Base Load Power Hub (BLPH)

TELECOM EQUIPMENT

EQUIPMENT MANUFACTURER RECORD BOOK

Document Number: 1724000452-QC-DB-00012

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
01	23/05/2025	Issue for Review (IFR)	L.Pizzigati	S.Montanari	S.Montanari
00	19/03/2025	Issue for Review (IFR)	L.Pizzigati	S.Montanari	S.Montanari

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01	ISSUE FOR REVIEW (IFR)

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PART 1
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DESIGN DOSSIER

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SECTION 1
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LIST

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1.1
-
EQUIPMENT
MANUFACTURER
RECORD BOOK INDEX

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Base Load Power Hub (BLPH)

EQUIPMENT MANUFACTURER RECORD BOOK INDEX – TELECOM EQUIPMENT

Document Number: 1724000452-QC-LIS-00011

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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Sign	Date
	31/01/2025

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00	03/09/2024	Issue for Review (IFR)	L.Pizzigati	L.Cavallini	M.Manenti
Rev.	Date	Description	Prepared	Reviewed	Approved
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1.2
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SUPPLIER MASTER
INDEX REGISTER
(SMIR)

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TELECOM EQUIPMENT

SUPPLIER MASTER INFORMATION REGISTER

Document Number: 1724000452-MD-LIS-00001

Document Class: 3

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Sign	Date
Marco Mastroforti	18/04/2024

00	04/04/2024	Issue for Information (IFI)	L.Cavallini	L.Cavallini	M.Manenti
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File: 1724000452-MD-LIS-00001 Rev.00

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SMIR - REGISTRO DOCUMENTI / *SMIR - SUPPLIER MASTER INFORMATION REGISTER*

Ordine n°/*order nr.*	1724000452		Fornitore/*Supplier* :	FORES Engineering S.r.l.	
data / *dated:*	27/02/2024		Codice F./ *S. Code:*	02178650400	
Commessa / *Job:*	123A90A		Indirizzo/ *address* :	Via Secondo Casadei, 12 - 47122 Forli (FC)	
Descrizione / *Description*	Telecom Equipment		Persona di riferim./ *contact person:*	Marco Manenti	
Macrofase / *Phase*					

Pos.	Document nr. Client (1)	Doc Client Rev. (1)	Document nr. Internal	Document nr. Internal Rev. (2)	Document nr. Supplier (3)	Doc Supplier Rev. (3)	Titolo Documento / *Document title* *PRESSURE VESSEL*	Disciplina / *Discipline*	Blocco Classe / *Class Block (6)*	Docum. Format (7)	first issue date (8)	Third Party Approval (I/A)	Design KEY Document	Document Approval (I/A)
							CONTROL DOCUMENTS							
1	1724000452-MD-LIS-00001	00	1724000452-MD-LIS-00001	00	224E20-DDL-PM-LIS-00001	00	SUPPLIER MASTER INDEX REGISTER (SMIR)	TELECOM		A4	27/03/2024			I
2	1724000452-QC-LIS-00002	00	1724000452-QC-LIS-00002	00	224E20-DDL-PRT-LIS-00001	00	SUB-SUPPLIER LIST	TELECOM		A4	08/04/2024			I
3	1724000452-QC-PL-00003	00	1724000452-QC-PL-00003	00	224E20-DDL-PM-PL-00001	00	FABRICATION / PRODUCTION SCHEDULE	TELECOM		A3	08/04/2024			I
							QUALITY DOCUMENTS							
4	1724000452-QC-ITP-00004	00	1724000452-QC-ITP-00004	00	224E20-DDL-QUA-ITP-00001	00	INSPECTION AND TEST PLAN	TELECOM		A4	08/04/2024			A
5	1724000452-TL-DS-00005	00	1724000452-TL-DS-00005	00	224E20-DDL-TL-DS-00001	00	EQUIPMENT DATASHEETS	TELECOM		A4	28/03/2024			A
6	1724000452-TL-LIS-00006	00	1724000452-TL-LIS-00006	00	224E20-DDL-TL-LIS-00001	00	EQUIPMENT and SPECIAL TOOLS LIST	TELECOM		A4	28/06/2024			A
							PROCEDURES							
7	1724000452-QC-PRO-00007	00	1724000452-QC-PRO-00007	00	224E20-DDL-TL-PRO-00001	00	FAT PROCEDURE	TELECOM		A4	28/06/2024			A
8	1724000452-QC-PRO-00008	00	1724000452-QC-PRO-00008	00	224E20-DDL-TL-PRO-00002	00	SAT PROCEDURE	TELECOM		A4	28/06/2024			A
							REPORT							
9	1724000452-QC-RE-00009	00	1724000452-QC-RE-00009	00	224E20-DDL-QUA-RE-00001	00	FAT REPORT	TELECOM		A4	05/07/2024			I
10	1724000452-QC-RE-00010	00	1724000452-QC-RE-00010	00	224E20-DDL-QUA-RE-00002	00	SAT REPORT	TELECOM		A4	05/07/2024			I
							DATA BOOK & CERTIFICATYES							
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12	1724000452-QC-DB-00012	00	1724000452-QC-DB-00012	00	224E20-DDL-QUA-DB-00001	00	EQUIPMENT MANUFACTURER MANUALS COLLECTION	TELECOM		A4	06/09/2024			A
13	1724000452-QC-CER-00013	00	1724000452-QC-CER-00013	00	224E20-DDL-QUA-CER-00001	00	EQUIPMENT HAZARDOUS AREA REGISTER and CERTIFICATE	TELECOM		A4	06/09/2024			A
							SPARES							
14	1724000452-COM-LIS-00014	00	1724000452-COM-LIS-00014	00	224E20-DDL-TL-LIS-00002	00	SPARE PARTS LIST	TELECOM		A4	10/05/2024			A

