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PHONTECH

SR 8300 MKII

VOLUME
DIMMER

ON/OFF

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About this Document

Document Scope

This document describes the installation and operation of the 8300 MkII Sound Reception System.

Product	Item Number
P-8300 MkII Display Unit	4000019415
P-8301 MkII Microphone Unit	4000019416
Junction Box for Microphone Unit	4000019634

Publication Log

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2.9	16.04.2024	AK/CV	Published	Chapter 6 Testing update

Type Approvals

The 8300 MkII Sound Reception System has been type approved by the MED, MER, CCS, ABS, DNV and RMRS classification societies.

CONTENT

SERVICE AND WARRANTY

Zenitel warrants that the product sold by Zenitel substantially confirm with said products written specifications for a period of up to 24 (twenty-four) months after invoice date. Notice of claims shall be made to Zenitel within 30 (thirty) calendar days after receipt of the product. The claim must be registered either online at www.zenitel.com/customer-service/claims or on RMA form provided by Zenitel through claims@zenitel.com.

a) Delivered batteries are generally not covered by Zenitel warranty terms.
b) Buyer also has an option to extend the 24 (twenty-four) (24) months warranty time at a separate charge. The details for this are found in the valid pricelist, and has to be settled before delivery of the products.
c) The product must have been properly stored, installed and used to claim under the warranty.
d) Within the warranty period, the Buyer shall give prompt written notice, if any part of the product is proven defective in material or workmanship, online either at www.zenitel.com/customer-service/claims or on RMA form provided by Zenitel through claims@zenitel.com.
e) Zenitel shall not be liable to Buyer or third party claims relevant to accidental or improper use, wrong installation performed by uncertified technicians, from damage to the product, or from other circumstances beyond Zenitel's control.
f) The product shall be returned to Zenitel, subject to prior written consent from Zenitel, in the form of a RMA reference number (Return Merchandise Authorization). The product shall be returned immediately, and no later than 60 days after RMA reference number has been received. Returned products in lack of such reference, will not be accepted by Zenitel and
returned to Buyer at Buyer's cost.
g) The cost of the return shipment is to be covered by the Buyer. Zenitel will cover the cost of shipment for replacement parts.
h) Zenitel decides whether a defective part shall be replaced, returned to factory for repair or being repaired onboard the vessel or on site.
i) If repair/change of parts is to be done onboard the vessel or on site, Zenitel shall approve by certification the company/technician doing the labor on their behalf. After the repair is done onboard the vessel or on site, Zenitel will, based on the repair report, decide if the mentioned repair is a warranty matter or not. If it is a warranty matter, Zenitel will cover labor time up to 4 hours, and spare parts to correct the fault. Service technician's preparation, travelling time and travelling expenses, if any, are for the account of the Buyer.
j) If Zenitel has to deliver new parts to solve a warranty matter before the claimed product is received for inspection and acceptance, Zenitel will invoice the new part with standard order terms at shipment, and then issue a credit note when the defective part has been received by Zenitel and approved as warranty by quality department.
k) Repair or replacement of parts in a configuration done by Zenitel during the warranty period, has no effect on the expiration of the warranty for a complete project delivery, and does not give rise to a renewal or extension of the warranty period for the configuration.

UTILIZATION:

This equipment is not to be disposed in normal waste, but be handled in accordance with applicable waste disposal regulations in the country where the equipment is used

Abbreviations

CMOS	Complementary metal-oxide semi conductor
DDC	Display dimming control (sentence)
DHCP	Dynamic Host Configuration Protocol
EMC	Electromagnetic compatibility
ESD	Electrostatic discharge
GMDSS	Global Maritime Distress and Safety System
HBT	Heartbeat (sentence)
HTTP	Hypertext Transfer Protocol
Hz	Hertz (unit of frequency)
IC	Integrated circuit (system)
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
IP	Internet protocol (address)
ISO	The International Organization for Standardization
kB/s	Kilobytes per second
kHz	Kilohertz
LED	Light-emitting diode
MED	Marine Equipment Directive
PCM	Pulse code modulation
PJTR	Zenitel proprietary sentence
RMA	Return Material Authorization number
RTCP	Real-time Transport Control Protocol
RTP	Real-time Transport Protocol
SFI	System function ID
SOLAS	Safety of Life at Sea
SPL	Sound Pressure Level
SRS	Sound Reception Signal (proprietary sentence)
TAG	Transport, Annotate and Group
UDP	User Datagram Protocol
VDC	Voltage Direct Current
VOL	Volume (proprietary sentence)

A100K11918

General

Zenitel develops and manufactures professional and state-of-the art products and communication systems for usage on land and at sea. Zenitel supplies products and services that comply with the latest applicable standards. The use of modern test instrumentation and detailed test procedures ensures that you are supplied with quality products.
Copies of all Phontech documentation can be downloaded from our website: www.phontech.net

All information contained within this manual has been verified and is correct. However, no responsibility is assumed by Zenitel for inaccuracy. Zenitel reserves the right to make changes to any product(s) or module(s) described herein to improve reliability, function or design, without further notice.

Standards

The 8300 MkII Sound Reception System has been verified, tested and meets the following product standards:

ISO 14859:2012	Ships and marine technology – Sound reception systems
IEC 60945:2002 + additional tests	Maritime navigation and radio communication equipment and systems – General requirements – Methods of testing and required test results. EMI/EMC 2-6 GHz Operational temperature: +70 °C
IEC 61162-1:2016	Maritime navigation and radio communication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners.
IEC 61162-450:2018	Maritime navigation and radio communication equipment and systems – Digital interfaces-Part 450: Multiple talkers and multiple listeners – Ethernet interconnection.
IEC 62288:2021	Maritime navigation and radio communication equipment and systems – Presentation of navigation – related information on shipborne navigational displays – General requirements, methods of testing and required test results.

8300 MkII also fulfils the following requirements:

SOLAS Chapter V - Safety of navigation - Regulation 19	Carriage requirements for shipborne navigational systems and equipment.
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 Res. MSC.36(63)	Adoption of the international code of safety for high speed craft (1994).
IMO Res. MSC.86(70)	Adoption of new and amended performance standards for navigational equipment.
IMO Res. MSC.97(73)	Adoption of the international code of safety for high speed craft (2000).
IMO Res. MSC.191(79)	Performance standards for the presentation of navigation-related information on the shipborne navigational displays.

NOTE: This product is ship wheel-marked and type approved in accordance with Marine Equipment Directive (MED).
NOTE: All statements of conformity are available at: www.phontech.net

1 Product Description

The 8300 MkII Sound Reception System is designed to:
- Receive and detect foghorn sounds from other vessels and pinpoint the direction of the signal source.
- Detect signals with a fundamental frequency ranging from 70Hz to 820Hz.
- Have a frequency response of 70Hz to >2100Hz.

Detected horns are amplified and played through the speaker on the display unit and the direction of the signal source appears on the display, with an accuracy of +/- 10 degrees. The 8300 MkII has adaptive background noise canceling to filter out unwanted sounds though advanced digital signal processing. Multiple display units can share the same microphone unit through an Ethernet connection.

Part Numbers:
- 4000019415 - P-8300 MkII Main Unit
- 4000019416 - P-8301 MkII Microphone Unit
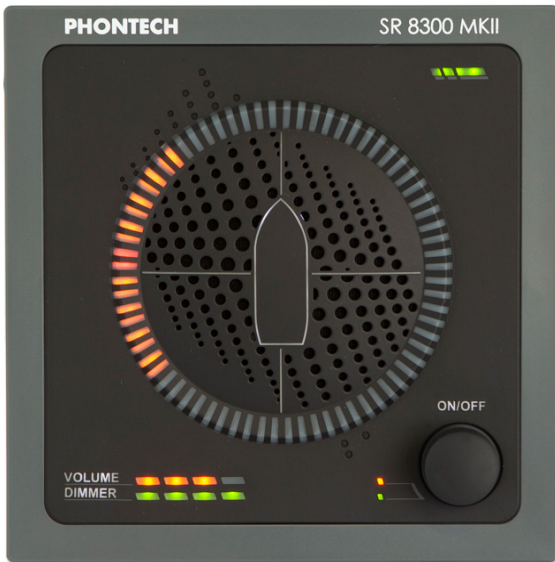- 4000019634 - Junction Box for Microphone Unit (optional)

Figure 1: P-8300 MkII Display Unit

Figure 2: P-8301 MkII Microphone Unit

CAUTION:
  This equipment contains CMOS integrated circuits.
  Observe precautions for handling electrostatic sensitive devices.
  Electrostatic discharge (ESD) may damage this equipment.

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2   System Description

A Sound Reception System is an acoustical electronic navigational aid that enables an individual to hear sound signals from other ships like foghorns when standing inside a totally enclosed bridge space, in order to perform the lookout function as required according to the International Regulations for Preventing Collisions at Sea, 1972.

The system works by listening and detecting the direction of a foghorn. The 8300 MkII system is always listening for sounds on the outside of the ship and will only play back and display sounds once a horn has been detected. The vessel's own horn can be suppressed by closing a closing contact on the 8300 MkII system, which will disable detection for the duration it is held closed.

Figure 3: 8300 MkII Sound Reception System

3 Technical Specifications
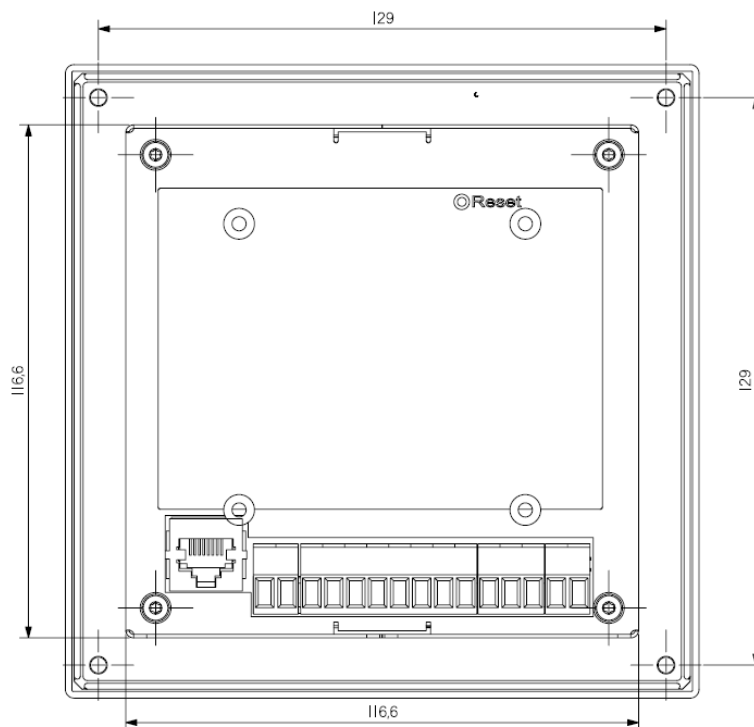
3.1 Product Specification P-8300 MkII Display Unit

Supply Voltage:	Nominal 24VDC
Maximum Power Consumption:	8 W
System Power:	4 W
Dimensions (W/H/D):	144 mm / 144 mm / 124 mm
Weight:	0.85 kg
Temperature Operating:	-15 to + 55 °C
Temperature Storage:	-15 to + 55 °C
Humidity:	93% @ + 40 °C
Ingress Protection:	IP-22 (console mounted)
Compass Safe Distance:	> 2.2 m
Interfaces:	100 Mbit Ethernet, Mute closing contact, P-8301 MkII interface
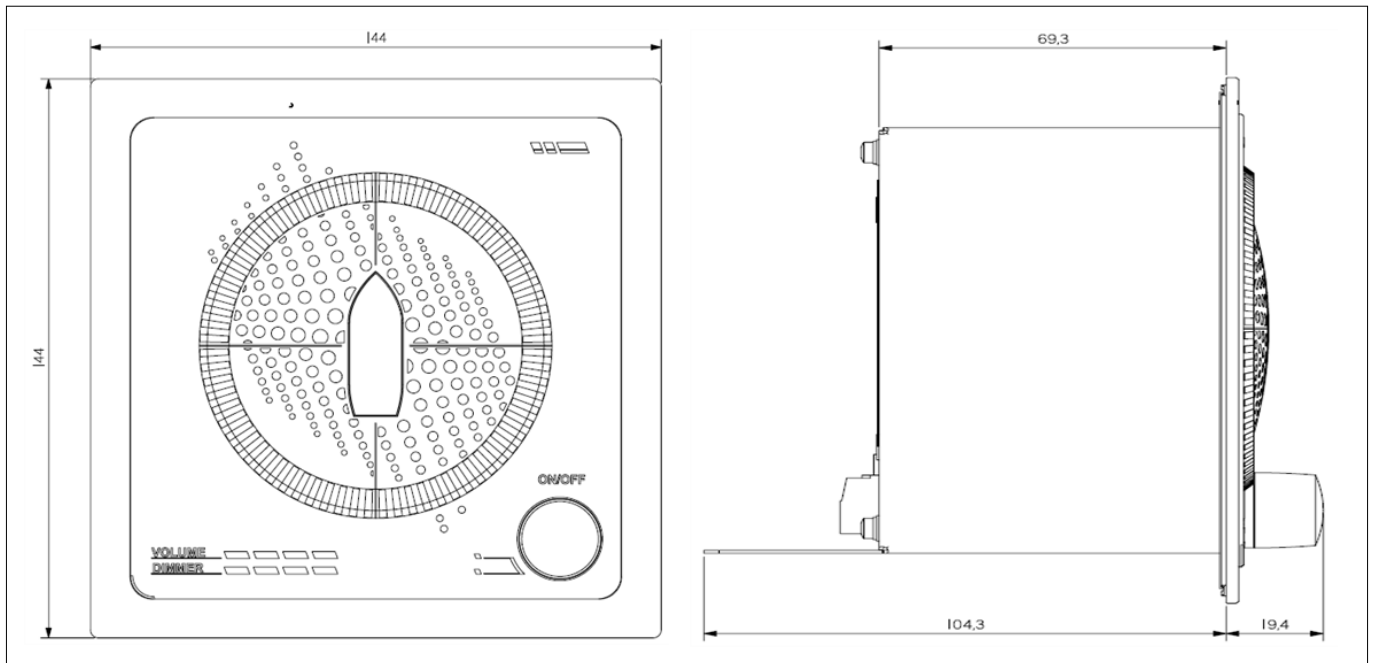
Figure 4: P-8300 MkII Display Unit - Dimensions (height/width/depth)

