

Public Address and Voice Alarm System

PRAESENSA

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1 DNV Type Approval

The DNV Type Approval for PRAESENSA systems installed on vessels requires certain installation and configuration directions to be adhered to.

1.1 Introduction

The Bosch PRAESENSA system is designed to operate as a PA/GA (Public Address/General Alarm) system, providing emergency announcement functions in accordance with the requirements of international standards, while also providing functions for business announcement and background music.

The PRAESENSA PA/GA system includes system controllers, multi-channel amplifiers, desktop and wall mount emergency call stations, uninterruptable power supplies and network switches.

Installers of the PRAESENSA PA/GA system shall review and understand the architecture and the installation and configuration processes of PRAESENSA in order to build up the system in compliance with the DNV Type Approval requirements. This information is available in the PRAESENSA installation manual, with focus on the hardware, and in the PRAESENSA configuration manual, with focus on the software.

2 Checklist

In this checklist specific issues that require special attention from the installers when installing a PRAESENSA PA/GA system are described. Each section of the checklist must be approved after installation for compliance (Y/N-field).

2.1 System compliance

Y/N:

PRAESENSA is a networked sound system in which all system elements are connected via OMNEO, the secure Bosch network protocol for audio and control on Ethernet. A system comprises several system elements, or devices.

The Type Approval Certificate TAA00002RC, issued by DNV, certifies that PRAESENSA is found to comply with:

- DNV rules for classification - Ships, offshore units, and high speed and light craft
- IMO Res. A.694(17) General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids
- IMO A.1021(26) Code on alerts and indicators (2009)
- LSA Code VII 7.2
- IMO MSC/Circ. 808 Recommendation on performance standards for public address systems on passenger ships, including cabling (2017)

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

The PRAESENSA Public Address and General Alarm system can be installed as either:

- PA system only
- GA system only
- Integrated PA and GA system

The PRAESENSA system may be used on cargo ships, passenger vessels, high-speed and light craft and mobile offshore units for compliance with the following codes/rules/regulations:

- SOLAS
- HSC Code
- MODU Code
- DNV Statutory Interpretations [July 2015]

PRAESENSA PA/GA installations that are used for GA-functions shall only use products that are listed in the PRAESENSA Type Approval Certificate TAA00002RC. Extension of a PRAESENSA system with non-listed equipment is possible, but if this equipment

- is directly connected to one of the system devices, or
- is network-linked to the system using OMNEO, Dante or AES67 for audio contribution or distribution, or
- is network-linked to the system using the PRAESENSA Open Interface, or
- is part of the network infrastructure, such as switches, routers and media converters, then the following restrictions apply to this equipment:
 - it shall not be used to perform GA-functions or transfer data to perform GA-functions, and
 - it shall be protected against unauthorized access, and

- its internet connection shall be provided with the highest level of cybersecurity, and
- its Wi-Fi and Bluetooth connections shall be disabled.

Note: The OMN-ARNIE, OMN-ARNIS and the CISCO IE-5000-12S12P-10G switch do not have DNV Type Approval. As such, PRAESENSA multi-subnet systems cannot be used for GA-functions.

2.2 Open Interface protocol

Y/N:

The Open Interface protocol allows for secure and non-secure connections to support legacy applications. Be aware that:

- For DNV applications, only secure connections must be utilized. In DNV usage, only the secure port 9403 is permitted, which allows communication only through TLS. In the *System settings* page of the configuration, the user can select between *TLS1.2* and *TLS1.3*. This device configuration is based on an IP-address, allowing access to be limited to devices from other subnets. Make sure to use only explicitly configured devices for the Open Interface.
- A firewall is required to use the Open Interface with networks beyond that of the PAGA system. The firewall needs to be an external device that separates and isolates the PAGA network from other networks. The firewall must only allow the intended network traffic to pass through.
- The passwords used must have the following:
 - A minimum of 12 characters of length.
 - At least one uppercase character.
 - At least one number.
 - At least one special character.
- The emergency functionality accessibility of the Open Interface must be disabled in the configuration, in the *System settings* page -> section *Open Interface*. For details, Refer to the PRAESENSA Configuration manual.

The process capacity for the Open Interface protocol is as follows:

- Receiving messages: one message per second on average with a burst of 10.
- Transmitting messages:
 - One response per command
 - A burst of up to 2000 events for each event registration
 - One or more call state updates per call
 - One or more zone state updates per call.