Notes:

(1) Numero documento Cliente
Document number assigned by final Client

(2) Numero documento interno
Document number internal

(3) Numero documento Fornitore (assegnato dal Fornitore)
Document number assigned by Supplier

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Fill in the document title (to be assigned by Vendor)

(5) Specific are la disciplina (compilato da Rosetti)
Process, Piping; Electrical, Expediting, Inspection, Commissioning, Quality, ecc (to be filled by Rosetti)

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Base Load Power Hub (BLPH)

SUB-SUPPLIER LIST – TELECOM EQUIPMENT

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Sign	Date
MARCO MASTROFORTI	23/01/2025

Document Class: 3

01	15/01/2025	Issue for Information (IFI)	M.Meskine	L.Fontana	M.Manenti
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Rev.	Date	Description	Prepared	Reviewed	Approved
FORES ENGINEERING					

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1 SUB-SUPPLIER LIST

MATERIAL / SERVICES	**SUPPLIER**
1 – UHF PORTABLE RADIO	SINORA SRL VIALE CARPEGNA 9 47838 RICCIONE RN - ITALY
2 - MOTION/DOOR SENSOR	ACCESS SOLUTIONS NETHERLANDS B.V. KELVINSTRAAT 7 6003 DH WEERK - NETHERLANDS
3 - MARINE RADIO AND NAVIGATION AIDS	GENERALMARINE SRL PIAZZA BALDINI 7/75 16149 GENOVA GE - ITALY
4 - CUFFIE PER SP3540+ELMETTI	NUOVA OLP SRL ANTINCENDIO SICUREZZA PROTEZIONE VIA M. MONTI, 38 – ZONA BASSETTE 48123 RAVENNA RA - ITALY
5 - SPARE PARTS PER SP3540	GENERALMARINE SRL PIAZZA BALDINI 7/75 16149 GENOVA GE - ITALY

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rendition.xdl - Changemark Notes (0 Notes)

No changemarks applied

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Base Load Power Hub (BLPH)

SPARE PARTS LIST - TELECOM EQUIPMENT

Document Number: 1724000452-COM-LIS-00014

Document Class: 2

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Sign	Date
MARCO MASTROFORTI	26/08/2024

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02	08/08/2024	Accepted for Construction (AFC)	L.Cavallini	L.Cavallini	M.Manenti
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File: 1724000452-COM-LIS-00014-02
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4	Spare Part List	X	X	X					

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SPARE PARTS LIST

CROSSWIND

Document Title	Spare Parts List					
The document relates to	HOLLANDSE KUST NOORD WIND PARK Project - Base Load Power Hub (BLPH)				Contract	
					CW-I-WP4-2023-05	
Project ID	123A90	Doc. n°	1724000452-COM-LIS-00014	Rev. 02	Rev. Date 08-Aug-24	Status AFC / Class 2