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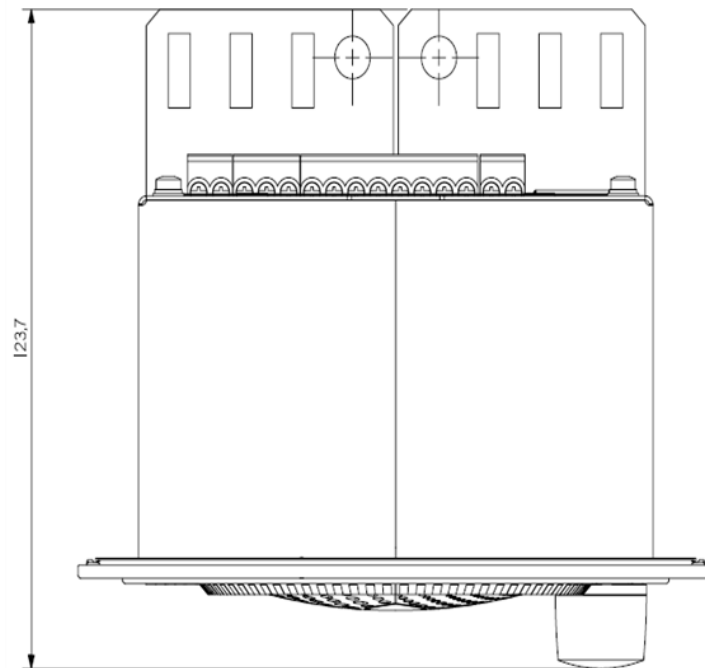
Figure 5: P-8300 MkII - dimensions top (depth/width)

Figure 6: P-8300 MkII - dimensions

3.2 Product Specification P-8301 MkII Microphone Unit

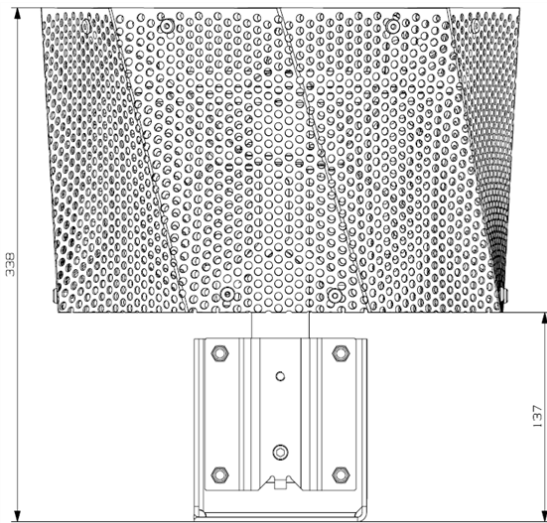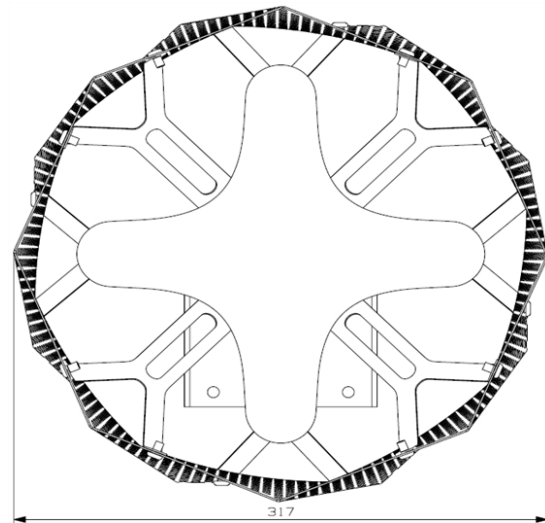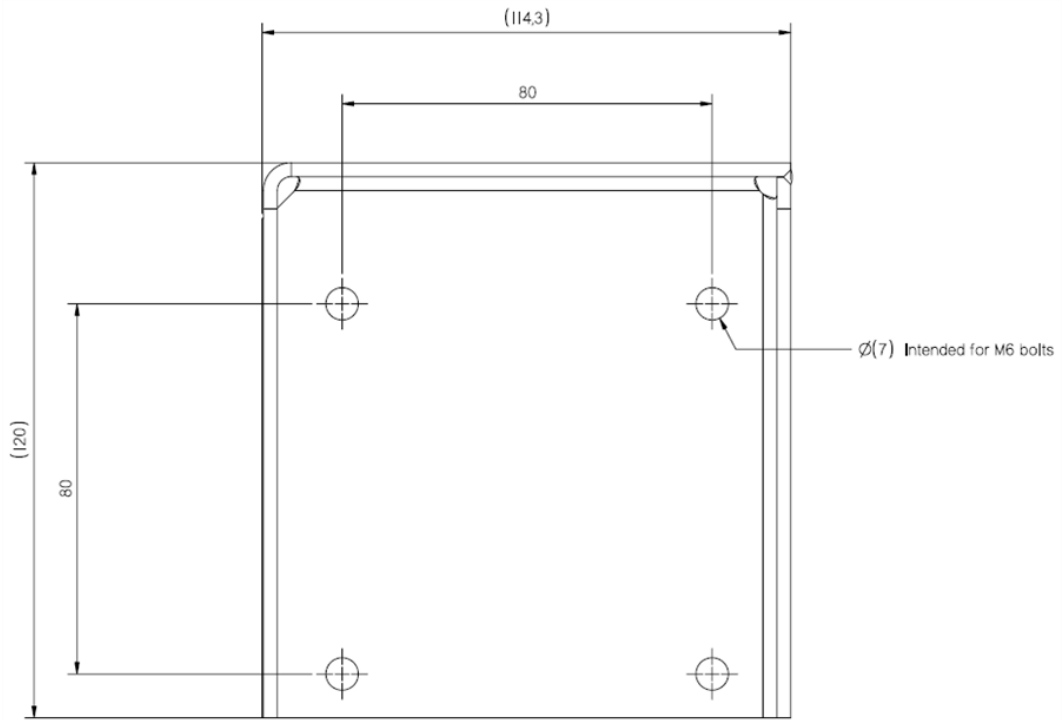|	
Supply Voltage:	Powered by 8300 MkII/+5VDC
Dimensions (W/H/D):	317 mm / 338 mm / 317 mm
Weight:	3.95 kg
Temperature Operating:	-60 to + 55 °C
Temperature Storage:	-60 to + 70 °C
Humidity:	93% @ + 40 °C
Ingress Protection:	IP-56
Compass Safe Distance	> 0.3 m
Microphones	4
Antenna Direction	Omnidirectional

Figure 7: P-8301 MkII - dimensions (height)

Figure 8: P-8301 MkII - dimensions (width)

Figure 9: P-8301 MkII - Dimensions (Mounting Bracket)

Figure 10: P-8301 MkII - Mounting Bracket

3.3 Product Specification Junction Box

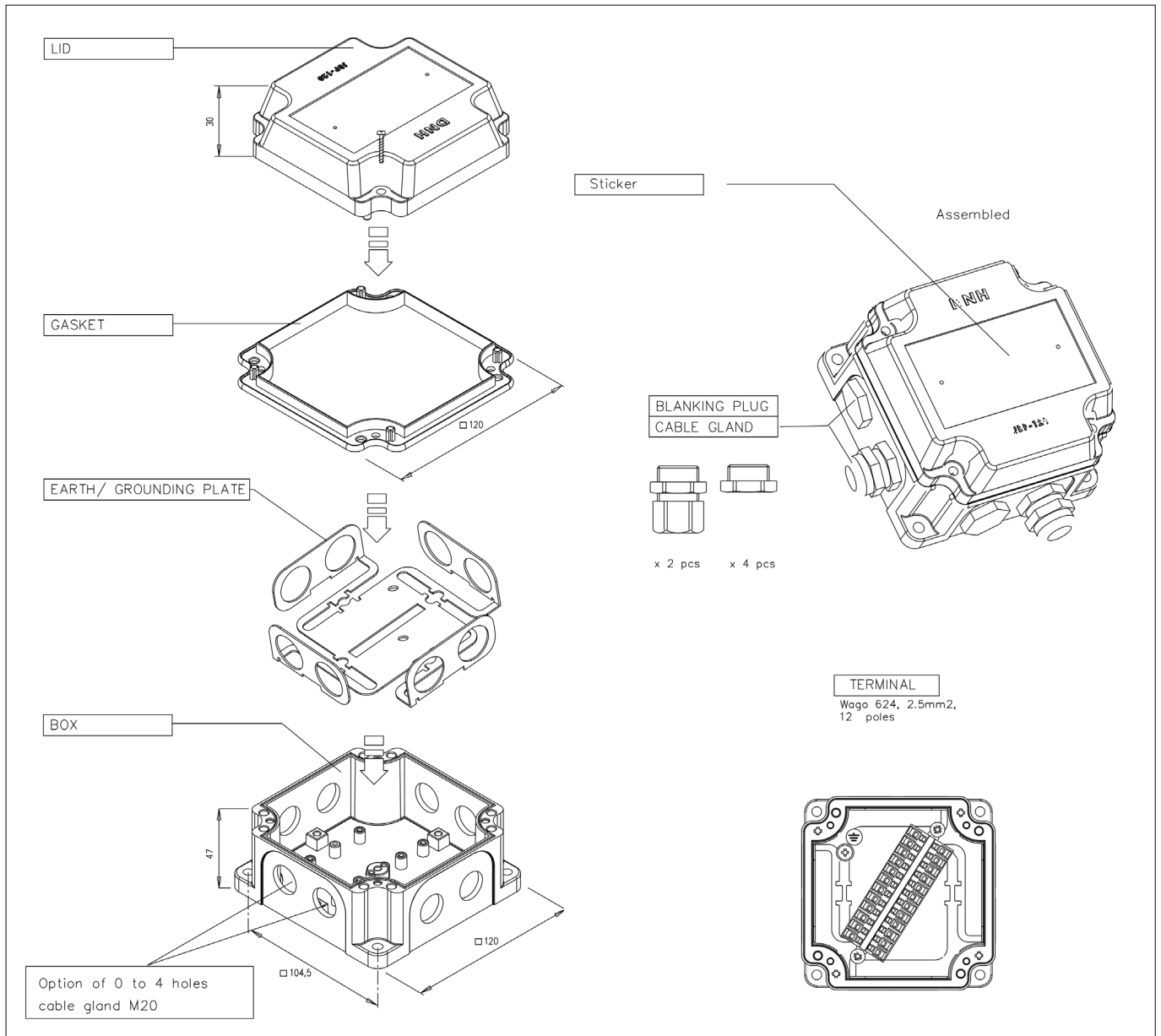| Dimensions (W/H/D):	120 mm / 78 mm / 104.5 mm
Weight:	0.35 kg
Ingress Protection:	IP-67
Temperature Operating:	-50 to + 90 °C

Figure 11: Junction Box - 12-way with screen (optional)

4   Installation

4.1   P-8301 MkII Microphone Unit

The microphone unit can be mounted with the attached mounting bracket by fastening the bracket to the ship or removing the bracket and attaching the steel tube by other means.

The mounting bracket can be mounted to a ship on the top or the side.

CAUTION:

The P-8301 MkII should be installed in an appropriate location, bearing the following in mind:
*   Install the microphone unit in a location far away from noise and any mechanical vibration sources.
*   The microphone unit should not be installed next to a sound reflective source or obstacle that may block sound from entering it in a straight line.

