

1 Introduction

On a vessel with totally enclosed bridge the sound reception signal system serves as an electronic acoustic navigational aid which alerts the officer on the watch to outside sound signals from other ships. The system displays the direction of the incoming sound in order to perform the look out function as required by the International Regulations for Preventing Collisions at Sea, 1972 (and SOLAS Chapter V Res. MSC.99(73)).

The system complies with the Concil Directive 96/98/EC of Dec. 1996 on Marine Equipment (MED), i.e. Annex A.1, item No. A.1/4.58 and Annex B, Module B in the Directive, SOLAS 74 as amended, Regulation V/18, V/19& X/3, IMO Res.A.694(17), 2000 HSC Code, IMO Res. MSC.85(70)&191(79).

- Reception of sound signals from all directions in the audio band 70 Hz to 2100 Hz by means of five microphones (ISO 14859 (2012))
- Acoustic-display of incoming sound signals inside the bridge
- Indication of the direction of meaningful incoming sound signals on an optical display
- Suppression of unwanted background noise, allowing reception of a relevant sound signal

1.1 Features

- The system is fully digital
- Communication between micro mast and bridge panel is IP based
- Indication that connection between bridge panel and micro mast is established
- System ok relay output see connection diagram 01506741 (X4)
- Signal detected relay output (X4)
- Automatic dimming
- VDR communication
- Remote dimming over VDR using \$--DCC command
- One micro mast can serve up to 10 bridge panels (optional with HUB)
- Very good distriction between signal and speaking and music
- Fast signal detection (400 ms)
- Full signal play back (delayed)
- Firmware upgradable
- No analog signal, i.e. easy cabling between micro mast and bridge panel
- The system can be joined to board network
- type approved by DNV-GL Certificate (module B) MED B00000U4
Certificate (module D) MED D0000086

2 Construction

The sound reception system type SRD414/4 consists of two main components:

- The master control panel for indication of the sound direction and for reproduction of an audible signal inside the bridge
- The microphone sensor unit located on top of the bridge superstructure for detecting the incoming sound signals

2.1 Master Control Panel SRD414/4

The master control panel has a display with 8 LEDs for directional indication, one dimmer control for the LEDs (automatic and remote dimming) and one volume control for the built-in loudspeaker. The system indicates clearly that it is working (LED red/green). Volume control and dimmer control have background illumination. The unit has a standard marine layout and is arranged for easy mounting. The unit is black.

2.2 Microphone Sensor Unit SRD414/4 (Arctic)

The unit consists of a small seawater resistant sensor unit with 5 microphones, designed for rough environmental conditions. All precautions for materials used, finishing and final material treatment were taken to develop a product which can withstand the corrosive atmosphere on board of a ship.

2.3 Microphone Sensor Unit SRD414/4 version Arctic

The arctic version has a special wind shield heating with 1000VA (tested at -62°C) requiring a separate cable.

3 Location

The microphone sensor unit shall be placed on top of the bridge, as far away as possible from large superstructures and sources of noise e.g. funnel and radar, ideally on a separate rigid mast. The actual position must be arranged on location. The sensor unit is readily assembled for ethernet connection (CAT5/7 must be shipyard provided) and can be easily bolted to the ship foundation and the cable can be easily routed inside the hull.

The master control panel shall be installed in the bridge control desk or conveniently in the bridge front, visible for the officer on watch.

3.1 Distances to the magnetic compass

Standard -magnetic- compass to the bridge panel 2.30 m
Steering -magnetic- compass to the bridge panel 1.40 m
Standard -magnetic- compass to the micro mast 0.60 m
Steering -magnetic- compass to the micro mast 0.40 m

4 Technical Data

4.1 Dimensions and technical data

Master Control Panel SRD414/4: 144x144x200 mm, for panel or console arrangement, mounting see drawing 01415651

Microphone Sensor Unit SRD414/4: Column 702 mm high
mounting see drawing 01415556-4 (Arctic 01415623)

Cable connection: see diagram 01506741 (Arctic 01506777)