2.3 Location

Y/N:

The following location requirements for installation must be taken into account:

- The PRAESENSA equipment can be installed in one of the main area locations on board in accordance with the Class Guideline DNVGL-CG-0339 and the location class of each product, as indicated on the DNV certificate.
- Call stations with functions for activation of emergency PA and GA are to be installed in locations with controlled access.
- To prevent acoustic feedback ('howling'), do not mount a zone loudspeaker close to a call station when that loudspeaker may receive calls from that call station. Because a PRAESENSA call station has a built-in monitor loudspeaker (that is switched off while the microphone is open) there is also no need for an overhead zone loudspeaker.
- The following safe distance to the *standard* magnetic compass must be considered for the PRA-CSLD, PRA-CSLW and PRA-CSE: > 85 cm (> 34 in).
- The following safe distance to the *steering* magnetic compass must be considered for the PRA-CSLD, PRA-CSLW and PRA-CSE: > 55 cm (> 22 in).

Other PRAESENSA products are not to be positioned in the vicinity of a magnetic compass.

2.4 Installation

Y/N:

The following installation restrictions apply:

- When separate PA and GA systems are installed, no single fault tolerance is required as the combination of both systems provides redundancy.
- For a system used for PA on passenger vessels or used for integrated PA and GA on any vessel, essential parts of the system shall be duplicated (A+B systems). Various duplications are possible with PRAESENSA, like system controller redundancy, double network connections, A/B loudspeaker cabling and power supplies with battery backup facilities. Other duplications are already integrated in PRAESENSA, like spare amplifier channels and redundant power converters. Information about duplication of essential parts of a system is available in the PRAESENSA installation manual.
- When used for passenger vessels, the A+B systems are to be installed in separate fire zones.
- When used for cargo vessels, the system may be installed on one location, but it must be installed with single fault tolerance.
- When used for a combined PA/GA system, as a minimum two independent speaker runs A and B are required with interleaved loudspeakers, or the loudspeakers must be connected in closed loop between zone group outputs A and B.
- For ongoing announcements during a switchover from the duty system controller to the backup system controller the following should be taken into account:
 - Automated GA emergency alarm activation should always be done via PRAESENSA control inputs (contact closure) to ensure that the GA emergency alarm continues after switchover. It is not allowed to activate GA emergency alarms from a call station.
 - For manual emergency PA announcements (using the PTT button on a call station or panel), it is accepted that the announcement is terminated after a switchover and must be reinitiated by the user.
 - A call station capable of issuing GA and emergency PA shall be connected to both system controllers (duty and backup). This is automatically achieved by connecting all PRAESENSA devices in the same subnet of the network and configuring both system controllers as a redundant pair.
- The following power management options are allowed:

- Connection to a mains and emergency source of power are handled by an Uninterruptable Power Supply (UPS) outside the PRAESENSA system.
- Connection to a mains source of power is handled by PRA-MPS3 devices, that have a battery connected of sufficient capacity.
- Output contacts shall be used to override local muting or local volume controls (at or near the speakers) during a GA and emergency PA announcement. Refer to the Control outputs chapter of the Installation manual.
- Emergency PA shall have a priority higher than GA, otherwise it is not possible to have an emergency PA announcement when GA is already running. General (business) PA should have a priority that is lower than GA and emergency PA.
- Any call station that is not used for emergency PA activation shall have a lower priority than GA.
- Call stations with functions for activation of emergency PA and GA shall be provided with means to avoid unintended use. Each configured button of a PRA-CSE call station extension for such a call station must have a clear descriptive label to identify its function. To protect buttons from being pushed accidentally, a button cap must be mounted on each button that can activate an emergency function. Refer to the chapters Labeling and Mounting a button cap of the Installation manual.

In order to reset a GA emergency alarm as a default single button action, a combined Acknowledge/Reset action must be configured for that button to prevent that two buttons need to be pressed separately. In addition, by selecting Reset aborts active emergency calls for that button, the reset action will not be blocked by emergency calls that are still active.

2.5

Cabling

Y/N:

Cables and wiring serving internal communications or signals should, as far as practicable, be routed clear of galleys, laundries, machinery spaces of category A and their casings, and other high fire risk areas unless serving those spaces.

Where possible, all such cables should be run in such a manner so as to preclude that they are being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space. All areas of each fire zone should be served by at least two dedicated loudspeaker runs sufficiently separated throughout their length.

Using loop wiring with entry into a fire compartment from two different sides, often the use of fire resistant cables can be evaded. But in case fire resistant cables are specified within the system design, these cables are available on the market with DNV Type Approval, for loudspeaker and power cabling, as well as for short distance CAT6A network cabling and for longer distance glass optical fiber cabling.

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