NOTE:

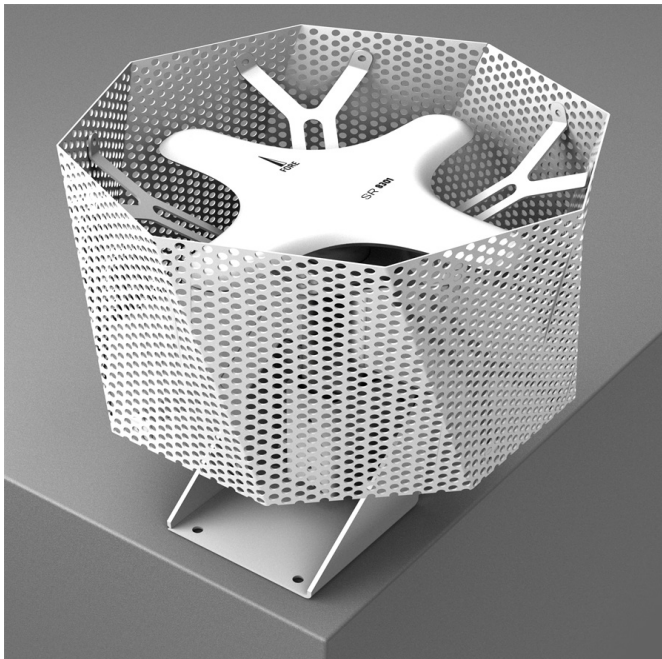Zenitel recommends that you install the microphone unit in a typical lookout position.
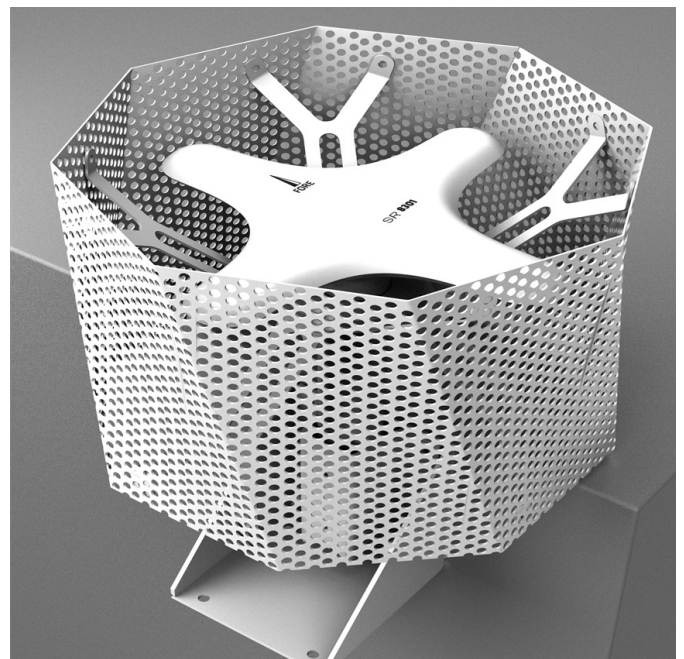

Figure 12: Mounting on the top

Figure 13: Mounting on the side

NOTE:

The fore direction of the microphone unit is marked with an arrow and should be pointing towards the bow of the ship when installed.

A100K11918

4.2 P-8300 MkII Display Unit

IMPORTANT:

Prior to fastening the unit to a console, connect both the power and microphone unit connectors.

To mount the P-8300 MkII Display Unit:

1. Find the appropriate location for mounting (bridge or similar structure).
2. Degrease the console.
3. Connect the power.
4. If applicable, attach the P-8301 MkII interface.
5. If applicable, plug in the Ethernet cable.
6. If applicable, attach the mute closing contact to the foghorn system.
   (This contact suppresses detection when the contact is closed)
7. Insert the unit into the console. **(Remove the protective layer on the gasket prior to insertion)**
8. Fasten all four screws, one in each corner.
9. Secure the frame to the unit

CAUTION:

Overtightening the screws may cause damage to the plastic frame.
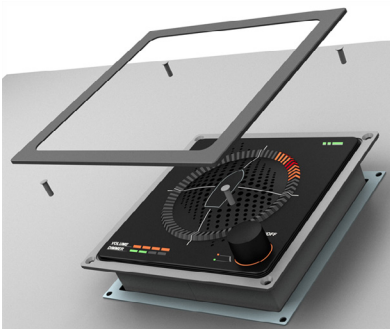
1: Put the 4 screws in place

2: Fasten the unit to the bridge console

3: Secure the frame in place

The display unit should be installed such that incoming sound signals can be heard at all positions inside the bridge and is visible from the conning position.
Advanced configuration options can be done using the web interface.
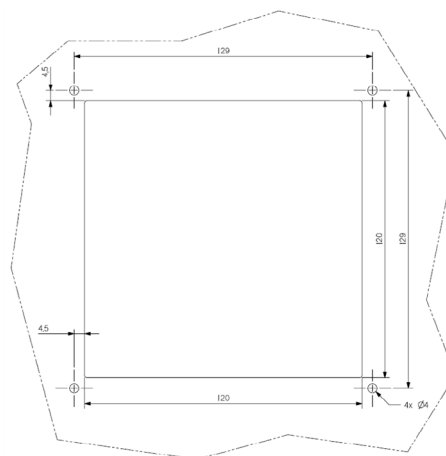
Figure 14: 8300 MkII dimensions (screw hole positioning)

4.3 Electrical Connections

The cable from the P-8301 MkII microphone unit is a 3-meter cable with flying leads and must be wired to a junction box suited to the environment it is placed in. A cable from the junction box must be laid to the P-8300 MkII display unit. When connecting the microphone unit to the display unit, the cable must be terminated in the 11-pin microphone connector on the back of the display unit.

The cable must be shielded and contain at least 5 twisted pairs made of bare copper and have a lead core size of 0.25 mm^2 or larger when the cable length is up to 100 meters. If a longer stretch of cable is required (up to a maximum of 200 meters), use a lead core size of 0.5 mm^2 or larger.
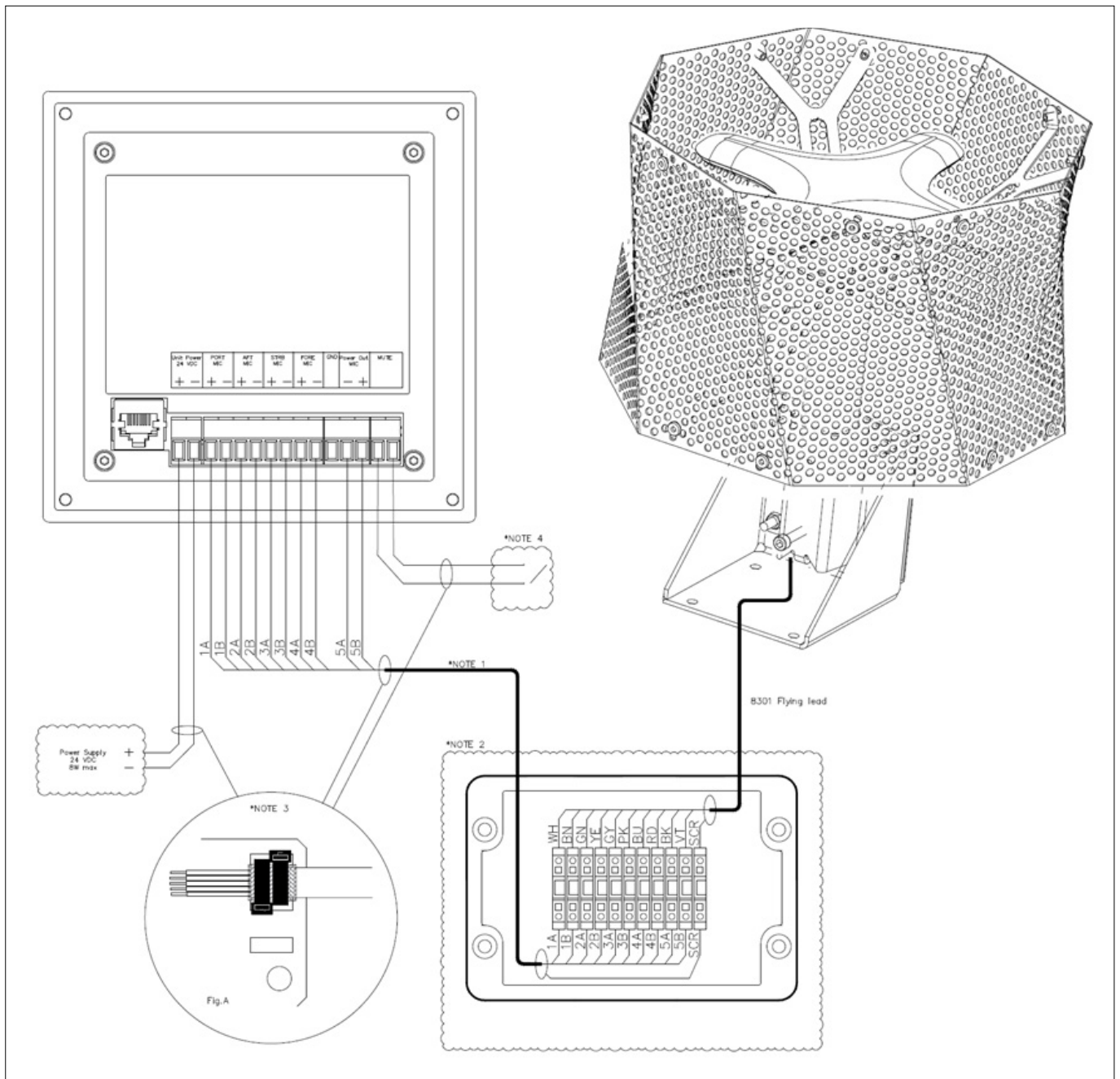

Figure 15: 8300 MkII system electrical connections

Designation	Colour	Function
WH	White	Port +
BN	Brown	Port -
GN	Green	Aft +
YE	Yellow	Aft -
GY	Grey	Strb +
PK	Pink	Strb -
BU	Blue	Fore +
RD	Red	Fore -
BK	Black	GND
VT	Violet	Vinn

NOTE:

Clarification of the notes in the above image:

1. Cabling is not supplied by Zenitel. The cable must be shielded with individual pairs and have a minimum 0.25 mm² core size.
2. A junction box is optional and can be supplied by Zenitel
3. To comply with EMC requirements, all cable shields must be safely connected to the chassis as shown.
4. The mute signal to the P-8300 MkII display unit.

A closing contact (normally open) will mute the sound reception system while closed. Generally, this input is used by the ship's foghorn system.
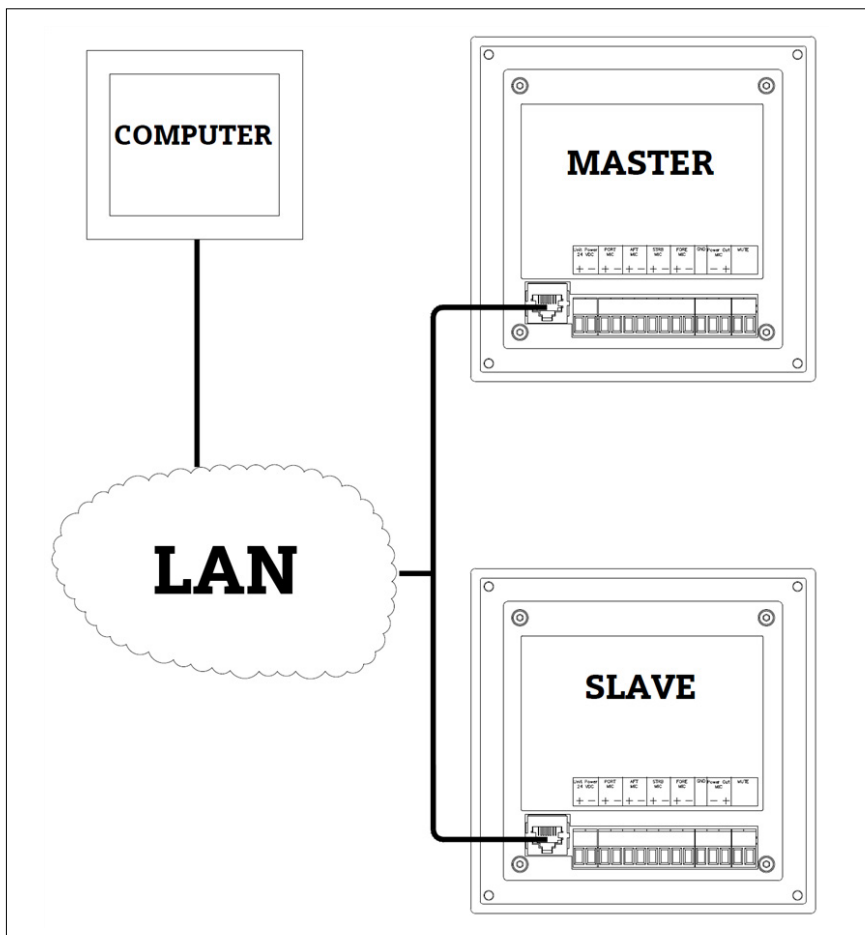

Figure 16: 8300 MkII Ethernet electrical connections

The setup for the master/slave web interface via a computer or connection to an IEC 61161-450 network is as shown above.

NOTE:

The cable must be a minimum of Cat 5 S/UTP quality. Master/Slave can be connected directly together or via a LAN switch.

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5   Operating Instructions

5.1   Operational Modes

The P-8300 MkII display unit has four different operational modes. The volume and lighting can be adjusted.
To switch between modes, do the following:
- Press and hold the control button for 5 seconds.

