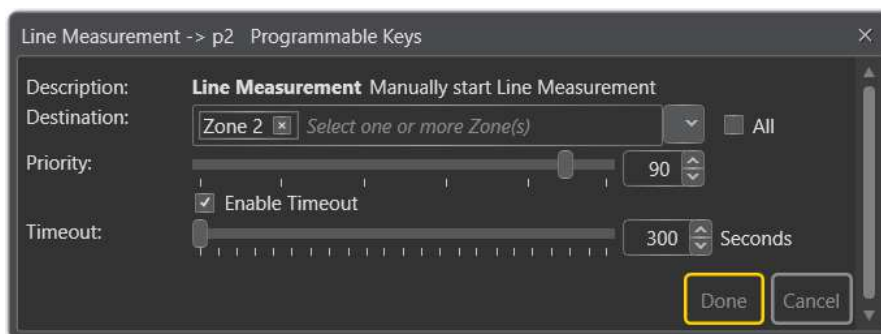

6.13.10   Line Measurement

Line Measurement is used for the manual control of line monitoring of the system. Manual line monitoring can be set on each channel of the amplifier. When line monitoring is set to manual, this function will, based on zone selection, enable line measurement for at least 5 minutes. During this period, the line will be measured against previous calibrations. Press the relevant DAK key to start the measurement process for the zones selected. Under such a measurement, all Control Outputs configured with Line Measurement will be toggled in the selected zones. This can be used when volume controllers need to be disabled to get the correct reading of the line.

- Drag-and-drop **Line Measurement** to:

Amplifier > Control Inputs > **CI_1-CI_6**

or

Access Panel > **Programmable Keys** > **p1-px**

Destination
All COs with line measurements in these zones will also be activated. (if they have line measurement type added).

Priority
The priority of the broadcast.

Enable Timeout
This decides whether the function will timeout or not.

Timeout
The amount of time in seconds that the Line Measurement will be active.

6.13.11   Live Speech

> ⚠ **NOTE**
>
> *Live Speech is, by default, preconfigured on the **PTT** key of the **ECPIR-x** access panels. For access panels **EAPII-x** og **EAPFX-x**, Live Speech is preconfigured on the PTT key of their respective external microphones when these are connected. By default, the parameters **press_action** is preconfigured to **Start Live Speech** and **release_action** is preconfigured to **Stop Live Speech**.*

To program the **PTT** key on access panels such as **ECPIR-x**/**EAPII-x**/**EAPFX-x** with parameters like zones, etc.:

- Select **Access Panel** > **Programmable Keys** > **ptt** > **press_action - Live Speech**
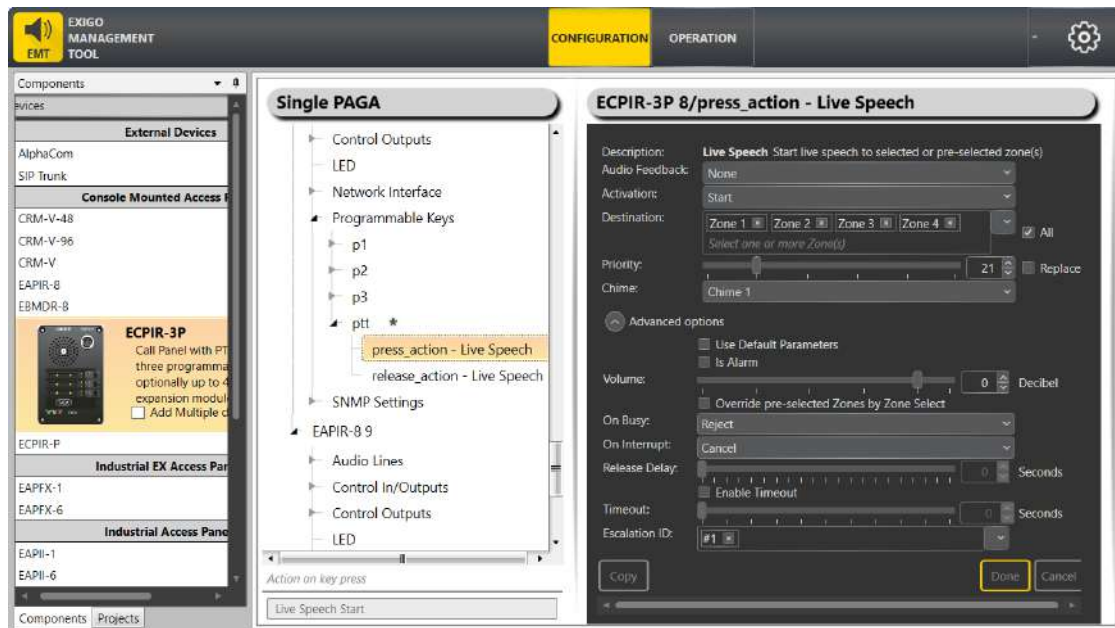
Escalation ID can be set if this particular function should have the option of being escalated.

Destination
The zones in which Live Speech will be started.

Priority
The priority of the broadcast. Checking the **Replace** box will make this broadcast replace other broadcast with the same priority. If the box is not checked, the same priority will be shown as busy. Default Priority = 21.

Chime
The chime sound that will be played before Live Speech starts.

6.13.12   Local Mute Control

Local Mute Control will force any Control Output that is being used (and configured with Local Mute as Source) to trigger. As with other broadcasts, it will be added to the queue if other broadcasts with higher priority are active in the selected zone. This function is useful in control rooms when you need to mute speakers during alarm situations.

- Drag-and-drop **Local Mute Control** to:

Amplifier > **Control Inputs** > **CI_1-CI_6**
or
Access Panel > **Programmable Keys** > **p1-px**
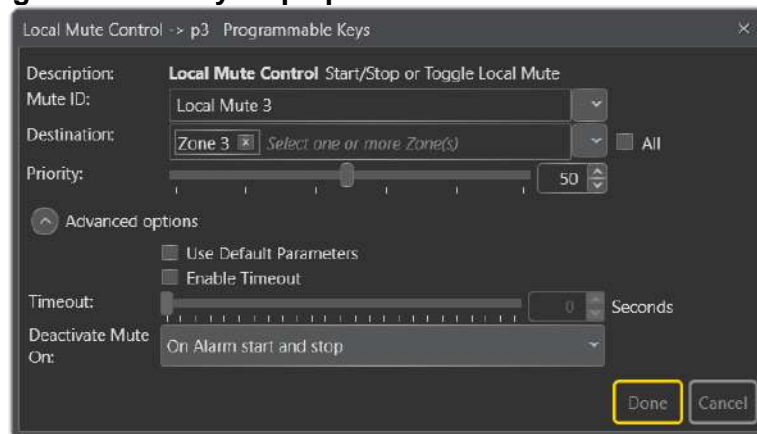
Mute ID

The Local Mute to be triggered. This is the source in the control output that directs the actual physical function. The CO must be configured with this mute ID for it to work.

Destination

The zones in which Local Mute will be started. The zone and source must correspond to the function configured in the output.

Priority

The priority of the broadcast. The muting will be active as long as the activity in the selected zone has a lower priority than the one set here. For example, the operator wants to mute GA with Priority 20, but he wants to hear the Abandon Alarm with Priority 15. In this case, Priority can be set to 18 here.

Advanced options

- Check the **Use Default Parameters** box to use default values for the parameters

- **Enable Timeout** – Decides whether the function will timeout or not

- **Timeout** – Maximum amount of time the manual initiation of the local mute can be active before it goes back to automatic control.

- **Deactivate Mute On** – Deactivate mute when the alarm state changes in the zone/broadcast:

  o **On Alarm start and stop** - Deactivate alarm when a new activity marked with alarm flag starts or all current activities marked with alarm flag are stopped.

  o **On Alarm start** - Deactivate alarm when a new activity marked with alarm flag starts.

  o **On Alarm stop** - Deactivate alarm when all current activities marked with alarm flag are stopped.

6.13.13 Message Control

Message Control determines the broadcast of messages.

- Drag-and-drop **Message Control** to:
Amplifier > **Control Inputs** > **CI_1-CI_6**
or
Access Panel > **Programmable Keys** > **p1-px**
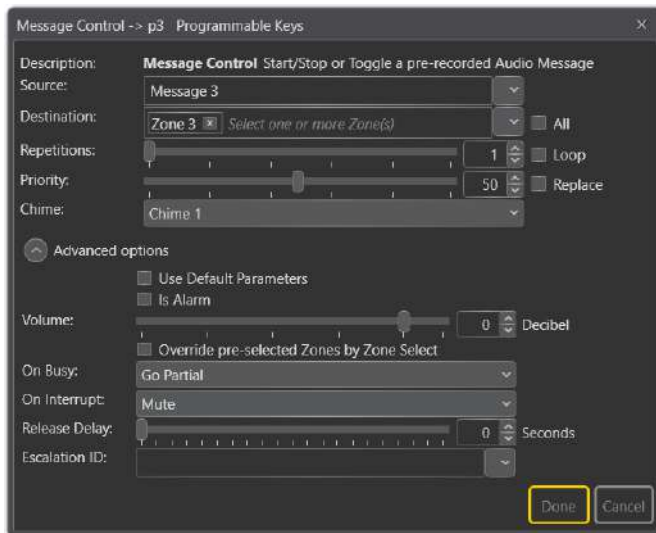
Source
The Message that should be broadcast.

Activation
Start, Stop or Toggle the message broadcast.

Destination
The Zone(s) that will receive the broadcast. Can be left blank if access panel keys are used for zone selection.

Repetitions
The number of times the message will be repeated. Check the **Loop** box for continuous playback.

Priority
The priority of the broadcast. Check the **Replace** box to make this broadcast replace other broadcasts with the same priority. If the box is not checked, broadcasts with the same priority will show busy. Default Priority = 50.

6.13.14 Microphone Test

Microphone Test is a variant of **Recall** where the audio is recorded with the microphone and "bounced" back to the access panel when the function times out or is switched off.

- Drag-and-drop **Microphone Test** to:

Access Panel > **Programmable Keys** > **p1-px**

Enable Timeout
Decides whether the function will timeout or not.

Timeout
The amount of time in seconds the broadcast will be active before it switches off. Default = 10 seconds.

Wait for PTT
Check the box for PTT microphones. The microphone test will not start until the PTT button is actually pressed. If the button is not pressed for 5 seconds, the microphone test will be cancelled.

6.13.15 Panel Lamp Test

Panel Lamp Test is used to check that all LEDs work properly.

- Drag-and-drop **Panel Lamp Test** to:

Access Panel > **Programmable Keys** > **p1-px**
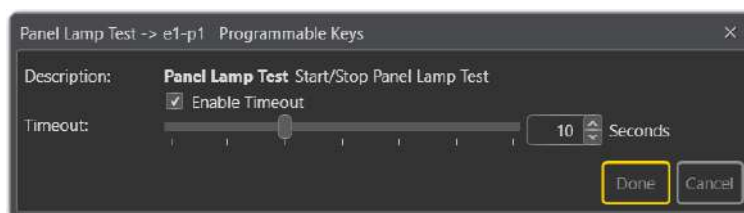
Enable Timeout
Decides whether the function will timeout or not.

Timeout
The amount of time in seconds the broadcast will be active before it switches off. Default = 10 seconds.

6.13.16   Recall, Control

Recall, Control is used to control the playback and dispatch of recall recorded messages. It can also be used to control recall messages on other devices, but are mostly used on access panels.

- Drag-and-drop **Recall Control** to:

Amplifier > **Control Inputs** > **CI_1-CI_6**
or
Access Panel > **Programmable Keys** > **p1-px**
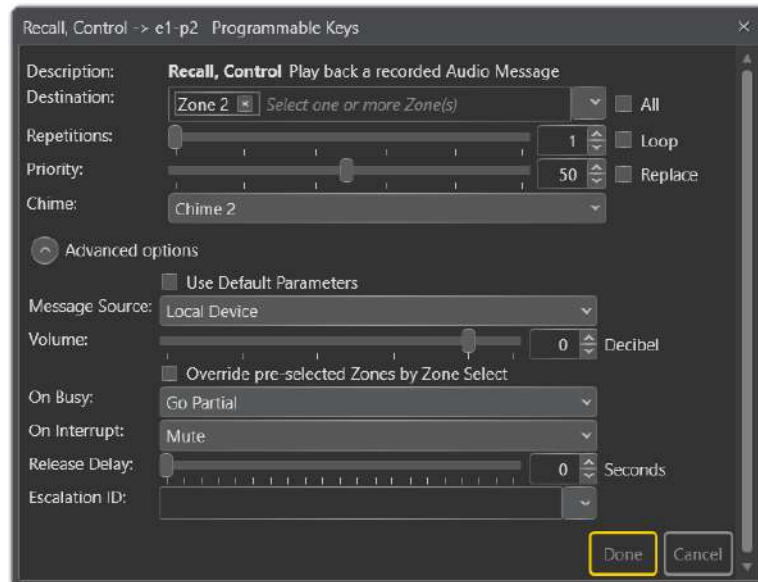
Destination
    The Zone(s) that will receive the broadcast. This may be left blank if access panel keys are used for zone selection.

Repetitions
    The number of times the message is played back. Check the **Loop** box for continuous playback.

Priority
    The priority of the broadcast. Check the **Replace** box to make this broadcast replace other broadcasts with the same priority. If the box is not checked, broadcasts with the same priority will be shown as busy. Default Priority = 50.

Chime
    The chime sound that will be played before the broadcast starts.

Message Source
This indicates which device was used as the source for the recording.

6.13.17 Recall, Record

Recall, Record records the message, which can then be played back on the built-in speaker of the indoor panel when this function is executed with Stop. The user can then verify the message before broadcasting it out to the selected zones with the Recall Control function.

- Drag-and-drop **Recall Record** to:

Amplifier > **Control Inputs** > **CI_1-CI_6**

or

Access Panel > **Programmable Keys** > **p1-px**
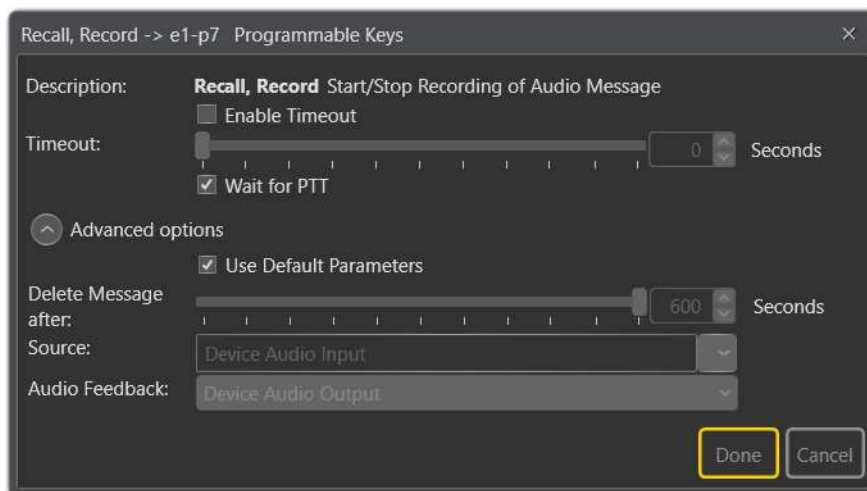
Enable Timeout
Decides whether the recording will timeout or not.

Timeout
The amount of time in seconds the message will be active.

Wait for PTT
Requires use of Press-To-Talk (M-key) when recording starts. The recording function will not become active until the PPT key is pressed.

Advanced options:

Delete Message after
The message will be deleted after a specified time. Default = 600 seconds.

Source
This is the audio input source that should be recorded. This could, in principle, be used for recording from the line input from another device.

Audio Feedback
This indicates which line output should play back the message after recording and the line output that should have the ready signal.

6.13.18   System Status

System Status is only relevant for access panels. This programs a dedicated key on the access panel to display system status and the connection status from the panel:

Status for
Select **System A**, **System B** or **System A and B** to display the system status for.

The Red LED will be lit if there are errors in the selected system. The Green LED will be lit when the panel is connected to the selected system.

> **!** NOTE   *System Status will override any other features on the same key with respect to LED behavior.*

- Drag-and-drop **System Status** to:

Access Panel > **Programmable Keys** > **p1-px** > **press_action/release_action**
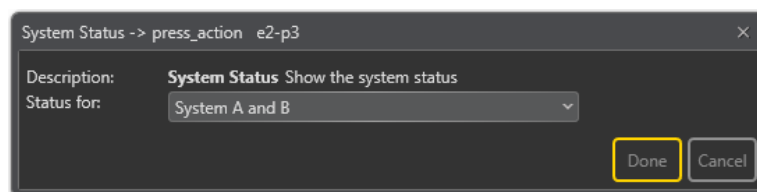
6.13.19   Tick Tone Control

Tick Tone Control is used to control advanced tick tones in zones. Tick tones can still be controlled from the system GUI for each channel, but Tick Tone Control will perform it for all zones, and moreover, can also define different tick tones for System A and System B respectively.

- Drag-and-drop **Tick Tone Control** to:

Amplifier > **Control Inputs** > **CI_1-CI_6**

or

Access Panel > **Programmable Keys** > **p1-px**
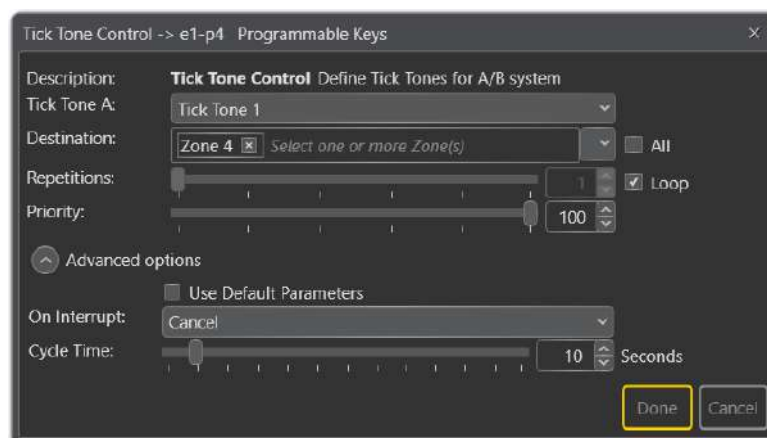
Tick Tone A
The tick tone that will be played in the system. In an A-B system, there will also be an option for a different tick tone in the B system.

Destination
The Zone(s) that will receive the activity. This may be left blank if access panel keys are used for zone selection.

Repetitions
The number of times the activity is played back. Check the Loop box for continuous activity.

Priority
The priority of the activity.

Cycle Time
Time in seconds between the tick tones. Default = 10 seconds.

6.13.20   Volume Control

Volume Control is used to increase and decrease Audio Program volume in selected zone(s) or directly on the channels. The last volume adjustment done will be the active one.

- Drag-and-drop **Volume Control** to:

  ESC / **ENA** > **Control Inputs** > **CI_1**-**CI_6**
  or

  Access Panel > **Programmable Keys** > **p1-px**
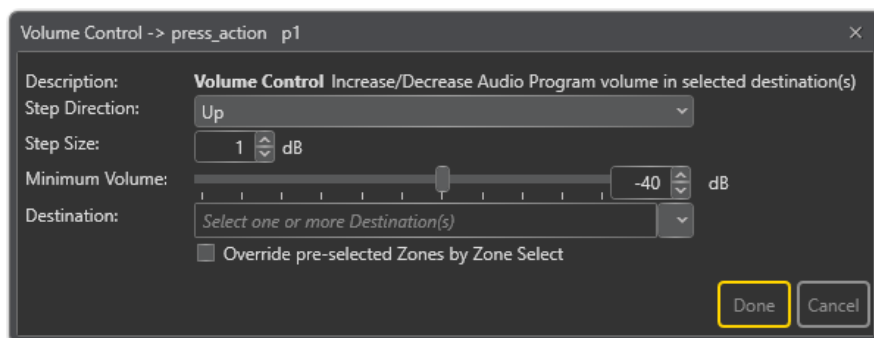
Step Direction
Up : Volume increase
Down : Volume decrease

Step Size
Step size in dB (decibel). Maximum: 10 dB, Minimum: 1 dB, Default: -40 dB.

Minimum Volume
The minimum volume that can be selected.

Destination
The Zone(s) and/or output(s) that are affected. This may be left blank if access panel keys are used for dynamic zone selection.

Override pre-selected Zones by Zone Select
Enabling this will override the pre-selected zone if dynamic zone selection is used.

6.13.21 Zone Selection

Zone Selection is used to select zones for dynamic functions such as those not selected in the Destination field. Only use Zone Selection on access panels.

- Drag-and-drop **Zone Selection** to:

Access Panel > **Programmable Keys** > **p1-px** > **press_action/release_action**
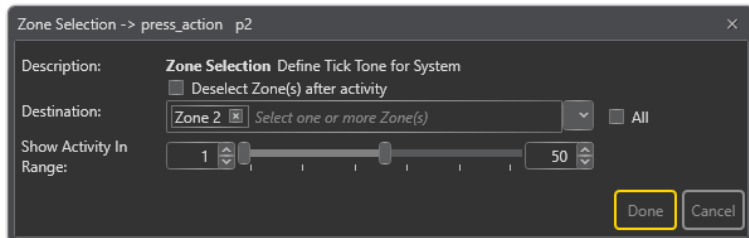
Deselect Zone(s) after activity
The selected zones will be cleared after the broadcast starts.

Destination
The Zone(s) that will receive the broadcast. *Note that at least one zone must be selected*.

Show Activity In Range
Shows the activity that has a priority inside the set range. This is useful for filtering out permanent background music programs. If Priority is set to 50, activities with priority below 50 will not light up the red LED on the key that indicates activity in the zone. Default Range = 1 – 50.

The LEDs on the access panel key that are programmed will indicate whether there is any activity in the zone or zones selected.

- **Green**: All zones are selected
- **Red**: Activity the zone(s) with priority inside the **Show Activity In Range** setting.
- **Flashing Green**: Some of the zones on this button are selected (usually if there are more than one zone select button). Clicking the button in this situation will select all the zones in Destination.

6.14 Configuring Output Actions

Outputs are configured by defining one or more actions to be triggered on an output event. To display the output actions:

- Click **Components** at the lower-left of the window.
- Click **Output Actions**

- Audio Activity
- Fault Indication
- Fault Indication Advanced
- Follow Any Alarm Tone
- Follow One Alarm Tone
- Local Mute
- Volume Override

6.14.1 Audio Activity

Audio Activity is a basic function that can be used to trigger control outputs for most activities. The different options are based on an internal AND logic (i.e. "one or other source" AND "one or other zone" etc.) There is a logical AND relation between the different parameters.

- Drag-and-drop **Audio Activity** to:

  ESC / **ENA** > **Control Outputs** > **CO_1**-**CO_6**

  or

  Access Panel > **Control Outputs** > **Internal relay 1** / **Internal relay 2**

Idle State
Sets the idle state for the output. The options are **Normally Open** or **Normally Closed**

Delay Activation
This delays the actual activation of the control output for the stipulated number of seconds after it should trigger.

Source
The source that will trigger the output such as specific Programs, Messages, etc. if Source is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not. It should trigger if the sources selected are active.

Zone
The zones in which the output on an activity is triggered. If Zone is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not. It should trigger if the zones selected are active.

Priority Range
The priority range within which the activity is triggered.

Audio State
Sets the audio state for the output to trigger. The options are **All**, **In Call**, **Queued**.

Audio Type
Sets the audio type for the output to trigger, such as Message, Live Speech, Alarm, etc.

Follow Alarm Tone
When enabled, the CO will activate or deactivate in sync with the alarm tone that has been set in Source, e.g. a lamp may flash in sync with an alarm tone.

Advanced options:

Limit High Not OK
When CO is cleared, and feedback voltage is at or above this value, the output is considered fed with alien voltage

Limit Low OK
When CO is set, and feedback voltage is above this value, the output is considered active OK

6.14.2 Fault Indication

Fault Indication is used to trigger on faults in the system.

- Drag-and-drop **Fault Indication** to:

  ESC / **ENA** > **Control Outputs** > **CO_1**-**CO_6**

  or

  Access Panel > **Control Outputs** > **Internal relay 1** / **Internal relay 2**

Idle State
Sets the idle state for the output. The options are **Normally Open** or **Normally Closed**

Delay Activation
Delays control output activation for the stipulated number of seconds when triggered.

Faults in System (only available in A-B System projects)
The system, i.e. **System A**, **System B** or **System A and B**, from which faults will be received.

Subscribe To
Options are **Faults** or **Warnings**.

Filter Parameters:

Filter Mode

Zones / Affected Zones
Trigger on faults that affect selected zones.

Devices / Affected Devices
Trigger on faults that affect selected devices.

Devices / Affected Lines
Trigger on faults that affect selected audio lines.

Severity (level)
Trigger on faults at selected levels

Fault State
Trigger on faults in selected state

System Message
Trigger on faults that have selected messages

6.14.3 Fault Indication Advanced

Fault Indication Advanced is used to trigger on faults in the system using a filter script.

- Drag-and-drop **Fault Indication Advanced** to:

  ESC / **ENA** > **Control Outputs** > **CO_1**-**CO_6**

  or

  Access Panel > **Control Outputs** > **Internal relay 1** / **Internal relay 2**
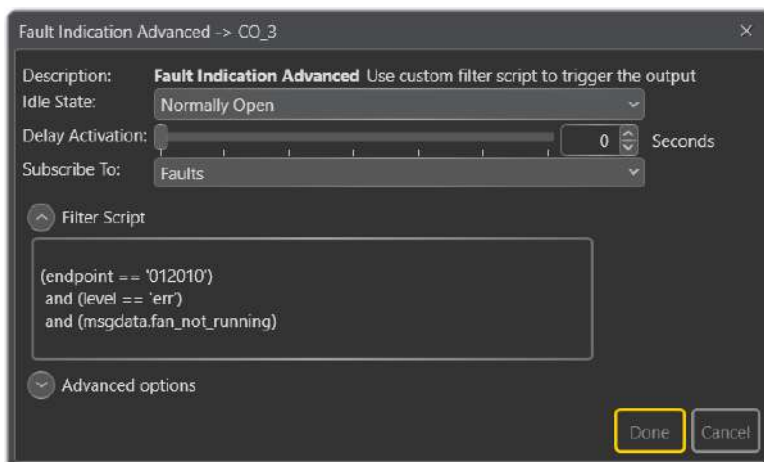
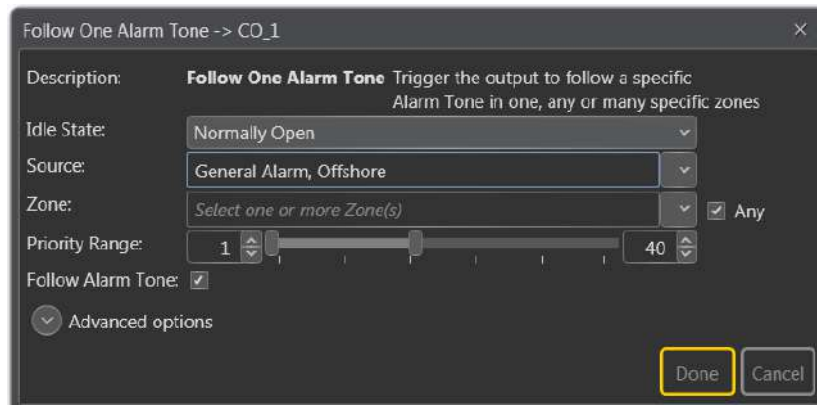- Enter the script in the **Filter Script** field

6.14.4 Follow Any Alarm Tone

Follow Any Alarm Tone is used to trigger the control output to follow any alarm tone in one specific zone. Make sure that alarm following will only work for alarms that originate from the digital alarm generator.

- Drag-and-drop **Follow Any Alarm Tone** to:

    ESC / **ENA** > **Control Outputs** > **CO_1**-**CO_6**

    or

    Access Panel > **Control Outputs** > **Internal relay 1** / **Internal relay 2**

Idle State
Sets the idle state for the output. The options are **Normally Open** or **Normally Closed**

Source
The source that will trigger the alarm output. If Source is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not.

Zone
The zone in which the output on an activity is triggered. If Zone is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not. Note that only one zone can be specified.

Priority Range
Will only trigger if the alarm has a priority within the priority range.

Follow Alarm Tone
If this is enabled the control output will toggle in tune with the alarm generator. If it is NOT enabled it will toggle on when the alarm is started and stay on until it ends.

6.14.5 Follow One Alarm Tone

Follow One Alarm Tone is used to trigger the control output to follow a specific alarm tone in any zone. Make sure that alarm following will only work for alarms that originate from the digital alarm generator.

- Drag-and-drop **Follow One Alarm Tone** to:

    ESC / **ENA** > **Control Outputs** > **CO_1**-**CO_6**

    or

    Access Panel > **Control Outputs** > **Internal relay 1** / **Internal relay 2**

Idle State
Sets the idle state for the output. The options are **Normally Open** or **Normally Closed**

Source
The source that will trigger the alarm output. If Source is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not.

Zone
The zones in which the output on an activity is triggered. If Zone is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not. The default is **Any** zone.

Priority Range
The priority range within which the activity is triggered.

Follow Alarm Tone
If this is enabled the control output will toggle in tune with the alarm generator. If it is NOT enabled it will toggle on when the alarm is started and stay on until it ends.

6.14.6 Local Mute

Local Mute is used when an output shall mute one or more speakers to prevent audio feedback. Local mute is also used when there is a need to do a manual initiation of local mute with the input function **Local Mute Control**.

- Drag-and-drop **Local Mute** to:

    ESC / **ENA** > **Control Outputs** > **CO_1**-**CO_6**

    or

    Access Panel > **Control Outputs** > **Internal relay 1** / **Internal relay 2**

Idle State
Sets the idle state for the output. The options are **Normally Open** or **Normally Closed**

Delay Activation
Delays control output activation for the stipulated number of seconds when triggered.

Source
The source that will trigger the control output. The Source field can only contain Local Mute, audio inputs and access panels. The **Local mute #** options can be triggered from panels to activate local muting in an alarm situation. If Source is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not.

Zone
The zones in which the output on an activity is triggered. If Zone is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not.

Example 1: Bridge
Access Panel 1 should mute a speaker right over the panel when broadcasting into Zone 1 but not when broadcasting into other zones.
Set the following parameters:
> **Source** = Access Panel 1
> **Zone** = Zone 1

Example 2: Control Room
Access Panel 1 should mute a speaker right over the panel when broadcasting into Zone 1 but not when speaking into other zones. Access Panel 1 should also be able to activate the relay that disconnects the speaker when a key is pressed.
Set the following parameters:
> **Source** = Access Panel 1 & Local Mute 1
> **Zone** = Zone 1

6.14.7 Volume Override

Volume Override is used when the system has volume controllers that must be kept active. Locally, such volume controllers may be used for adjusting the volume in a corridor for instance. As long as the volume controller has voltage/power, the physical volume setting will apply. If there is no more current, it will be overridden and go into bypass mode (i.e. no effect).

- Drag-and-drop **Volume Override** to:

  ESC / **ENA** > **Control Outputs** > **CO_1**-**CO_6**
  or
  Access Panel > **Control Outputs** > **Internal relay 1** / **Internal relay 2**
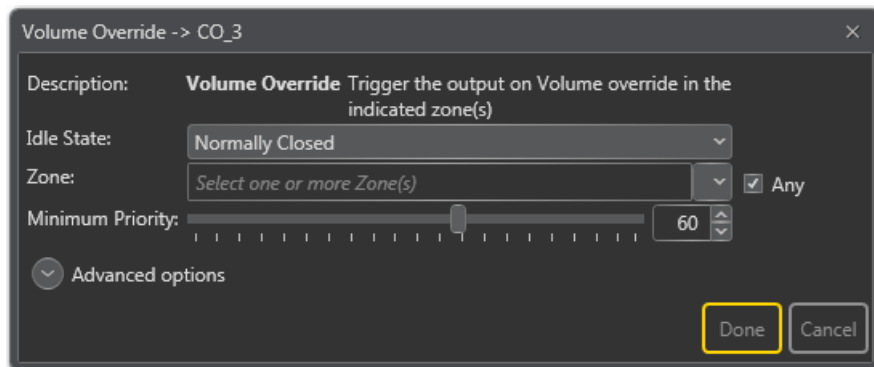
Idle State
Sets the idle state for the output. The options are **Normally Open** or **Normally Closed**. Note that the default is **Normally Closed**.

Zone
The zones in which the output on an activity is triggered. If Zone is not specified, it will be ignored when checking whether the conditions for the audio activity triggering are present or not. The default is **Any** zone.

Minimum Priority
The priority level above which the volume override will trigger.

Volume Override should not trigger when low priority activities are taking place (e.g. background music), but should always trigger when high priority activities are taking place (e.g. announcements from the bridge, alarms, etc.).

6.15 Analog Audio Integration

6.15.1 Audio Program Source

- ▪ Click **Components** at the lower-left of the window.