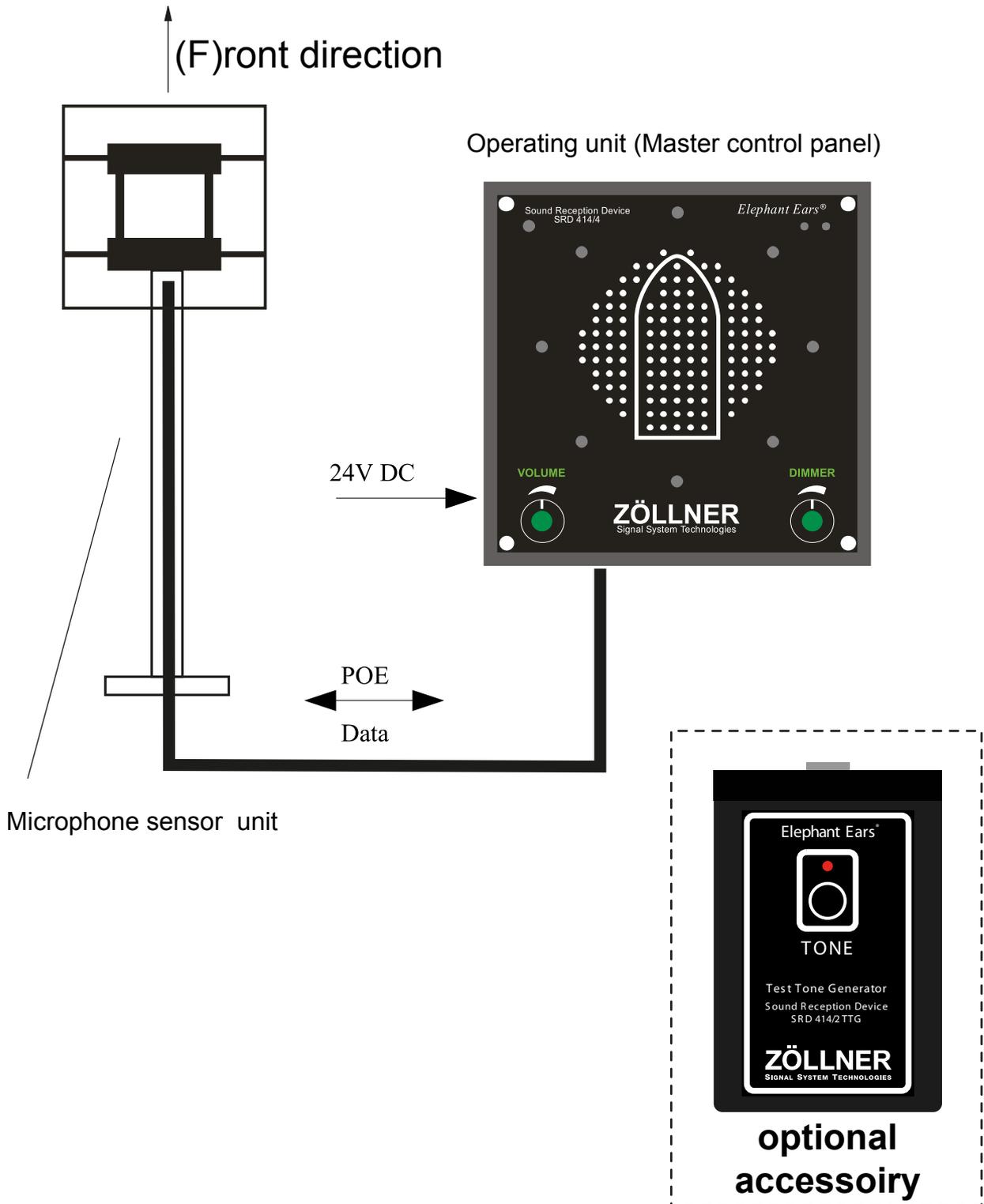
Power supply: 24 V DC, +30 / -10 %

Power consumption: stand by 5 VA, max. 12 VA (Arctic heating 230VAC-1000VA)

Frequency range: 70 Hz to 2100 Hz

Protection: IP 56 (microphone sensor unit), IP 22 (master control panel)

SYSTEM OVERVIEW



4.2 Cable connection

Standard CAT5/7 ethernet cable suitable for marine outdoor use.

At the master control panel the earthing terminal/housing shall be firmly connected to the ship main earthing.

4.3 Drawings

	Drawing No	Date/Rev.	Note
master control panel: layout & mounting	01415651		subject to alteration
microphone sensor unit: layout & mounting	01415556		"
cable connection diagram	01506741		"
microphone sensor unit: Arctic	01415623		"
cable connection diagram: Arctic	01506777		"

4.4 Installation and adjustments

The units shall be installed as indicated above and according to the drawings.
For orientation and fixing of the microphone unit refer to the mechanical installation drawing.

The microphone sensor unit shall have a firm earthing connection to the ship hull.
Supply and signal wiring shall be connected according to the cable connection diagram.

No further checking and adjustments are necessary.

5 Operation

5.1 Operation

Once the system is connected to the power supply, a short tone and full indication on all LEDs will indicate that the system is working properly.

After a short period of time the master control panel will work in operating mode. OK and failure LEDs show whether the system operates as expected.

The signal detecting properties can be checked by releasing a tone close to the microphone sensor unit with the test tone generator. While the signal is being released the master control panel shall give a reproduced sound and indicate the signal direction.

5.1.1 Sound adjustment

The sound level is adjusted by turning the volume control switch. A built-in feature secures a minimum level for safety precautions.

5.1.2 Illumination level

The lighting level of the LEDs is adjusted by the dimmer control. A built-in feature secures a minimum level for safety precautions.

6 Maintenance

The system is almost maintenance-free.

Every 2 to 3 months the metal mesh cylinder and the microphone openings must be cleaned from dirt, salt crystals or ice.

7 Trouble shooting

If the system is not working properly, few and simple trouble shooting routines can be used to determine the location of the failure.

7.1 Master Control Panel

- Check the power supply of 24 V DC between terminals 1 and 2 at the terminal strip "power supply 24 V DC". The measurements shall be "+" at terminal 1 and "-" at terminal 2.
- Make sure that the unit is not blocked (deactivated). The unit is blocked if a voltage of 12-24 V DC is connected to terminals 1 and 2 at the terminal strip "mute/blocking".
- Check the network connection to the micro mast. Connect the micro mast to an ethernet switch. Check if it is possible to establish network connection to it (web page or ping, default IP address: 192.168.2.160)

7.2 Microphone Sensor Unit

- Check the network cable.
- Connect the micro mast to a PoE switch. Check if it is possible to establish network connection to it (web page or ping, default IP address : 192.168.2.161)

8 Repair on board

A repair on board is not possible. If the trouble shooting measures do not lead to a positive result, the microphone sensor unit or master control panel must be sent to our workshop or replaced by a new unit.