NOTE:

Continuing to hold the button will advance you into the next mode. The mode will change for every additional 5 seconds.
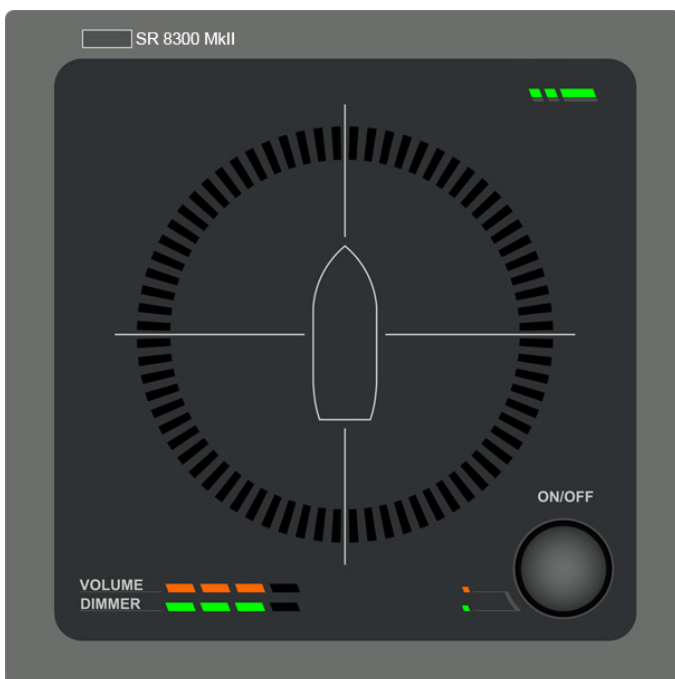
5.1.1   Normal Mode

When the display unit is first started, it will start in normal mode. When in this mode, the unit will idle until a horn signal is detected. Detected horns will play on the speaker and indicate the direction of the source of the signal.

The speaker will play the detected horn at a consistent level regardless of the level of the input. This level can be adjusted using the volume control. Differences in the level of the input can be perceived in the clarity of the signal compared to the background noise.

As a reference, the expected level for a whistle with a fundamental frequency of 120Hz, with a level of 143dB (SPL) within 1/3 octave at 1 meter, from 2 nautical miles should be around 65-70 dB(A) at the listening post. The second volume setting (two notches clockwise when muted) will result in a similar level in dB(A) produced by the display.

Within the first 3 seconds of detection, an 80-degree arch will light up in orange while the center of the arch is lit in red. After 3 seconds, only the red light remains active. Multiple indications can be active at once. The indication pointer will remain for a configurable amount of time (7 seconds by default) after the detection is finished. The indication pointer configuration time can be altered within the web interface.

The light behind the control button is off when the unit is in this mode.

Figure 17: Normal mode, idle

5.1.2   Manual Listen Mode

In the manual mode, a user can listen to each of the four microphones individually. The sound from the active microphone plays through the speaker at all times in this mode.

To activate the manual listen mode, do the following:

1.   In the normal mode, press and hold the control button for 5 seconds.
NOTE: When active, the light around the control button appears green.

2.   Rotate the control button to select the microphone.
NOTE: Neither the volume nor dimmer row is lit orange when the microphone is selected.

When the device first enters the manual listen mode, it activates the Fore microphone. The indication ring displays the currently active microphone
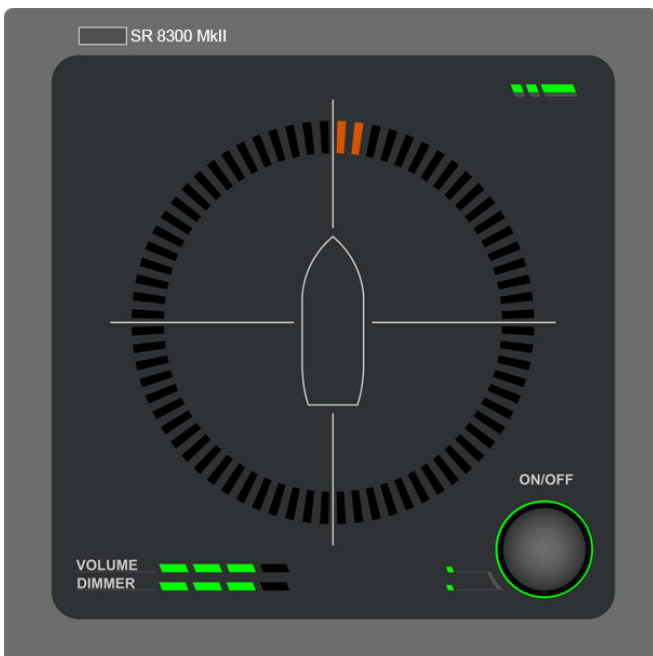

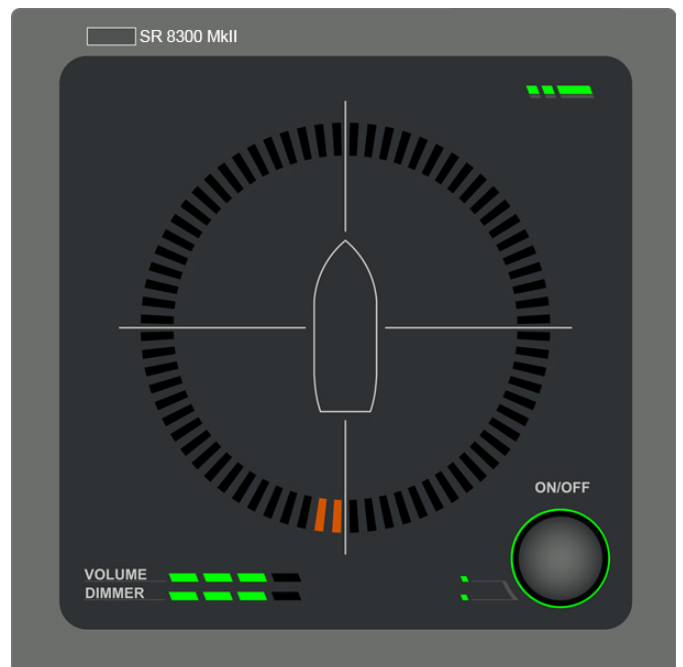*Figure 18: Selecting the Fore microphone*

Figure 19: Selecting the Aft microphone

5.1.3   Calibration Detection Mode

Use the calibration detection mode to adjust the offset display. You would, for example, do this to adjust the offset of an incorrectly mounted P-8301 MkII microphone unit.

To enter the calibration detection mode, do the following:

1. Press and hold the control button for 10 seconds
NOTE: If the unit is in the manual listen mode, then you only need to press and hold the control button for 5 seconds. When the calibration mode is activated, the light behind the control rotary button switches to orange

2. Rotate the control button to calibrate the position, to add (right) or subtract (left) the offset for all detections
NOTE: The default is a zero degree offset and a single tick with the control button will adjust the offset by 10 degrees.
The indication ring displays the current offset. A more precise offset can be set in the web interface.
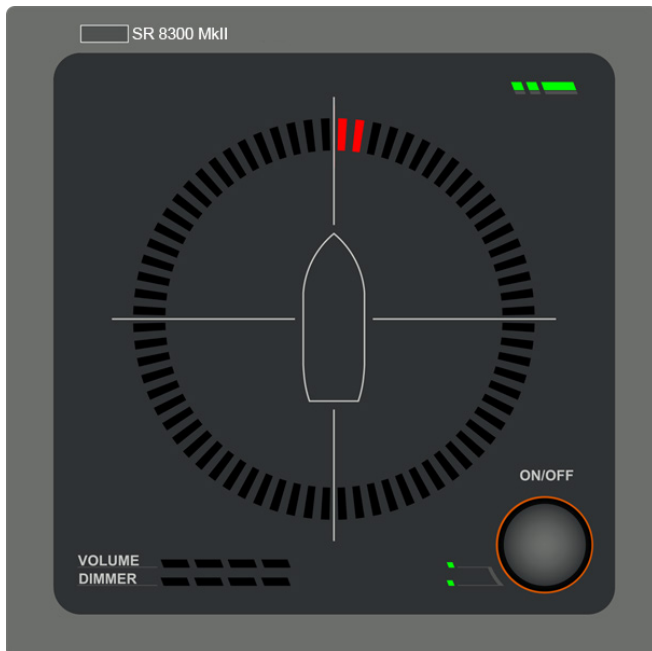

Figure 20: No offset (0 degree)
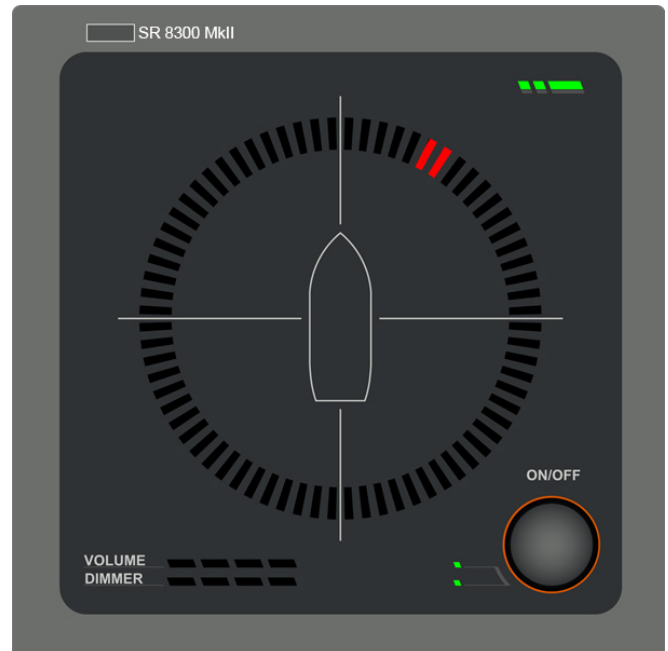
Figure 21: 30 degree offset

5.1.4   LED Test Mode

To enter the LED test mode, do the following:

1. Press and hold the control button for 15 seconds when in normal mode
NOTE:
If the manual listen mode is active, press and hold the control button for 10 seconds.
If the calibration detection mode is active, press and hold the control button for 5 seconds.
All LEDs on the display unit will light up when enabled, making any failed LEDs visible.

2. Hold the control button for another 5 seconds to return to normal operation.
NOTE: The LED test mode will automatically return to normal mode if the control button is not pressed
or rotated for 30 seconds.

A100K11918

5.2 Network Operations

The 8300 MkII performs multiple network operations according to part 450 of the IEC 61162 standard. This includes inter-device communication and logging.

The transmission groups are mapped to the following multicast addresses and ports:

Transmission Group	Address Port Combination
MISC	239.192.0.1:60001
PROP	239.192.0.8:60008
NETA	239.192.0.56:60056
USR1	239.192.0.9:60009
USR2	239.192.0.10:60010
USR3	239.192.0.11:60011
USR4	239.192.0.12:60012
USR5	239.192.0.13:60013
USR6	239.192.0.14:60014
USR7	239.192.0.15:60015
USR8	239.192.0.16:60016

NOTE:

These transmission groups are defined in part 450 of the IEC 61162 standard.

Multiple IEC 61162-450 sentences are sent and received by the P-8300 MkII display unit.
Below is a list of the applicable sentences:
- SRP Sentence
- PJTR sentences (SRS proprietary sentences, HBT sentence and VOL proprietary sentences)
- DDC sentences

CAUTION:

For more information or clarification regarding the above sentences, please refer to IEC 61162-450.

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5.2.1 PJTR Sentence

The PJTR sentence is a proprietary sentence that is used for communication between the master and slave P-8300 MkII display units. The first parameter of this sentence is the sentence code for our proprietary sentences. The remaining parameters depend on the sentence code that is sent.

The 8300 MkII has the following three proprietary sentences:
- Sound Reception Signal (SRS)
- Volume (VOL)
- Heartbeat (HBT)

5.2.1.1 SRS Proprietary Sentence

When a sentence code of the PJTR sentence is sound reception signal (SRS), the sentence is a detection notification. This sentence is sent from the master unit to the configured transmission group such that the slave(s) can receive them.

The SRS sentence has three additional parameters:

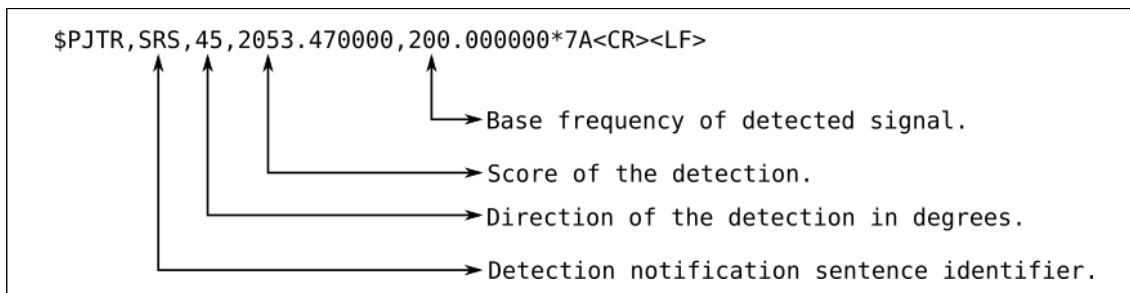| Description	Type
Direction of the detection	An integer between 0 and 359 inclusive.
Score of the detection	Score with decimal point when required.
Base frequency of the detected signal	Frequency with decimal point when required.

Figure 22: Example, SRS proprietary sentence

5.2.1.2 VOL Proprietary Sentence

When a sentence code of the PJTR sentence is volume (VOL), the sentence is a volume adjustment notification. This sentence is sent from both the master and the slave units when an individual adjusts the volume using the control button on the display unit. The sentence is sent on the configured transmission group. When a p-8300 MkII display unit receives a message, it automatically adjusts the volume to match the volume of the device that sent the sentence.