- ▪ Click **External Connections**

This option configures an audio program source on a line input on either the system controller or amplifier.
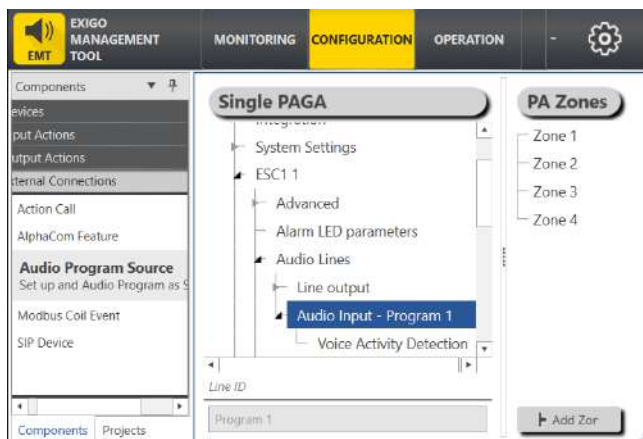
- • Drag-and-drop **Audio Program Source** to:

    ESC1 > **Audio Lines** > **Audio Input**
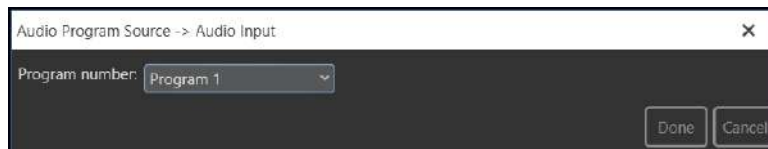
- • Set **Program number** to **Program 1** or **Program 2** in the dialog-box

6.16 Digital Audio Integration

The options available are for external connections such as AlphaCom or SIP servers. See Appendix D for more information on AlphaCom Integration.

To display the External Connections:

- • Click **Components** at the lower-left of the window.

- • Click **External Connections**
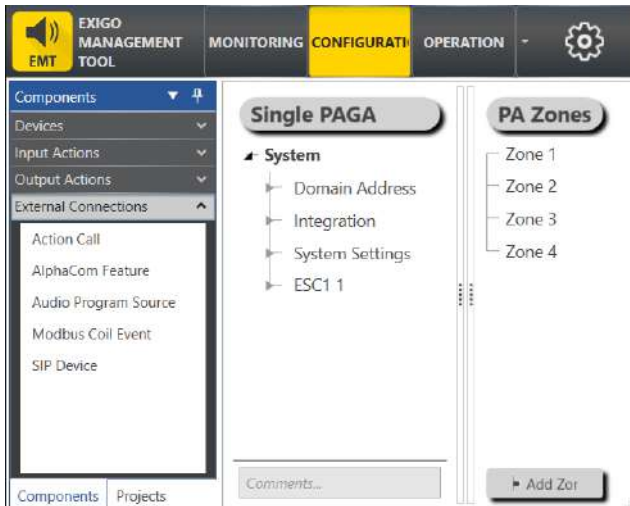
6.16.1 AlphaCom Feature
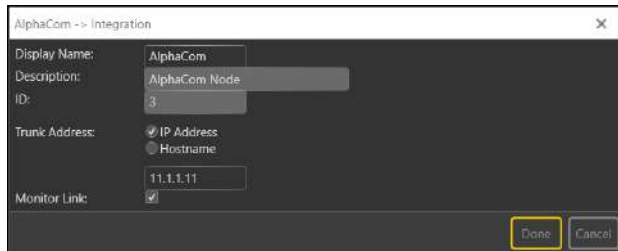
This option configures an AlphaCom Feature or Directory Number that Exigo can call to or activate. External device **AlphaCom** must first be added to the system if it has not already been added during project setup. For information about AlphaCom Integration, see Appendix C.

<u>Adding AlphaCom</u>

To add AlphaCom to the system:

- Select **Components** > **Devices** > **External Devices**

- Drag-and-drop **AlphaCom** on **System** > **Integration**
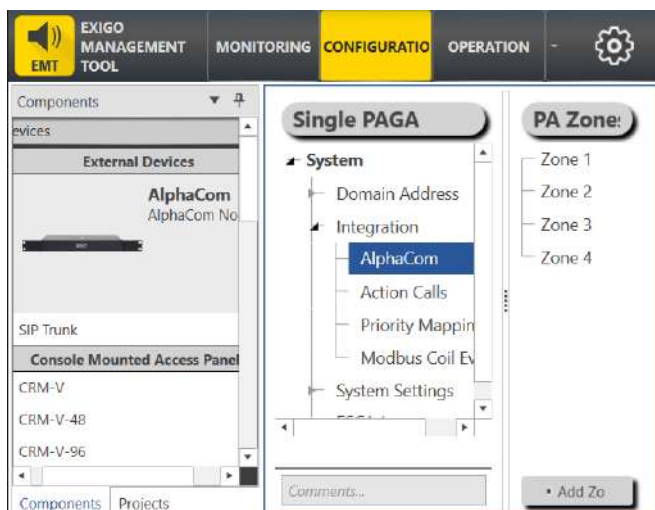
- Enter the **IP Address** of the AlphaCom

Configuring AlphaCom Feature

To configure the AlphaCom Feature to the system:

- Select **Components** > **External Connections** > **AlphaCom Feature**
- Drag-and-drop **AlphaCom Feature** on **System** > **Integration** > **AlphaCom**
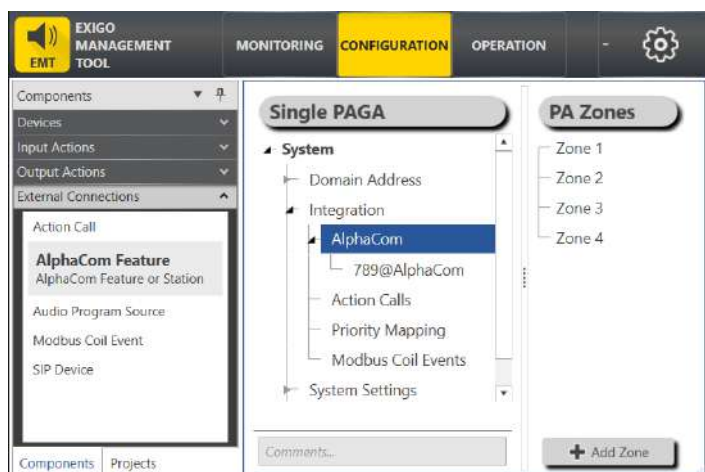
- Enter the **Feature Number** for AlphaCom

A Feature Number is the number that Exigo sends audio to in the AlphaCom or SIP server.

Note that to call an AlphaCom feature from Exigo, the AlphaCom feature has to be included in a Zone. Each AlphaCom feature should be part of a zone. If audio is sent to the zone, the AlphaCom feature or SIP device will be called and the zone audio will be forwarded to this.

6.16.2 SIP Device

This option configures a directory number of a SIP device (IP phone) that Exigo can call to. External device **SIP Trunk** must first be added to the system.

Adding SIP Trunk

To add a SIP trunk to the system:

- Select **Components** > **Devices** > **External Devices**

- Drag-and-drop **SIP Trunk** on **System** > **Integration**
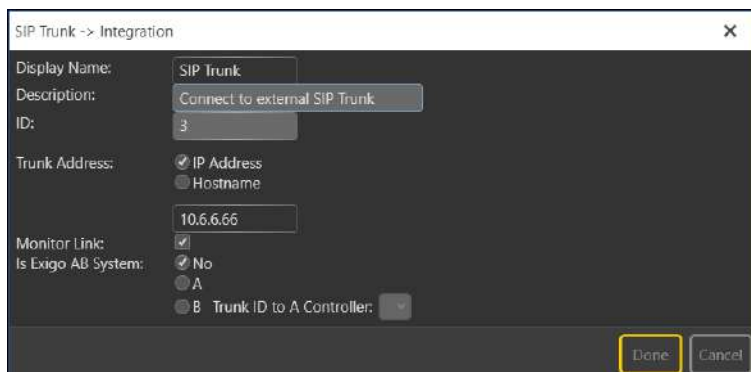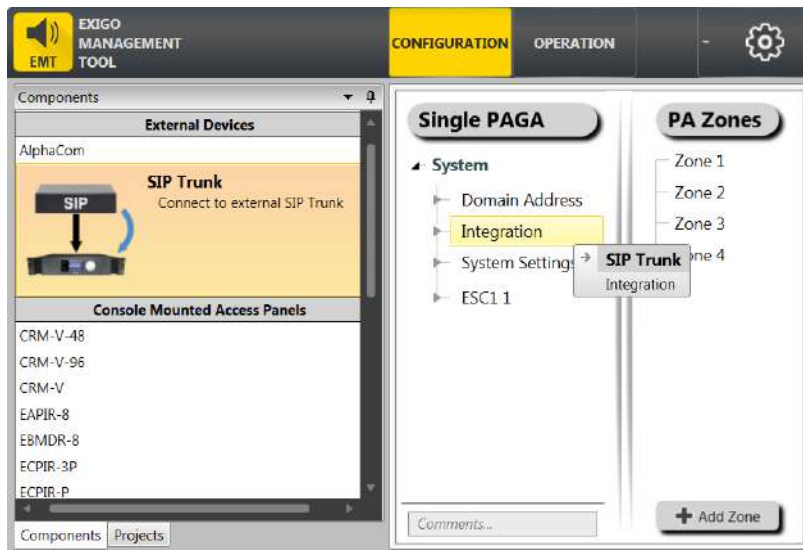
- Enter the **IP Address** of the SIP trunk

Configuring SIP Device

To configure a SIP device on the system:

- Select **Components** > **External Connections**

- Drag-and-drop **SIP Device** on **System** > **Integration** > **SIP Trunk**
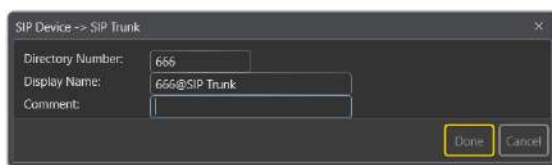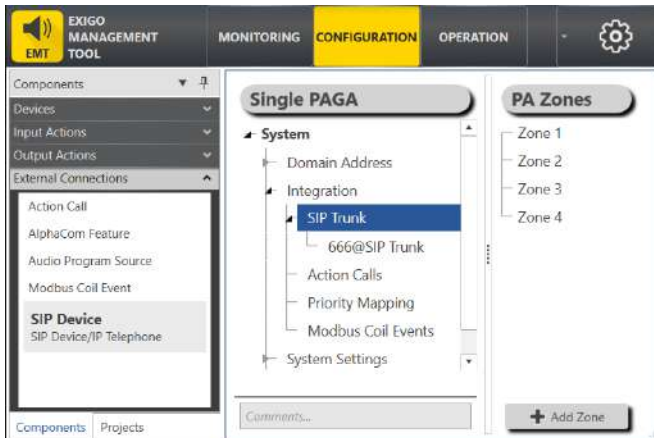
- Enter the **Directory Number** to the SIP Device

Note that to call a SIP Device from Exigo, the SIP Device has to be included in a Zone.

6.16.3 Action Call

This option configures a directory number that when called from the AlphaCom or SIP server, will trigger an input action. Any control input function can be assigned to the Action Call feature.

Note that **Action Calls** is **disabled until** a SIP Trunk or AlphaCom is configured under Integration.

- Select **Components** > **External Connections**
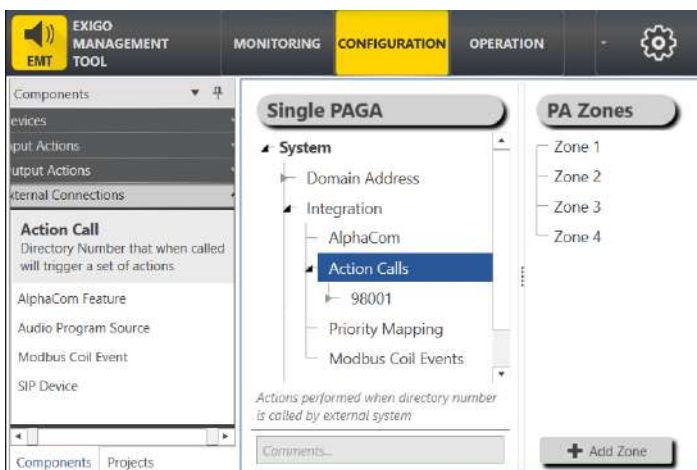
- Drag-and-drop **Action Call** on **System** > **Integration** > **Action Calls**
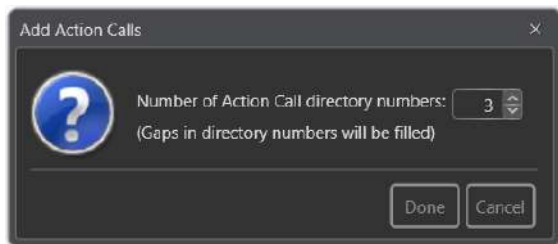
- Set the number of directory numbers to add in the dialog-box

Each directory number will have **On Connect** and **On Disconnect** containers where input actions can be configured. This is typically used to allow external systems (e.g. AlphaCom) to trigger actions in Exigo.

6.17 Backup & Restore Project Database

It is possible to back up or restore the project database that to/from the hard disk.

- Select **Projects**
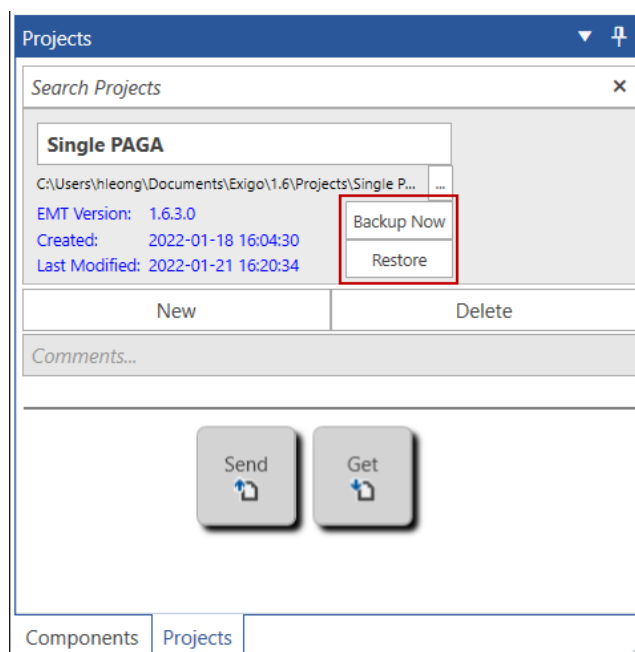
Backup Now

This will back up the project database to the hard disk under: **/Documents/Exigo/1.6/Projects/**

Restore

This will restore the project database from the hard disk under: **/Documents/Exigo/1.6/Projects/**

6.18 Importing Project Files

If desired, it is possible to import database files from existing projects.

To import files from an existing project:

- Select **Projects** > **New**
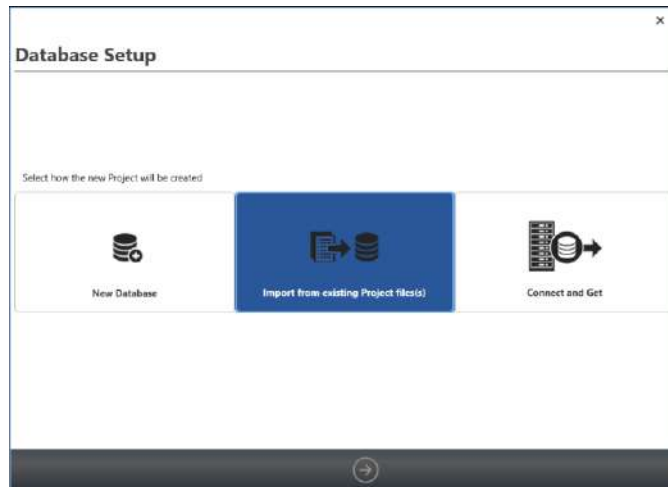
- Click the **Import from existing Project files** tab

- Click the **right-arrow** icon at the bottom of the window
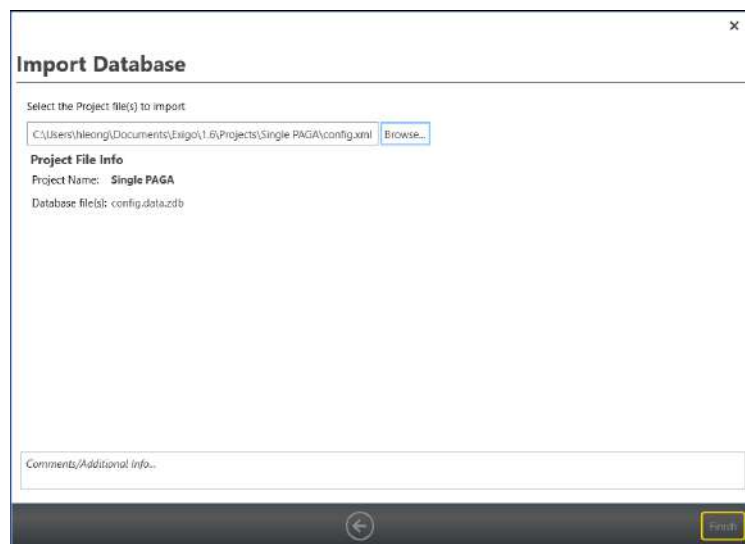
- Click **Browse** to select the files under the directory /Documents/Exigo/Projects/

- Click **Finish** to complete the project file import procedure

6.19 Sending/Getting Data to/from System Controller

The System Controller IP address is used by the Exigo Management Tool to Send/Get project database files to/from the system controller. When all configuration procedures have been done in the Exigo Management Tool, the data has to be sent to the system controller where it is centrally stored. When endpoint components such as amplifiers and access panels are connected in a network, the data is then distributed to them from the system controller.

To send data to the system controller:

3. Click the **Send** button

To get data from the system controller:

4. Click the **Get** button

If a transfer operation is completed successfully, the progress bar will get a green frame. The progress bar will disappear after 30 seconds.

If for some reason the transfer operation fails, the progress bar will get a red frame and an error message will be displayed. The progress bar will not be removed/hidden after 30 seconds.

Error on Send will not be cleared. Only a successful Send will be cleared.

6.20 Connecting to System Controller & Downloading Project Database

To connect to the system controller and to download the project database:

- Select **Projects** > **New**
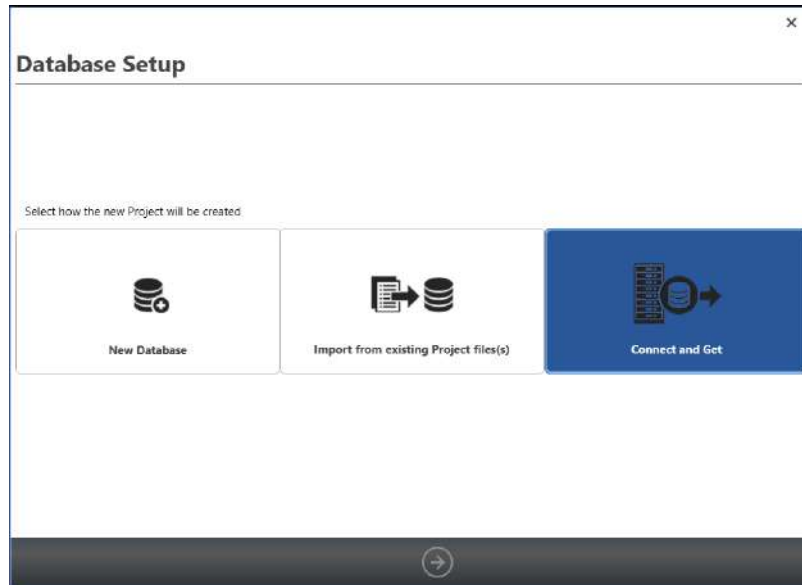
- Click the **Connect and Get** tab

- Click the **right-arrow** icon at the bottom of the window

- Enter the **Project** name
- Enter the **Controller IP Address**
- Click **Finish**

The system controller project database will now be downloaded as a new Exigo project file.

7 Configuration Reference List

The Exigo configuration reference list consists of a set of tables summarizing the main information needed to configure an Exigo system. The configuration reference list is usually in the form of a standard Excel spreadsheet file.

The configuration reference list exemplified in this section is for a typical Exigo A-B system used on a medium sized marine vessel as shown in Figure 59.
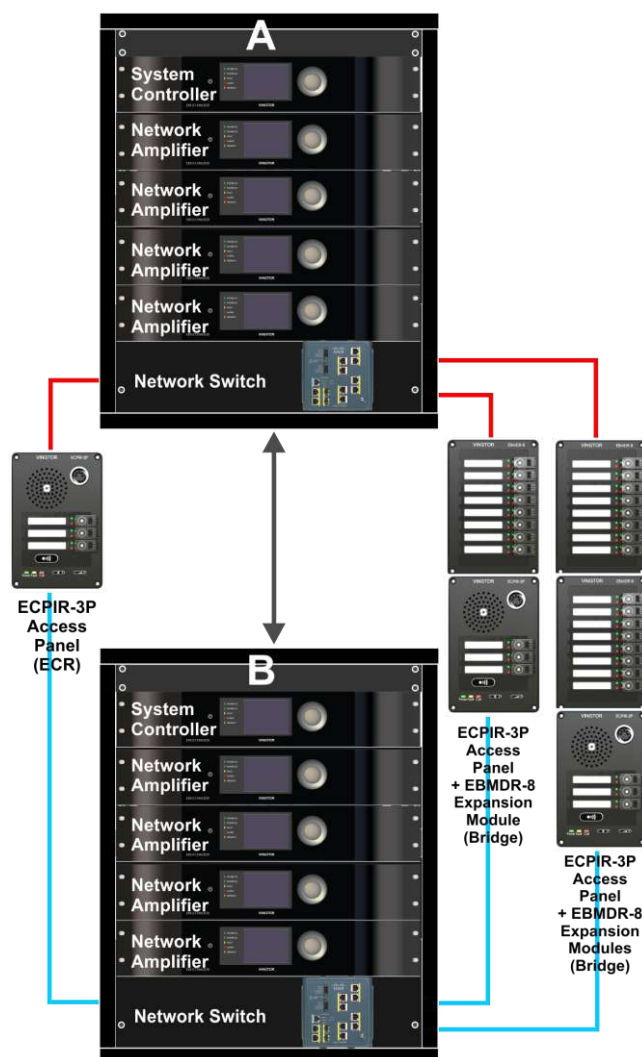
Figure 59: Configuration Example System

7.1 System Components

7.1.1 Central Equipment in A-B System

Type	Description	Directory Number	Device Name	IP Address	Subnet	Location
ESC1	Domain Controller	-	-	10.5.11.11	255.255.255.0	System Rack A
ESC1	Secondary System Controller - SSC	013010	ESC1 A	10.5.11.100	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012010	ENA2200-AC2 A1	10.5.11.110	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012020	ENA2200-AC2 A2	10.5.11.120	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012030	ENA2200-AC2 A3	10.5.11.130	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012040	ENA2200-AC2 A4	10.5.11.140	255.255.255.0	System Rack A
	Network Switch	-		10.0.0.5		System Rack A

Table 4: Central Equipment – System A

Type	Description	Directory Number	Device Name	IP Address	Subnet	Location
ESC1	PSC - Domain Controller	-	-	10.5.12.11	255.255.255.0	System Rack B
ESC1	SSC	023010	ESC1 B	10.5.12.100	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022010	ENA2200-AC2 B1	10.5.12.110	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022020	ENA2200-AC2 B2	10.5.12.120	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022030	ENA2200-AC2 B3	10.5.12.130	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022040	ENA2200-AC2 B4	10.5.12.140	255.255.255.0	System Rack B
	Network Switch	-		10.0.1.5		System Rack B

Table 5: Central Equipment – System B

The tables above are used for maintaining information on IP Addresses and Directory Numbers for the central equipment in System A and System B.

> **NOTE**
> *The two rows for the ESC1 System Controller describe the same physical device. The ESC1 consists of two processors, the PSC and the SSC.*

7.1.2 Access Panels

Access panels are connected to both systems, and are hence considered as a part of both systems. The table below holds the information for all access panels in the entire A-B system.

Type	Description	Directory Number	Device Name	IP Address	Subnet	Location
ECPIR-3P	Call Panel, PTT + 3 Keys	011010	AP-1	10.5.11.200		Bridge
EBMDR-8	Expansion Module, 8 Keys					Bridge
EBMDR-8	Expansion Module, 8 Keys					Bridge
ECPIR-3P	Call Panel, PTT + 3 Keys	011020	AP-2	10.5.11.210		Bridge
EBMDR-8	Expansion Module, 8 Keys					Bridge
ECPIR-3P	Call Panel, PTT + 3 Keys	011030	AP-3	10.5.11.220		ECR

Table 6: Access Panels – A-B System

7.2 Zone Configuration

7.2.1 Zone Overview

Zones must be defined and given explanatory names.

Zone	Display Name	Description
1	Crew Cabins	Cabins/Bathrooms Crew
2	Crew Accom	Accommodation/Corridors Crew
3	Passenger Cabins	Cabins/Bathrooms Passengers
4	Passenger Accom	Accommodation/Corridors Passengers
5	Engine Room	Engine Room Area
6	Lifeboats	Lifeboat Area
7	Open Deck	Open Deck Area

Table 7: Zone Overview

7.2.2 Amplifier Channels in A-B System

For each zone, one or more amplifier channels from the A and B system must be used. The tables below are used to assign amplifier channels and to ensure that each amplifier channel isn't overloaded.

Zones Loop A

Loop	Type	Amplifier	Channel	Mon	LETs	Z1	Z2	Z3	Z4	Z5	Z6	Z7
A1	ENA2200-AC2	ENA2200-AC2 A1	1	On	2	88W						
A2	ENA2200-AC2	ENA2200-AC2 A1	2	On	2		75W					
A3	ENA2200-AC2	ENA2200-AC2 A2	1	On	3		104W					
A4	ENA2200-AC2	ENA2200-AC2 A2	2	On	7			105W				
A5	ENA2200-AC2	ENA2200-AC2 A3	1	On	4				97W			
A6	ENA2200-AC2	ENA2200-AC2 A3	2	On	1					116W		
A7	ENA2200-AC2	ENA2200-AC2 A4	1	On	0						90W	
A8	ENA2200-AC2	ENA2200-AC2 A4	2	On	1							116W
Watts per zone:						88W	179W	105W	97W	116W	90W	116W

Zones Loop B

Loop	Type	Amplifier	Channel	Mon	LETs	Z1	Z2	Z3	Z4	Z5	Z6	Z7
B1	ENA2200-AC2	ENA2200-AC2 B1	1	On	2	88W						
B2	ENA2200-AC2	ENA2200-AC2 B1	2	On	2		75W					
B3	ENA2200-AC2	ENA2200-AC2 B2	1	On	3		104W					
B4	ENA2200-AC2	ENA2200-AC2 B2	2	On	7			105W				
B5	ENA2200-AC2	ENA2200-AC2 B3	1	On	4				97W			
B6	ENA2200-AC2	ENA2200-AC2 B3	2	On	1					116W		
B7	ENA2200-AC2	ENA2200-AC2 B4	1	On	0						90W	
B8	ENA2200-AC2	ENA2200-AC2 B4	2	On	1							116W
Watts per zone:						88W	179W	105W	97W	116W	90W	116W

Loop: The identification of the speaker loop. This should be aligned with the number used on drawings, etc.

Type: The type of amplifier used for the loop.

Amplifier: The identification (name) of the amplifier used for the loop.

Channel: The channel number of the amplifier used for the loop.

Mon: Whether monitoring of the loop should be enabled or not.

LETs: The number of line end transponders on the loop.

Z1 – Zn: The loudspeaker load for the loop.

7.2.3 Line End Transponder Configuration (A & B Loops)

Each amplifier can have a total of 10 LET units, divided among the channels. The two tables below are used to configure LET units per amplifier channel.

Loop	Amplifier	Channel	LET 1	LET 2	LET 3	LET 4	LET 5	LET 6	LET 7	LET 8	LET 9	LET 10	# LETs
A1	ENA2200-AC2 A1	1	X	X									2
A2	ENA2200-AC2 A1	2									X	X	2
A3	ENA2200-AC2 A2	1	X	X	X								3
A4	ENA2200-AC2 A2	2				X	X	X	X	X	X	X	7
5A	ENA2200-AC2 A3	1	X	X	X	X							4
A6	ENA2200-AC2 A3	2									X		1
A7	ENA2200-AC2 A4	1											0
A8	ENA2200-AC2 A4	2									X		1

Loop	Amplifier	Channel	LET 1	LET 2	LET 3	LET 4	LET 5	LET 6	LET 7	LET 8	LET 9	LET 10	# LETs
B1	ENA2200-AC2 B1	1	X	X									2
B2	ENA2200-AC2 B1	2									X	X	2
B3	ENA2200-AC2 B2	1	X	X	X								3
B4	ENA2200-AC2 B2	2				X	X	X	X	X	X	X	7
B5	ENA2200-AC2 B3	1	X	X	X	X							4
B6	ENA2200-AC2 B3	2									X		1
B7	ENA2200-AC2 B4	1											0
B8	ENA2200-AC2 B4	2									X		1

7.2.4 Audio Inputs

Audio inputs in the system can be used to distribute entertainment, external alarm tones or live speech from microphones. The table below summarizes all the audio inputs in the system.

System	Type	Device	Input	Phantom	Monitored	Description	Program input ID
A	ESC1	ESC1 A	Mic	Yes	Yes	Microphone 1	
A	ESC1	ESC1 A	Line	Yes	No	CD player 1	Program 1
A	ENA2200-AC2	ENA2200-AC2 A1	Mic				
A	ENA2200-AC2	ENA2200-AC2 A1	Line	Yes	No	Computer 1	Program 2
A	ENA2200-AC2	ENA2200-AC2 A2	Mic				
A	ENA2200-AC2	ENA2200-AC2 A2	Line	Yes	No	Elevator music	Program 3
A	ENA2200-AC2	ENA2200-AC2 A3	Mic				
A	ENA2200-AC2	ENA2200-AC2 A3	Line				
A	ENA2200-AC2	ENA2200-AC2 A4	Mic				
A	ENA2200-AC2	ENA2200-AC2 A4	Line				
B	ESC1	ESC1 B	Mic	Yes	Yes	Microphone 2	
B	ESC1	ESC1 B	Line	Yes	No	CD player 2	Program 1
B	ENA2200-AC2	ENA2200-AC2 B1	Mic				
B	ENA2200-AC2	ENA2200-AC2 B1	Line	Yes	No	Computer 2	Program 2
B	ENA2200-AC2	ENA2200-AC2 B2	Mic				
B	ENA2200-AC2	ENA2200-AC2 B2	Line	Yes	No	Elevator music	Program 3
B	ENA2200-AC2	ENA2200-AC2 B3	Mic				
B	ENA2200-AC2	ENA2200-AC2 B3	Line				
B	ENA2200-AC2	ENA2200-AC2 B4	Mic				
B	ENA2200-AC2	ENA2200-AC2 B4	Line				

7.3 System Parameters

7.3.1 Alarms

The alarms in the system must be planned, defined and configured. Alarms may be added and removed as required by class and specification.

Alarm ID	Name	Fixed Zone	Priority	Storage Location	Pattern
1	Abandon Ship	All Zones	9	ESC1 A, ESC1 B	
2	General Alarm	All Zones	10	ESC1 A, ESC1 B	7 short, 1 long. 1 kHz
3	Fire Alarm	Crew Area	11	ESC1 A, ESC1 B	
4	Man Overboard	Crew Area	12	ESC1 A, ESC1 B	
5	Muster Alarm	Crew Area	13	ESC1 A, ESC1 B	

Table 8: Alarm Definitions

7.3.2 Prerecorded Messages

Prerecorded messages must be defined and uploaded to the system. Messages may be added and removed as required by the customer specification.

Message ID	Name	Description	Filename	Storage Location
1	Dinner 1	Played when dinner is served.	msg1.wav	ESC1 A, ESC1 B
2	Dinner 2	Played when dinner is finished.	msg2.wav	ESC1 A, ESC1 B
3	Greeting 1	Played when boat leaves port.	greeting.wav	ESC1 A, ESC1 B
4	Shop open	Played when shops are opened.	shops.wav	ESC1 A, ESC1 B

Table 9: Message Definitions

7.3.3 Access Control

The Exigo system can be set up with access control to the user interface on the system controllers and amplifiers. The different users must be assigned an access level and a PIN code.

User ID	Level	PIN Code	Name	Comments
1	1	1234	Chief Electrician	
2	2	4321	Crew Member 1	

Table 10: User Access Definitions

7.4 Control Inputs and Control Outputs

7.4.1 Control Outputs

In most systems, several control outputs must be configured. These control outputs are usually used to signal other systems, or to activate/deactivate other parts of the safety and emergency system.

Output ID	Description	Trigger situation
ESC1 A.O1	Mute typhoon/foghorn	During Emergency PA
ESC1 A.O2	Mute alarm	During Emergency PA
ENA2200-AC2 A1.O1	Signal unit - zone 5	During Alarm or Emergency PA (Engine Area)
ENA2200-AC2 A1.O2	Signal unit - zone 5	During Normal PA (Engine Area)
ENA2200-AC2 A1.O3	Volume override	Any PA activity with priority higher than 20 in any zone
ENA2200-AC2 A1.O4	Mute entertainment	Any PA activity with priority 30 or higher in any zone

Table 11: Control Outputs

The output IDs are a combination of the device name and the control output number on that device. In the table above, ESC1 A.O1 refers to control output number 1 on the system controller 1A.

7.4.2 Control Inputs

Control inputs are used by other systems or actuators to signal and give commands to the Exigo system. Control inputs must be assigned a function and a priority.

Input ID	Action	Priority	Functions	Trigger	Zones	Comment
ESC1 A.I1	Start fire alarm	1	Fire system follow	Release	Crew Area	Monitored, normally open
ESC1 A.I2	Custom fault	-	Fault relay data switch-1	Press	-	
ESC1 A.I3	Custom fault	-	Fault relay data switch-2	Press	-	
ESC1 A.I4	Toggle Alarm #4	12	Alarm	Toggle	Crew Area	Monitored, toggle alarm
ESC1 A.I5	Toggle Alarm #5	13	Alarm	Toggle	Crew Area	Toggle Alarm

Table 12: Control Inputs

The input IDs are a combination of the device name and the control input number on that device. In the table above, ESC1 A.I1 refers to control input number 1 on the system controller 1A.