The equipment consists of the following units/components

1	Tag no.	Y-89-25-TBC-001+004	Y-89-06-THU-001+002	Y-89-73-TIR-001+009	Y-89-73-TDC-001+018	
2	Tag description	Single unit charger for VHF Marine Radio	UHF DMR Portable Radio	Microwave Motion Detector	Door Contact	
3	Manufacturer model/type no.	403536A	DP4801Ex	6931P	DC108	
4	Manufacturer serial no.					
5	No. of units	4	2	9	18	

Supplier: FORES Engineering S.r.l.
Address: Via Secondo Casadei, 12
47122 Forli (FC)
ITALY

PO Number: 1724000452
PO description: BLPH - Telecom System
Supplier telephone no: +39 0543 813537
E-mail: spare.parts@fores.it

Contact name: Mrs Paola Bacchini
Contact mobile no:
WEBSITE http://www.fores.it/

General Information:

6 Quantity of parts FITTED / INSTALLED per unit/component

Item Number	Total number of identical spares installed	Description of recommended spare parts	Parts/drawing ref. Project Datasheet no.	Project Detail dwg. no.	Item ref.	Material	Certificate Type (if applicable)	Certificate Reference (if applicable)	Shelf life (years)	Weight (net)	Weight (gross)	Volume	HS Code	ECCN Code	% US Content	Country of origin	Supplier part no.	Manufacturer part no.	Manufacturername	Commissioning spares Quantity ordered	2 Years spares Quantity ordered	Remarks
7		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	4	ATEX single battery charger kit for SP3540	1724000452-TL-DS-00005															403536A	Sailor		1	
2	2	Hard Leather Carry Case																PMLN8299A	Motorola		2	
3	2	ATEX Remote Speaker Microphone for DP4801Ex	1724000452-TL-DS-00005															PMMN4094	Motorola		1	
4	2	2075mAh Li-ion Battery for DP4801Ex	1724000452-TL-DS-00005															NNTN8359	Motorola		2	
5	9	Motion Sensor	1724000452-TL-DS-00005															6931P	Carrier	1		
6	18	Door magnetic contact	1724000452-TL-DS-00005															DC108	Carrier	1	2	
7																						
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SECTION 2
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DATA SHEETS

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EQUIPMENT DATASHEETS

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Base Load Power Hub (BLPH)

EQUIPMENT DATA SHEETS – TELECOM EQUIPMENT

Document Number: 1724000452-TL-DS-00005

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4	APPROVAL NOT REQUIRED

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Sign	Date
MARCO MASTROFORTI	13/06/2024

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00	04/04/2024	Issue for Review (IFR)	L.Cavallini	L.Cavallini	M.Manenti

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1 IDCS

1.1 IDCS - MICROVAWE MOTION DETECTOR

6931P

Mini outdoor motion sensor, Dual Technology, 24 GHz

Dual Technology outdoor motion sensor

The Mini Dual variants are outdoor motion sensors and alarm triggers that use two independent passive infrared detectors plus a microwave sensor module. All three sensors must trigger to cause the detector to signal an alarm. They use triple detection technology to deliver precise, reliable presence detection.

Easy and quick to install

Programmable options include a variable pulse count and LED able/disable functionality. Moreover, the integral dual-axis tilt sensor allows 90º of pan and 45º of tilt, which increases the speed of the outdoor installation and provides incredibly accurate aiming of the detection pattern.

Aesthetics and hidden sensor module

The design has a neat appearance that gives no visible indication of the orientation of the detector head and totally hides the wiring. It blends smoothly into residential outdoor applications.



Details

- New outdoor family containing wired PIR, 2 Dual Technology variants and wireless PIR
- Attractive aesthetics
- 14 to 70º detection angle
- 90º pan & 45º tilt for flexible installation
- Sensor module is hidden
- High dust and humidity resistance (IP65)
- 5 years warranty

6931P
Mini outdoor motion sensor, Dual Technology, 24 GHz

Technical specifications

General

Technology	Dual
Application type	Wall mount
Anti masking	No
Pet immune	No
Camera	No
Processor	Digital microprocessor with nonvolatile memory

Detection

Max. detection range	15 m
Detection range	14 to 70° detection angle, 15 x 13 m
No. of curtains	21
Microwave frequency (nom.)	24 GHz
Undercrawl protection	No
Fresnel lens	20 zones for each detection element, which can be masked with the curtain sliders
Microwave module	X-band radar 24 GHz
Adjustment	90° pan, 45° tilt
Customized optics	Double silicon shielded quad element eliminates 50,000 lux of white light
Pulse count	1 or 2