The VOL sentence has one additional parameter:

Description	Type
New volume setting	An integer between 0 and 99 inclusive.

```
$PJTR,VOL,15*4D<CR><LF>


            ┌──────►New volume setting.

   └──────────────►Volume notification sentence identifier.
```
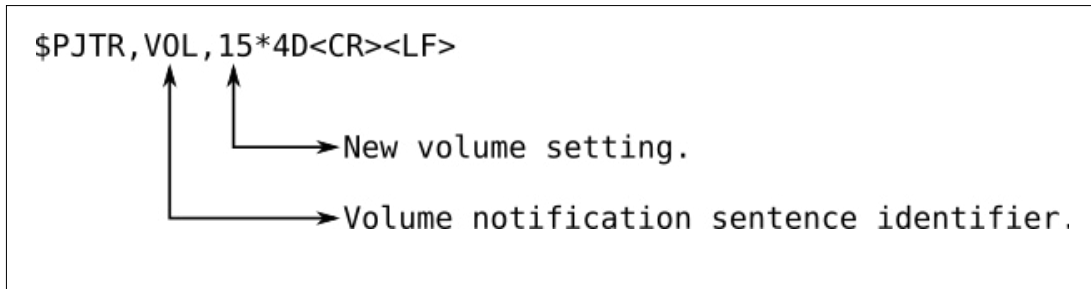
Figure 23: Example, VOL proprietary sentence

5.2.1.3   HBT Sentence

The P-8300 MkII sends a heartbeat (HBT) sentence once every 60 seconds. This sentence is sent to the MISC transmission group. It is equal to the standard HBT sentence, except that it is sent as a parameter to the PJTR sentence.

NOTE:

Refer to IEC 61162-1 standard for more information regarding heartbeat sentence.

```
$PJTR,HBT,60,A,10*04<CR><LF>


              └──►Incremented counter for HBT sentences. Wraps after 99.

           └─────►Will always be 'A' when sent from Phontech 8300 MkII.

        └────────►Interval in seconds between heartbeats.

   └─────────────►Heartbeat sentence identifier.
```
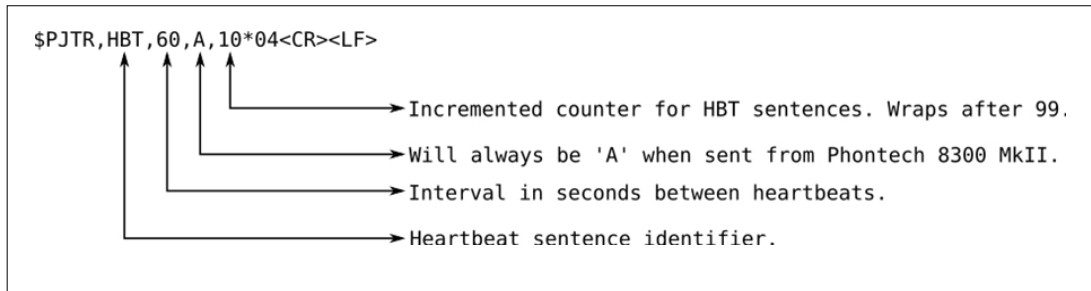
Figure 24: Example, HBT sentence

5.2.2 DDC Sentence

The P-8300 MkII display unit listens for all display dimming control (DDC) sentences. Sentences may come from other units on the network by default from the MISC channel.

When a DDC sentence is received, the display unit will adjust the brightness to the new level.
Two variants of the DDC messages are supported: one with and one without the sentence status parameter at the end of the sentence.

NOTE: Refer to IEC 61162-1 standard for more information regarding the two variants and the DDC sentence.
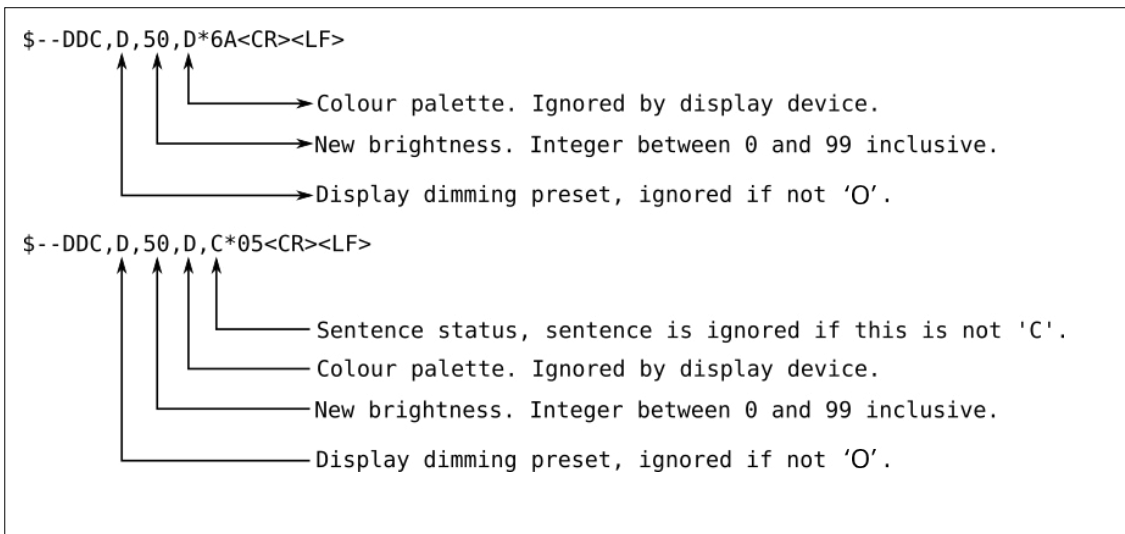
```
$--DDC,D,50,D*6A<CR><LF>

              ┌──────► Colour palette. Ignored by display device.
           ┌──────────► New brightness. Integer between 0 and 99 inclusive.
        ┌─────────────► Display dimming preset, ignored if not 'O'.

$--DDC,D,50,D,C*05<CR><LF>

              ┌───────── Sentence status, sentence is ignored if this is not 'C'.
           ┌──────────── Colour palette. Ignored by display device.
        ┌─────────────── New brightness. Integer between 0 and 99 inclusive.
     ┌────────────────── Display dimming preset, ignored if not 'O'.
```

Figure 25: Example, DCC sentence

NOTE: The two dashes before the DDC message represents the sender and can be any two upper case characters from A-Z.

5.2.3 SRP Sentence

The P-8300 MkII sends SRP messages in accordance with 61162-450:2018 which means that it will send an SRP message on boot, after 1 minute and after 5 minutes. It will also send one after the SFI has been changed in the configuration through the web interface. These messages are always sent to 239.192.0.56 on port 60056.
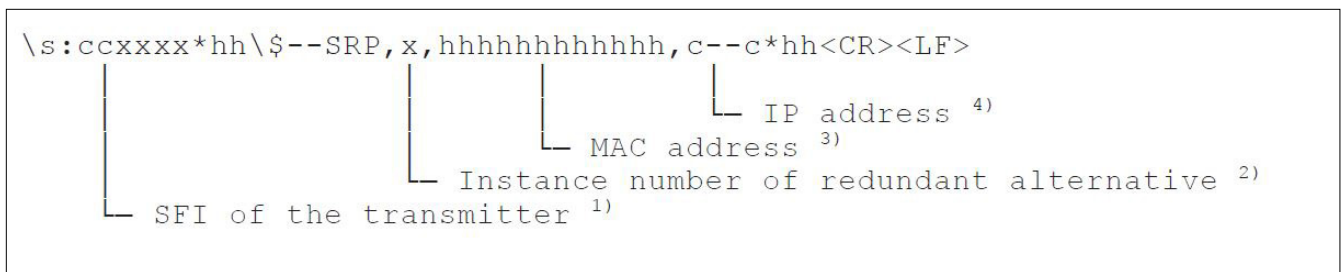The format of the sent SRP messages can be seen here:

```
\s:ccxxxx*hh\$--SRP,x,hhhhhhhhhhhh,c--c*hh<CR><LF>
      │              │          │         │
      │              │          │         └─ IP address 4)
      │              │          └─ MAC address 3)
      │              └─ Instance number of redundant alternative 2)
      └─ SFI of the transmitter 1)
```

Figure 26: Example, SRP sentence

NOTE:
1) Reported SFI of the transmitter
2) Instance number for interface redundancy (i.e. number of physical port for identical SFI), null if interface redundancy not in use. The instance numbers shall be ordinal with no skipping (1, 2, 3,...).
3) Reported MAC address used by SFI, 48bit hexadecimal number, for example 32613C4EB605
4) Reported IP address used by SFI as text string, for example 239.192.0.1

5.2.4 Maximum Data Rates

These are the maximum data rates as required by IEC 61162-450, section 4.3.2.

Description	Amount
Maximum received per second, intended for target.	50/sec
Maximum received per second, not intended for target-	2000/sec
Maximum received per second, not intended for target at 50% of the maximum load.	1000/sec

5.3 Syslog Messages

When syslog network logging is enabled, syslog messages are sent to the network address specified in the web interface. Refer to the network settings for more information.

The following table lists messages that are sent when there is a problem with the unit.

Message ID	Level	Message Text	Additional Information
SURV_AUDIO_FAILURE	Warning	Surveillance failed for audio channels: <Mask>	<Mask> is replaced with a bitmask in hex of the channels that have failed audio surveillance. Available channels: • 0x1 Fore • 0x2 Aft • 0x4 Starboard • 0x8 Port For example, 0xC indicates a failure of port and starboard microphones.
SURV_LED_FAIL	Warning	Bad health state of LED <LED id>	<LED id> is replaced with the ID of the LED that failed.
SURV_WDOG_NOT_ FEEDING	Critical	Not feeding watchdog because all required tests have not been passed: <Mask>	Message informs that the unit will restart due to a failing watchdog test. <Mask> is replaced with a bitmask in hex that identifies the failing test. Tests include: • 0x1 Audio surveillance test • 0x2 DSP surveillance test • 0x4 Display response surveillance test

5.3.1 Syslog levels

- Emergency – System malfunction that causes the system to halt
- Alert – Not in use
- Critical – System malfunction that might cause the system to fail
- Error – System malfunction that might cause erratic operation
- Warning – System malfunction that might cause incorrect operation
- Notice – No logging (default level)
- Info – Information messages
- Debug – Debugging messages (for service purposes only)

5.4 Audio Packet Stream

A proprietary audio packet stream is sent together with all other network traffic.

This stream contains the audio data from a detected foghorn signal. The master unit sends the data to the multicast group at

239.192.0.65 on port 5004 and 5005. This audio packet stream is a RTP stream with RTP data on port 5004 and RTCP data on port

5005. The audio is sent as a single channel 24-bit signed PCM at a 24-kHz sampling rate. The RTP stream uses a packet size of 20 ms.

An audio stream is only sent when a foghorn is detected and stops when the detection ends.

The maximum bandwidth used by this stream is 96 kB/s, with approximately 50 packets per second.

A100K11918

5.4.1 Preparing for Audio Packet Stream capture

••   SR P-8300 MkII Network Settings:

Figure 27: Network settings example-enable logging

•   **Check that connection is OK from the capture host:**

~ » ping 10.9.34.214

PING 10.9.34.214 (10.9.34.214) 56(84) bytes of data.

64 bytes from 10.9.34.214: icmp_seq=1 ttl=255 time=0.748 ms

64 bytes from 10.9.34.214: icmp_seq=2 ttl=255 time=7.49 ms

64 bytes from 10.9.34.214: icmp_seq=3 ttl=255 time=27.6 ms

64 bytes from 10.9.34.214: icmp_seq=4 ttl=255 time=49.5 ms

64 bytes from 10.9.34.214: icmp_seq=5 ttl=255 time=72.9 ms

- Check that RTP stream is broadcasted from P-8300 MkII using Wireshark <make some noise to make it trigger, src ip should be

the P-8300 MkII:

Figure 28: Screendumping logging PC- Wireshark

· **Capture RTP stream or play directly:**

Alt 1: save to MP3 file

» gst-launch-1.0 udpsrc multicast-group=239.192.0.65 port=5004 caps='application/x-rtp, media=(string)audio, clock-rate=(int)24000, encoding-name=(string)L24, encoding-params=(string)1, channels=(int)1, payload=(int)96' ! rtpL24depay ! queue ! audioconvert ! volume volume=10.0 ! audioconvert ! lamemp3enc ! filesink location=output.mp3

Setting pipeline to PAUSED ...

Pipeline is live and does not need PREROLL ...

Pipeline is PREROLLED ...

Setting pipeline to PLAYING ...

New clock: GstSystemClock

Redistribute latency...

Redistribute latency...

Make some sound that will register to the Microphone Unit

^C

handling interrupt.

Interrupt: Stopping pipeline …

Execution ended after 0:00:17.496388232

Setting pipeline to NULL …

Freeing pipeline …

Alt 2 : play directly

gst-launch-1.0 udpsrc multicast-group=239.192.0.65 port=5004 caps='application/x-rtp, media=(string)audio, clock-rate=(int)24000, encoding-name=(string)L24, encoding-params=(string)1, channels=(int)1, payload=(int)96' ! rtpL24depay ! queue ! audioconvert ! volume volume=10.0 ! pulsesink device=alsa_output.pci-0000_00_1f.3.hdmi-stereo
<< FIND DEVICE NAME VIA "pactl list sinks" -> Monitor Source: X
Setting pipeline to PAUSED …

Pipeline is live and does not need PREROLL …

Pipeline is PREROLLED …

Setting pipeline to PLAYING …

New clock: GstSystemClock

Redistribute latency…

Redistribute latency…

Make some sound that will register to the Microphone Unit

- ^C
- handling interrupt.
- Interrupt: Stopping pipeline …
- Execution ended after 0:00:14.675448409
- Setting pipeline to NULL …
- Freeing pipeline …

5.5 Error Indicator

When an error is detected, the status LED on the P-8300 MkII display unit lights up orange.
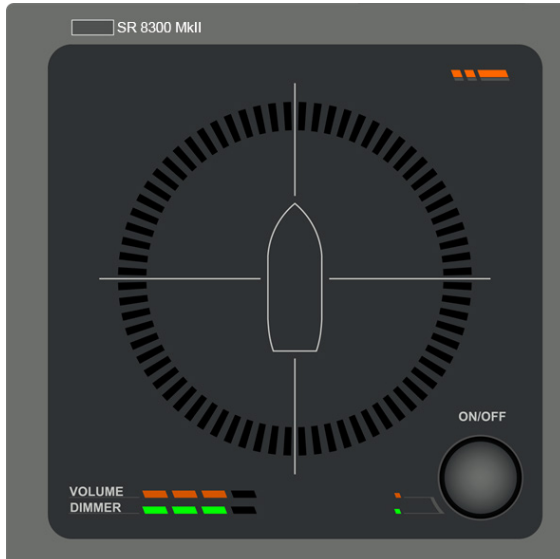
Figure 29: Indicating an error is detected

NOTE: For more information regarding potential failures or issues, refer to the section on Troubleshooting.