7.5 Access Panel Keys

The keys on the access panels are designated according to function, priority, etc. in tables, using one table per access panel as shown below. The number of keys in the table depends on the access panel type.

7.5.1 Access Panel AP-1

The AP-1 access panel is of the type ECPIR-3P and has 3 keys and one PTT key which must be configured. It is also equipped with two EBMDR-8 expansion modules which add 16 more keys.

Key	Function	Priority	Comments
ptt	PA to selected zone	15	Normal PA, timeout 3 seconds
p1	General Alarm	12	Toggle general alarm in all zones
p2	Fire Alarm	10	Start fire alarm in crew quarters
p3	Fire Alarm Cancel	-	Cancel fire alarm
e1-p1	Emergency PA	6	Overrides all other activities in system. Timeout 3 seconds.
e1-p2	Manual alarm in public zones	8	Manual alarm in all zones except passenger cabins
e1-p3	Message 1 to preselected zone	50	Only passenger zones
e1-p4	Message 2 to preselected zone	50	Only passenger zones
e1-p5	Message 3 to preselected zone	50	
e1-p6	Message 4 to preselected zone	50	
e1-p7	Program 1 in preselected zone	85	Start/stop program in passenger area
e1-p8	Program 2 in preselected zone	85	Start/stop program in crew/public area
e2-p1	Zone select 1	-	Dynamically select zone 1
e2-p2	Zone select 2	-	Dynamically select zone 2
e2-p3	Zone select 3	-	Dynamically select zone 3
e2-p4	Zone select 4	-	Dynamically select zone 4
e2-p5	Zone select 5	-	Dynamically select zone 5
e2-p6	Zone select 6	-	Dynamically select zone 6
e2-p7	Zone select 7	-	Dynamically select zone 7
e2-p8	Zone select 8	-	Dynamically select zone 8

Table 13: Key Definitions – AP-1

The PTT key and the three keys named p1, p2 and p3 are the keys on the ECPIR-3P access panel. The keys named E*x*-p*y* are the keys on the expansion modules where '*x*' is the expansion module number and '*y*' is the key number on that module. E.g. E1-p6 is key 6 on expansion module 1.

7.5.2 Access Panel AP-2

The AP-2 access panel is of the type ECPIR-3P and has 3 keys and one PTT key which must be configured. It is also equipped with one EBMDR-8 expansion module which adds 8 more keys.

Key	Function	Priority	Comments
ptt	PA to preselected zone	15	Normal PA, timeout 3 seconds
p1	General Alarm	12	Start general alarm in all zones
p2	Fire Alarm Start	10	Start fire alarm in crew quarters
p3	Fire Alarm Stop		Stop fire alarm
e1-p1	Emergency PA	6	Overrides all other activities in system.
e1-p2	Message 1 to preselected zone	50	Only passenger zones
e1-p3	Message 2 to preselected zone	50	Only passenger zones
e1-p4	Message 3 to preselected zone	50	Only passenger zones
e1-p5	Message 4 to preselected zone	50	Only passenger zones
e1-p6	Program 1 in preselected zone	85	Start/stop program in passenger area
e1-p7	Program 2 in preselected zone	85	Start/stop program in crew/public area
e1-p8	Program 3 in preselected zone	85	Start/stop program in passenger area

Table 14: Key Definitions – AP-2

The PTT key and the three keys named p1, p2 and p3 are the keys on the ECPIR-3P access panel. The keys named E*x*-p*y* is the keys on the expansion modules where '*x*' is the expansion module number and '*y*' is the key number on that module. E.g. E1-p6 is key 6 on expansion module 1.

7.5.3 Access Panel AP-3

The AP-3 access panel is of the type ECPIR-3P and has 3 keys and one PTT key which must be configured.

Key	Function	Priority	Comments
ptt	Emergency PA to bridge	20	
p1	General Alarm	15	Start general alarm in all zones
p2	Fire Alarm	10	Start fire alarm in crew quarters
p3	Manual Alarm	12	Manual alarm to crew zones

Table 15: Key Definitions – AP-3

The PTT key and the three keys named p1, p2 and p3 are the keys on the ECPIR-3P access panel.

8 Exigo A-B System Configuration Example

The configuration procedure of the Exigo system will be carried out according to the reference list for an A-B system as specified in *Section 7 Configuration Reference List*. The configuration is done using the Exigo Management Tool installed on your PC.
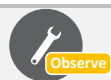
> **Observe**
>
> ***Exigo devices that are replaced can be configured remotely in EMT. See section 9.4.***

8.1 Central Rack Devices

The system controller, network amplifiers and access panels need to be configured with unique IP addresses using the embedded web interface. The directory numbers are automatically and sequentially created in the EMT.

Components in the example system comprising 2 system racks A and B are as follows:

Type	Description	Directory Number	Device Name	IP Address	Subnet	Location
ESC1	PSC - Domain Controller	-	-	10.5.11.11	255.255.255.0	System Rack A
ESC1	SSC	013010	ESC1 A	10.5.11.100	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012010	ENA2200-AC2 A1	10.5.11.110	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012020	ENA2200-AC2 A2	10.5.11.120	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012030	ENA2200-AC2 A3	10.5.11.130	255.255.255.0	System Rack A
ENA2200-AC2	Network Amplifier	012040	ENA2200-AC2 A4	10.5.11.140	255.255.255.0	System Rack A
	Network Switch	-		10.0.0.5		System Rack A

Table 16: Central Equipment – System A

Type	Description	Directory Number	Device Name	IP Address	Subnet	Location
ESC1	Domain Controller card	-	-	10.5.12.11	255.255.255.0	System Rack B
ESC1	System Controller card	023010	ESC1 B	10.5.12.100	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022010	ENA2200-AC2 B1	10.5.12.110	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022020	ENA2200-AC2 B2	10.5.12.120	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022030	ENA2200-AC2 B3	10.5.12.130	255.255.255.0	System Rack B
ENA2200-AC2	Network Amplifier	022040	ENA2200-AC2 B4	10.5.12.140	255.255.255.0	System Rack B
	Network Switch	-		10.0.1.5		System Rack B

Table 17: Central Equipment – System B

8.2 Configuring the System Controller

For the System Controller, the following two controller cards have to be configured:

- Primary System Controller / Domain Controller (AMC-IP card)
- Secondary System Controller (Turbine card)

Configuration is done via the system controller's web interface. After making sure that the system controller is connected to the same LAN and logical subnet as your PC, follow the procedure described below. Connection to the system controller is made via the **npe_eth0** port accessible behind the front panel of the ESC.

8.2.1 Primary System Controller

1. Open a web browser and enter the default IP address: **169.254.1.5**

2. Log in with username: **admin** and password: **alphaadmin**

3. Select **System Configuration** > **Interfaces**

4. Enter the IP address for System A in the **npe_eth1** field: **10.5.11.11**

   o **The address entered here is the IP address of the primary system controller**

5. Select **System Configuration** > **Filters**

   o Configure the **Firewall Filter Settings** as described in section 6.1.1.1

After configuring the primary system controller in System A, follow the same procedure described above to configure the primary system controller in System B, i.e. with IP address: **10.5.12.11**.

8.2.2 Secondary System Controller

When the system controller is connected to the network, the IP address is automatically obtained in one of two ways:

1. An IP address is obtained from a DHCP server if there is one.

2. If there is no DHCP server, an IP address in the range **169.254.x.x** will be assigned.

4. Turn the control knob on the system controller to select **Settings** > **Network** to see the IP address on the display.

To configure the IP address and directory number:

1. Open a web browser and enter IP address: **169.254.x.x**

2. Log in with username: admin and password: **alphaadmin**

3. Select **Station Main** > **Main Settings**

System Controller in System A

Set the following values:

- Station Mode: **Use Exigo**

- Registration Settings:

  - Domain Controller IP: **10.5.11.11** (IP address previously set in System A **npe_eth1**)

  - Directory Number: **013010** (corresponds to the **Directory Number** automatically assigned to the system controller in the Exigo Management Tool)

- IP Settings: **Static IP**

  - IP-address: **10.5.11.100**

  - Subnet-mask: **255.255.255.0**

  - Gateway: **10.5.11.1** (example Default Gateway address)

System Controller in System B

Set the following values:

- Station Mode: **Use Exigo**

- Registration Settings:

  - Domain Controller IP: **10.5.12.11** (IP address previously set in System B **npe_eth1**)

  - Directory Number: **023010** (corresponds to the **Directory Number** automatically assigned to the system controller in the Exigo Management Tool)

- IP Settings: **Static IP**

  - IP-address: **10.5.12.100**

  - Subnet-mask: **255.255.255.0**

  - Gateway: **10.5.12.1** (example Default Gateway address)

8.3   Configuring the Amplifier

The procedure described below is a basic configuration for the amplifier to connect to the Domain Controller. Configuration is done via the amplifier's web interface. After the amplifier is connected to the same LAN and logical subnet as your PC, follow the IP address is automatically obtained in one of two ways:

1. An IP address is obtained from a DHCP server if there is one.

2. If there is no DHCP server, an IP address in the range 169.254.x.x will be assigned.

3. Turn the control knob on the amplifier to select **Settings** > **Network** to see the IP address on the display.

To configure the IP address and directory number:

1. Open a web browser and enter IP address: 169.254.x.x

2. Log in with username: admin and password: alphaadmin

3. Select **Station Main** > **Main Settings**

Amplifier in System A

Set the following values:

- Station Mode: **Use Exigo**
- Registration Settings:
    - Domain Controller IP: **10.5.11.11** (IP address previously set in System A)
    - Directory Number: **012010** (corresponds to the **Directory Number** automatically assigned to the amplifier in the Exigo Management Tool)
- IP Settings: **Static IP**
    - IP-address: **10.5.11.110** (IP address of System A Amplifier)
    - Subnet-mask: **255.255.255.0**
    - Gateway: **10.5.11.1** (example Default Gateway address)

Follow the same setup procedure for each amplifier in System A. The directory numbers for amplifiers in System A according to Table 22 above are: 012010, 012020, 012030, 012040.

Amplifier in System B

Set the following values:

- Station Mode: **Use Exigo**
- Registration Settings:
    - Domain Controller IP: **10.5.12.11** (IP address previously set in System B)
    - Directory Number: **022010** (corresponds to the **Directory Number** automatically assigned to the amplifier in the Exigo Management Tool)
- IP Settings: **Static IP**
    - IP-address: **10.5.12.110** (IP address of System B Amplifier)
    - Subnet-mask: **255.255.255.0**
    - Gateway: **10.5.12.1** (example Default Gateway address)

Follow the same setup procedure for each amplifier in System B. The directory numbers for amplifiers in System B according to Table 23 above are: 022010, 022020, 022030, 022040.

8.4 Configuring the Access Panels

Access Panels

Type	Description	Directory Number	Device Name	IP Address	Subnet	Location
ECPIR-3P	Call Panel, PTT + 3 Keys	011010	AP-1	10.5.11.200		Bridge
EBMDR	Expansion Module, 8 Keys					Bridge
EBMDR	Expansion Module, 8 Keys					Bridge
ECPIR-3P	Call Panel, PTT + 3 Keys	011020	AP-2	10.5.11.210		Bridge
EBMDR	Expansion Module, 8 Keys					Bridge
ECPIR-3P	Call Panel, PTT + 3 Keys	011030	AP-3	10.5.11.220		ECR

Table 18: Access Panels in the System

Configuration is done via the access panel's web interface. After making sure that the access panel is connected to the same LAN and logical subnet as your PC, follow the procedure described below. The configuration example below is for an ECPIR-3P access panel and we assume that it will be registered in System A.

To configure the IP address and directory number:

1. Open a web browser and enter IP address: **169.254.x.x**

2. Login with username: **admin** and password: **alphaadmin**

3. Select **Station Main** > **Main Settings**

Set the following values:

- Station Mode: **Use Exigo**

- Registration Settings:

- o Domain Controller IP: **10.5.11.11** (IP address previously set in System A)
  - o Directory Number: **011010** (corresponds to the **Directory Number** automatically assigned to the access panel in the Exigo Management Tool)
- IP Settings: **Static IP**
  - o IP-address: **10.5.11.200** (IP address of Access Panel)
  - o Subnet-mask: **255.255.255.0**
  - o Gateway: **10.5.11.1** (example Default Gateway address)

Follow the same setup procedure for each panel in the system. The directory numbers for access panels in the system according to Table 24 above are: 011010, 011020, 011030.

8.5 Setting Up the Project Using EMT

> **NOTE** *Download latest release of EMT from Zenitel web*

- Start the Exigo Management Tool
- Click **Projects** at the lower-left of the window.
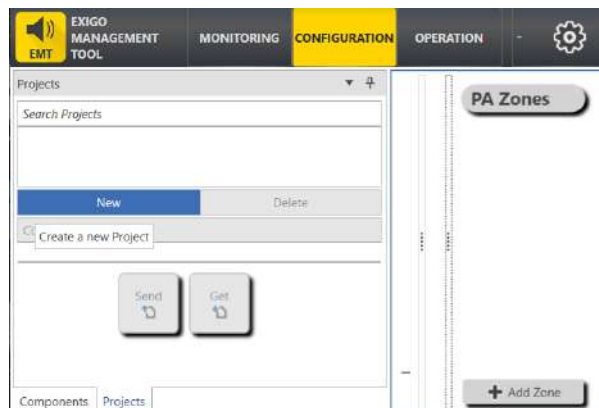
- Click **New**

- Click the **New Database** tab
- Click the right-arrow icon at the bottom of the window
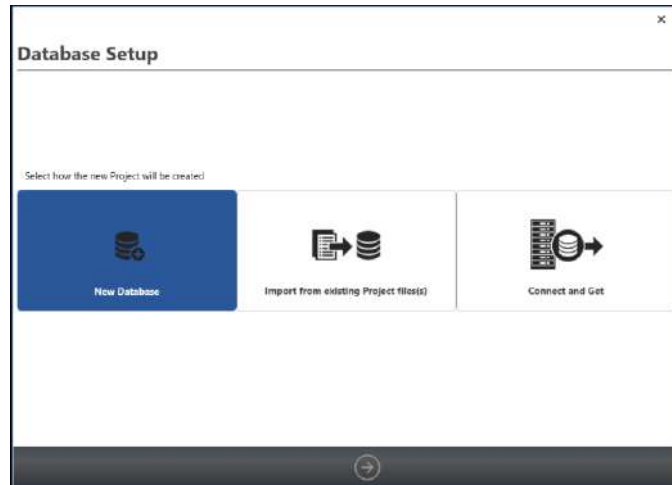
- Enter a project name in the **Project Name** field
- Select the **A-B System** tab
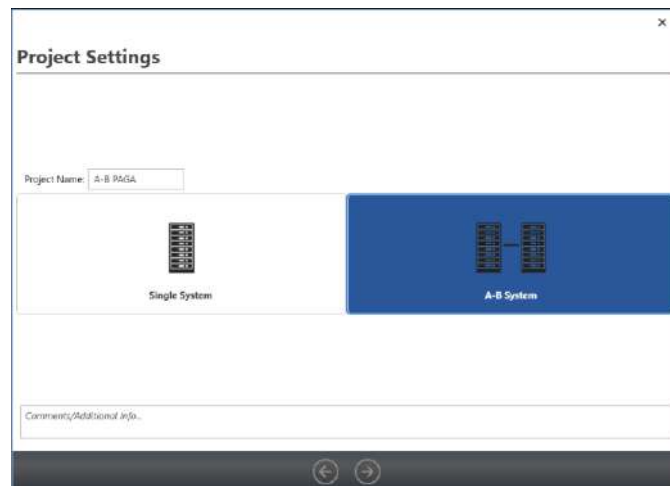
- Click the right-arrow icon at the bottom of the window
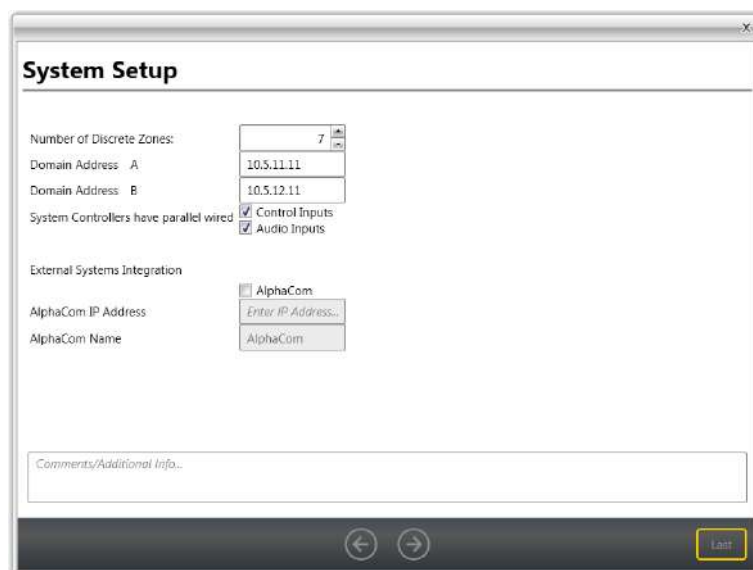
- Set **7** for the **Number of Discrete Zones**
- Enter IP address **10.5.11.11** in **Domain Address A**
- Enter IP address **10.5.12.11** in **Domain Address B**
- Check the box for parallel wired **Control Inputs**
- Check the box for parallel wired **Audio Inputs**
- Click the right-arrow icon at the bottom of the window

- Click the **right-arrow** icon at the bottom of the window

You can make the following settings:

Rack Devices

- **Eth Port Monitoring** (default = selected for **Eth1**, **Eth2**)

- **AC Monitoring** (default = not selected)

- **DC Monitoring** (default = not selected)

- **Amplifier Line Voltage** (**100 Volt** or **70 Volt**)

- **Report Line Faults as Warning** (default = not selected)

- **Missing Device Reporting** (**In Primary**, **Both**, or **None**)

Access Panels and Kits

- **Eth Port Monitoring** (default = selected for **Eth1**, **Eth2**)

- **Missing Device Reporting**
    - **IP Speakers and Kits** (**In Primary**, **Both**, or **None**)
    - **Access Panels** (**In Primary**, **Both**, or **None**)

System Settings

- **Audio Device Mode** (**HD Audio** or **Voice**)

- Click the **right-arrow** icon at the bottom of the window

Select the **Advanced Settings** required for:

- Set the number **4** for **Audio Messages** (default = 5)

- Set the number **3** for **Audio Programs** (default = 2)

- Set the number of **Chimes** (default = 2)

- Set the number of **External Fault Sources** (default = 0)

- Set the number of **Flowires** (default = 0)

- Set the number of **Local Mutes** (default = 5)

- Click the **right-arrow** icon at the bottom of the window to display a project summary

- Click **Finish** to complete the setup of the project

After setup, your Exigo system should look something like the following:

8.6 Assigning Amplifiers to System A & B

8 amplifiers will be assigned to each system.

- Select **Components** > **Devices**

- Under **Rack Mounted Devices** click **ENA2200-AC2**
  - Check the **Add Multiple devices** box
  - Enter **8** in the drop-down box
- Drag-and-drop **ENA2200-AC2** to **System**
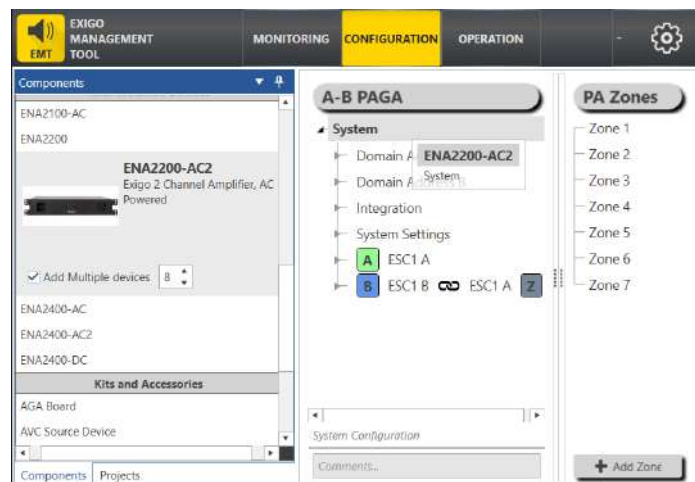
A dialog-box is displayed:
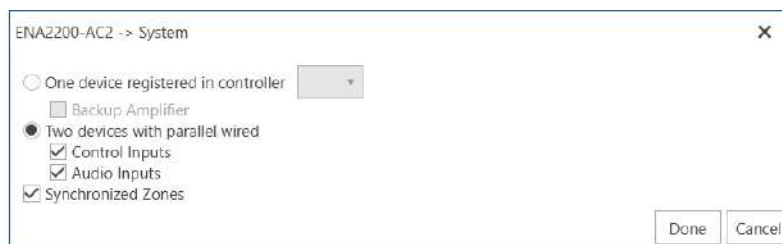
- Select the options for the A-B system, in this example, **parallel wired** for **Control Inputs** and **Audio Inputs**

- Click **Done**
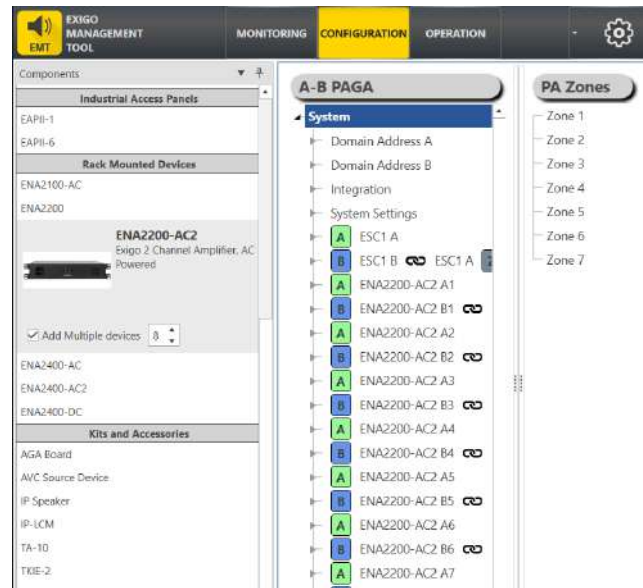
All the 8 ENA2200-AC2 amplifiers will now be automatically assigned to both the A and B systems.

8.6.1 Missing Reporting Parameter

In an A-B System, there are several options for choosing where to report a 'missing device' fault.

- Select the assigned **ENA2200-AC2**
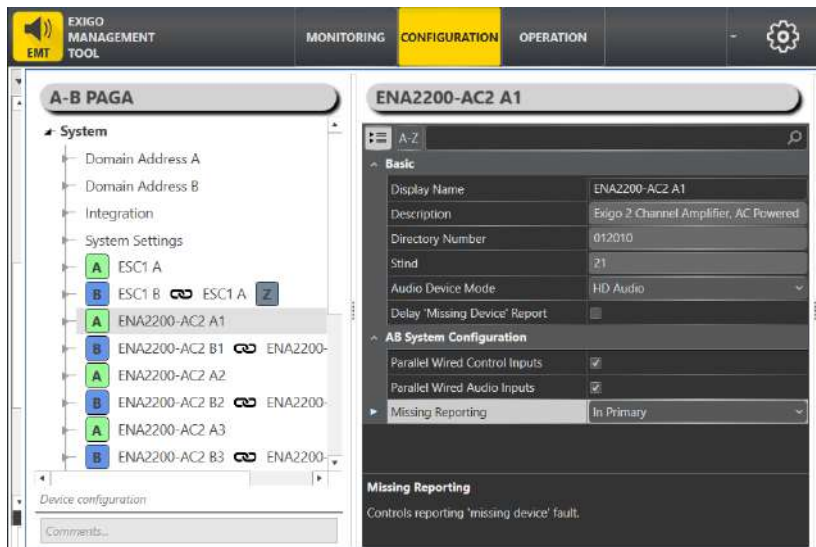
- Open the drop-down box in the **Missing Reporting** field for options:
  - In Both (default for Access Panel)
  - In Primary (default for Amplifier)
  - None

In Primary means that amplifiers in B will be reported missing only in the B system controller. **In Both** means that amplifiers will be reported missing in both the A and B system controllers.

8.7 Assigning Channels on Amplifier to Zones

Assign the channels according to the following tables for Loop A and Loop B for 7 zones.

Zones Loop A

Loop	Type	Amplifier	Channel	Mon	LETs	Z1	Z2	Z3	Z4	Z5	Z6	Z7
A1	ENA2200-AC2	ENA2200-AC2 A1	1	On	2	88W						
A2	ENA2200-AC2	ENA2200-AC2 A1	2	On	2		75W					
A3	ENA2200-AC2	ENA2200-AC2 A2	1	On	3		104W					
A4	ENA2200-AC2	ENA2200-AC2 A2	2	On	7			105W				
A5	ENA2200-AC2	ENA2200-AC2 A3	1	On	4				97W			
A6	ENA2200-AC2	ENA2200-AC2 A3	2	On	1					116W		
A7	ENA2200-AC2	ENA2200-AC2 A4	1	On	0						90W	
A8	ENA2200-AC2	ENA2200-AC2 A4	2	On	1							116W
Watts per zone:						88W	179W	105W	97W	116W	90W	116W

Zones Loop B

Loop	Type	Amplifier	Channel	Mon	LETs	Z1	Z2	Z3	Z4	Z5	Z6	Z7
B1	ENA2200-AC2	ENA2200-AC2 B1	1	On	2	88W						
B2	ENA2200-AC2	ENA2200-AC2 B1	2	On	2		75W					
B3	ENA2200-AC2	ENA2200-AC2 B2	1	On	3		104W					
B4	ENA2200-AC2	ENA2200-AC2 B2	2	On	7			105W				
B5	ENA2200-AC2	ENA2200-AC2 B3	1	On	4				97W			
B6	ENA2200-AC2	ENA2200-AC2 B3	2	On	1					116W		
B7	ENA2200-AC2	ENA2200-AC2 B4	1	On	0						90W	
B8	ENA2200-AC2	ENA2200-AC2 B4	2	On	1							116W
Watts per zone:						88W	179W	105W	97W	116W	90W	116W

According to the above table for Loop A, start by assigning channel ch1 on the amplifier ENA2200-AC2 1-1 to Zone 1:

- Select **ENA2200-AC2 A1** > **Audio Lines** > **Amplifier output channel 1**

- Drag-and-drop **Amplifier output channel 1** to **Zone 1** under **PA Zones**
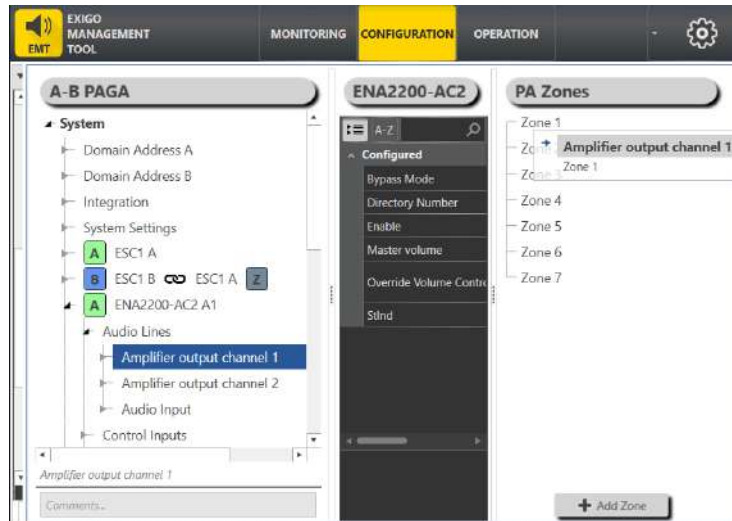
- Repeat the procedure to assign all the channels 1 and 2 on the amplifiers to each zone.

You only need to do this for System A as the **ENA2200-AC2 A** amplifier channels will be automatically replicated in parallel in the System B **ENA2200-AC2 B** amplifier channels in each zone.
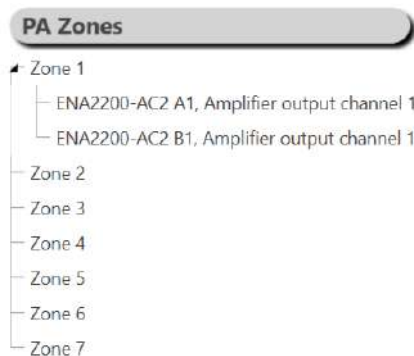
After the amplifiers and channels have been assigned, they can be freely moved among the zones by dragging and dropping them to the destination zones. They can also be deleted.

8.8   Setting up the Zones

7 Zones have been designated:

Zone	Display Name	Description
1	Crew Cabins	Cabins/Bathrooms Crew
2	Crew Accom	Accommodation/Corridors Crew
3	Passenger Cabins	Cabins/Bathrooms Passengers
4	Passenger Accom	Accommodation/Corridors Passengers
5	Engine Room	Engine Room Area
6	Lifeboats	Lifeboat Area
7	Open Deck	Open Deck Area

- Enter the Display Name and Description for each zone according to the above table.

For example, to set up Zone 1:

- Click Zone 1 under PA Zones

- Enter the relevant data into the **Description** field, in this case: **Cabins/Bathrooms Crew**

- Enter the relevant data into the **Display Name** field, in this case: **Crew Cabins**

- Click **Done**

The name of the zone will now be displayed under PA Zones.

- Repeat the above procedure for each zone.

After entering the display names for all the zones, the zone configuration should look like this:

8.9   Programming Control Inputs

Input ID	Action	Priority	Functions	Trigger	Zones	Comment
ESC1 A.I1	Start fire alarm	1	Fire system follow	Release	Crew Area	Monitored, normally open
ESC1 A.I2	Custom fault	-	Fault relay data switch-1	Press	-	
ESC1 A.I3	Custom fault	-	Fault relay data switch-2	Press	-	
ESC1 A.I4	Toggle Alarm #4	12	Alarm	Toggle	Crew Area	Monitored, toggle alarm
ESC1 A.I5	Toggle Alarm #5	13	Alarm	Toggle	Crew Area	Toggle Alarm

ESC1 A.I1 = System Controller 1A, input number 1

To configure **Start & Stop Fire Alarm Action** on System Controller ESC1 A, input 1:

- Click **Components** at the lower-left of the window.

- Click **Input Actions** and select **Alarm Control** from the menu box

- Drag-and-drop **Alarm Control** to **ESC1 A** > **Control Inputs** > **CI_1** > **on_action**
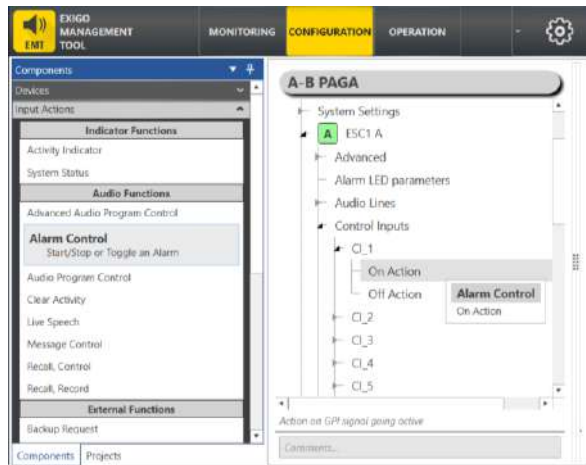
- Enter the following values in the dialog-box displayed
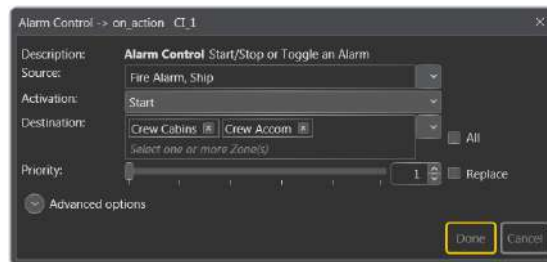
- Drag-and-drop **Alarm Control** to **ESC1 A** > **Control Inputs** > **CI_1** > **off_action**
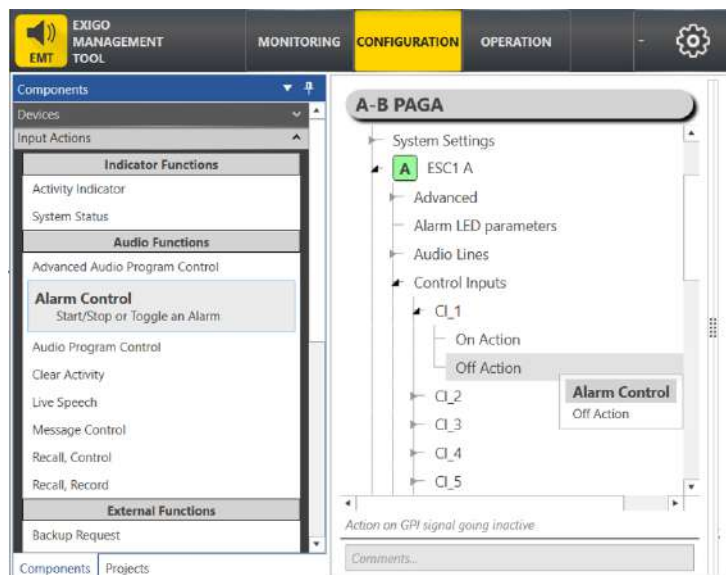
- Enter the following values in the dialog-box displayed
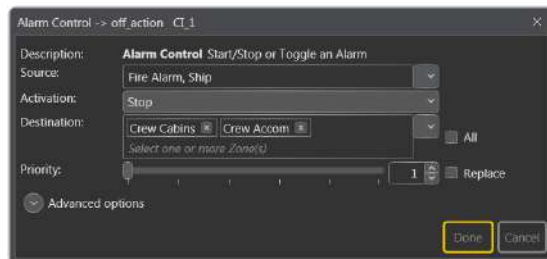
- Repeat the above procedure for each input action that needs to be programmed.