5.6 Detecting a Sound Signal

When the P-8300 MkII detects a sound signal and determines the direction of the signal, the direction will appear on the display unit.
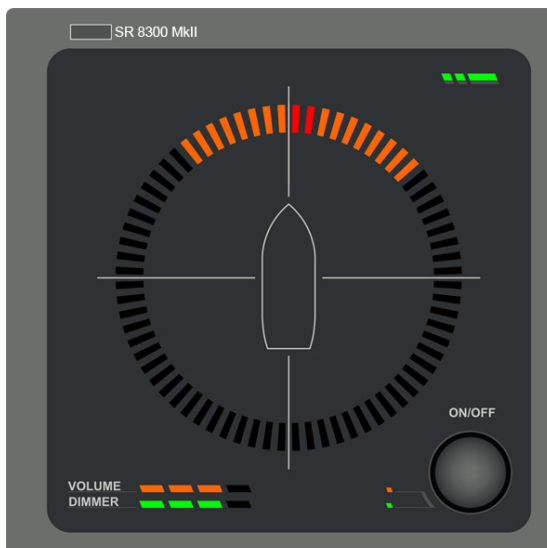
Figure 30: Sound signal, as it is detected
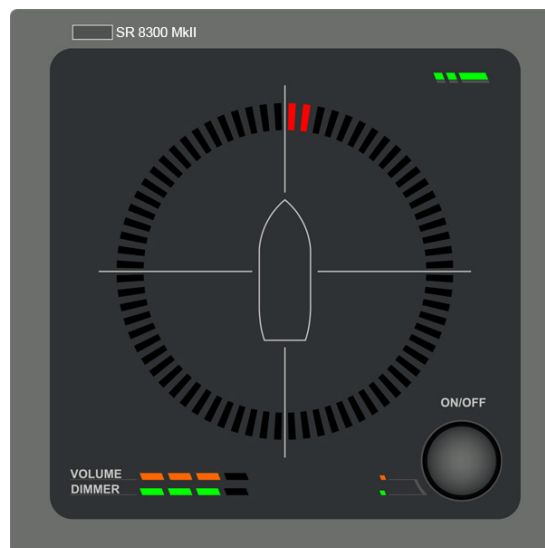
Figure 31: Sound signal, 3 seconds after detection

After 3 seconds, the orange LEDs disappear and the red LEDs remain. The red LED indicators remains by default for 7 seconds or the configured length of time.

NOTE: You can adjust the display timing (in seconds) in the web interface.

kII is able to detect multiple sound signals simultaneously.
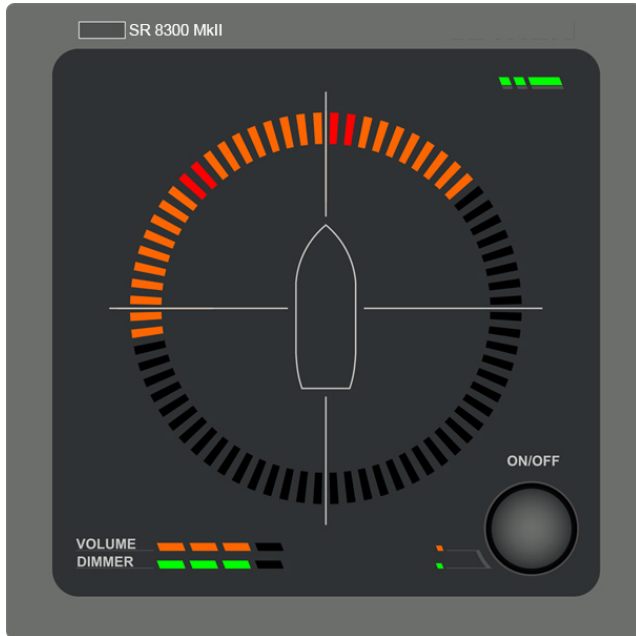
Figure 32: Detecting multiple sound signals, 0˚ and 310˚
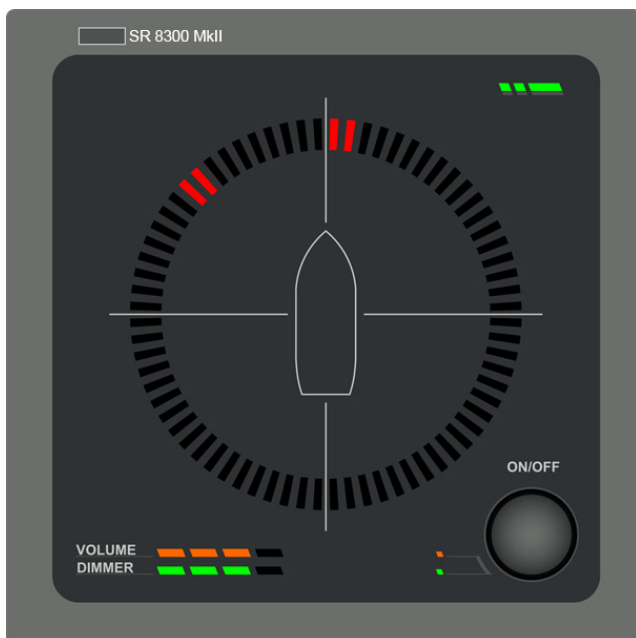
Figure 33: Detecting multiple sound signals 3 seconds after detection

5.8 Adjusting Volume and Lighting

Both the volume and display lighting LEDs of the P-8300 MkII display unit are adjustable.

NOTE: An orange LED displays the active state. This is also indicated by the lights on the left of the control button.

To adjust the volume, do the following:

1. Press and release the control button to select the volume adjust mode.

2. Rotate the knob clockwise to increase and counterclockwise to decrease the volume.
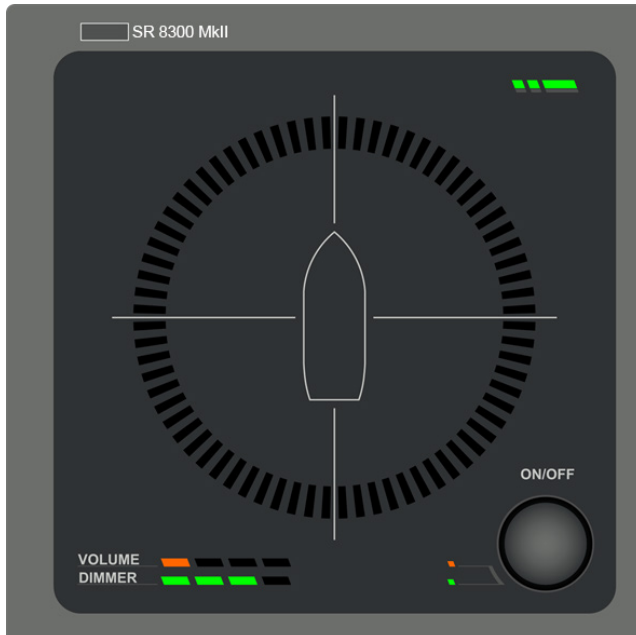
Figure 34: Volume adjust mode
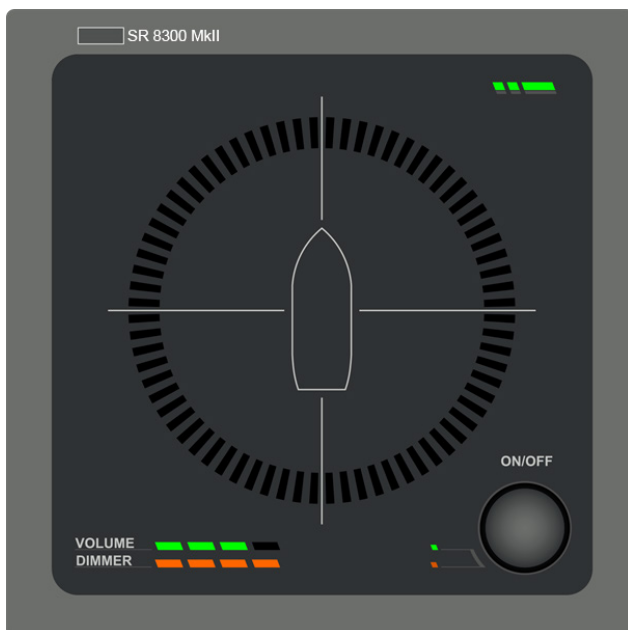
Figure 35: Dimming adjust mode

To adjust the LED light intensity:
- Press and release the control button to select the dimming adjust mode.
- Rotate the knob clockwise to increase and counterclockwise to decrease the LED intensity.

NOTE: The nominal viewing and listening distance is 0.8 m.

A100K11918

5.9 Web Interface

The P-8300 MkII display unit has a web interface for logging and configuring the unit, and also supplies information regarding the state of the unit.

The web interface can be accessed by entering the P-8300 MkII display unit IP address into any web browser. The **default IP address is: 192.168.0.100/24** with a netmask of **255.255.255.0**. You will be prompted to enter your username and password the first time you access the web interface. The default username and password are: **admin/admin**.

You can navigate between pages by clicking or hovering with your mouse over the striped button. This button activates the navigation menu where you can access the pages. The active page is marked orange with a white arrow pointing to it.

NOTE:

Some changes require a reboot of the unit. If this is the case, the web interface will display a message indicating that a reboot is necessary. This is done in **Additional options** and is explained under **Maintenance**.

5.9.1 Home Screen

The home screen is the first page you see when you access the web interface on the P-8300 MkII display unit. This screen displays the status of the unit.

The following information appears in the Status section of the screen:

Status	Notification Colour	Text Description
Normal	Green	Everything operating as normal
Error detected	Red	A message describing the error

IMPORTANT:

If an error has been observed and attended to, then you can press the **Acknowledge messages** button to clear the status LED on the display.
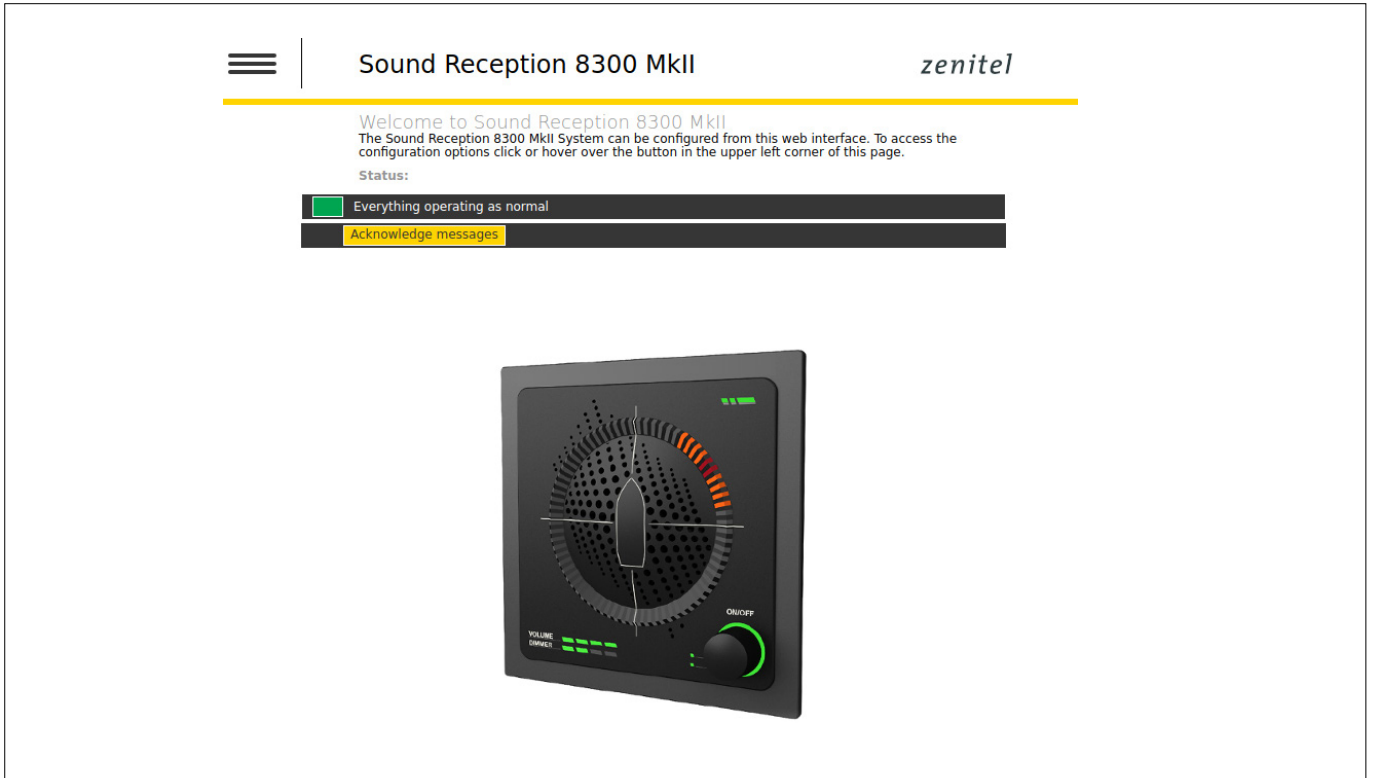
Figure 36: Home screen, status OK - acknowledge messages
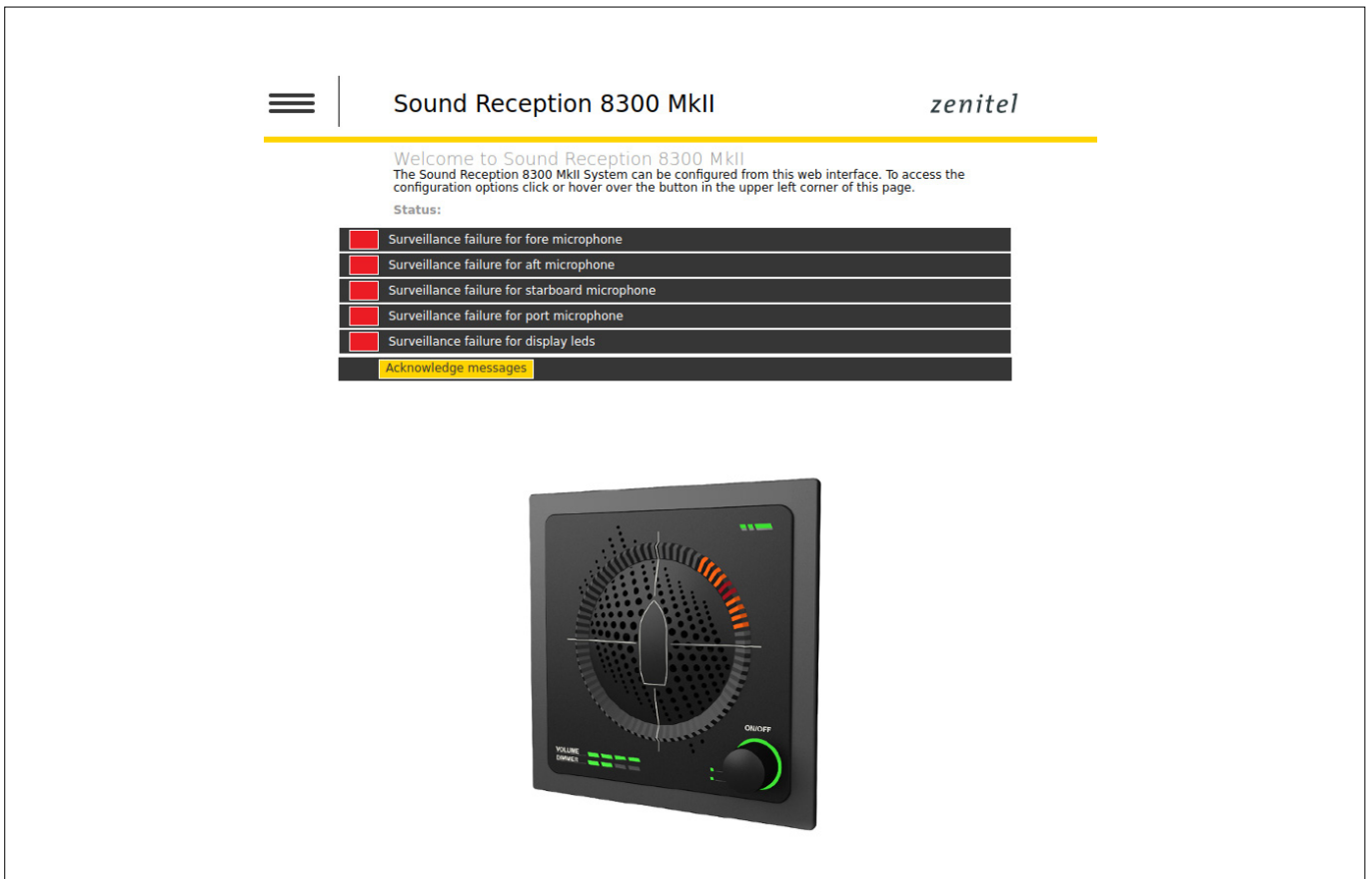
Figure 37: Home screen, status Failed - Acknowledge messages

5.9.2   Network Settings

You can configure the following network settings:

Configurable network settings	Description
Network address of the unit (2 options)	1. Static - this option allows you to configure any static network address along with the applicable netmask and gateway. 2. DHCP - this option will request the DHCP server for an address either when you start the unit or when a network cable is plugged in.
IEC 61162-450 settings	Configure the transmission group used for sending and receiving messages by selecting from the PROP or USR1-USR8 groups.
Syslog settings	You can enable the device logging over network through the syslog protocol. By enabling the syslog network logging the Phontech 8300 MkII display unit will send information and error messages over the Ethernet network. Syslog messages can either be sent to the IEC 61162-450 compliant address (239.192.0.254:514) or a user can configure a custom server address by changing the IP address and port fields in the syslog section. To change the messages that are logged, ensure you change the log level setting in the same section, the options range from Debug to Emergency priority. When this is set, all messages at the selected level or higher will be sent to the syslog server.

NOTE:

The default network address is an IEC 61162-450 compliant address of 192.168.0.100

IMPORTANT:

Prior to using the P-8300 MkII display unit on an IEC 61162-450 network to send sentences to other units, a valid SFI address must be configured. The configuration value for the address must start with SR and be followed by 4 digits, for example SR0001. In a system consisting of more than one SR P-8300, the different units must have different SFI addresses.

To configure the network settings:

1. Select the address type.
2. Enter the applicable settings (Subnet/Gateway).
3. Enter the applicable IEC 61162-450 NMEA settings
4. Select the Syslog network options (See chapter 5.3.1.)
5. Click the **Save settings** button.

Figure 38: Network settings - overall configuration

5.9.3 Audio Settings

The audio settings of the P-8300 MkII display unit allows a user to adjust the signal-to-noise ratio required prior to a foghorn being detected. The default value is 2.25, calibrated to handle a foghorn where the bulk of the energy lies between 700-2100 Hz from 0.5 nautical miles when a horn creates a 111 dB SPL sound level.

The signal-to-noise ratio configuration ranges from 2 to 6. The higher the values the stricter the P-8300 MkII display unit will be in detecting foghorns. Lower values will detect more foghorns but are more susceptible to false detections.
This setting does not apply to the Slave units.

To configure the signal-to-noise ratio:

1. Use the slider or manually type in a value.
2. Click the **Save settings** button.
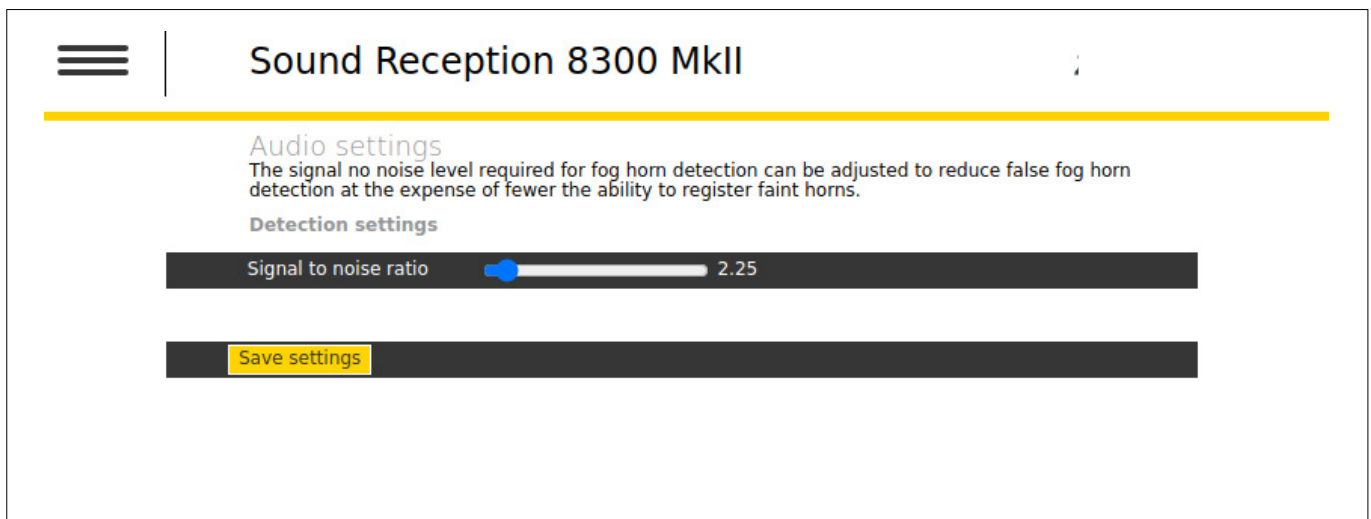
Figure 39: Audio settings - signal-to-noise ratio

5.9.4 System Log

The P-8300 MkII display unit has a logging feature that enables logging at several levels. The system log page displays a real-time log of the system, in addition to previously generated messages.

To view logs:

• Click the **Enable logging** button.

NOTE:

Log messages will appear in the window below.
As long as logging is enabled, messages will continue to come as they are generated on the unit.

To search or filter a log:

• Use the **Filter text** or **Filter level** settings.

NOTE:

This displays only log lines that contain a phrase or are as important as the given log level.

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There are counters recording the number of IEC 61162-450 sentence errors received. There are six different types:

Error types:	Description:
Invalid UDP headers	Packets that have been received but are lacking the required IEC 61162-450 UDP header.
TAG format	Format or structural error in the TAG block
TAG checksum	Checksum errors in the TAG block.
TAG syntax	Syntax error in the TAG block, such as illegal characters or fields.
TAG framing	Framing errors in the TAG block, such as missing the beginning and/or ending characters.
Sentence syntax	Syntax errors in IEC 61162-450 sentences.

NOTE:

For more information regarding sentences and error types, refer to part 450 of the IEC 61162 standard.

To export the log:
- Click the Export log button
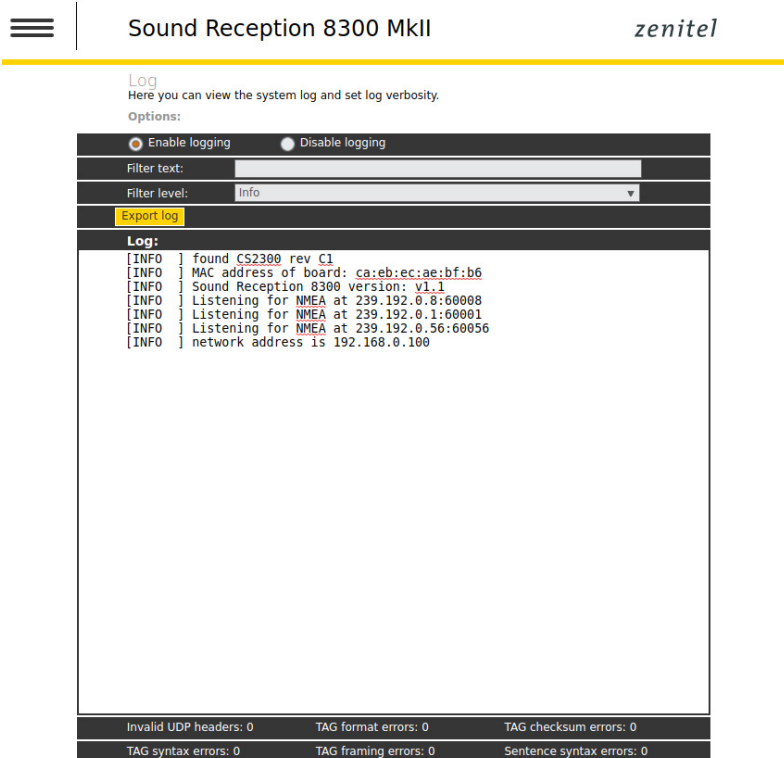
Figure 40: Event logging

A100K11918

5.9.5   Additional Options

The Additional options page contains configuration options that do not fall under any of the other categories.

To adjust any of these options:

1.   Select the applicable option.
2.   Enter the applicable information.
3.   Click the Save settings button.

Options:	Description:
Detection direction: Fore	This is the default setting. If Fore is selected, horns detected to the fore of the microphone unit will be displayed at the fore of the display unit.
Detection direction: Aft	If Aft is selected, all horns detected will be offset by 180˚ in the display unit. Horns detected to the fore of the microphone unit, will be displayed at the aft of the display unit.
Master	This is the default setting. The master unit must be connected to the microphone unit. The master unit will transmit all detected signals to any slave units over Ethernet.
Slave	The slave unit can not be connected to the microphone unit, but will receive detections and sound from the master unit over Ethernet. There may be multiple slave units in an installation.
Alignment offset	Use this setting to add an offset to all detections in case the microphone unit has not been mounted accurately in the fore direction.This setting does not apply to the slave units.
Pointer hold	Use this setting to adjust the length of time a detection is displayed after the detection has ended. The default value is 7 seconds.
Horn Mute hold	This setting can be used to avoid echo from the ships whistle to trigger the SR system; 0-10seconds. This setting does not apply to the slave units.