> **NOTE**
> *This input action will start the fire alarm in the selected zones when the control input is closed. The alarm will stop when the control input is released.*

The Alarm Control Input set in System A controller will be automatically replicated in parallel in the System B controller.

8.10 Programming Control Outputs

Output ID	Description	Trigger situation
ESC1 A.O1	Mute typhoon/foghorn	During Emergency PA
ESC1 A.O2	Mute alarm	During Emergency PA
ENA2200-AC2 A1.O1	Signal unit - zone 5	During Alarm or Emergency PA (Engine Area)
ENA2200-AC2 A1.O2	Signal unit - zone 5	During Normal PA (Engine Area)
ENA2200-AC2 A1.O3	Volume override	Any PA activity with priority higher than 20 in any zone
ENA2200-AC2 A1.O4	Mute entertainment	Any PA activity with priority 30 or higher in any zone

ESC1 A.O1 = System Controller 1A, output number 1
ENA2200-AC2 A1.O3 = Amplifier 1A, output number 3

To configure **Mute typhoon/foghorn** on System Controller ESC1 A, output 1:

- Click **Components** at the lower-left of the window.
- Click **Output Actions** and select **Audio Activity** from the menu box
- Drag-and-drop **Audio Activity** to **ESC1 A** > **Control Outputs** > **CO_1**
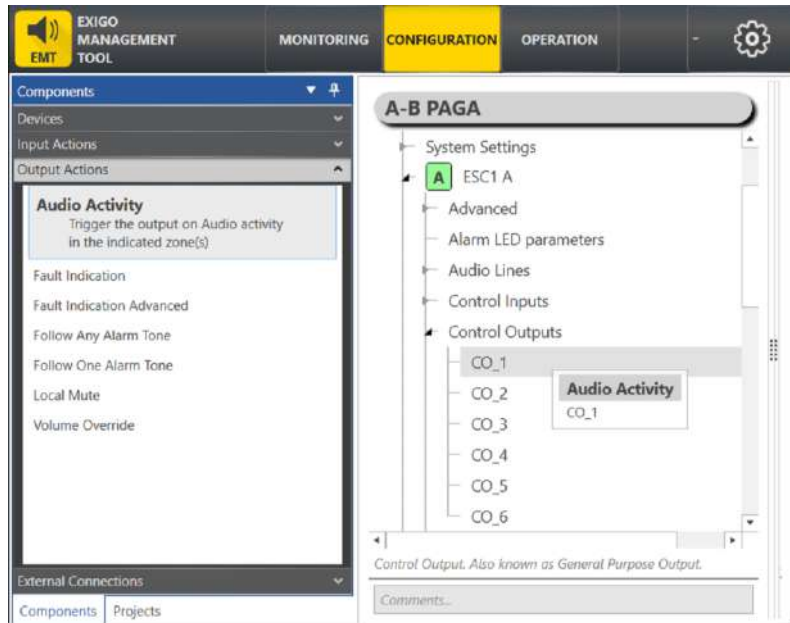
- Enter the following values in the dialog-box displayed
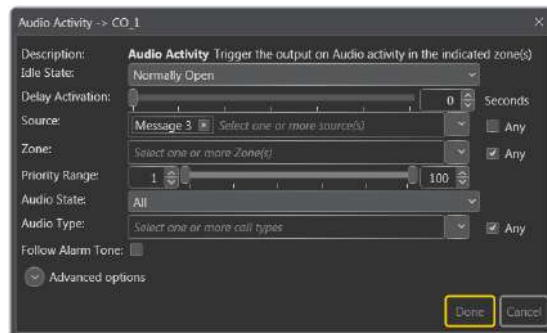
- Repeat the procedure for the rest of the output actions in the programming reference list for Control Outputs.

> **NOTE** *This control output will toggle when Message 3 is broadcast to any of the zones selected.*

8.11 Programming Audio Inputs

System	Type	Device	Input	Phantom	Monitored	Description	Program input ID
A	ESC1	ESC1 A	Mic	Yes	Yes	Microphone 1	
A	ESC1	ESC1 A	Line	Yes	No	CD player 1	Program 1
A	ENA2200-AC2	ENA2200-AC2 A1	Mic				
A	ENA2200-AC2	ENA2200-AC2 A1	Line	Yes	No	Computer 1	Program 2
A	ENA2200-AC2	ENA2200-AC2 A2	Mic				
A	ENA2200-AC2	ENA2200-AC2 A2	Line	Yes	No	Elevator music	Program 3
A	ENA2200-AC2	ENA2200-AC2 A3	Mic				

A	ENA2200-AC2	ENA2200-AC2 A3	Line				
A	ENA2200-AC2	ENA2200-AC2 A4	Mic				
A	ENA2200-AC2	ENA2200-AC2 A4	Line				
B	ESC1	ESC1 B	Mic	Yes	Yes	Microphone 2	
B	ESC1	ESC1 B	Line	Yes	No	CD player 2	Program 1
B	ENA2200-AC2	ENA2200-AC2 B1	Mic				
B	ENA2200-AC2	ENA2200-AC2 B1	Line	Yes	No	Computer 2	Program 2
B	ENA2200-AC2	ENA2200-AC2 B2	Mic				
B	ENA2200-AC2	ENA2200-AC2 B2	Line	Yes	No	Elevator music	Program 3
B	ENA2200-AC2	ENA2200-AC2 B3	Mic				
B	ENA2200-AC2	ENA2200-AC2 B3	Line				
B	ENA2200-AC2	ENA2200-AC2 B4	Mic				
B	ENA2200-AC2	ENA2200-AC2 B4	Line				

Assign the audio inputs to the system controller or amplifier according to the table above.

For example, to assign Program 1 to the audio line of the system controller:

- Select **Components** > **External Connections** > **Audio Program Source**
- Drag-and-drop **Audio Program Source** to **ESC1 A** > **Audio Lines** > **Audio Input**
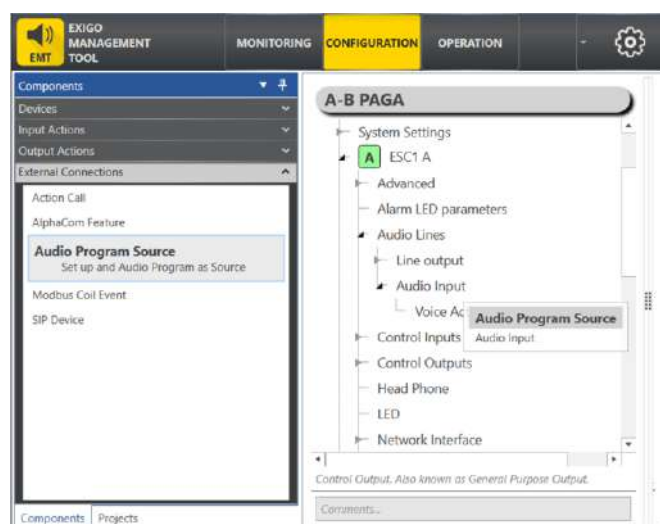
- Set **Program number** to **Program 1** in the dialog-box displayed
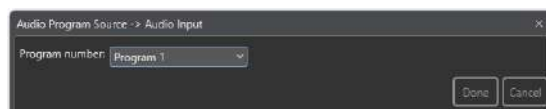
- Repeat the procedure for Program 2 and Program 3.

The Audio Program Source set in the System A controller will be automatically replicated in parallel in the System B controller.

8.12 Programming the Line End Transponders

Each amplifier can have a total of 10 LETs (ELTSI-1) divided among the channels.

Loop	Amplifier	Channel	LET 1	LET 2	LET 3	LET 4	LET 5	LET 6	LET 7	LET 8	LET 9	LET 10	# LETs

Loop	Amplifier	Channel	LET 1	LET 2	LET 3	LET 4	LET 5	LET 6	LET 7	LET 8	LET 9	LET 10	# LETs
A1	ENA2200-AC2 A1	1	X	X									2
A2	ENA2200-AC2 A1	2									X	X	2
A3	ENA2200-AC2 A2	1	X	X	X								3
A4	ENA2200-AC2 A2	2				X	X	X	X	X	X	X	7
5A	ENA2200-AC2 A3	1	X	X	X	X							4
A6	ENA2200-AC2 A3	2										X	1
A7	ENA2200-AC2 A4	1											0
A8	ENA2200-AC2 A4	2										X	1

Loop	Amplifier	Channel	LET 1	LET 2	LET 3	LET 4	LET 5	LET 6	LET 7	LET 8	LET 9	LET 10	# LETs
B1	ENA2200-AC2 B1	1	X	X									2
B2	ENA2200-AC2 B1	2									X	X	2
B3	ENA2200-AC2 B2	1	X	X	X								3
B4	ENA2200-AC2 B2	2				X	X	X	X	X	X	X	7
B5	ENA2200-AC2 B3	1	X	X	X	X							4
B6	ENA2200-AC2 B3	2										X	1
B7	ENA2200-AC2 B4	1											0
B8	ENA2200-AC2 B4	2										X	1

For example, to program LET 1 on Channel 1 on amplifier ENA2200-AC2 A1:

- Select **ENA2200-AC2 A1** > **Audio Lines** > **Amplifier output channel 1** > **Line End Transponders**
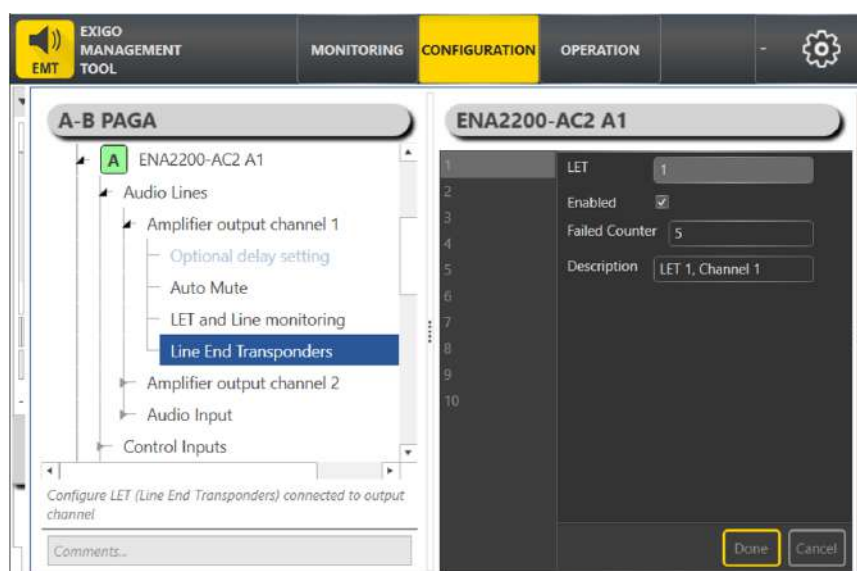
- Check the **Enabled** box

- Click **Done**

- Repeat the procedure for the rest of the LETs on the loop.

8.13 Programming the Access Panels

In an A-B system the access panels can be registered either in System A or System B.

Type	Description	Directory Number	Device Name	IP Address	Subnet	Location
ECPIR-3P	Call Panel, PTT + 3 Keys	011010	ECPIR-3P A1	10.5.11.200		Bridge
EBMDR-8	Expansion Module, 8 Keys		-			Bridge
EBMDR-8	Expansion Module, 8 Keys		-			Bridge
ECPIR-3P	Call Panel, PTT + 3 Keys	011020	ECPIR-3P A2	10.5.11.210		Bridge
EBMDR-8	Expansion Module, 8 Keys		-			Bridge
ECPIR-3P	Call Panel, PTT + 3 Keys	011030	ECPIR-3P A3	10.5.11.220		ECR

The AP-1 access panel is of the type ECPIR-3P and has 3 keys and one PTT key. It is also integrated with two EBMDR-8 expansion modules which add 16 additional keys.

In our example, the following panels will now be programed according to the table below:

Key	Function	Priority	Comments
PTT	PA to selected zone	15	Normal PA, timeout 3 seconds
p1	General Alarm	12	Toggle general alarm in all zones
p2	Fire Alarm Start	10	Start fire alarm in crew quarters
p3	Fire Alarm Stop	-	Cancel fire alarm in crew quarters
e1-p1	Emergency PA	6	Overrides all other activities in system. Timeout 3 seconds.
e1-p2	Manual alarm in public zones	8	Manual alarm in all zones except passenger cabins
e1-p3	Message 1 to preselected zone	50	Only passenger zones
e1-p4	Message 2 to preselected zone	50	Only passenger zones
e1-p5	Message 3 to preselected zone	50	
e1-p6	Message 4 to preselected zone	50	
e1-p7	Program 1 in preselected zone	85	Start/stop program in passenger area
e1-p8	Program 2 in preselected zone	85	Start/stop program in crew/public area
e2-p1	Zone select 1	-	Dynamically select zone 1 - Crew Cabins
e2-p2	Zone select 2	-	Dynamically select zone 2 - Crew Accom
e2-p3	Zone select 3	-	Dynamically select zone 3 - Passenger Cabins
e2-p4	Zone select 4	-	Dynamically select zone 4 - Passenger Accom
e2-p5	Zone select 5	-	Dynamically select zone 5 - Engine Room
e2-p6	Zone select 6	-	Dynamically select zone 6 - Lifeboats
e2-p7	Zone select 7	-	Dynamically select zone 7 - Open Deck
e2-p8	Local Mute	-	Local Mute to be Activated from Access Panel Key

8.13.1 Assigning the Panel ECPIR-3P to the System

According to the table above, three ECPIR-3P access panels should be assigned.

- Select **Components** > **Devices**

- Under **Console Mounted Access panels** click **ECPIR-3P**
  - o Check the **Add Multiple devices** box
  - o Enter **3** in the drop-down box

- Drag-and-drop **ECPIR-3P** on **System**
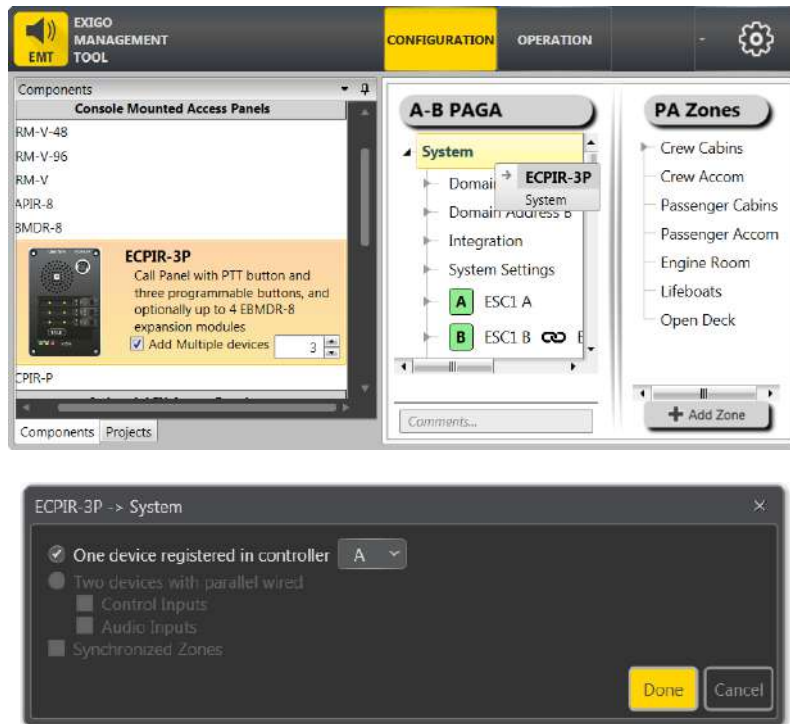
- Select **A** for **One device registered in controller**

- Click **Done**

The access panels will now appear as **ECPIR-3P A1**, **ECPIR-3P A2**, **ECPIR-3P A3** in the device list under **System**.

8.13.2 Assigning EBMDR-8 Expansion Module to Panel ECPIR-3P A1

- Select **Components** > **Devices** > **EBMDR-8**

- Drag-and-drop **EBMDR-8** on **ECPIR-3P A1**
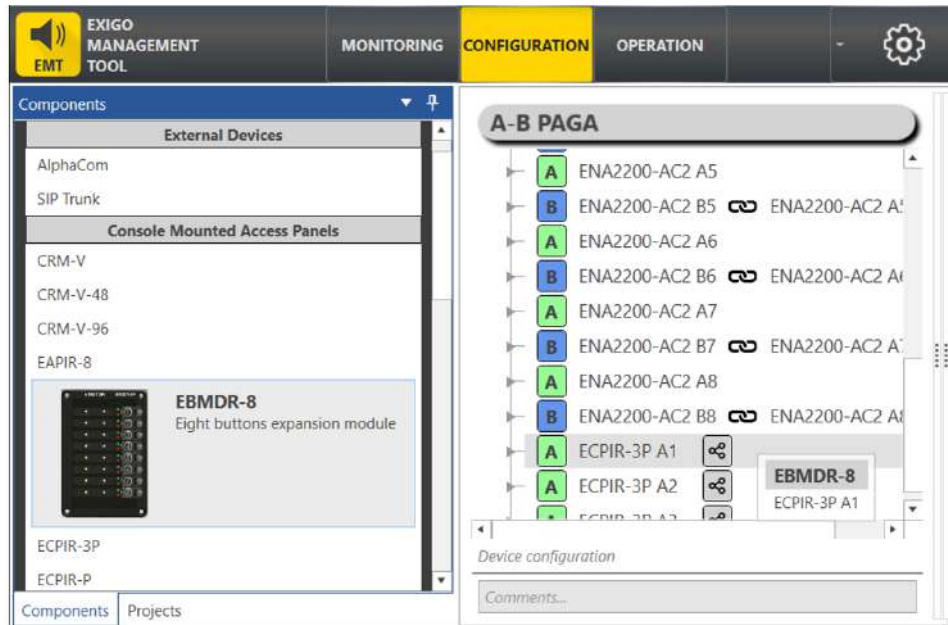
A dialog-box is displayed:
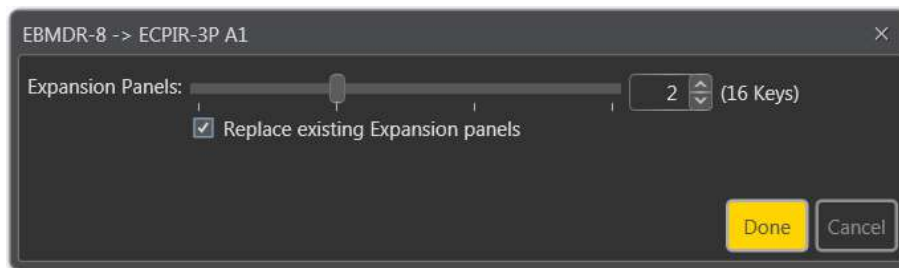
- Since two EBMDR-8 modules will be assigned to **ECPIR-3P A1** select the value **2** for **16 keys**

- Click **Done**

16 extra keys **e1-p1** to **e1-p8** and **e2-p1** to **e2-p8** will now be added under **ECPIR-3P A1** > **Programmable Keys**.

8.13.3 Programming the Keys on the ECPIR-3P Access Panel

Key	Function	Priority	Comments
PTT	PA (Live Speech) to passenger zone	15	Normal PA, timeout 3 seconds
p1	General Alarm	12	Toggle general alarm in all zones
p2	Fire Alarm Start	10	Start fire alarm in crew quarters
p3	Fire Alarm Stop	10	Cancel fire alarm in crew quarters

8.13.3.1 Programming Normal PA

> **NOTE**
>
> *Live Speech is, by default, preconfigured on the **PTT** key of the **ECPIR-3P** access panels. By default, the parameters **press_action** is preconfigured to **Start Live Speech** and **release_action** is preconfigured to **Stop Live Speech**.*

To program the **PTT** key on panel **ECPIR-3P A1** as normal PA for passenger zones, chime, etc.:

- Select **Programmable Keys** > **ptt** > **press_action - Live Speech** under **ECPIR-3P A1**
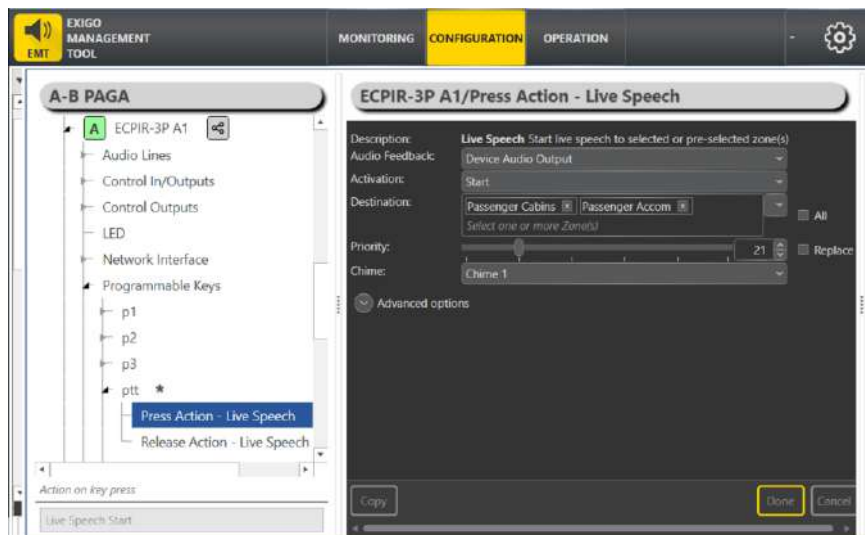
- Set the above values in the dialog-box displayed

8.13.3.2 Programming General Alarm

To program the function key **p1** on panel **ECPIR-3P A1** as General Alarm:

- Select **Components** > **Input Actions** > **Alarm Control**
- Drag-and-drop **Alarm Control** on **ECPIR-3P A1** > **Programmable Keys** > **p1**
- Set the following values in the dialog-box
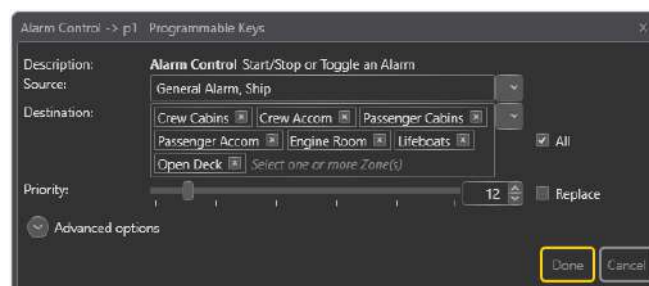
- Since General Alarm is broadcast to all zones, check the **All** box for **Destination**

- Click **Done**

For the **p1** key:

  o **press_action** will be automatically configured to **Start** the General Alarm

- o **release_action** will be automatically configured to **Stop** the General Alarm

8.13.3.3 Programming Fire Alarm

To program the function key **p2** on panel **ECPIR-3P A1** for starting the Fire Alarm:

- Select **Components** > **Input Actions** > **Alarm Control**

- Drag-and-drop **Alarm Control** on **ECPIR-3P A1** > **Programmable Keys** > **p2** > **press_action**

- Set the following values in the dialog-box
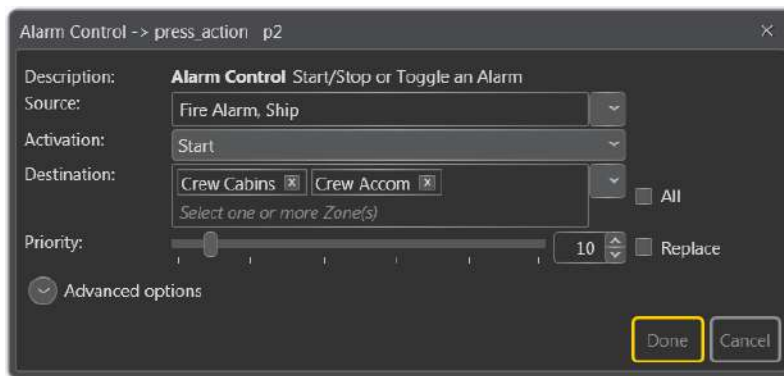
- Select **Fire Alarm, Ship** in the **Source** field
- Select **Start** in the **Activation** field

The Fire Alarm is only broadcast to the zones where the crew quarters are located.

To program the function key **p3** on panel **ECPIR-3P A1** for stopping the Fire Alarm:

- Select **Components** > **Input Actions** > **Alarm Control**

- Drag-and-drop **Alarm Control** on **ECPIR-3P A1** > **Programmable Keys** > **p3** > **press_action**

- Set the following values in the dialog-box
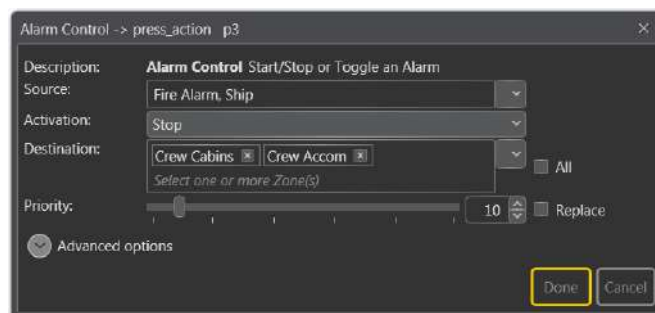
- Select **Fire Alarm, Ship** in the **Source** field
- Select **Stop** in the **Activation** field

8.13.4 Programming Keys on the EBMDR-8 Expansion Module

Key	Function	Priority	Comments
e1-p1	Emergency PA	6	Overrides all other activities in system. Timeout 3 seconds.
e1-p2	Manual alarm in public zones	8	Manual alarm in all zones except passenger areas
e1-p3	Message 1 to preselected zone	50	Only passenger areas
e1-p4	Message 2 to preselected zone	50	Only passenger areas
e1-p5	Message 3 to preselected zone	50	
e1-p6	Message 4 to preselected zone	50	
e1-p7	Program 1 in preselected zone	85	Start/stop program in passenger areas
e1-p8	Program 2 in preselected zone	85	Start/stop program in crew/public areas

8.13.4.1 Programming Emergency PA

To program the **e1-p1** key on the EBMDR-8 as Emergency PA broadcasting to all zones:

- Select **Components** > **Input Actions** > **Live Speech**

- Drag-and-drop **Live Speech** on **ECPIR-3P A1** > **Programmable Keys** > **e1-p1** > **press_action**

- Set the following values in the dialog-box
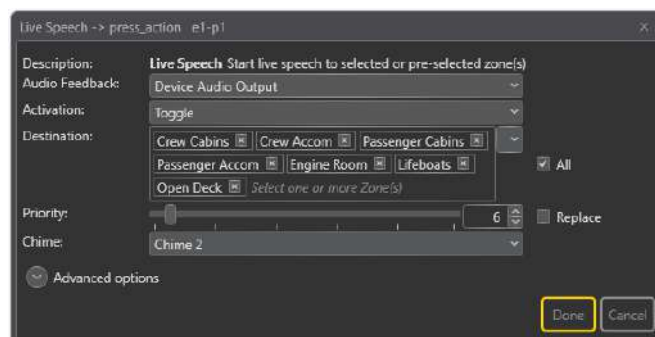
Emergency PA always has the highest priority of all the broadcasts, which in this case is 6, and is broadcast to all zones.

8.13.4.2 Programming Manual Alarm

To program the function key **e1-p2** on panel **ECPIR-3P A1** for starting the Manual Alarm:

- Select **Components** > **Input Actions** > **Alarm Control**

- Drag-and-drop **Alarm Control** on **ECPIR-3P A1** > **Programmable Keys** > **e1-p2** > **press_action**

- Set the following values in the dialog-box
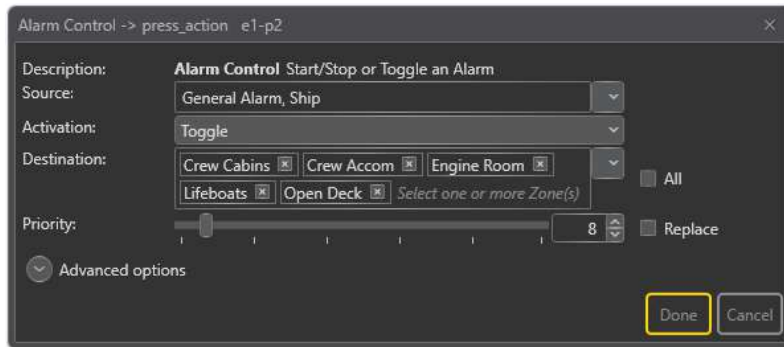
- Select **General Alarm, Ship** in the **Source** field
- Select **Toggle** in the **Activation** field

The Manual Alarm is broadcast to all zones except for the passenger quarters.

8.13.4.3 Programming Messages

In our example, the available prerecorded messages are as follows:

Message ID	Name	Description	Filename	Storage Location
1	Dinner 1	Played when dinner is served.	msg1.wav	ESC1 A, ESC1 B
2	Dinner 2	Played when dinner is finished.	msg2.wav	ESC1 A, ESC1 B
3	Greeting 1	Played when boat leaves port.	greeting.wav	ESC1 A, ESC1 B
4	Shop open	Played when shops are opened.	shops.wav	ESC1 A, ESC1 B

To program the **e1-p3** Key on the EBMDR-8 to broadcast Message 1 to passenger zones:

- Select **Components** > **Input Actions** > **Message Control**

- Drag-and-drop **Message Control** on **ECPIR-3P A1** > **Programmable Keys** > **e1-p3** > **press_action**

- Set the following values in the dialog-box
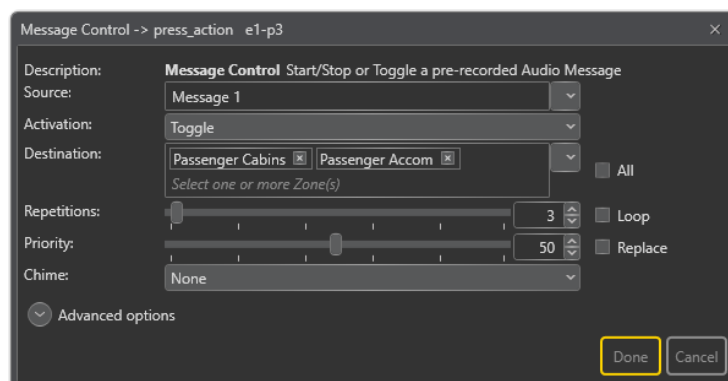
- Repeat the above procedure to program Message 2, Message 3, and Message 4 for the keys e1-p4, e1-p5, e1-p6 respectively.

8.13.4.4 Programming Audio Programs

To program the **e1-p7** key on the EBMDR-8 to broadcast Program 1 to the passenger zones:

- Select **Components** > **Input Actions** > **Audio Program Control**

- Drag-and-drop **Audio Program Control** on **ECPIR-3P A1** > **Programmable Keys** > **e1-p7** > **press_action**
- Set the following values in the dialog-box
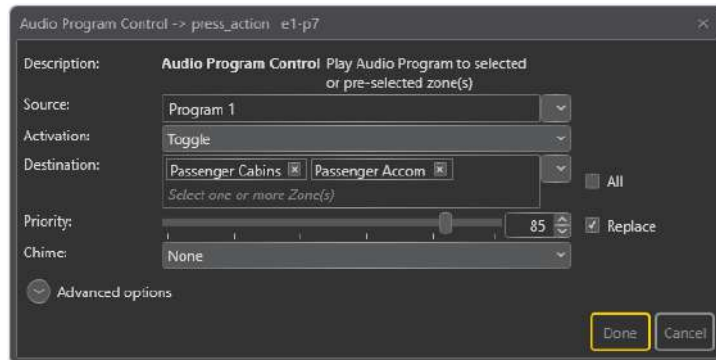
- Repeat the procedure for Program 2 for the key e1-p8.

8.13.4.5 Programming Zone Selection

Key	Function	Priority	Comments
e2-p1	Zone select 1	-	Dynamically select zone 1 - Crew Cabins
e2-p2	Zone select 2	-	Dynamically select zone 2 - Crew Accom
e2-p3	Zone select 3	-	Dynamically select zone 3 - Passenger Cabins
e2-p4	Zone select 4	-	Dynamically select zone 4 - Passenger Accom
e2-p5	Zone select 5	-	Dynamically select zone 5 - Engine Room
e2-p6	Zone select 6	-	Dynamically select zone 6 - Lifeboats
e2-p7	Zone select 7	-	Dynamically select zone 7 - Open Deck

To program the **e2-p1** key on the second EBMDR-8 to select Zone 1 (Crew Cabins):

- Select **Components** > **Input Actions** > **Zone Selection**
- Drag-and-drop **Zone Selection** on **ECPIR-3P A1** > **Programmable Keys** > **e2-p1** > **press_action**
- Set the following values in the dialog-box
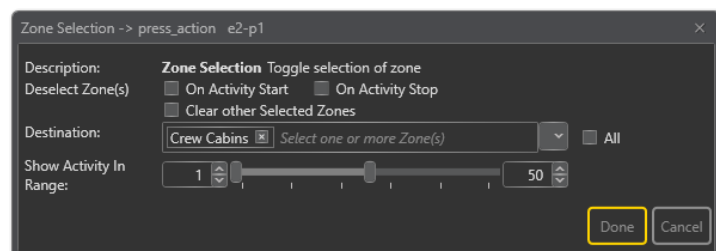
- Repeat the procedure to select Zones 2 to 7 for the keys e2-p2 to e2-p7 respectively.

8.14 Configure Local Mute to be Activated from Access Panel Key

Key	Function	Priority	Comments
e2-p8	Local Mute	-	Local Mute to be Activated from Access Panel Key

8.14.1 Configure Control Output on Access Panel with Local Mute

- Drag-and-drop **Output Actions** > **Local Mute** to **ECPIR-3P A1** > **Control Outputs** > **Internal relay 1**
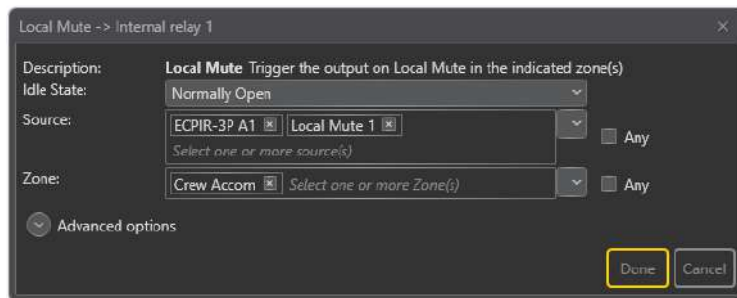
Source: Set access panel **ECPIR-3P A1** and one of the Local Mute identifiers, e.g. **Local Mute 1**

Zone: Set to the zone in which the access panel is located, e.g. **Crew Accom**

8.14.2 Configure Key on Access Panel with Input Action Local Mute Control

To program the **e2-p8** key on the EBMDR-8 with input action Local Mute Control:

- Drag-and-drop **Input Actions** > **Local Mute Control** to **ECPIR-3P A1** > **Programmable Keys** > **e2-p8** > **release_action**
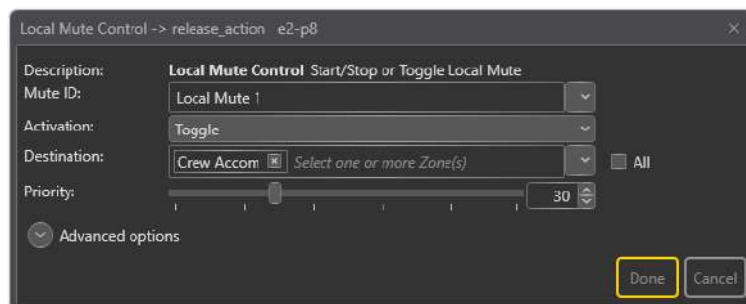
Mute ID: Set to the same identifier used for the actual control output to manually override, i.e. **Local Mute 1**

Activation: Set to Start, Stop or Toggle

Destination: Set to the zone in which the access panel is located, e.g. **Crew Accom**

Priority: The local mute will be active as long as any activity in the zone has a priority lower than the threshold set. If any activity occurs in the zone with a priority higher than the threshold, the local mute will be queued.

8.15 Send Programming Database to System Controller

All the programming database such as devices, input/output actions and programs that have been configured in the system should now be sent to the system controller in System A. Make sure that the EMT is connected to the system controller and send the database to it:

5. Click the **Send** button
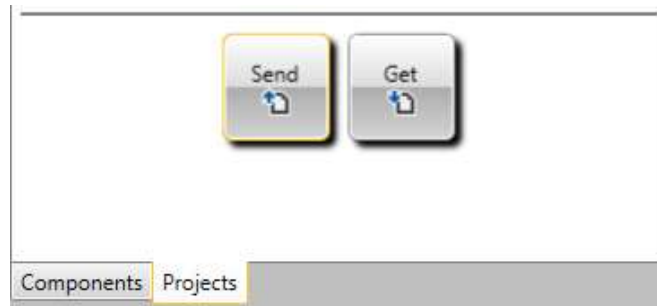
9 System Maintenance

9.1 Factory Reset on ESC1 System Controller

The Primary System Controller and the Secondary System Controller of the ESC1 are reset separately to factory default settings.

9.1.1 Resetting Primary System Controller

To reset the Primary System Controller (AMC-IP board or ICX-500) to factory defaults:

- Log into the PSC web interface
- Select **System Maintenance** > **System Recovery**
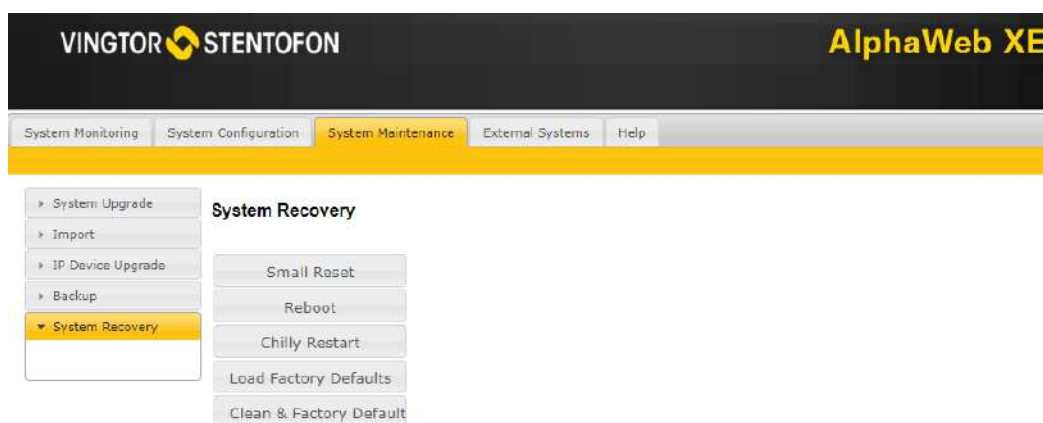
Select one of two ways to do a factory reset:

- **Load Factory Defaults** - This resets the configuration data. Current IP settings are retained.
- **Clean & Factory Default** - This resets the configuration data. It also deletes licenses, SysLog and Backup files, as well as the Exigo mode. Current IP settings are retained.
- **Chilly Restart** - This resets the system.

9.1.2 Resetting Secondary System Controller

9.1.2.1 Resetting from Web Interface

To reset the Secondary System Controller to factory defaults:

- Log into the SSC web interface
- Select **Station Administration** > **Reboot**
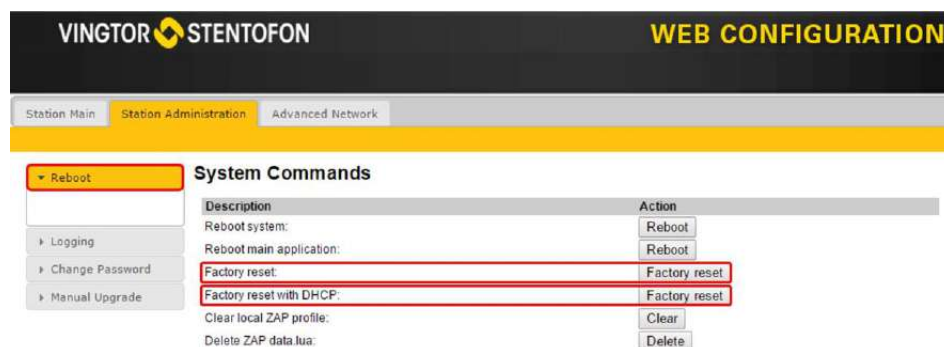
Select one of two ways to do a factory reset:

- **Factory Reset** - This resets the configuration data. The SSC gets the default IP address 169.254.1.100.
- **Factory Reset with DHCP** - This resets the configuration data. The SSC is set to receive an IP address from DHCP.

9.1.2.2 Resetting from GUI Display

It is also possible to do a Factory Reset from the GUI display on the system controller front panel.

- Select **Service** > **Restart & Restore**

Factory Reset from the GUI display will not restart the applications responsible for audio and monitoring (EdgeAudioClient & SysMon). Hence, it is recommended to do a factory reset from the web interface if possible.

9.2 Factory Reset on ENA Amplifier

9.2.1 Resetting from Web Interface

To reset the ENA amplifier to factory defaults:

- Log into the amplifier web interface
- Select **Station Administration** > **Reboot**
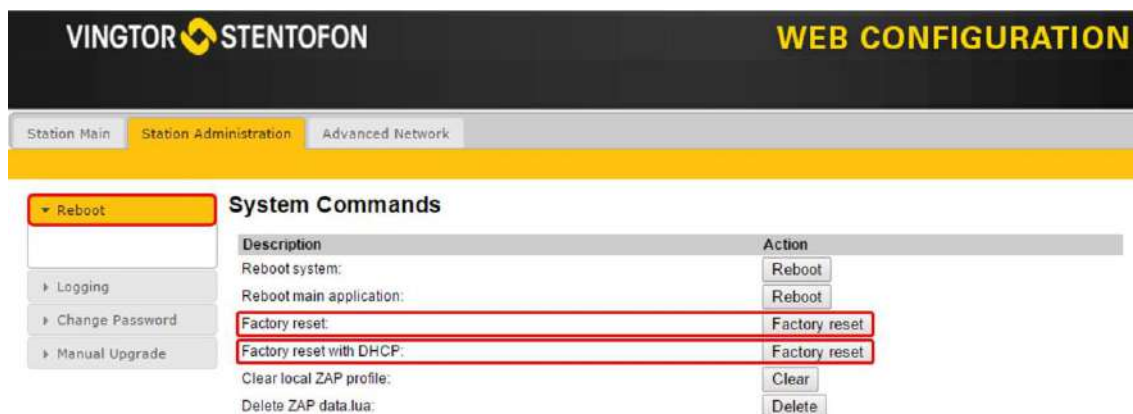
Select one of two ways to do a factory reset:

- **Factory Reset** - This resets the configuration data. The amplifier gets the default IP address 169.254.1.100.

- **Factory Reset with DHCP** - This resets the configuration data. The amplifier is set to receive an IP address from DHCP.

9.2.2 Resetting from GUI Display

For amplifiers with GUI it is also possible to do a Factory Reset from the GUI display on the amplifier front panel.

- Select **Service** > **Restart & Restore**
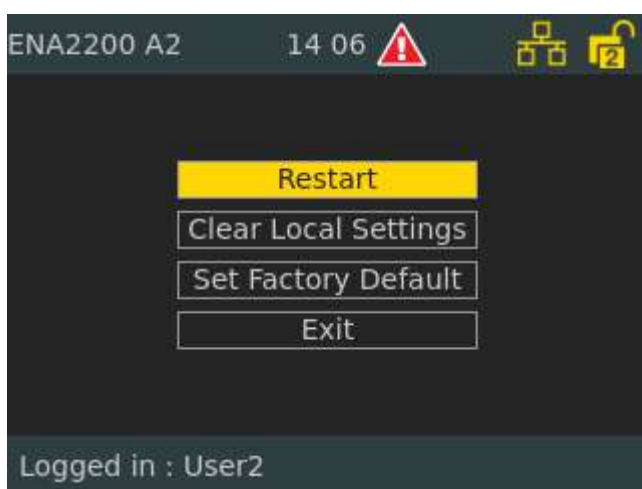
Factory Reset from the GUI display will not restart the applications responsible for audio and monitoring (EdgeAudioClient & SysMon). Hence, it is recommended to do a factory reset from the web interface if possible.

9.3 Factory Reset on Access Panels

To reset an access panel to factory defaults:

- Log into the access panel web interface
- Select **Station Administration** > **Reboot**
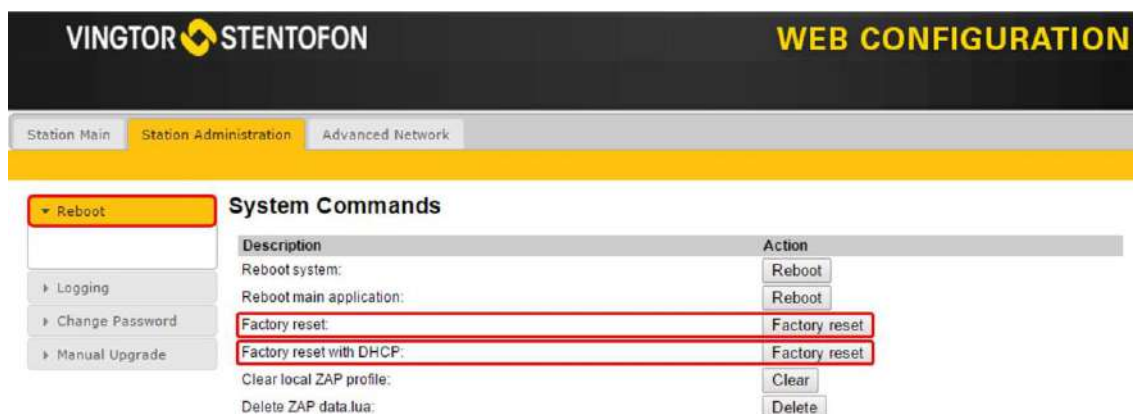
Select one of two ways to do a factory reset:

- **Factory Reset** - This resets the configuration data. The access panel gets the default IP address 169.254.1.100.
- **Factory Reset with DHCP** - This resets the configuration data. The access panel is set to receive an IP address from DHCP.

9.4 Replacing System Devices

Refer to the following replacement manuals for Exigo devices available on www.zenitel.com.

- A100K11607 Replacing Access Panels ECPIR/EAPIR
- A100K11960 Replacing Flowire FCDC1/FCDC2 with Flowire FCDC3
- A100K11600 Replacing Amplifier Module on ENA2200
- A100K11606 Replacing PSC on ESC1 System Controller
- A100K11605 Replacing ENA2200/ENA2400-DC/ENA2400-AC Amplifier

9.4.1 Device Configuration

When devices are replaced in the system, they can be configured remotely from EMT.

To configure a replaced device in EMT:

1. Click the **OPERATION** tab

1. Select the replaced device to configure

2. Enter relevant values for parameters such as **New Device IP Address**, etc.

3. Click **Apply**

Note that Device IP Address is the current IP address of the device. The IP address can be found on the device's interface or via the speaker. Make sure that the device is set up with an identical IP address as that of the device it replaces to ensure proper operation. Consult the project documentation to implement this correctly.

9.4.2 Scan and Identify Devices

There is a feature for scanning and discovering devices in the system within an IP range.

To scan for devices in EMT:

> 3. Click the **OPERATION** tab

> 4. Select the IP range you want to scan and click **Start Scan**

To identify the device:

- Select the device and click **Identify Selected**

This will send a command to the device to make the fault LED blink (works for ENA, Access Panel, and SSC devices).

- Click the IP address hyperlink to access the device via a web browser

9.5 Maintenance of System Controller

The configuration of the system controller's primary system controller board can be backed up to a PC and restored to another board. The system controller's primary system controller board is pluggable and can be changed via a simple maintenance procedure.

9.5.1 Battery Life (only AMC-IP)

The battery on the AMC-IP card in the ESC1 System Controller has a life span of 10 years.

The battery type is a standard **CR2032 coin cell**.

The battery should be changed after a period of 7 years. For the sake of preventive maintenance, it is recommended that the battery be changed every 5 years.

When the battery is depleted and the power goes off, the clock will reset. If NTP is available, the clock will utilize this.

Powering up without a battery will always generate a 'chilly restart' but the configuration data and logs will not be lost.

However, ongoing activities such as recall messages will be lost.

9.6 Maintenance on Speaker Loops

The system controller can activate/deactivate amplifier loop outputs, rendering the output free of any voltage by disabling the amplifier circuit. The system controller and the affected amplifier(s) will enable their disabled indicators when speaker loops are disabled by this function.

This function can be used when maintenance must be done on speaker loops during operation.

9.7 Tick Tone

The system controller can generate a tick tone and route this to the selected zones.

This function can be used to audibly verify that the system works properly.

The tick tone is a "clicking sound".

9.8 Indicator Test

The system controller can initiate a test of all indicators. This test can either be local or global. The local test will turn on the indicators (visible and audible) for the system controller only. A global test will initiate the indicator test for all devices controlled by the system controller. The indicators will be activated for 5 seconds, and then turned off. Indicator tests for access panels and amplifiers can also be initiated from local menus or buttons where available.

9.9 Software Upgrade

Software in the system controller, amplifier and access panels can be upgraded by uploading the software to the individual devices. The software upgrade procedure and the latest software image files can be found on Exigo Wiki at https://exigo.zenitel.com.

A   System Controller Menu Structure

Figure 60: ESC1 System Controller Front Panel

The user's means of interaction with the system controller is through the control knob. The control knob is located next to the LCD screen and can be turned clockwise and counter clockwise, as well as being pressed.

Items in the menu system are selected by turning the control knob:

- Clockwise rotation will move the "selector" to the right or down
- Counter-clockwise rotation will move the "selector" to the left or up

Whether the selector is moved up/down or left/right depends on the current menu displayed.

- Press the control knob to activate the selected menu item
- **Press and hold** the control knob to return to the previous page

To change or input the parameter values in the selected menu item:

1. Turn the control knob to move between the parameter fields
2. Press the control knob to select the parameter field
   - The **field turns green** to indicate that it is selected and ready for input value
3. Turn the control knob to change the parameter value
4. Press the control knob to select the parameter value

Factory Default with DHCP

To remove all configuration data, set the default configuration and reset to DHCP, press and hold the control knob for 20 seconds while booting up the System Controller.

A.1   Idle Screen

System up and running without any faults or warnings
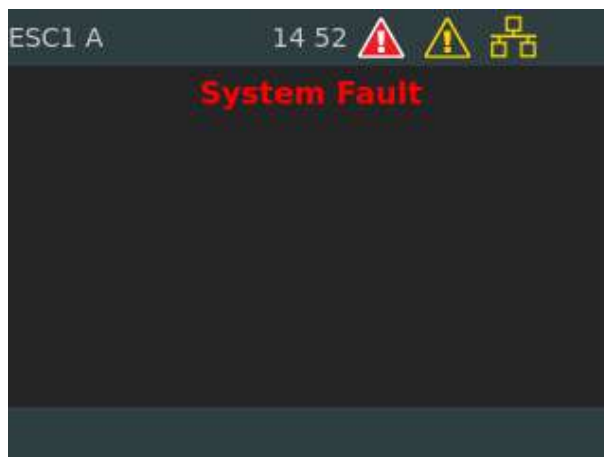
Red icon indicates fault in the system and yellow icon are warnings

The system controller can display two different idle screens, depending on whether the controller is responsible for fault handling or not.

General Information

The idle screen will always display the following general information:

- Current system time

- A line saying that this unit is a system controller

- A line saying that the system is OK or not, or that the system is managed by another controller

Status Icons

Fault
A red icon indicating that there are faults present in the system controller / system.

Warnings
A yellow icon indicating that there are warnings present in the system controller / system.

Locked / Unlocked
A padlock icon indicating whether the system controller's user interface is locked or not.

ESC Connection Status

These status icons reflect whether the device has a connection to the PSC/Domain Controller.

The two lower squares of the icon reflect ESC-A controller (left) and ESC-B controller (right).

Icon	Meaning
	Single system: ESC controller connected.
	Single system: ESC controller disconnected.
	A-B system: ESC-A and ESC-B controllers connected.
	A-B system: ESC-A controller disconnected, ESC-B controller connected.
	A-B system: ESC-A controller connected, ESC-B controller disconnected.
	A-B system: ESC-A and ESC-B controllers disconnected.

A.1.1   Idle Screen Examples
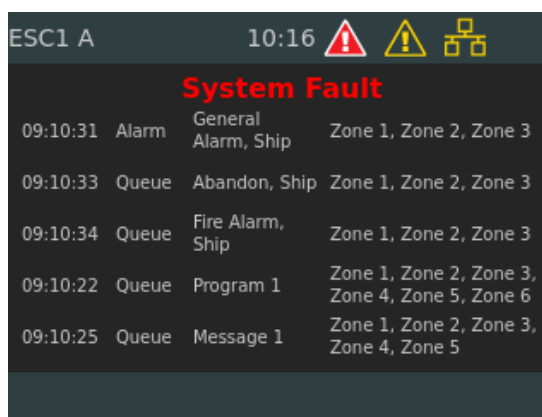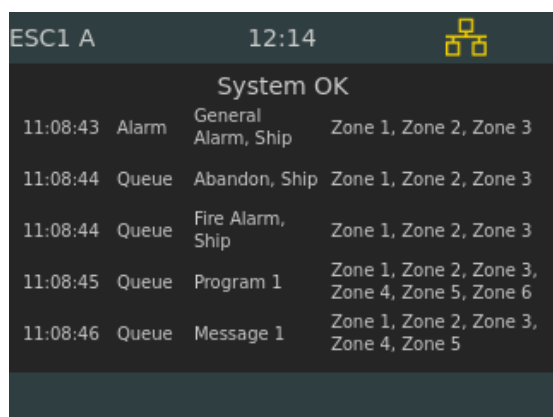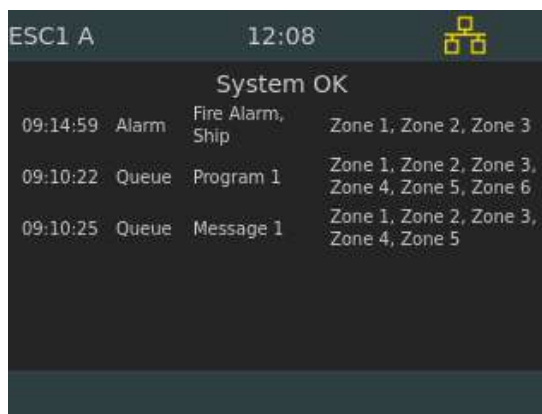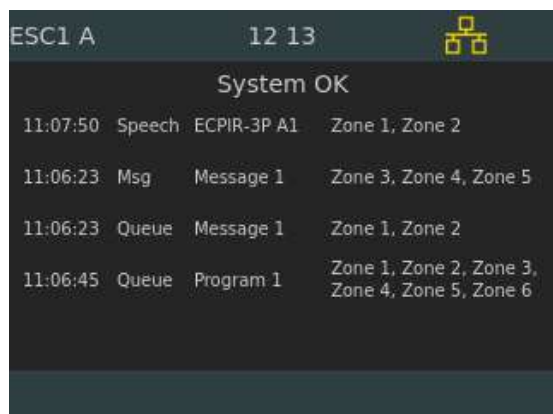
Column 1: Time when broadcast was started

Column 2: Broadcast Status
    PA Call : Live speech from Call Panel
    Prog : Program distribution setup
    Msg : Message
    Alarm : General Alarm
    Queue : Broadcast is queued - set on hold while higher priority call is active in one of the same zone(s)

Column 3: Call Source, e.g. Live speech device, Message, Program.

Column 4: Zone destinations.

A.2   Access Control
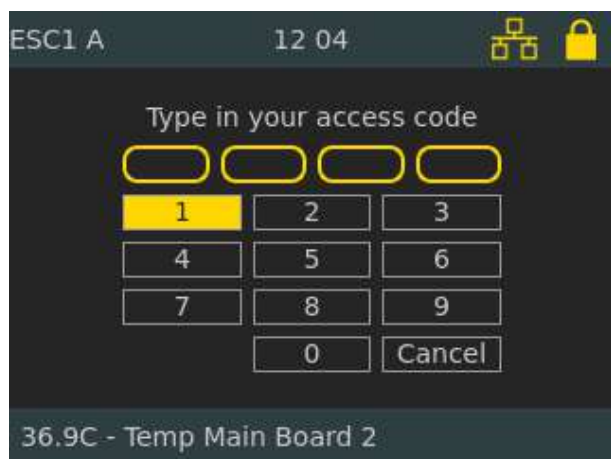
Access to the system controller is via a PIN code. There are two access levels. For Access Level 1 and Access Level 2 the default PIN codes are **1111** and **2222** respectively.

- Turn the control knob to select the number
- Press the control knob to enter the number

A.3   System Controller Menu Options

Access Level = 1

System Fault & Warning

System Fault List: lists all active faults in the system

Reset System Fault List: resets all acknowledged faults in the system

System Warning List: lists of all active warning messages for the system

Service

Local Message List: lists all active fault and warning messages for the system controller

Headphone: selects audio source and adjusts volume of headphone

Audio Output State: restarts the audio output channel when an output is shut down

Restart & Restore: restarts software and restores factory settings

Settings

General: sets menu timeout

Audio Output Volume: changes the output volume locally

Audio Input Gain: sets gain for microphone and line

Display: sets display parameters

Information

Device Info: shows information like HW board, software packages, Linux kernel, etc.

Network: displays network information for the system controller

Attached Devices: list all devices connected to the system controller

Control Input: displays status of the control input

Control Output: displays status of the control output

Diagnostic: displays diagnostics of the system controller
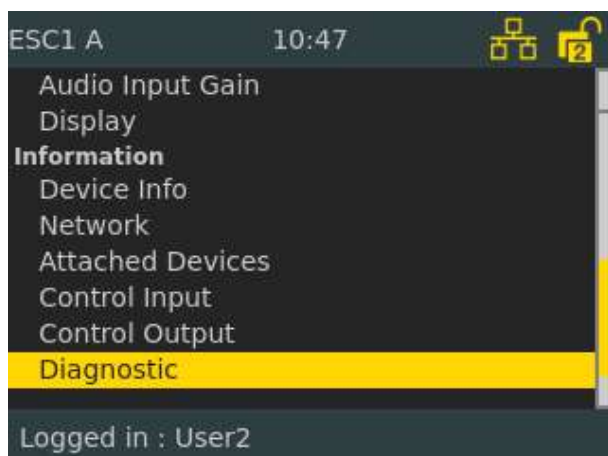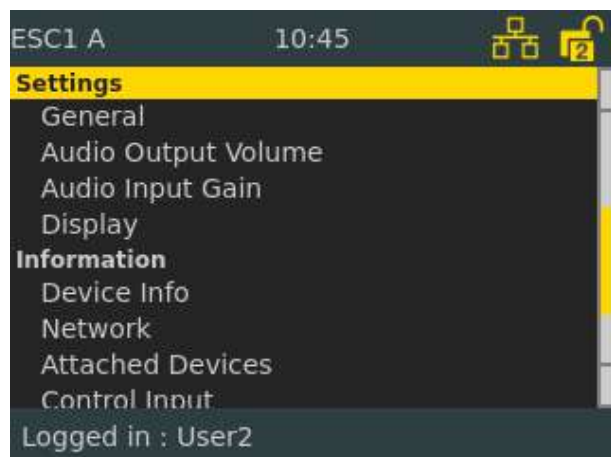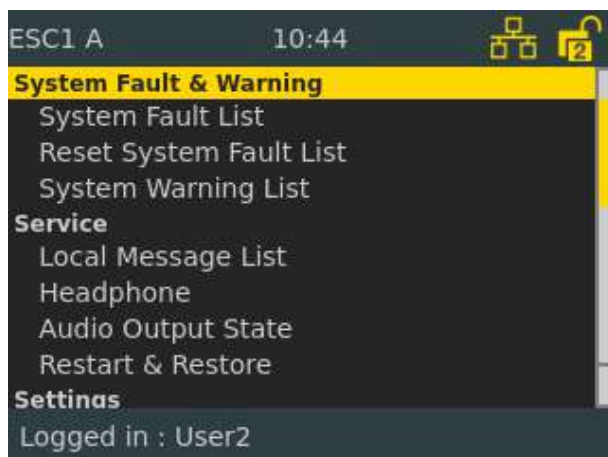
A.4 System Fault & Warning

The submenu for faults and warnings is only available if the system controller is in control of faults. In systems with several system controllers, it is possible to set up the system controllers to forward their faults to one centrally located system controller. When faults are forwarded, they cannot be handled locally.

A.4.1 System Fault List

Access Level = 1

The fault list displays all active faults in the system. One fault is displayed per page and it is clearly visible if more faults are in the list. The severity levels are: Error, Critical, Emergency.
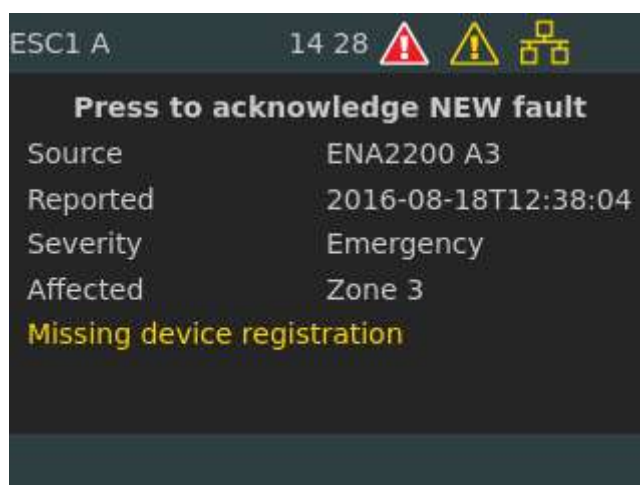
A new fault requires acknowledgement. Press the control knob to acknowledge.
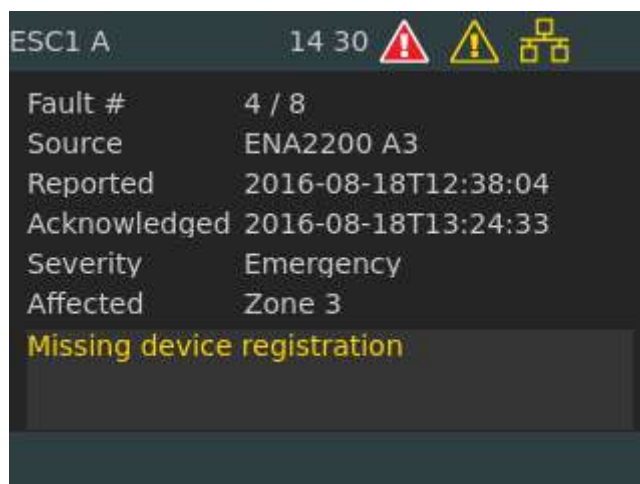
The new acknowledged fault will now be found in the fault list.

- Turn the control knob to scroll through several pages of faults.

The fault page displays all relevant information about the fault:

- Fault caption
- Time of detection

- System component reporting the fault
- Zones affected by the fault
- Acknowledgement status

When the Fault is no longer active/valid, it is possible to remove the fault from the system.

To reset the fault:

- Press the control knob
- Turn the control knob to select **Yes** and press the control knob to execute
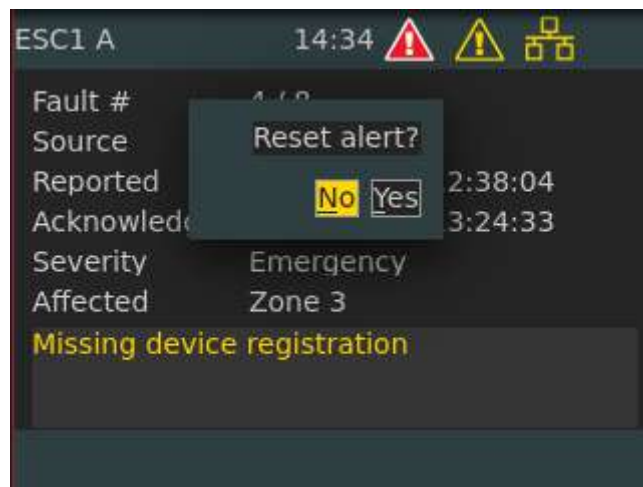
A.4.2 Reset System Fault List

Access Level = 1
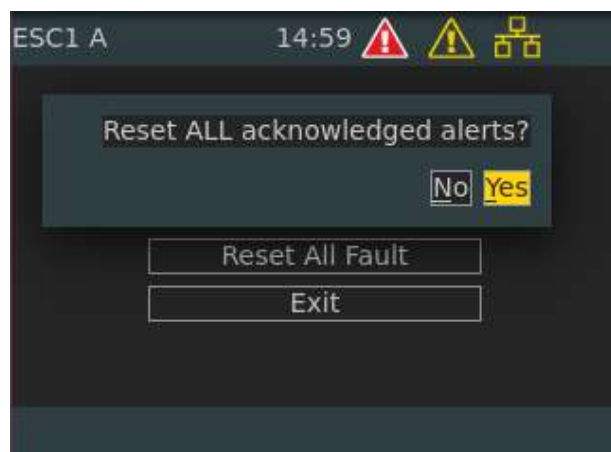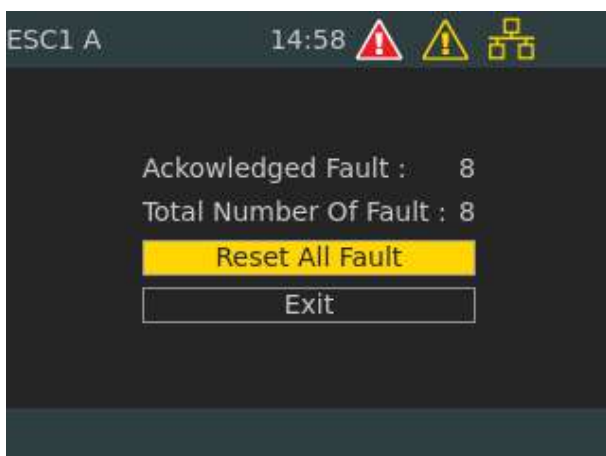
This function will try to reset all acknowledged faults in the system. This option is only available if there is at least one acknowledged fault in the fault list. The system will check that each and every fault being reset no longer is present, before clearing it from the list. If the system detects that the fault is still present, the visual and audible indicators on the system controller will be retriggered and the fault will remain in the list. If the fault is no longer present, it will be removed from the fault list and added to the system log history.

A.4.3 System Warning List

Access Level = 1
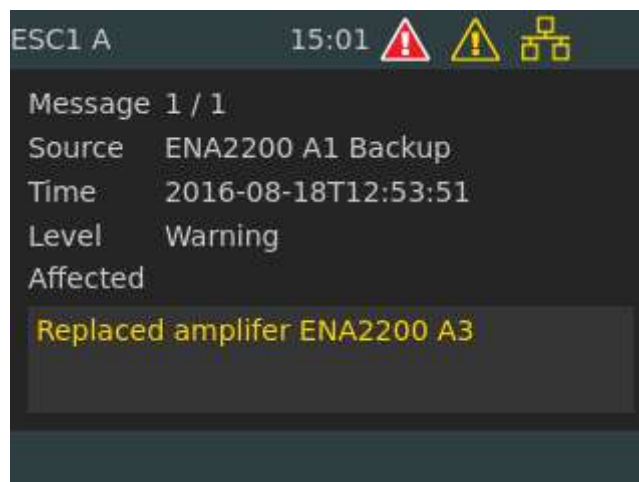
This is a list of all active warning messages for the system. The message displays relevant information on:

- Time of detection
- Security level
- Zones affected
- Description of the fault
- Time of acknowledgement

A.5 Service

The submenu for service and maintenance contains all functions related to service and maintenance of the system.