IMPORTANT:

When working with a master or slave setup, all units must be:
- **Connected to the same network.**
- **Configured with different IP addresses.**
- **Use the same transmission group.**

NOTE:

You can view more information about the options by clicking on the (?) question mark buttons next to the

individual options.

The Additional options page also offers the possibility to do the following maintenance:
- Firmware updates
- Restore the unit to the factory defaults
- Reboot the system

To complete any of the additional maintenance options:
- To complete a Firmware update, click Update firmware
- To restore the factory defaults, click Factory reset
- To reboot the system, click Reboot

Figure 41: Additional options, including maintenance (update firmware, reset and reboot)

6 Testing

No periodical test or maintenance is required for the Sound Reception System. In case of suspicion of failure or other reasons, testing should be done when required.
To keep record, please use the table on page 45 – Chapter 8 – Test and Maintenance log.
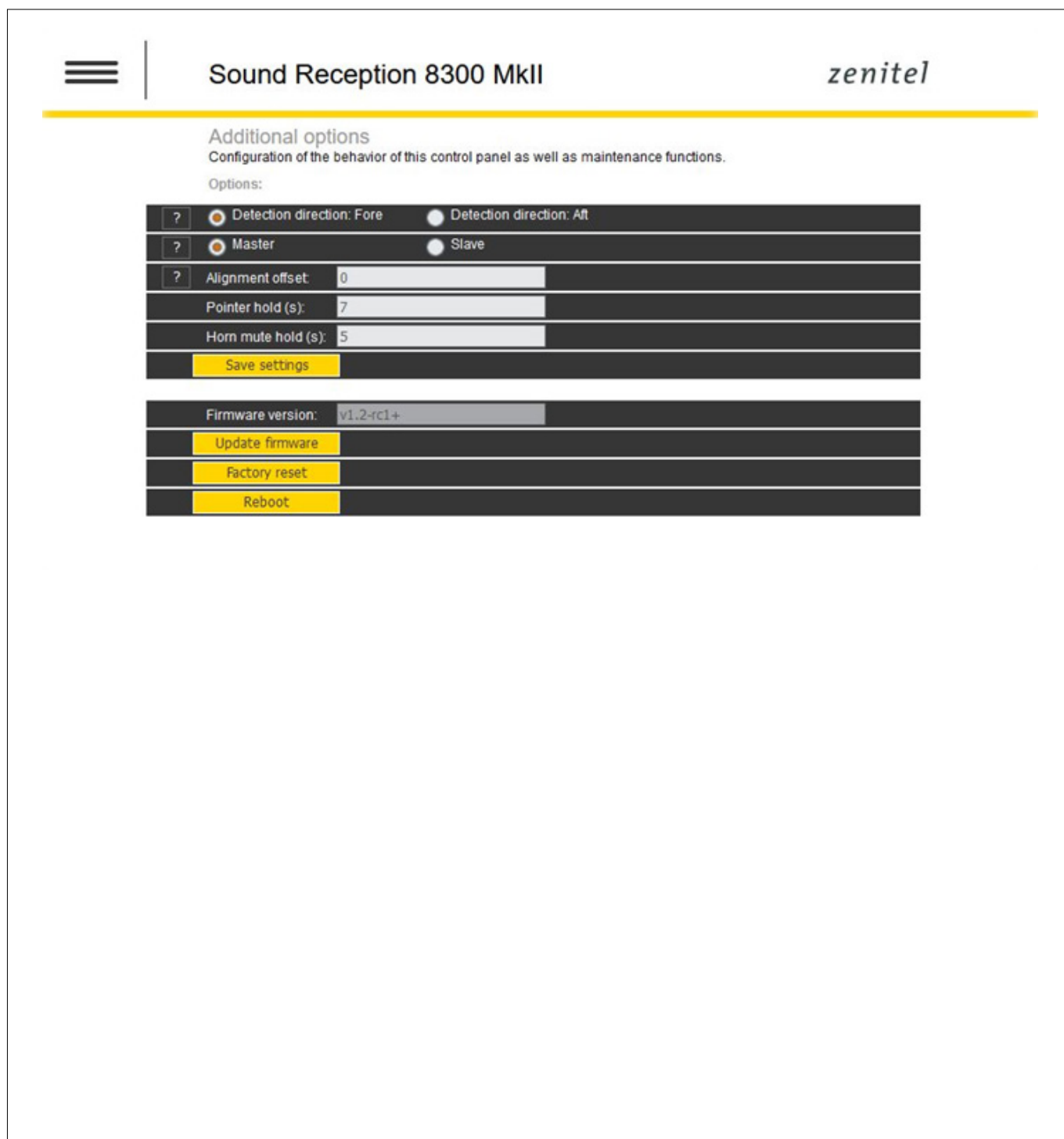
6.1 LED Self Test

See page 21. Perform LED test according to the specified procedure.

6.2 Calibration and Testing

Testing of the operational functionality of the 8300 MkII is done using a portable foghorn.

> **NOTE:**
>
> *The 8300 MkII automatically and continuously tests both the display and microphone unit.* See page 35 for failure detection and acknowledge.
>
> *In the event of an error, the error will be displayed by the LEDs in the web interface or in the syslog server (if configured).* See page 38/39 – Chapter 5.9.4 System Log

Foghorn activity should be in 3-second bursts with at least 10 seconds between each burst.

> **NOTE:**
>
> *If the microphone unit is not correctly mounted, the display unit can compensate for this by adding an offset to the detections.*
> *Check the calibration mode or additional options.*

6.3 SAT/ Advanced testing

This test is specified by ISO 14859:2012.

The sound reception system can be tested under voyage speed conditions for the ship.
The sound signal intensity and the range of audibility for all possible length of vessels (according to COLREG, Annex III point 1.a-c) shall be covered by the test.
The shipboard type testing shall be carried out with at least two sound signals and up to the relevant audibility range of the sound signal (listed in Table 1).
One signal shall meet the fundamental frequency range of 70 Hz to 200 Hz and has to be recognized up to 2 nautical miles and the other signal shall meet the fundamental frequency range of 250 Hz to 700 Hz and has to be recognized as specified in Table 1.

Table 1 — Sound signal intensity and range of audibility

Length of vessel m	Limits of fundamental frequencies Hz	1/3rd-octave band level at 1 m [dB referred to 2 x 10 −5 N/m2] dB	Audibility range in nautical miles
> 200	70 to 200	143 dB	2
75 up to 200	130 to 350	138 dB	1,5
20 up to 75	250 to 700	130 dB	1
< 20	250 to 700	120/ 115/ 111 dB	0,5

Confirm that the sound reception system reproduces the incoming sound signals in accordance with 4.1.2 and indicates the approximate direction of incoming sound signals in accordance with 4.1.4. The results displayed from the sound reception systems shall be as good as at least two human observers at a lookout position outside the enclosed bridge. Annex A provides the methodology to perform type testing on a representative test vessel.

6.4 SAT/Simplified testing

A test signal is needed to make performance test. As test signal, a true typhoon or whistle can be used, alternatively a handheld/mobile air-compressed horn or even a speaker can be used. This test is to be performed for different angles to verify that all directions are correctly indicated.

Test signal:
- Test signal source must resemble actual horn signal as much as possible. For best performances use signals rich in harmonics such as a square or triangle signal.
- The fundamental frequency of the signal shall lie within the range 70-820 Hz.
- Test signal must be set to generate a minimum sound pressure level, SPL, of 75dB(A) measured at center of the microphone unit.
- The test signal shall be a 3-second-long test tone. Best testing is with a minimum signal separation of ten (10) seconds between tests and different angles:

A100K11918
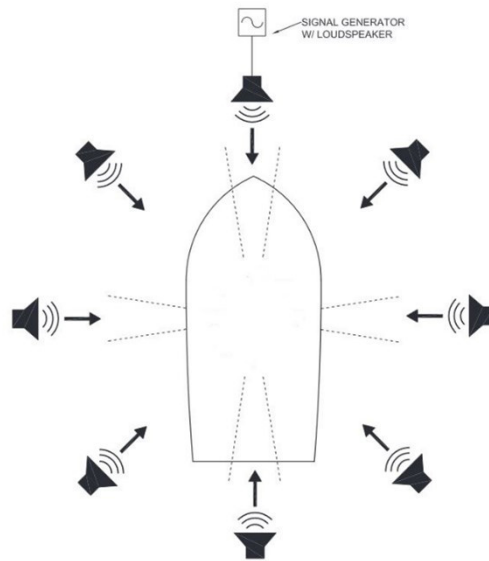
7   Maintenance

All maintenance options for the 8300 MkII are completed in the Additional options page of the web interface. The maintenance options are as follows:

- Upgrade or view the current firmware version.
- Perform a factory reset.

To perform a firmware upgrade:

1. Click the Update firmware button.
2. Select the firmware upgrade package in the dialog box

NOTE:

When the firmware upgrade is complete, the unit will automatically restart

To perform a factory reset:

1. Click the Factory reset button.
2. Click Yes in the dialog box.

NOTE:

All configuration options will be reset to the factory default, including the network IP address setting.
The default network IP address (192.168.0.100) must be entered manually in a web browser to regain access to the web interface.
If the original default address was not changed, the web interface will refresh automatically.
When the reset is complete, the unit will automatically restart.

To perform a reboot:

- Click the Reboot button.

NOTE:

The device will automatically restart.

A100K11918

8 Test and Maintenance Records

Record all test and maintenance activities below:

Date	M/T*	Signature	Inspection

*M=Maintenance, T=Test.

9 Troubleshooting

If the P-8300 MkII display unit detects a problem, the front status LED will switch from green to orange.

To get an indication of what may be wrong, do one of the following:
- Check the syslog server if syslog network logging is enabled
- Check the web interface of the unit

Below are tips for solving the following potential failures or issues:
- Microphone surveillance failure
- LED surveillance failure
- Foghorn detection failure
- Display unit boot failure

9.1 Microphone Surveillance Failure

If the signal coming from one or more of the microphones on the P-8301 MkII microphone unit
is malfunctioning, do the following:

1. Check the cabling

NOTE:

The power leads should be connected to the display unit, on the left side of the Mute connection. A description of all the connectors is displayed on the back of the unit.
If the web interface indicates that all microphones are down, then the problem might lie within the power cable going to the microphone unit.

2. Check the individual microphone cabling

NOTE:

Do this when only one microphone has failed.
After checking the cabling, restart or acknowledge the error message in the web interface.

3. Inspect the unit for physical obstruction of the failing microphone.

NOTE:

If you do not find any visible obstruction on the microphone, the unit should be consider damaged. In this case, contact Zenitel for support.
Internal parts of the microphone unit are not serviceable.

9.2 LED Surveillance Failure

If a LED failure is indicated, do the following:

- Start the LED test mode

NOTE:

This should indicate which LED is failing.

If any of the red indicator LEDs have stopped working, a foghorn detection might not be visible to the user; in this event contact Zenitel for support.
Refer to the additional information under the LED test mode.

A100K11918

9.3 Foghorn Detection Failure

If the unit fails to detect a foghorn, do the following:

1. Check to see if there are any microphone surveillance failure messages in the web interface.

NOTE:
Refer to the additional information under Microphone Surveillance Failure.

2. Adjust the signal to noise ratio setting in the web interface.

NOTE:
Refer to the additional information under Audio Settings.

3. Do a factory reset.

NOTE:
Refer to the additional information under Maintenance.

9.4 Display Unit Boot Failure

If the P-8300 MkII display unit fails to start when power is connected, do the following:
• 	Press and hold the reset button at the back of the display unit for 10 seconds.

NOTE:
Power must be connected to the unit to recover the firmware.

CAUTION:
If the firmware starts the unit properly, do a firmware upgrade to ensure the primary firmware is not corrupt.
After upgrade, the unit will restart with the primary firmware loaded. The recovery firmware can always be accessed by performing this step again.

Refer to the additional information under Additional Options.

Warranty Claims

Warranty claims can be submitted during the warranty period, all claims will be appropriately handled according to the warranty agreement specified for this product and in accordance with the terms and conditions of your sales agreement.

Prior to returning your product for product claims you must submit at warranty claim in writing to claims@zenitel.com.

Service

All services such as installation, maintenance or replacement must by done by an authorized Zenitel service agent.

CAUTION:

Improper maintenance may destroy the functionality and/or performance of this product.

NOTE:

*Zenitel does not accept any responsibility for the dismantling or reassembling of a 8300 MkII
that occurs externally from a Zenitel authorized facility and/or is handled by someone other than an authorized,
trained and certified person.*

Spare Parts

Keep the original packaging. If the 8300 MkII needs to be shipped for servicing, it is required to be shipped within the same packaging as when the product was first received.

Part Number	Part Name
4000019415	P-8300 MkII display unit
4000019416	P-8301 MkII microphone unit
4000019634	Junction Box (optional)

IMPORTANT:

**Ensure that all spare parts being fitted to the 8300 MkII are original spare parts manufactured or approved by Zenitel.
Any use of counterfeit spare parts will deviate from the product type approval certificates.**

Recycling & Disposal

The 8300 MkII is not to be disposed as normal waste and must be handled in accordance with the applicable waste disposal regulations in the country where the equipment is used.

Support/Contact

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