A.5.1 Local Message List

Access Level = 1
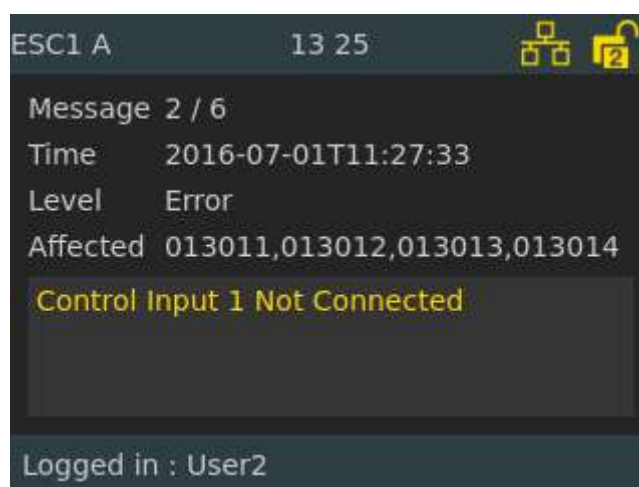
This is a list of all active fault and warning messages for the system controller. The message displays relevant information on:

- Time of detection
- Security level
- Zones affected
- Description of the fault
- Time of acknowledgement

A.5.2 Headphone

Access Level = 1

The Headphone function allows an operator to select the following audio source to monitor:

- MicIn
- LineIn
- AudioStream

Set the volume for the headphone output by turning the control knob.

A.5.3 Audio Output State
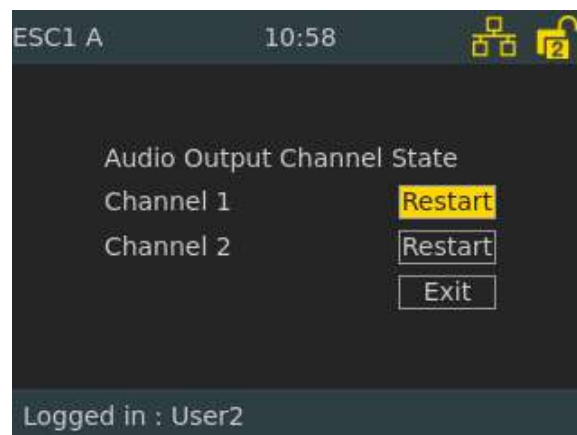
Access Level = 1

This submenu can be used to restart the audio output channel when an output is shut down due to being overheated or shorted.

A.5.4 Restart & Restore

Access Level = 2

- • **Restart**: This will restart all software.
- • **Clear Local Settings**: This will remove settings done manually in the system controller such as enable/disable audio output.
- • **Set Factory Default:** This will remove all configuration data and set the default configuration. This will not change the IP address.

A.6 Settings

The Settings submenu allows an operator to adjust the most basic settings for the system controller. An operator shall be able to replace the system controller with another one by using these menu options.

A.6.1 General

Access Level = 2
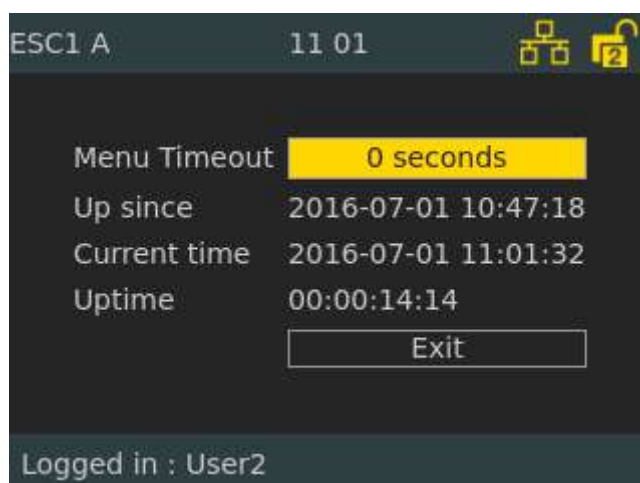
- • **Menu Timeout**: The system controller will automatically log off and return to the idle screen if there has been no user action for the time specified.

- • Value 0 means no timeout (Will not automatically return to idle screen).

- • Default = 60 seconds.

A.6.2 Audio Output Volume

Access Level = 1

- This submenu changes the volume on the line output.
- Range : -40dB to +2dB.

A.6.3 Audio Input Gain

Access Level = 1

Menu for setting the gain for microphone and line in both the system controller and amplifier.

- Default setting : 0 dB
- Value range : 0 to 47 dB

A.6.4 Display

Access Level = 1

The display settings page is used to set the different parameters for the display.

Brightness : Adjusts the brightness level of the display

Self-test buttons : Toggle relay/LEDs/buzzer at 1 sec off, 5 sec on, 1 sec off, back to normal position.

Test leds : Self-test for LEDs
Test Fault Relay : Self-test for relay
Test Buzzer : Self-test for buzzer

A.7   Information

The information submenu contains information about the system controller and the system.

A.7.1   Device Info

Access Level = 1
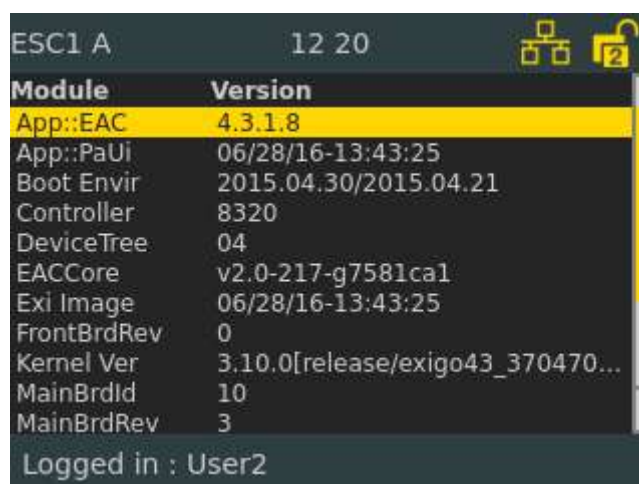
The device information page will show all relevant information about the system controller such as HW board, software packages, Linux kernel, etc.

A.7.2 Network

Access Level = 2
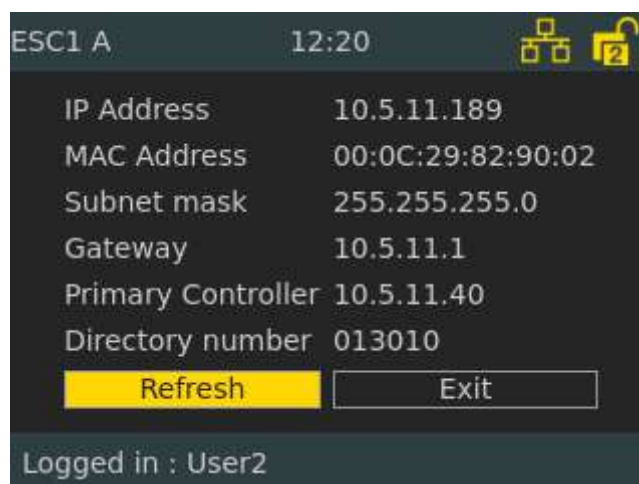
This menu displays network information for the system controller such as IP & MAC addresses, gateway, and directory number.

A.7.3 Attached Devices

Access Level = 1

The attached devices information page will display a list of all devices connected to this system controller.

This list indicates status for endpoints configured for the controller.

When the device is offline, the IP address is unknown and not shown.

Device : Name of the endpoint/device attached to the ESC system controller

IpAddr : IP Address of the endpoint/device attached to the ESC system controller

Status : Connection status of the endpoint/device attached to the ESC system controller
    Offline : Device is registered in ESC but not connected
    Online : Device is registered in ESC and connected
    Unregistered : Device tries to connect to ESC but the directory number is unknown
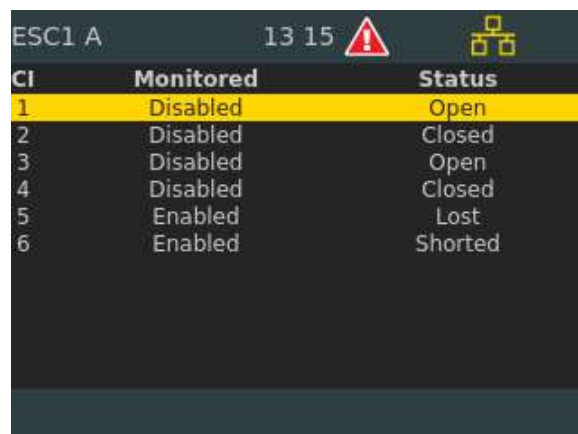
A.7.4 Control Input

Access Level = 1

This menu displays the status of the control input when monitored.

Monitored
When enabled the input is checked whether it is shorted or left unconnected.

Status
Unknown : Unknown state, initial state during startup
Lost : Failure, Line broken (too high input voltage)
Open : OK, Switch/relay is open
Closed : OK, Switch/relay is closed
Shorted : Failure, Line broken (too low input voltage)
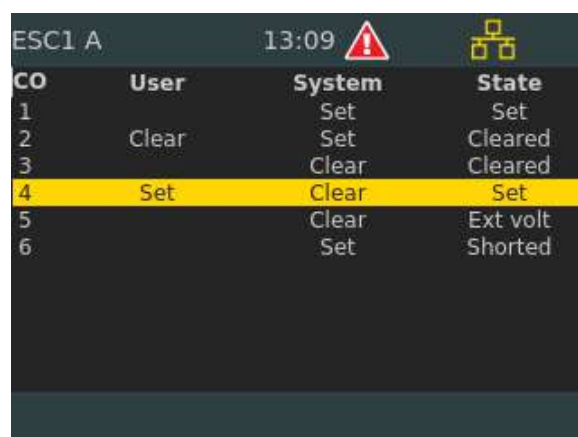
Note that status Lost or Shorted will only occur when monitoring of the input is enabled as shown in section 4.11.1.

A.7.5 Control Output

Access Level = 1

This menu displays the status of the control output when monitored.

Each Control Output supports both Normal Open (NO) and Normal Closed (NC) connections.
The relation between control output state and the NO and NC position is shown below:

State (Control Output)	NO	NC
Set	Closed	Open
Clear	Open	Closed

<u>User</u>
User has the option to manually control the output state to overrule system control output state.
> Set : Manually "set" (close) the control output
> Clear : Manually "clear" (open) the control output

<u>System</u>
System calculated state for the control output.
> Set : System will "set" (close) the control output
> Clear : System will "clear" (open) the control output

<u>State</u>
<u>This is the current state of the physical control output.</u>
> Unknown: Unknown state, initial state during startup
> Cleared : Output relay released - NO:open, NC:closed and 0VDC
> Set : Output relay activated - NO:closed / NC:open and +24VDC
> Shorted : Output relay activated - NO:open / NC:closed and +0VDC
> Ext volt : Output relay released - NO:open, NC:closed and high voltage at VDC
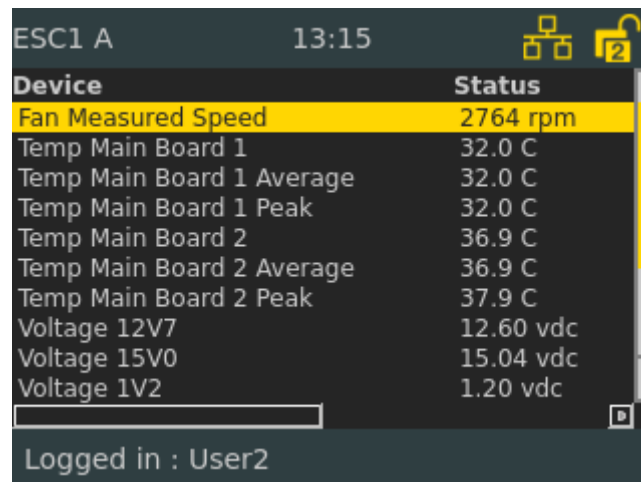
A.7.6 Diagnostic

Access Level = 1

This menu displays the diagnostics of the system controller. The following units are monitored:

- Temperature sensors
- Fan applied effect
- Fan speed sensors
- Fuses
- AC and DC inlet
- Internal power supplies

Figure 61: Amplifier Front Panel

The user's means of interaction with the amplifier is through the control knob. The control knob is located next to the LCD screen and can be turned clockwise and counter clockwise, as well as being pressed.

Items in the menu system are selected by turning the control knob:

- Clockwise rotation will move the "selector" to the right or down
- Counter-clockwise rotation will move the "selector" to the left or up

Whether the selector is moved up/down or left/right depends on the current menu displayed:

- Press the control knob to activate the selected menu item
- Press and hold the control knob to return to the previous view

To change or input the parameter values in the selected menu item:

1. Turn the control knob to move between the parameter fields
2. Press the control knob to select the parameter field
   - o   The field **turns green** to indicate that it is selected and ready for input value
3. Turn the control knob to change the parameter value
4. Press the control knob to select the parameter value

Factory Default with DHCP

To remove all configuration data, set the default configuration and reset to DHCP, press and hold the control knob for 20 seconds while booting up the Amplifier.

B.1   Idle Screen

Audio Output Channel State

- **Disabled**   Audio Output Channel is disabled manually or from configuration tool EMT
- **Audio**   Audio Output Channel works as expected
- **Unknown**   Audio Output Channel state is unknown
- **Refresh**   Audio Output Channel is under calibration
- Shorted   Audio Output Channel is monitored and detected as shorted
- Open   Audio Output Channel is monitored and detected as open missing speaker load
- Load Change Audio Output Channel is monitored and detected change in speaker load

- **Gnd Fault** Audio Output Channel is monitored and detected connection between ground and audio channel signals
- **Shutdown** Audio Output Channel is shut down due to high temperature or extremely high current
- **Low Pilot** Audio Output Channel is monitored and detected low line pilot voltage due to shorted or too high line load
- **Calib failed** Audio Output Channel is configured for monitoring but required calibration failed
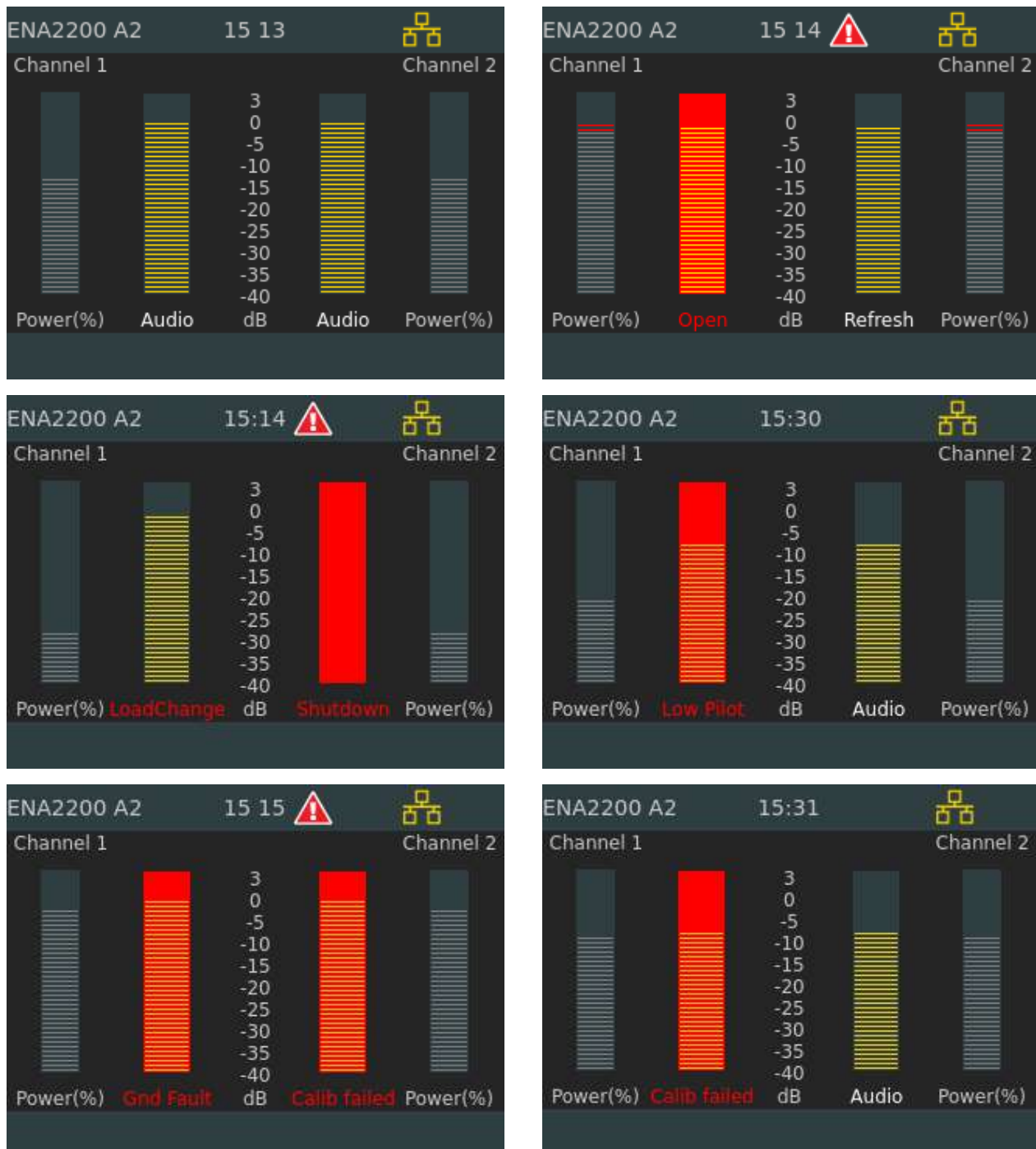
Figure 62: Various Audio Output Channel States

B.1.1   Idle Screen for Backup Amplifier

This idle screen will only be displayed on the backup amplifier itself.

When the Backup Amplifier is in standby mode, this means that it is not replacing another amplifier.
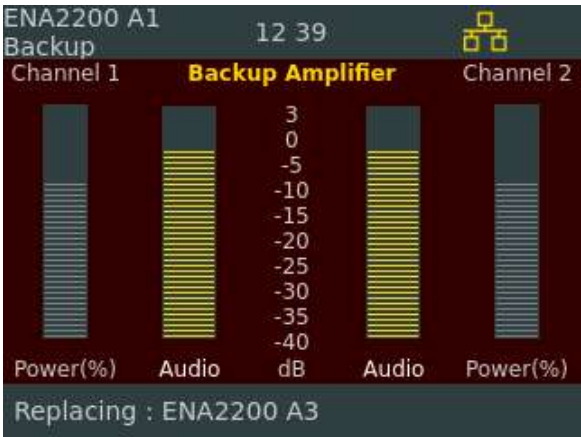
When the Backup Amplifier replaces another amplifier, the background color of the idle screen turns dark red and indicates the audio and power levels in the channels. The identity of the amplifier that the Backup Amplifier is replacing is indicated, e.g. **Replacing : ENA2200 A3**.

B.2   Access Control

Access control can be implemented using a 4-digit PIN code.
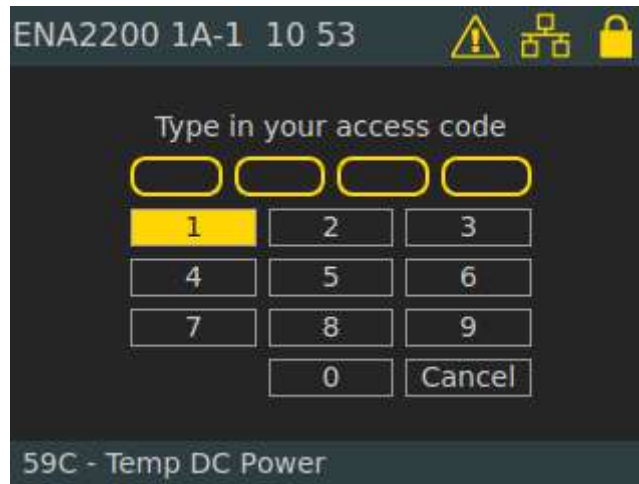
Exigo has two pin code access levels. When logged in the user can see the pin code access level (1 or 2) on the padlock icon at the upper-right corner of the display.

B.3   Amplifier Menu Options

Service

Local Message List: lists all active fault and warning messages for the amplifier

Headphone: selects audio source and adjusts volume of headphone

Tick Tone: selects the tick tone to be used in the particular zone

Audio Output State: restarts the audio output channel when an output is shut down

Backup Amplifier Control (only in Backup Amplifier menu)

Restart & Restore: restarts software and restores factory settings

Settings

General: sets menu timeout

Audio Output Monitoring: displays audio output measurement statuses

Audio Output Volume: increases or decreases volume of audio on channels

Audio Input Gain: sets gain for microphone and line

Display: sets display parameters

Information

Device Info: shows information like HW board, software packages, Linux kernel, etc.

Network: displays network information for the amplifier

Attached Devices: list all LETs connected to the amplifier

Control Input: displays status of the control input

Control Output: displays status of the control output

Diagnostic: displays diagnostics of the amplifier
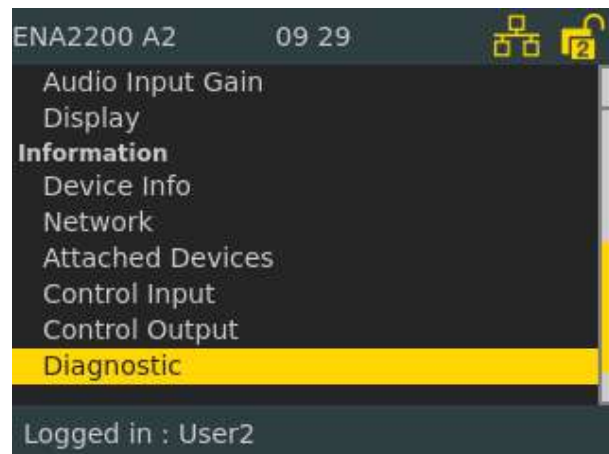
B.3.1   Backup Amplifier Menu Options
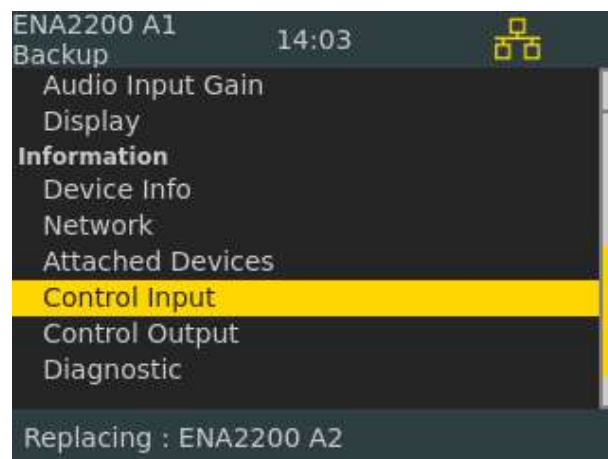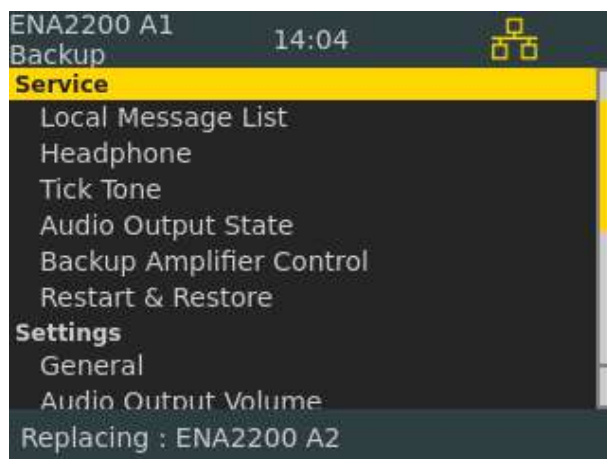
B.4 Service

B.4.1 Local Message List
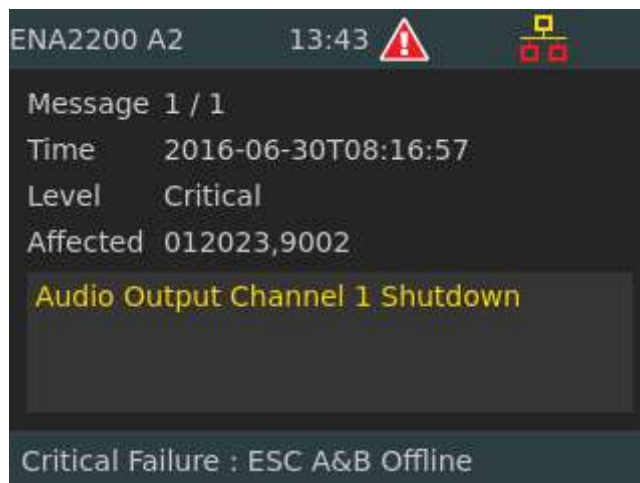
Access Level = 1

This is a list of all active fault and warning messages for the amplifier.
The message displays relevant information on:
- Time of detection
- Security level
- Zones affected
- Description of the fault

B.4.2 Headphone

Access Level = 1
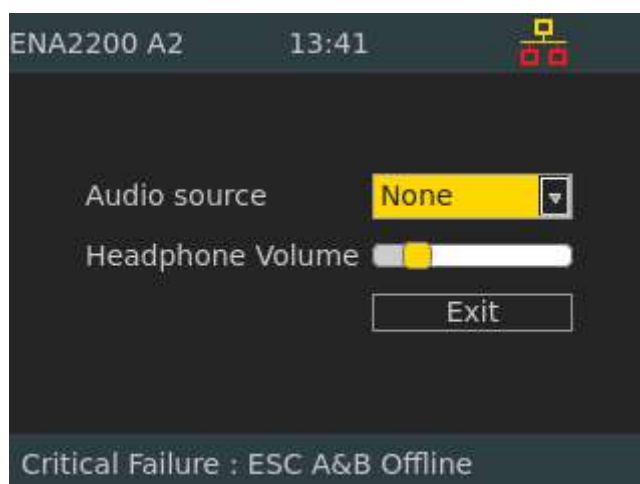
Defaults
Audio source: None
Volume: 20%

B.4.3 Tick Tone

Access Level = 1
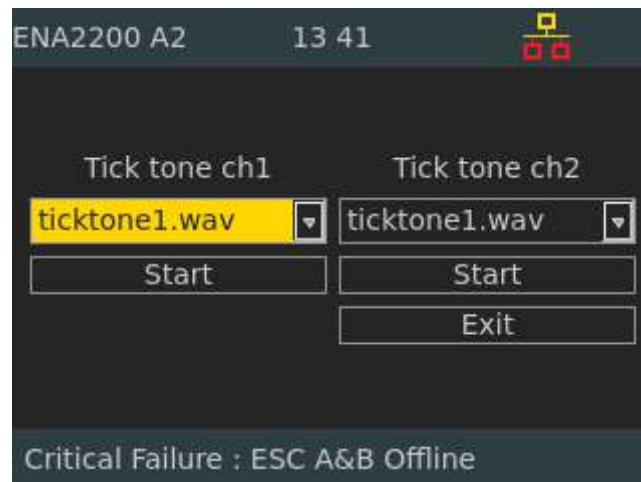
This submenu selects the tick tone to be used in the particular zone.

B.4.4 Audio Output State
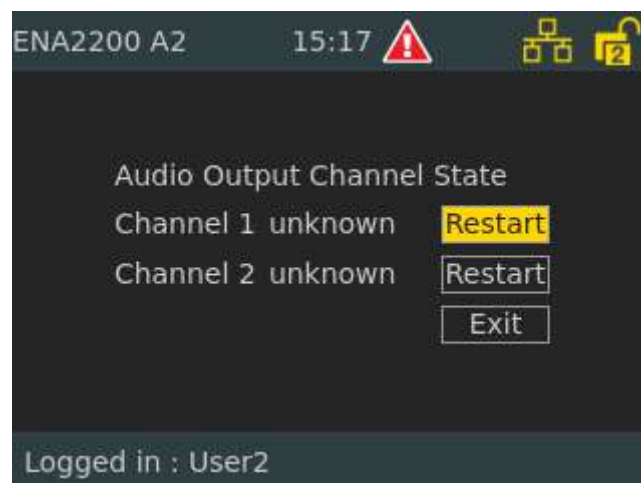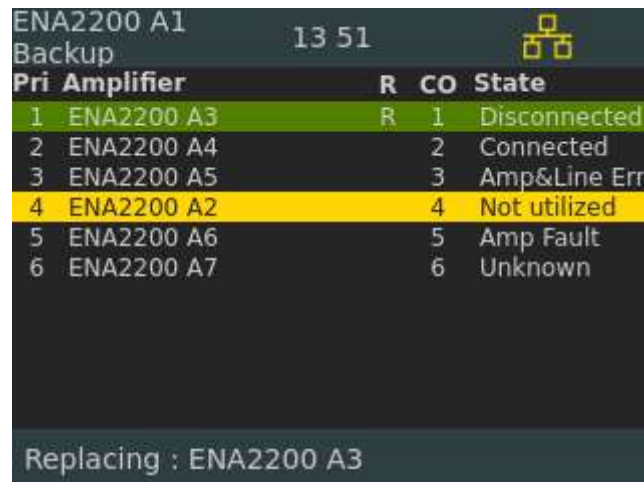
Access Level = 1

This submenu can be used to restart the audio output channel when an output is shut down due to being overheated or shorted.

B.4.5 Backup Amplifier Control

Access Level = 2

Backup Amplifier Control menu option is only available in the Backup Amplifier itself.
The yellow background indicates which line has focus.

R: Indicates replaced amplifier - green background.
Pri: Backup Amplifier will automatically select the amplifier with highest priority (lowest value).
CO: Indicates which Backup Amplifier CO (Control Output) that controls the audio output switch in the replaced amplifier.
State: Indicates the amplifier state for the Backup Amplifier replace candidates.
Automatically replacement will only take effect if an amplifier has status **Disconnected** or **Amp Fault**.

To release an automatically replaced amplifier:

- Select + press control knob and accept the **Release replaced** action by confirming **Yes**.
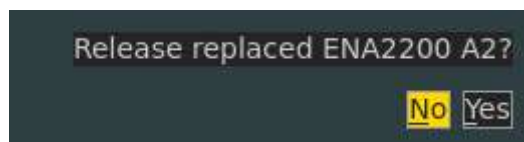
To manually replace an amplifier:

- Select + press control knob and accept the **Manual replace** action by confirming **Yes**.
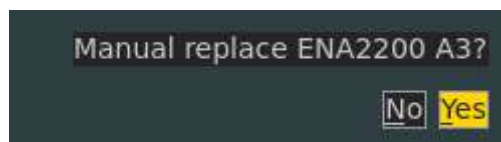
B.4.6 Restart & Restore

Access Level = 1

- • **Restart**: This will restart all software.
- • **Clear Local Settings**: This will remove settings done manually in the system controller such as enable/disable audio output.
- • **Set Factory Default:** This will remove all configuration data and set the default configuration. This will not change the IP address.

B.5   Settings

B.5.1   General

Access Level = 2
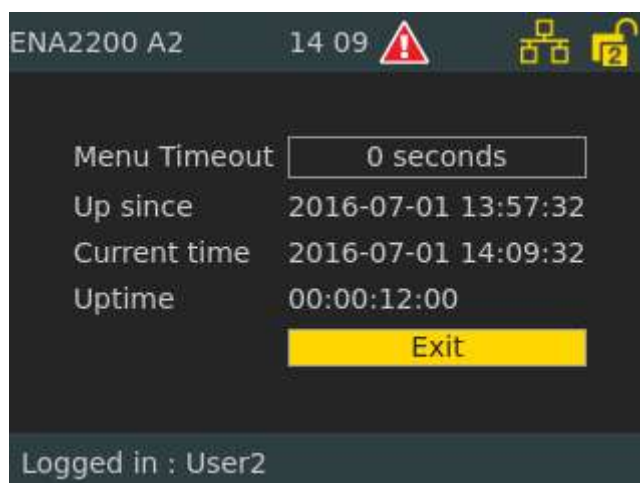
- • **Menu Timeout**: The amplifier will automatically log off and return to the idle screen if there has been no user action for the time specified.

- • Value 0 means no timeout (Will not automatically return to idle screen).

- • Default = 60 seconds.

B.5.2 Audio Output Monitoring

Access Level = 2

ENA2200 A2	14 44 ⚠ 🔲 🔓	ENA2200 A2	14:45 ⚠ 🔲 🔓
Audio Output Channel	1 Enabled	Audio Output Channel	2 Enabled
Line Voltage	100V Pilot Gain 38%	Line Voltage	100V Pilot Gain 47%
Line State	Open	Line State	OK
Calibration State	Failed - Allowed	Calibration State	Calibrated - Allowed
Calibration Date	2016-07-01T13:43:53	Calibration Date	2016-07-01T13:45:34
Pilot Voltage Vector	36	Pilot Voltage Vector	0 36
Pilot Current Vector	1	Pilot Current Vector	0 88
Pilot Phase Vector	46	Pilot Phase Vector	0 95
Line Ground Fault	4	Line Ground Fault	0 2
Logged in : User2		Logged in : User2	

Audio Output Line Measurement Statuses

Audio Output Channel: **Enabled** (Amplifier channel is turned ON) / **Disabled** (Amplifier channel is turned OFF)

Line Voltage: **70V** or **100V**

Pilot Gain: Value given in % (Range 0..100) - will not be shown when not calibrated.

Line States:
- **OK** : Audio Output Channel is considered OK
- **Unknown** : Audio Output Channel is either Disabled or Uncalibrated
- **Refreshing.....** : Waiting for Audio Output Channel line measurement, typical after initiated Calibration or after enabling a calibrated Audio Output Channel.
- **Line Fault**: When calibrating or on a calibrated Audio Output Channel, the line measurement indicates that the Audio Output Channel is Shorted or Open
- **Load Change** : On a calibrated Audio Output Channel, the line measurement indicates that the Audio Output Channel load has changed
- **Ground Fault** : When calibrating or on a calibrated Audio Output Channel, the line measurement indicates that the Audio Output Channel has a Ground Fault
- **Shutdown** : The Audio Output Channel has been (temporarily) shut down due to internal safety precaution (amplifier has reached "Emergency Shutdown" temperature)
- **Measurement Failed Timeout**: Calibration failed due to internal timeout. Repeat calibration.
- **Measurement Receive Error**: Calibration failed due to communication failure between measurement controller and main controller. Repeat calibration.
- **Low Voltage**: Calibration failed due to heavy load - cannot set Pilot Tone Voltage within acceptable limits.

Line States that indicate one of the following: Shorted, Open, Load Change, Ground Fault, or Shutdown will be displayed as soon as the fault condition is detected. However, the same fault condition must be present for 4 more subsequent measurements (approximately 60 - 75 seconds) before it is reported as a fault.

Calibration State :
- **Uncalibrated**: Audio Output Channel not yet calibrated
- **Calibrating.....**: Calibration is ongoing.
- **Calibrated**: Audio Output Channel calibrated OK.
- **Failed**: Audio Output Channel calibration function failed - see Line State for details.
- **Failed - Low Pilot Tone**: Pilot Tone Voltage used to calibrate Audio Output Channel is too low - not possible to execute a calibration.

Calibration Date: Date for last successful calibration, i.e. 2015-01-06T10:11:12

Pilot Voltage Vector: Typical calibration values for Pilot Tone Voltage Vector (Range 0..100) :: Line State OK: 36, Line State Open: 36, Line State Shorted: 0

Pilot Current Vector: Typical calibration values for Pilot Tone Current Vector (Range 0..100) :: Line State OK 50 ohm load: 79, Line State Open: 0-1, Line State Shorted: 90-99

Pilot Phase Vector: Typical calibration values for Pilot Tone Phase Vector (Range 0..100) :: Line State OK 50 ohm load: 89, Line State Open: 46-50, Line State Shorted: 65-69

Line Ground Fault: Typical calibration values for Ground Fault Tone Vector (Range 0..100) :: Line State OK: 0-5, Line State Ground Fault: > 10

- Press the control knob to enter the submenu with access to:
    - **Cancel**
    - **Disable** / **Enable** - Audio channel amplifier output
    - **Monitor** - start line impedance check and LET/ELTSI supervision
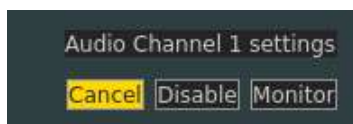
- Select the **Monitor** button to enter the submenu with access to:
    - **Cancel**
    - **Calibrate** - Start calibration sequence for line impedance measurements. If Cailbration succeeds, enabled line and/or LET monitoring will start.
    - **UnCalibrate** - Removes previous line calibration information. Terminates ongoing line and/or LET monitoring.
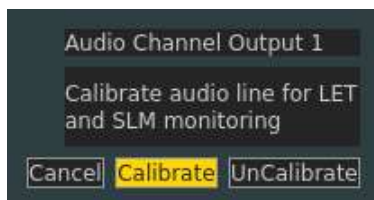
B.5.3   Audio Output Volume

Access Level = 2

This parameter increases or decreases the volume of the audio on the channels.

B.5.4   Audio Input Gain

Access Level = 2

This parameter sets the gain for microphone and line in both the system controller and amplifier.

Default setting : 0 dB
Value range : 0 to 47 dB

B.5.5   Display

Access Level = 1

Display Control : Manual (Default)

Brightness : Adjusts the brightness level of the display

Self-test buttons :
This will toggle the relay/LEDs/buzzer in the following sequence: 1 sec off, 5 sec on, 1 sec off and back to normal position.

Test leds : Self-test for LEDs
Test Fault Relay : Self-test for relay

B.6   Information

B.6.1   Device Info

Access Level = 1

Device Info shows a list of device parameters such as installed software and revisions of the various PCBs.

B.6.2 Network

Access Level = 2
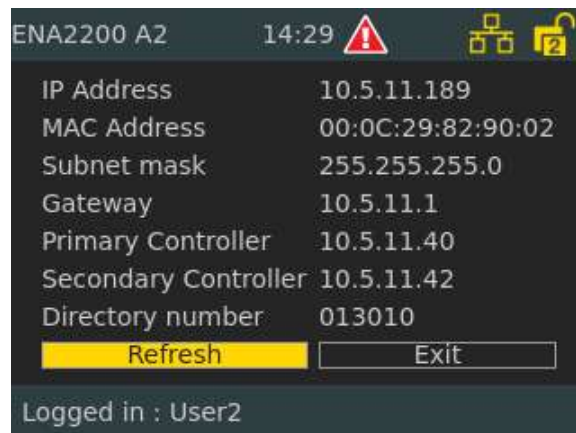
This menu displays network information for the amplifier such as IP & MAC addresses, gateway, and directory number.

B.6.3 Attached Devices

Access Level = 1

This parameter lists all connected LETs for each channel.

Let/ch: LET [1 -10] / Channel number [1 - 2]

Description: Description of the LETs

SW: Software version

HW: Hardware version

Volt: Voltage Vector. LET power supply voltage. Normally from 21.0 to 23.0 volts

Live: Indicates in % uptime since last polling. (In suspended mode this value will not be accurate.)

- Press the control knob to enter the submenu to disable/enable LETs
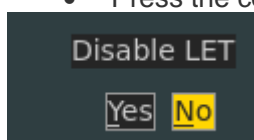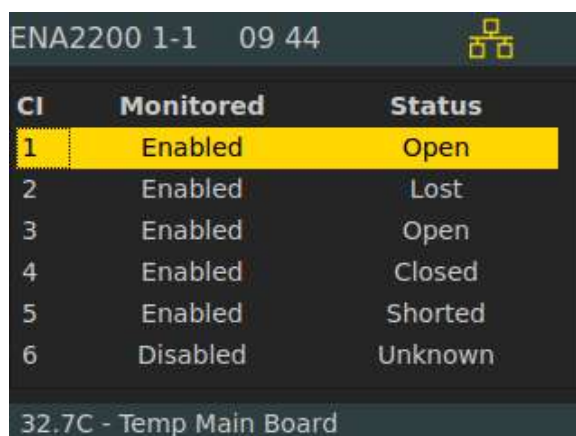
- Select **Yes** to disable the LET

Note that to monitor the LETs, the Audio Output channel for LET monitoring must be enabled in EMT (see section 6.9.3).

B.6.4   Control Input

Access Level = 1

This menu displays the status of the control input when monitored.

Monitoring
When enabled the input is checked whether it is shorted or left unconnected. Configured in EMT.
Status
Unknown : Unknown state, initial state during startup
Lost : Failure, Line broken
Open : OK, Switch/relay is open
Closed : OK, Switch/relay is closed
Shorted : Failure, Line broken
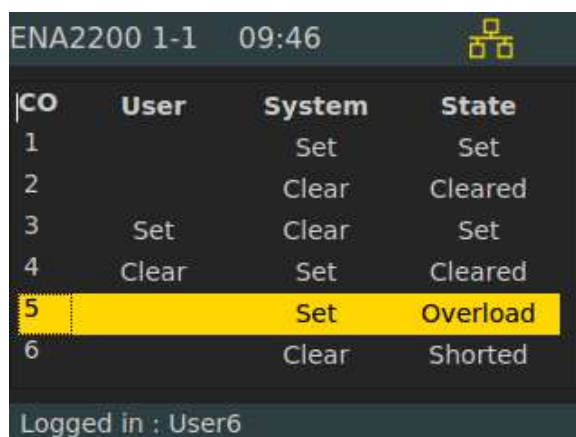
Note that the status Lost or Shorted will only occur when monitoring of the input is enabled as shown in section 4.11.1.

B.6.5   Control Output

Access Level = 1

This menu displays the status of the control output when monitored.

Each Control Output supports both Normal Open (NO) and Normal Closed (NC) connections.

The relation between control output state and the NO and NC position is shown below:

State (Control Output)	NO	NC
Set	Closed	Open
Clear	Open	Closed

<u>**User**</u>
User has the option to manually control the output state to overrule system control output state
　　Set : Manually "set" (close) the control output
　　Clear : Manually "clear" (open) the control output

<u>**System**</u>
System calculated state for the control output
　　Set : System will "set" (close) the control output
　　Clear : System will "clear" (open) the control output

<u>**State**</u>
<u>This is the current state of the physical control output</u>
　　Unknown: Unknown state, initial state during startup
　　Open: OK, control output is cleared
　　Closed: OK, control output is set
　　Shorted: control output was set, but output is lower than limit
　　Overload: control output was cleared, but output is higher than limit
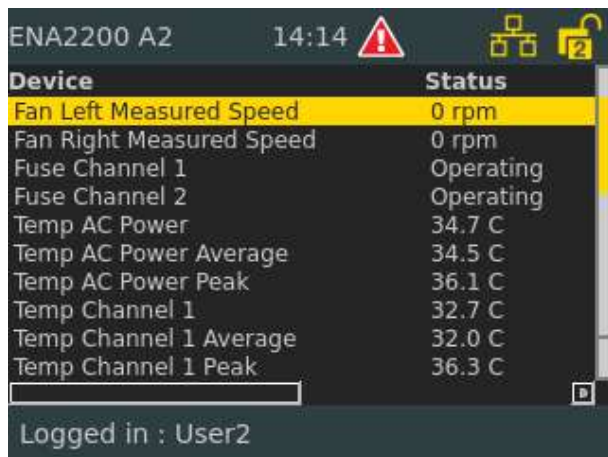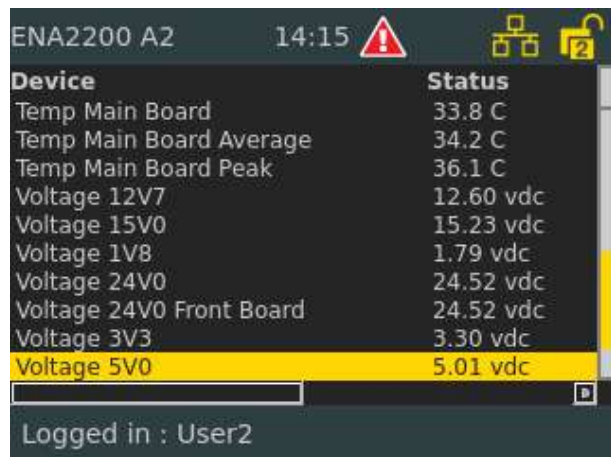
B.6.6   Diagnostic

Access Level = 1

This displays the different aspects of the device that are monitored such as:

- Temperature sensors
- Fan applied effect
- Fan speed sensors
- Fuses
- Inlet AC and DC
- Internal power supplies

C ENA2200-AC2 / ENA2400-AC2

The 2. Generation ENA amplifier some of the GUI settings and controls will taking place on the web interface. General status is given in tab name Amplifier Settings.

C.1.1 Status

C.1.1.1 Backup functionality

If amplifier is used in a backup environment in the tab named Amplifier Settings – Status, a list of amplifiers is given and with the possibility to manual take control by pressing "Takeover".

It is also possible to manually release it.

C.1.2 Line Control

Details on the speaker lines are found on the Line Control page.

C.1.3 Testing

Activating LEDs and Fault Relays on this page.
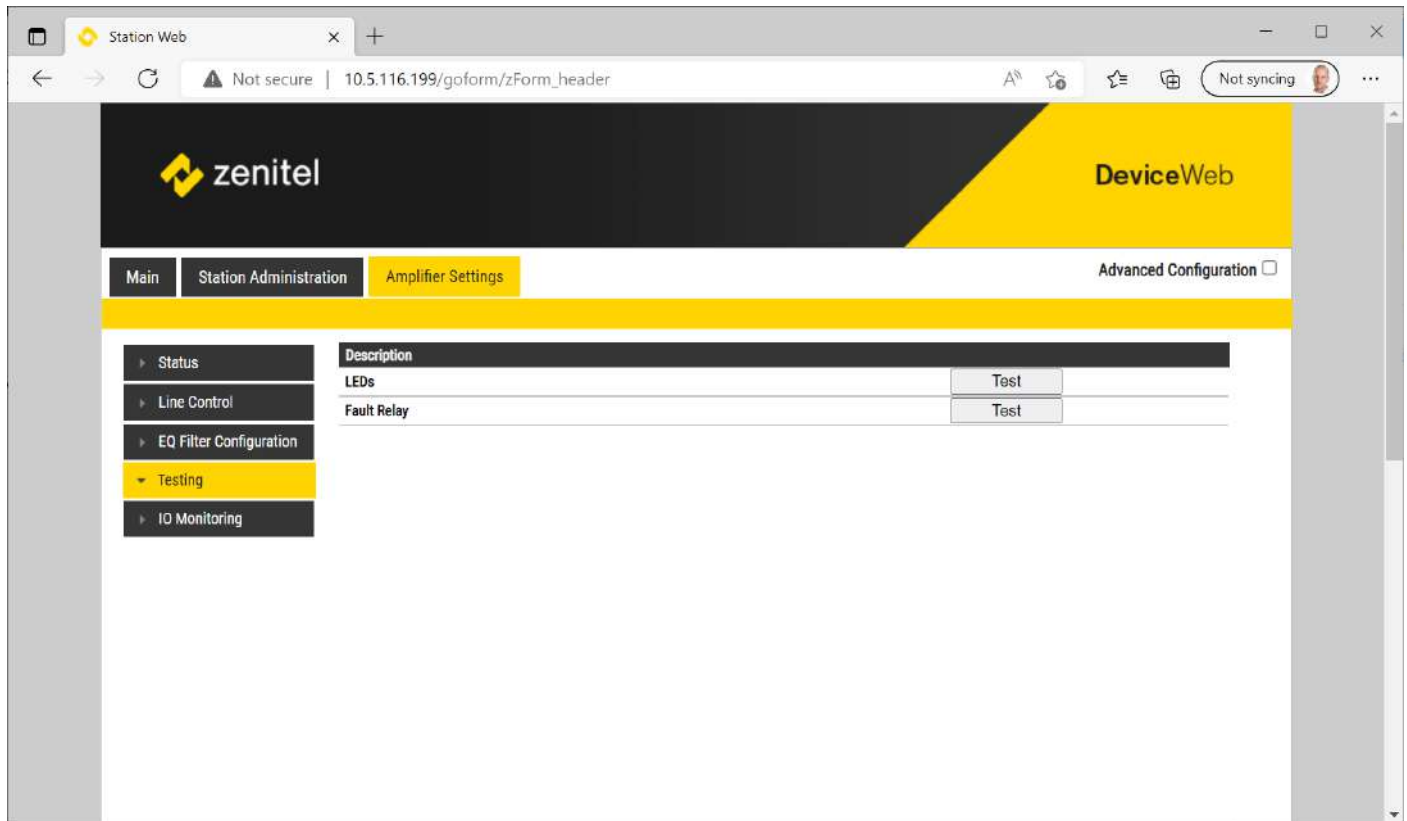
C1.4 IO Monitoring

IO Monitoring shows current status and for the gpo from this page the outputs can be manually controlled by Set and Clear buttons.

D AlphaCom Integration

The Exigo-AlphaCom integration allows audio to be sent from Exigo to AlphaCom and vice versa.

AlphaCom can be integrated with different external systems using SIP trunks such as:

- Voice Gateways (Analog, GSM, ISDN)
- SIP iPABX
- Call Managers
- Asterisk Software PBX
- Tetra Radio Systems

Hence, through AlphaCom integration, Exigo can be connected to a wide variety of systems.

> **NOTE** *See the manual 'A100K10805 AlphaCom XE Installation, Configuration & Operation' for further information on AlphaCom and the AlphaPro programming tool.*

D.1   Exigo-AlphaCom IP Addresses

Exigo and AlphaCom is integrated with each other using SIP.

The AlphaCom server must be able to communicate with the Exigo PSC. This is accomplished by setting IP and subnet addresses within the same range on both devices.

AlphaCom
10.1.11.150

Exigo
10.1.11.50

A call from Exigo to AlphaCom will be in the format:

\<directory number\>@\<AlphaCom IP\>

Similarily, a call from AlphaCom to Exigo will be in the format:

\<directory number\>@\<Exigo IP\>

D.2   System Configuration

For integration the following configuration tools are used:

- EMT is used for setting up the integration on Exigo
- AlphaPro is used for setting up the integration on AlphaCom
- The web interface is used for setting up all devices

Two types of actions are defined for the integration as seen from Exigo:

- Action Calls (See section D.4.2)
- AlphaCom Features (See section D.4.5)

Action Calls

AlphaCom Feature

AlphaCom Features are treated as any audio channel and can be part of a zone.

Action Calls are similar to a button where potentially different actions can be assigned to **on_connect** or **on_disconnect**.

AlphaCom will use directory numbers from 98001 and higher to start activities in Exigo, e.g.

98001@Exigo

Outgoing actions from Exigo can define any directory number, e.g. for Group Call:

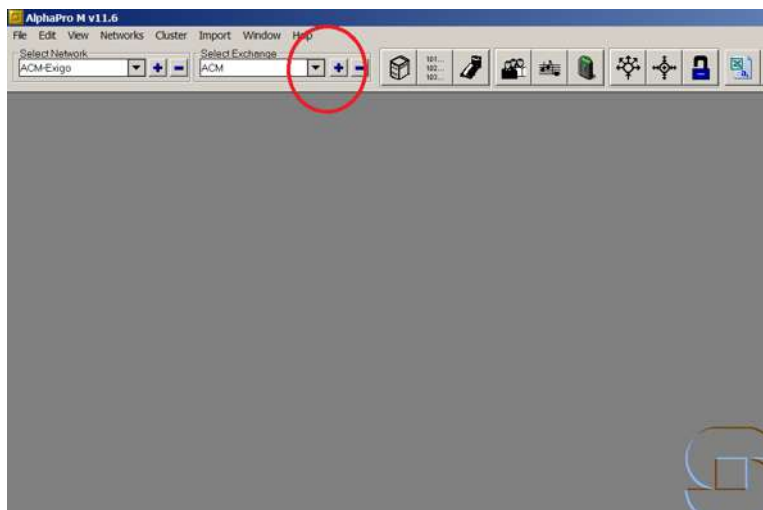**85@Alphacom**

85@Alphacom

98001@Exigo

What the different directory numbers will trigger in the AlphaCom system is dependent on how the AlphaCom server is configured.
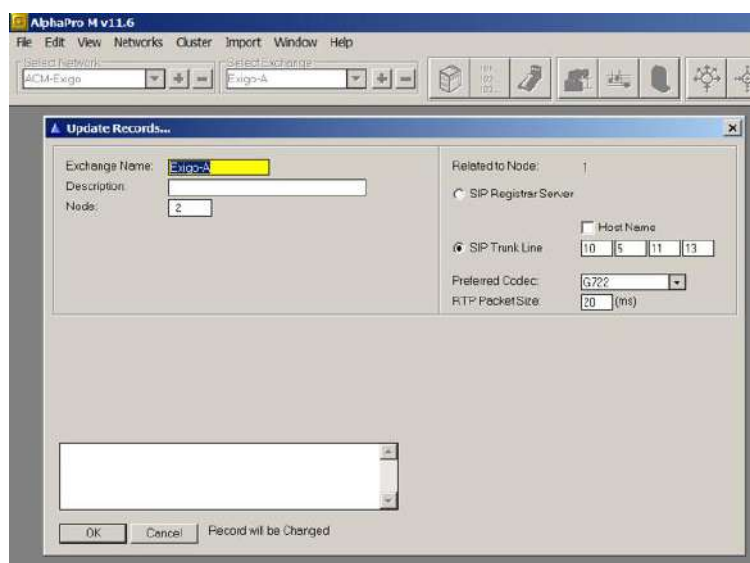
D.3 AlphaCom Server Configuration

Basic configuration on the AlphaCom server comprises two steps using AlphaPro:

1. Define and map IP addresses to the Exigo Node
2. Define and set up the Directory Number that Exigo should call to

D.3.1 Defining IP Addresses to Exigo Node

Define the values for SIP Trunk Line, Node, etc.

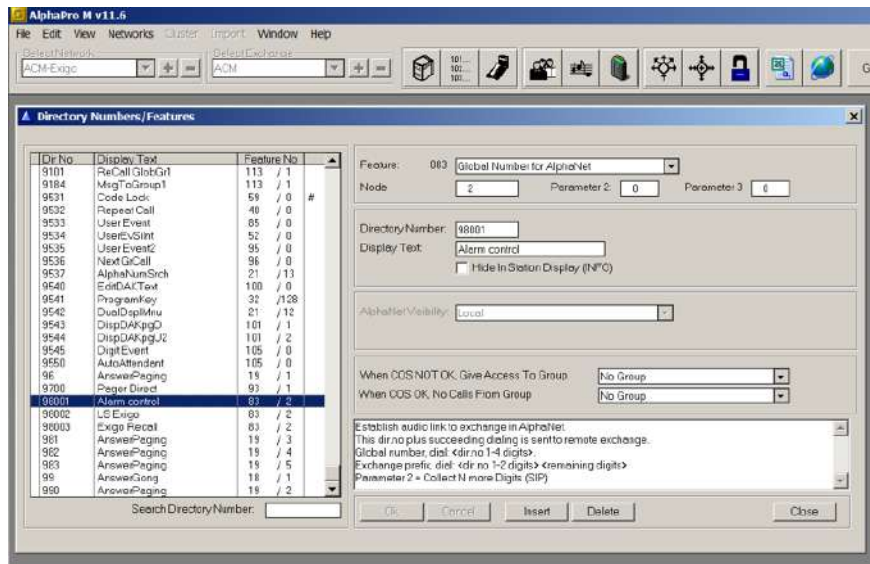To enable Exigo to be integrated with AlphaCom both ways:

- The Domain Controller IP address of Exigo should be used as the **SIP Trunk Line**

The **Node** number will depend on how many other SIP trunks are configured.

D.3.2 Defining Directory Numbers

Directory numbers that are used to call from Exigo have to be defined in AlphaCom.

- These numbers start from **98001 and higher**

The directory number used by Exigo is a **Global Number for AlphaNet** with **Feature Number 83**.

The **Node number** must be the same as the one defined in the Exigo Node configuration in section D.3.1.

Logical names can be given to the directory number, but is not required.

Any intercom can now dial this directory number. What happens in the Exigo system is dependent on how Exigo is configured.

D.4 Exigo Configuration

The first step in configuring the Exigo system for AlphaCom integration is to add the AlphaCom Node using EMT.
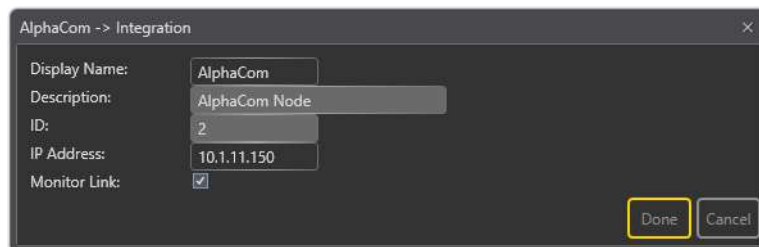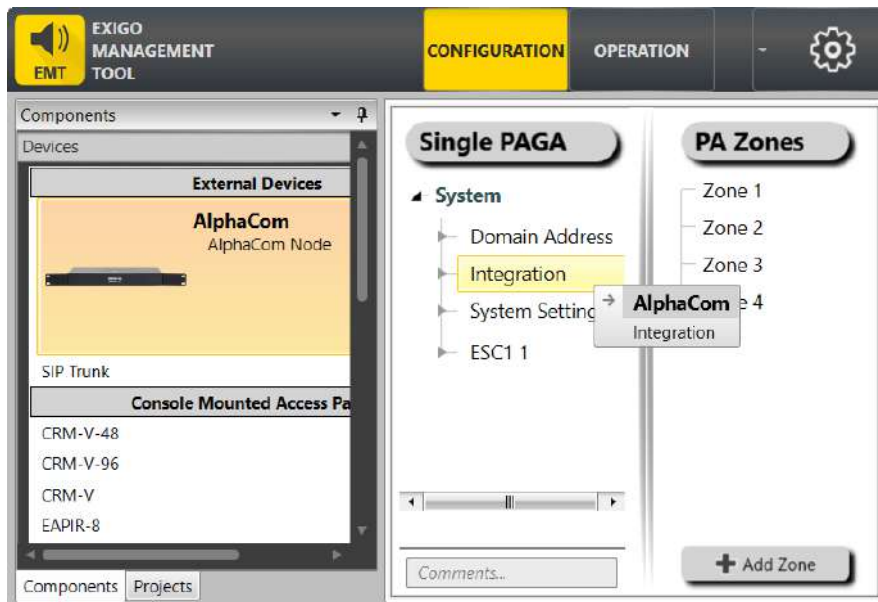
D.4.1 Adding AlphaCom Node

To add an AlphaCom Node:

Either

- Add AlphaCom when a new Project is first set up with the EMT wizard

or

- Select **Components** > **Devices** > **External Devices**

- Drag-and-drop **AlphaCom** on **System** > **Integration**

- Enter the IP address of the AlphaCom server in the **IP Address** field
- **Monitor Link** is enabled by default

This will now enable the Exigo system to configure and use the integration with the AlphaCom system.

D.4.2 Adding Action Calls

For the AlphaCom to trigger features in the Exigo system, one or more **Action Calls** have to be added.

Each **Action Call** can then be configured to trigger different activities based on the connection state.

After an activity is triggered from the AlphaCom, normal Exigo-related aspects are used such as priority.

To add Action Call:

- Drag-and-drop **External Connections** > **Action Call** on **System** > **Integration** > **Action Calls**
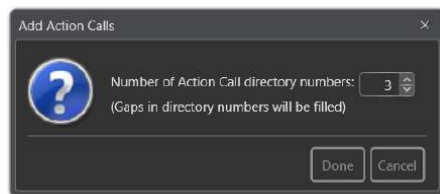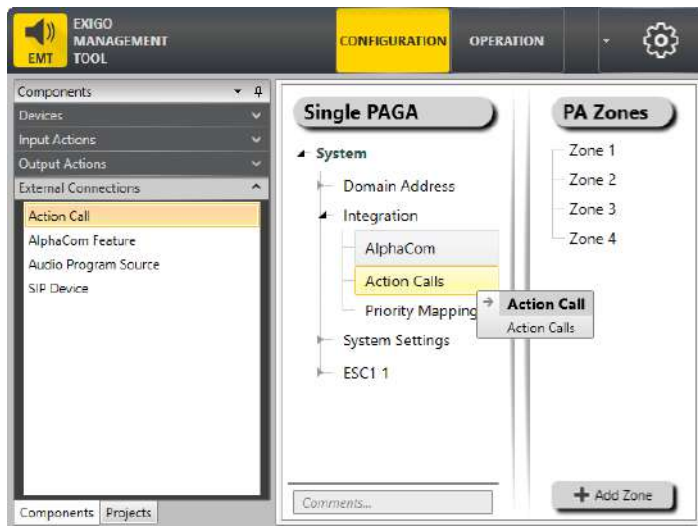
- Set the number of directory numbers to add in the dialog-box

The directory numbers added will start from **98001** and upwards. In this example, the directory numbers will range from 98001 to 98003.

The following are configuration examples of Action Call directory numbers using Input Actions: Live Speech and Recall.

D.4.3   Live Speech

For example, to add Input Action Live Speech to the Action Call directory number 98001:

- Drag-and-drop **Input Actions** > **Live Speech** on **Action Calls** > **98001** > **On Connect**
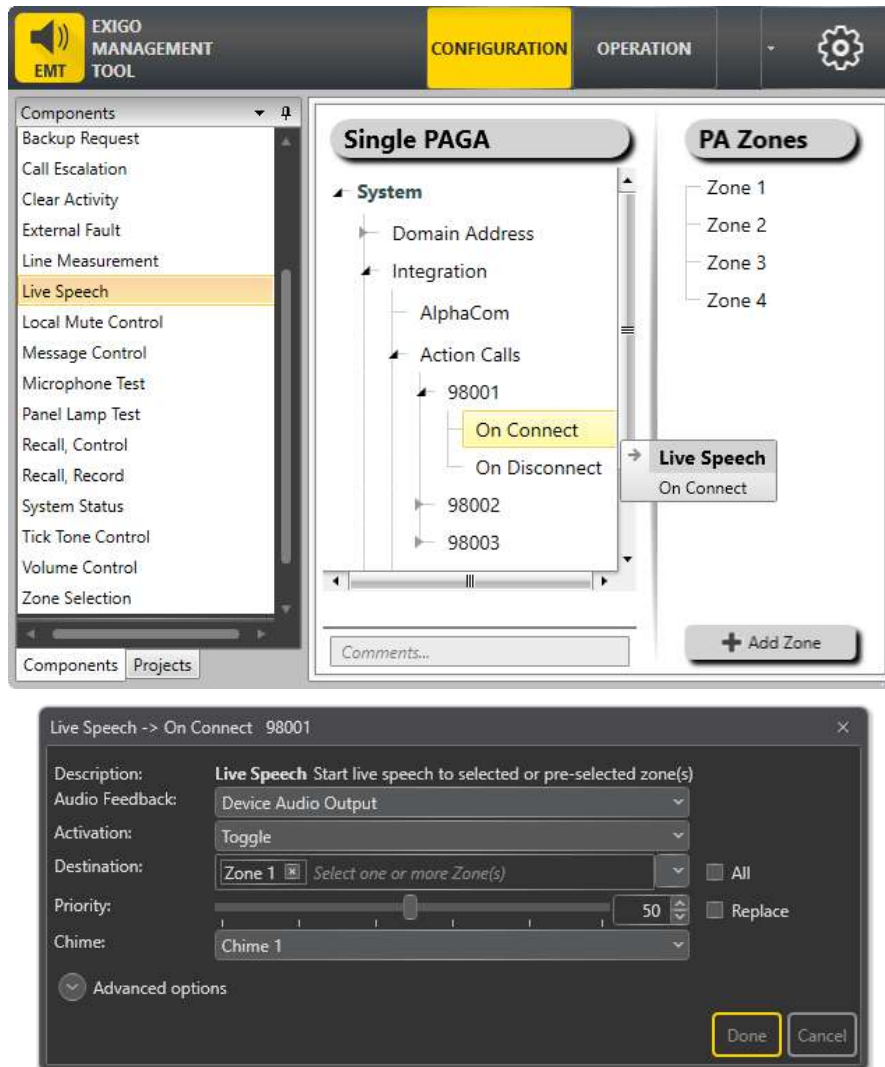
Live Speech will now use the caller from AlphaCom as a source for the live speech. Priorities and zone distribution are set on the live speech function as for any other activity. When the caller disconnects the call will be taken down as the source disappears.

D.4.4   Recall Record Control

Input Action Recall is useful in situations where there is potential audio feedback.

For example, to add Recall Record & Control to the Action Call directory number 98002:

- Drag-and-drop **Recall Record** on **Action Calls** > **98002** > **On Connect**

- Drag-and-drop **Recall Control** on **Action Calls** > **98002** > **On Disconnect**

When the directory number is called up from AlphaCom, the recording will be started.

When the call is disconnected, the recording will be dispatched.

D.4.5 Adding AlphaCom Feature

Adding an **AlphaCom Feature** to **Integration** allows Exigo to trigger activities in the AlphaCom system.

To add the AlphaCom Feature to the system:

- Drag-and-drop **External Connections** > **AlphaCom Feature** on **Integration** > **AlphaCom**
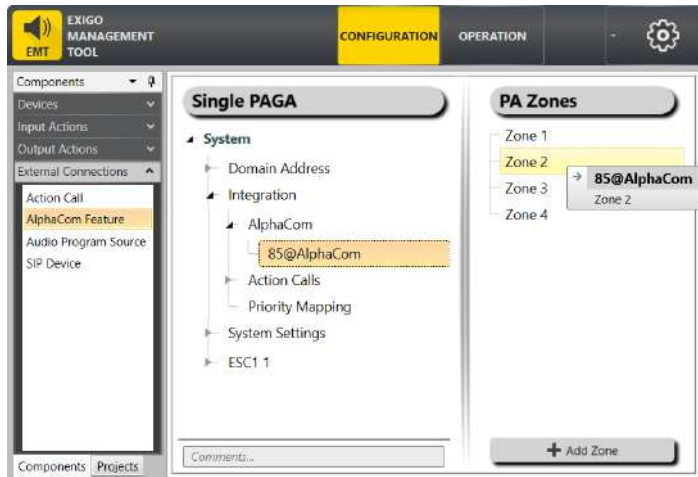
- Enter the **Feature Number** for AlphaCom

Each AlphaCom Feature relates to one feature number, typically an AlphaCom group number such as 85, 86 and so on. Each AlphaCom feature can then be assigned to different zones in the system.

In this example:

- Drag-and-drop **85@AlphaCom** on **Zone 2**

Sending audio to a zone that contains an AlphaCom Feature will route the audio to the AlphaCom system using the SIP interface. It is best practice to not mix AlphaCom Features with other audio channels.

D.5   Priorities

Exigo has 100 priorities while AlphaCom and SIP has only four, i.e. Emergency, Urgent, Normal, Non-Urgent. Hence, outgoing activities from Exigo will be translated based on a **Priority Mapping**. This Priority Mapping allows different groups/range of priorities to be translated into the four priorities that can be used by AlphaCom. To map the priorities:

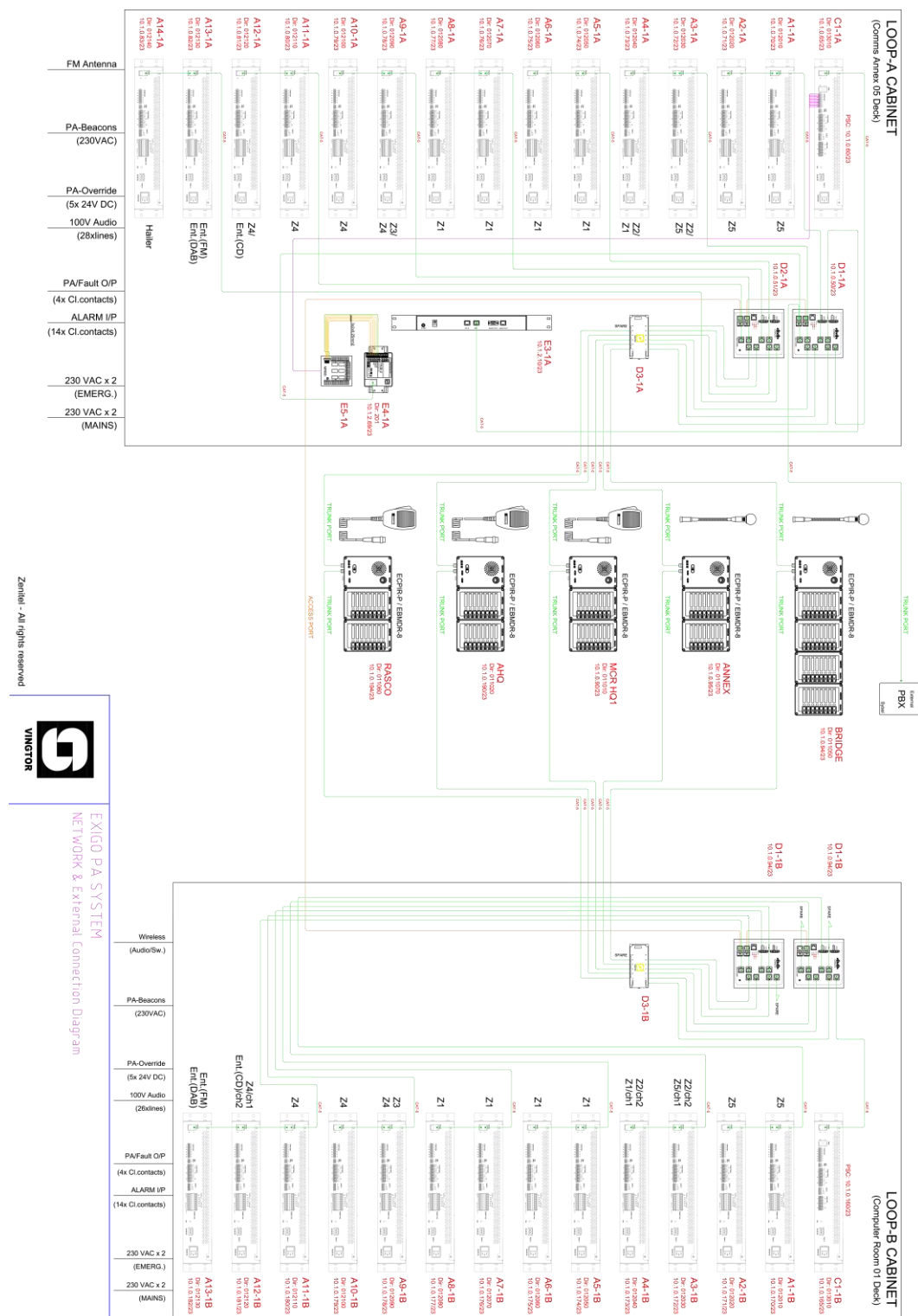- Click **Integration** > **Priority Mapping**

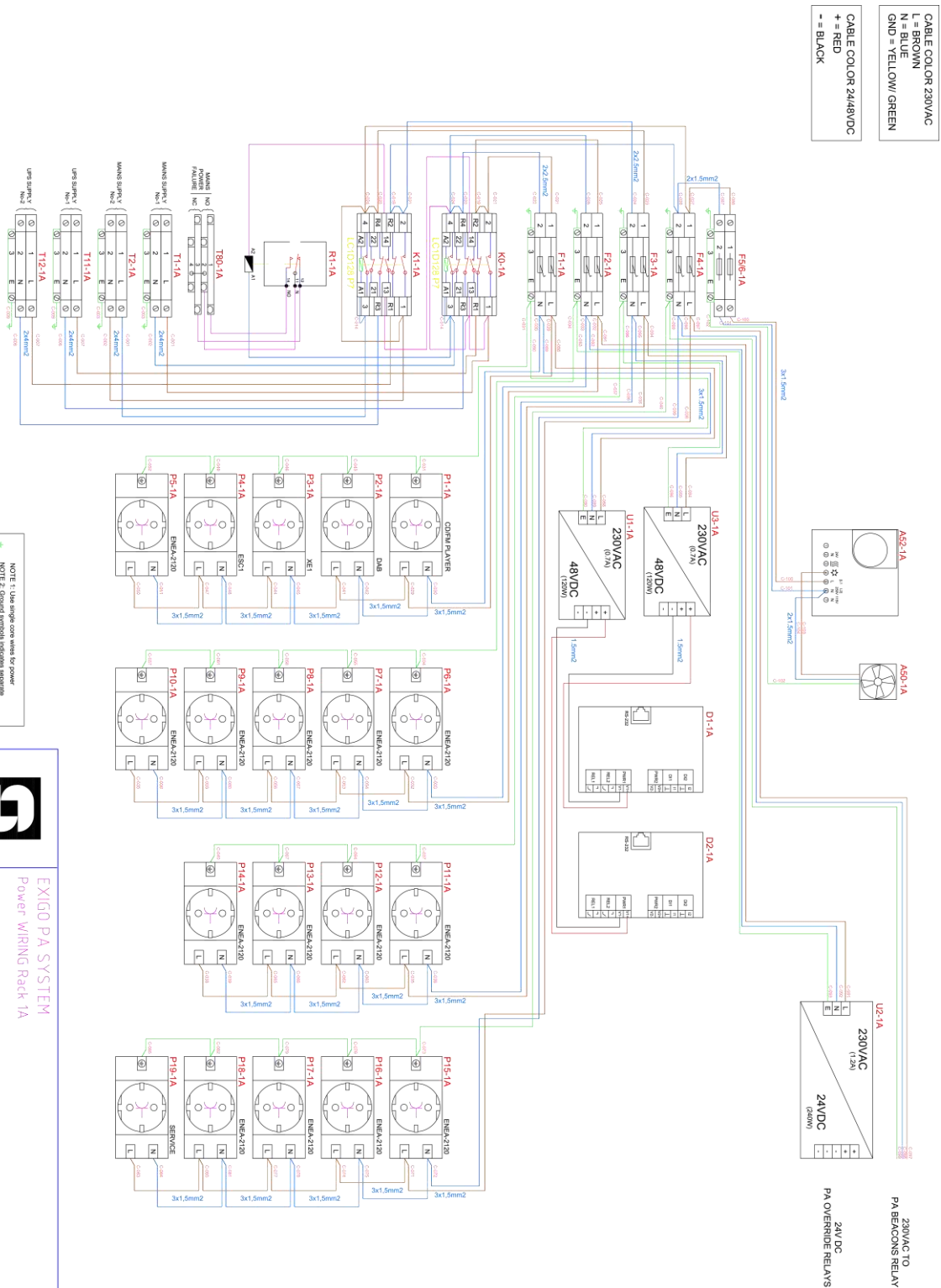- Set the desired priority range under **Exigo Priority**

E Commissioning, Connection & Wiring Diagrams

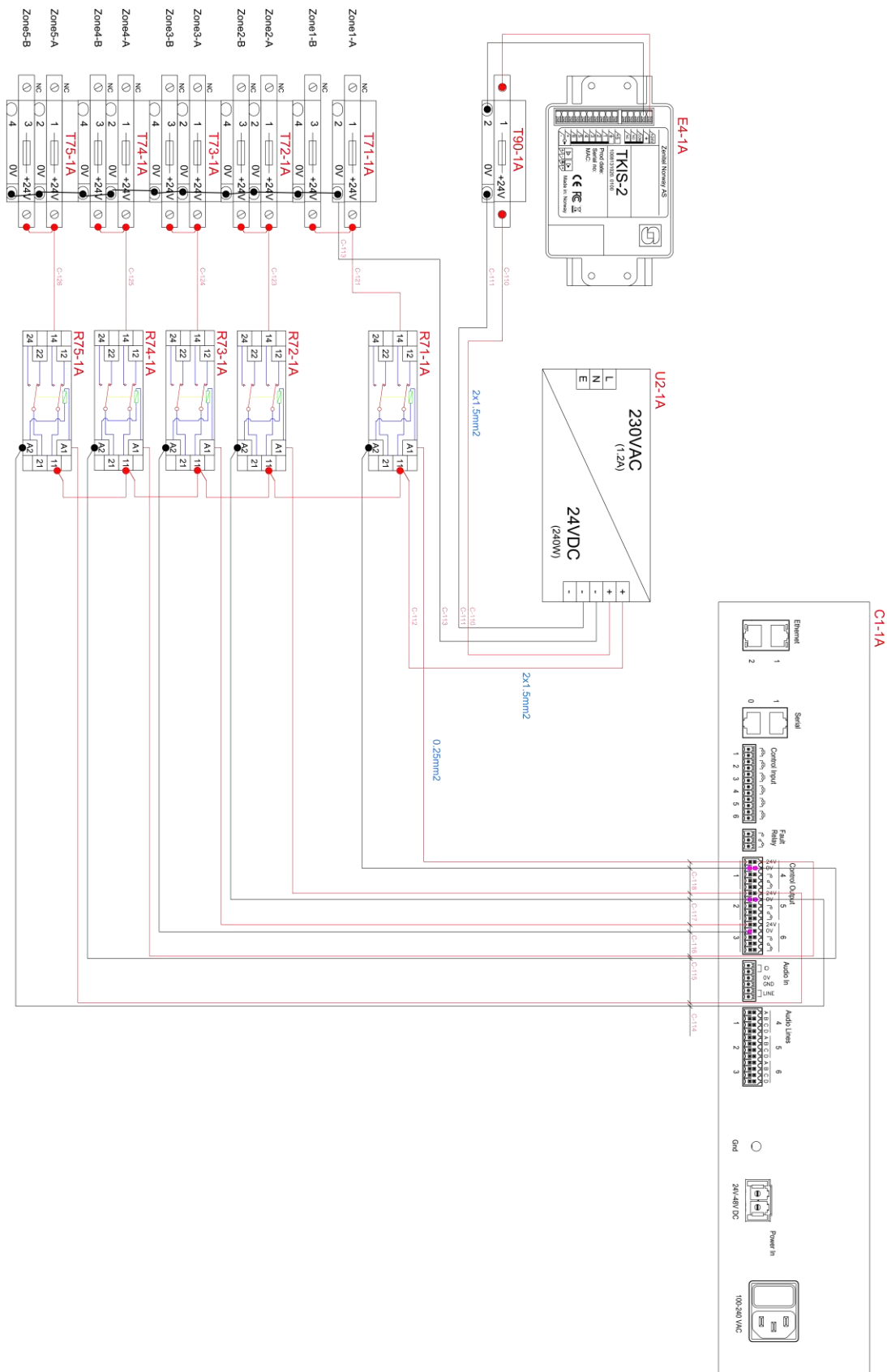The diagrams in this section are examples from commissioned projects.

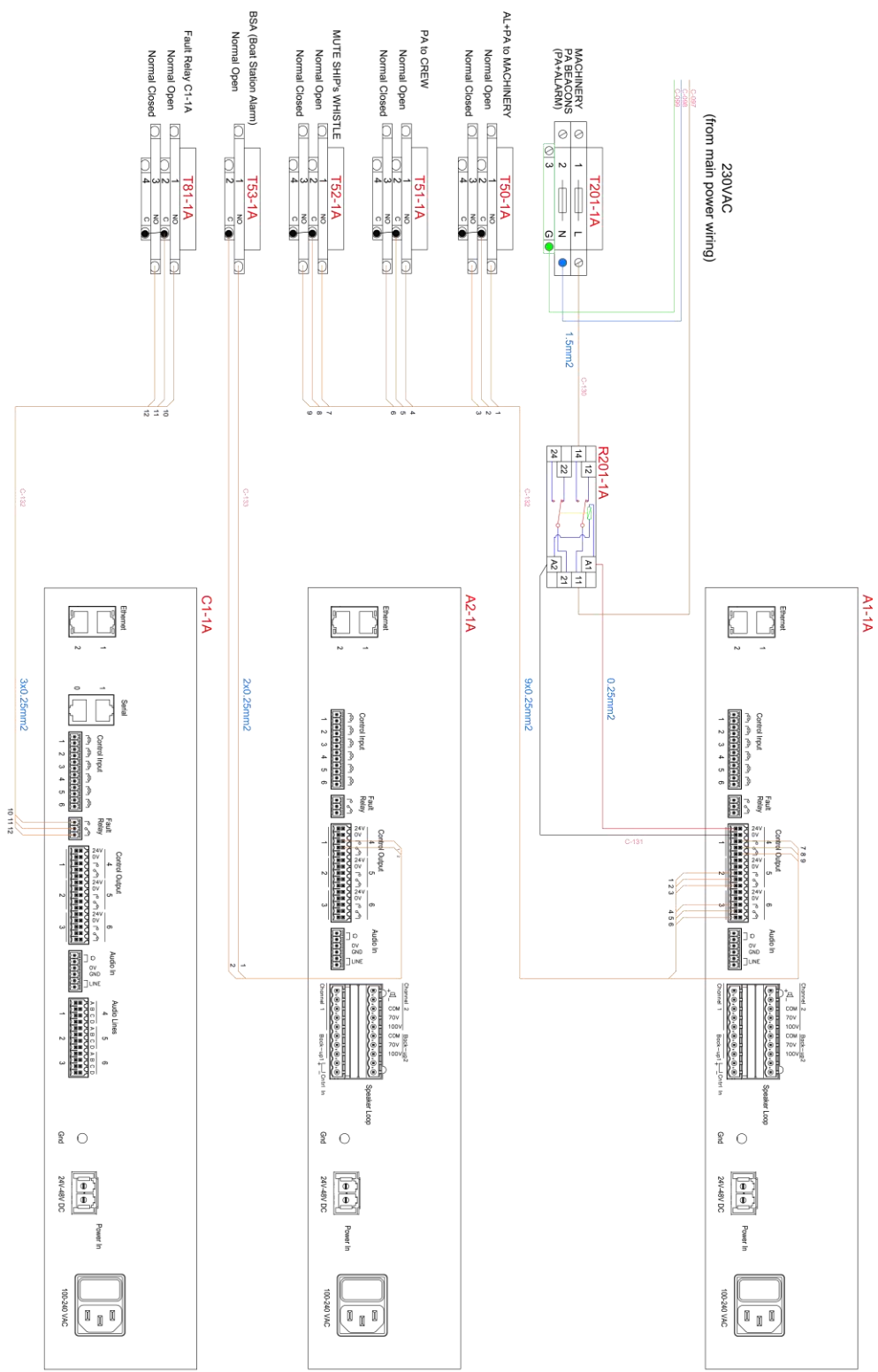## E.1 Network & External Connections – A-B System

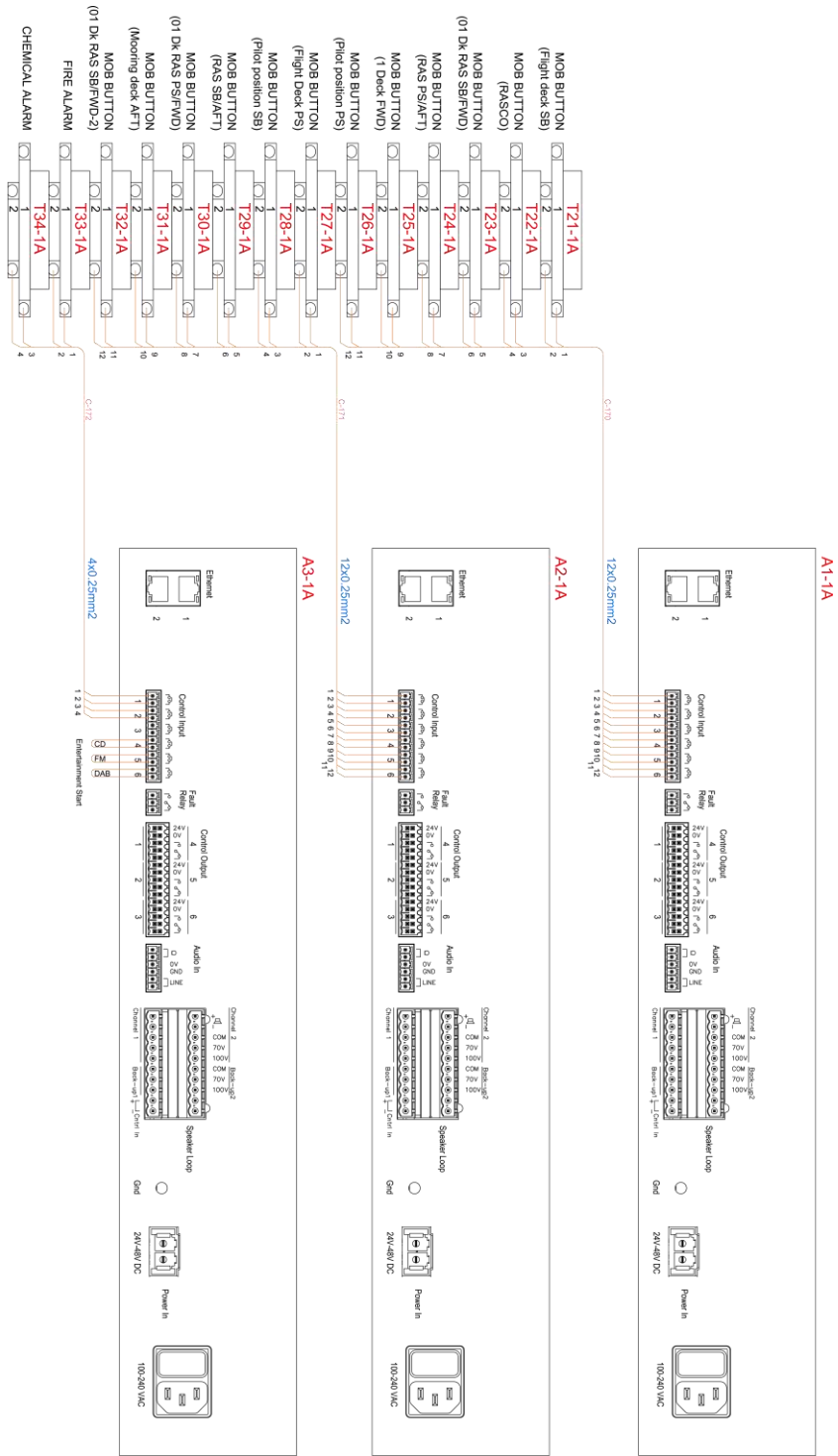# E.3 PA Override Relays Wiring

EXIGO PA SYSTEM
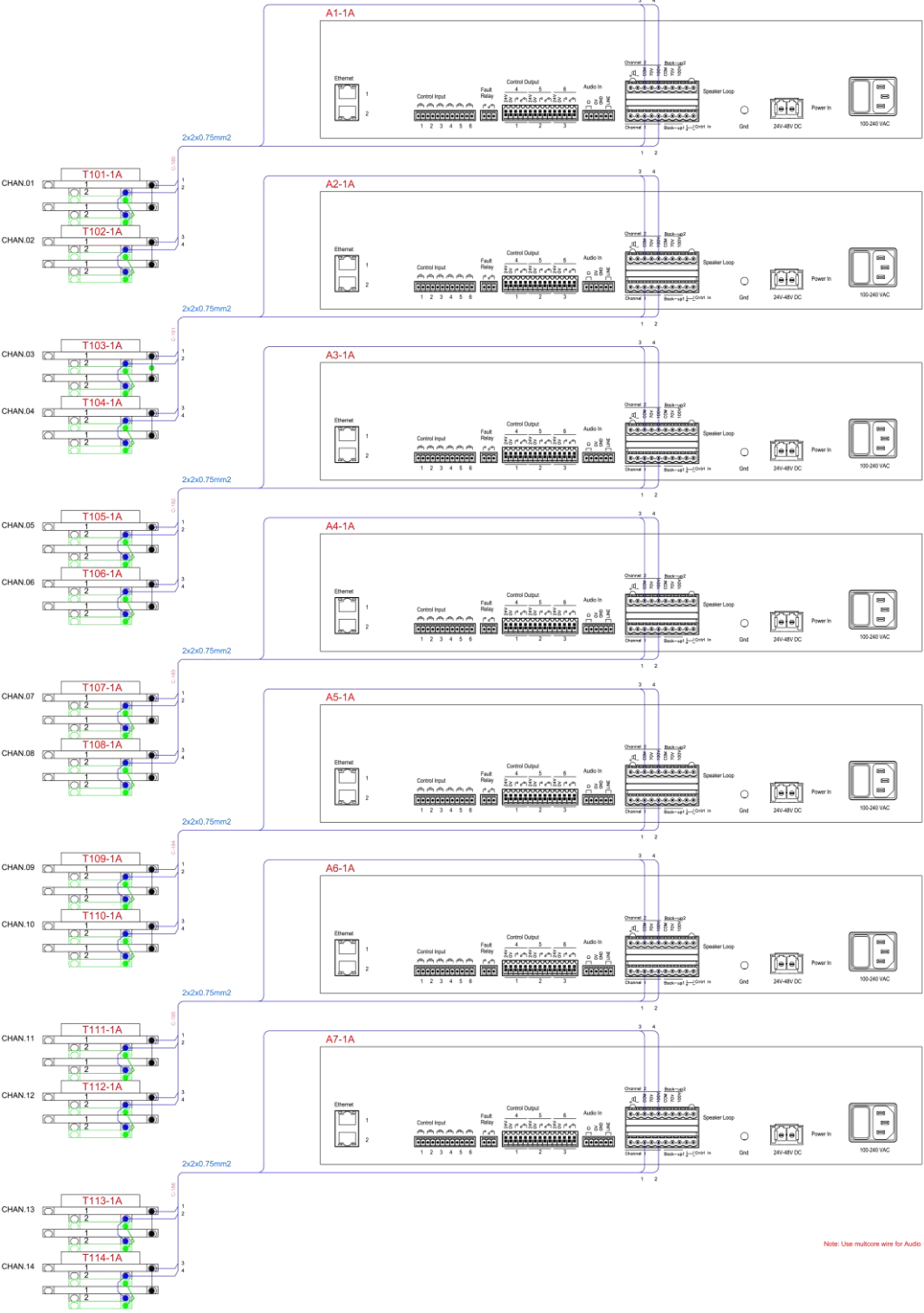RELAY OUTPUTS (GPO) WIRING Rack 1A

EXIGO PA SYSTEM
Closing Contacts Inputs (GPI) Wiring Rack 1A

E.6 Audio Wiring

EXIGO PA SYSTEM
100V AUDIO WIRING Rack 1A

VINGTOR

E.7 Entertainment & PBX Wiring

TOP VIEW

SWING FRAME

388

INSIDE LAYOUT VIEWED FROM LEFT

FRONT LAYOUT (SWINGFRAME)

1HU free space (CO2 inlet)

A14-1A A13-1A A12-1A A11-1A A10-1A A9-1A A8-1A A7-1A A6-1A A5-1A A4-1A A3-1A A2-1A A1-1A C1-1A E3-1A E2-1A E1-1A

BACK MOUNTING PLATE LAYOUT

E8-1A E7-1A E6-1A E5-1A E4-1A

D2-1A Mounting plate D1-1A U3-1A U1-1A U2-1A Mounting plate

INSIDE LAYOUT VIEWED FROM RIGHT

P18-1A P17-1A P16-1A P15-1A P14-1A P13-1A P12-1A P11-1A P10-1A P9-1A P8-1A P7-1A P6-1A P5-1A P4-1A P3-1A P2-1A P1-1A

A32-1A
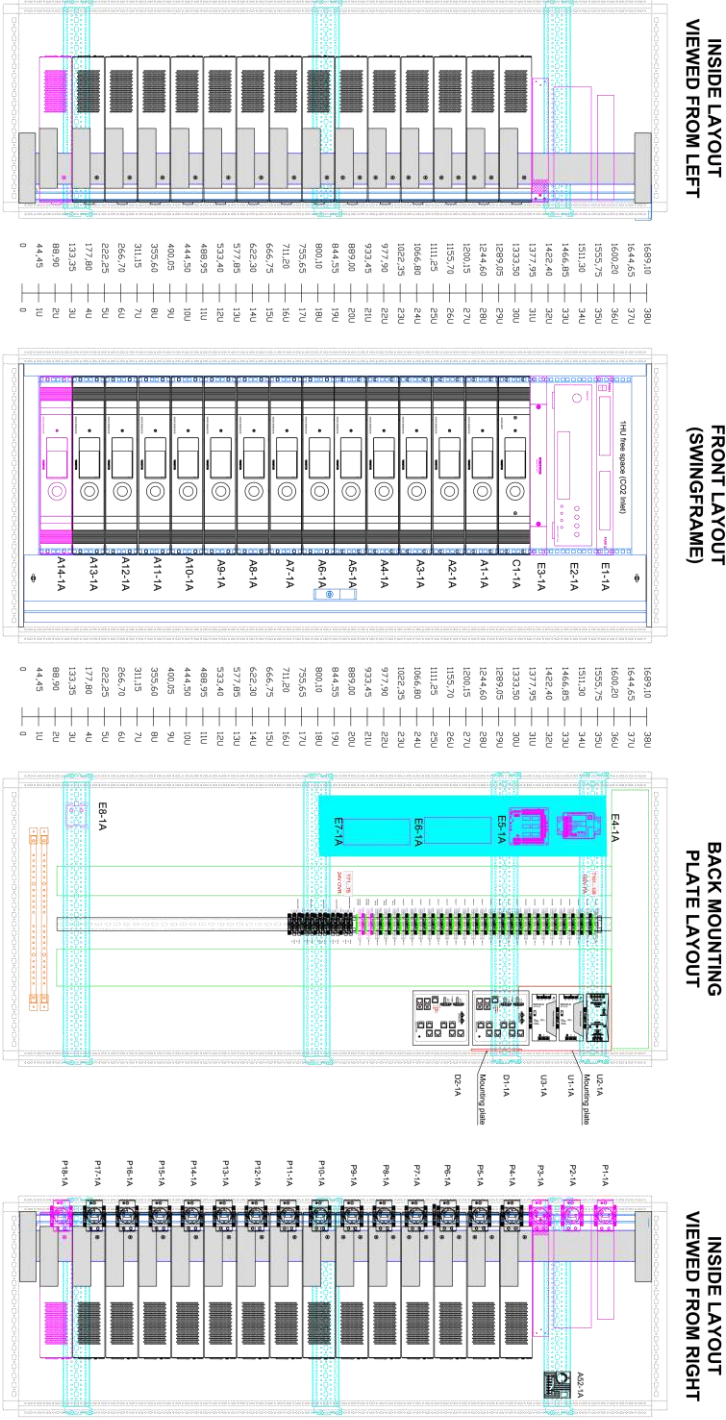
NOTE:
REINFORCED SWING FRAME &
WING NUTS TO SECURE WHEN
CLOSED.

TOTAL WEIGHT: ~290 kg
(Weight empty rack: ~50kg)

SCALE: 1:12 @A3

VINGTOR

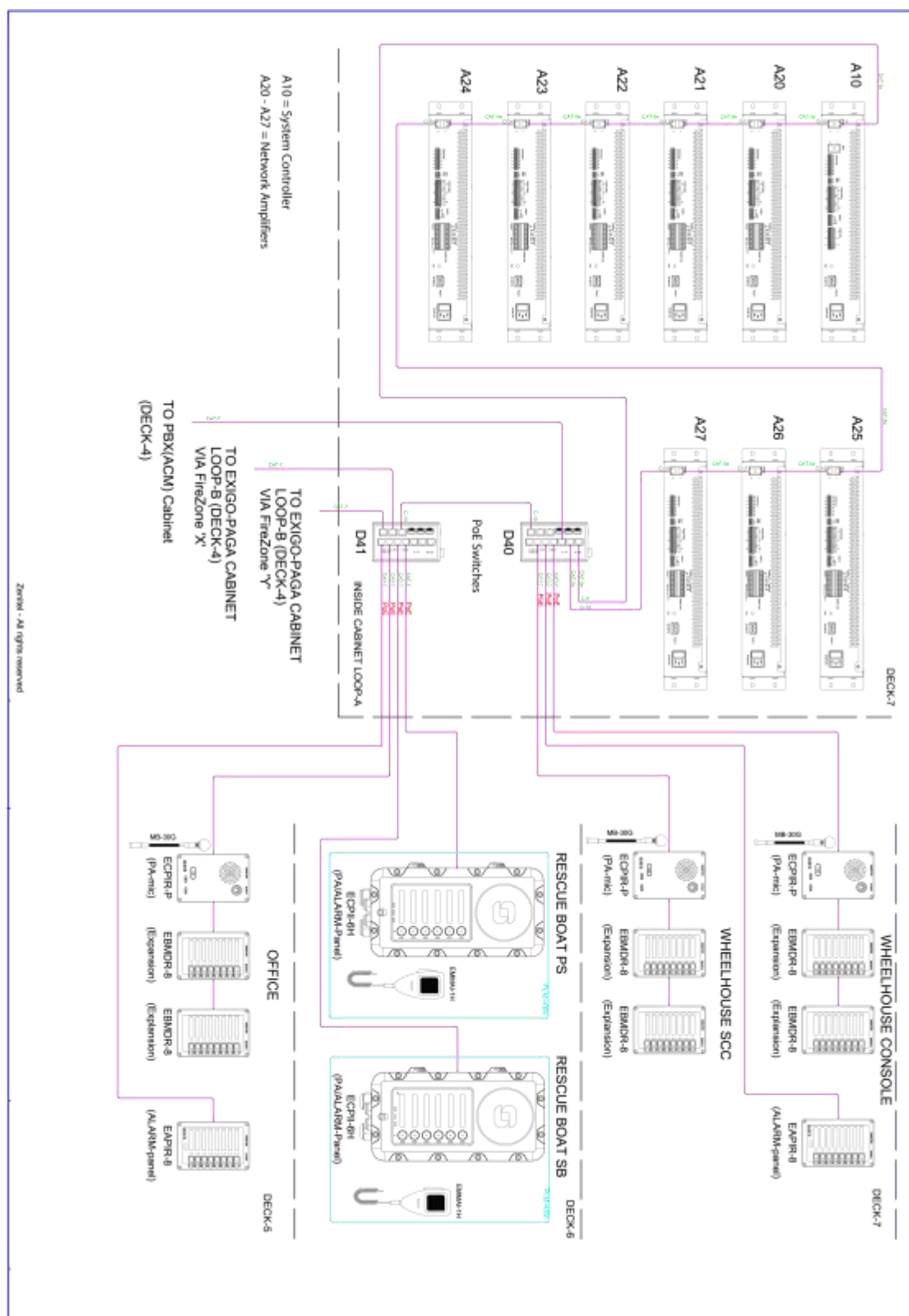EXIGO PA SYSTEM
CABINET LAYOUT Rack 1A

COMPONENT INDEX

ID	ITEM	DESCRIPTION
A1-A14	1023102120	ENEA-2120 EXIGO AMPLIFIER 2x120W
C1	1023000000	ESC1 EXIGO SYSTEM CONTROLLER
D1-D2	1023604008	ENSIR-8 EXIGO MANAGED NETWORK SWITCH
E1	2382990002	SPA-F80B3 FM/CD/USB Entertainment player
E2	S-100	DHcyo T-4030 DAB FM Tuner
E3	1009601000	AlphaCom XE1
E4	1008131020	TKIS-2
E5	1009970200	MRBD
E6-E7	9011205009	AUDIO MIXER CARD
E8	3006224040	RF SPLITTER (SPEF)
P1-P19	-	POWER OUTLETS
U1/U3	1023597000	EPMN-120 EXIGO POWER SUPPLY FOR ENSIR-8
U2	2590000033	24V DC Power Supply (SNT-250 10A)

E.9 Panel Connection & IP Wiring – Single System

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⚠️ **The WEEE Directive does not legislate that Zenitel, as a 'producer', shall collect 'end of life' WEEE.**

This 'end of life' WEEE should be recycled appropriately by the owner who should use proper treatment and recycling measures. It should not be disposed to landfill.

Many electrical items that we throw away can be repaired or recycled. Recycling items helps to save our natural finite resources and also reduces the environmental and health risks associated with sending electrical goods to landfill.

Under the WEEE Regulations, all new electrical goods should now be marked with the crossed-out wheeled bin symbol shown.

Goods are marked with this symbol to show that they were produced after 13th August 2005, and should be disposed of separately from normal household waste so that they can be recycled.

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