Wired / wireless

Wired-wireless	Wired

Inputs / outputs

Alarm relay characteristic	NC, volt free relay, signal contact 24 VAC/DC @ 50 mA with an integral 25 Ohm series resistor

Electrical

Power supply value	10 to 15 VDC
Current consumption	8 mA (12 V nominal)

Physical

Physical dimensions	71 x 120 x 75 mm (W x H x D)
Net weight	225 g
Shipping weight	325 g
Colour	Bronze
Material	High impact ABS plastic with HDPE cover, UV stabilized
Mounting height	3 to 6 m
Mounting height	Variable up to 6 m / Optimum height 3 m for full range

Environmental

Operating temperature	-30 to +65°C
Environment	Outdoor
IP rating	IP65
Temperature compensation	Analogue (thermistor) and digital sensitivity adjustment

Inputs / outputs

Outputs	Silent, solid state, magnetically immune. PIR AND Microwave

LED

	Orange : Microwave activated
	Red : PIR activated
	Orange & Red : Detector alarm

As a company of innovation, Carrier Fire & Security reserves the right to change product specifications without notice. For the latest product specifications, visit firesecurityproducts.com online or contact your sales representative.

1.2 IDCS – DOOR CONTACT

DC108

Surface, overhead, floor mount contact

Overhead door magnetic contact

The DC108 series overhead door magnetic contact is for use in the rigorous environments of commercial and industrial installations. The floor mount units are constructed with a low profile heavy cast aluminium housing. The reed switch assembly is fully encased in an exclusive polyurethane potting material to prevent damage due to moisture or humidity.

Easy installation

A wide operating gap distance of up to 7.5 cm makes installation easy and helps prevent false alarms caused by door movement or damaged and loose fitting doors.



Details

- Miniature, low-profile design
- Stainless steel armoured cable for added security, reliability
- Wide working gap for overhead doors
- Small size less likely to be damaged by forklifts
- Tamper loop provided

DC108

Surface, overhead, floor mount contact

Technical specifications

Général

Application type	Overhead
Contact type	NC
Connectivity	4 wires, 2 m

Wired / wireless

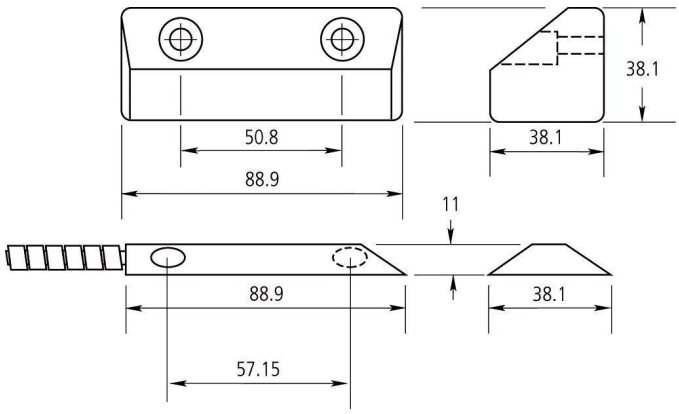
Wired-wireless	Wired
Operating gap	75 mm

Caractéristiques physiques

Dimensions magnet	89 x 38 x 38 mm
Dimensions contact / sensor	89 x 38 x 38 mm
Colour	Metallic silver
Material	Aluminium

Régulateur

EN50131 grade	Grade 2
Certification	IMQ, ULC



As a company of innovation, Carrier Fire & Security reserves the right to change product specifications without notice. For the latest product specifications, visit firesecurityproducts.com online or contact your sales representative.

2 NAVIGATION AIDS

2.1 NAVIGATION AIDS – SART

Tron AIS-SART

AIS transmitter



- Efficient SAR operation based on AIS technology
- Detectable on all AIS receivers
- Easy battery replacement
- Wide range of accessories
- 5 year warranty

JOTRON
Performance for Life

Tron AIS-SART

A robust and proven GMDSS search and rescue transmitter

- Adopted by IMO RES MSC. 256 (84) as an alternative to 9GHz SART
- Unique AIS technology contribute to a more effective and less time consuming SAR operation, due to superior position accuracy
- The AIS-SART is detected on AIS Class A and B
- Small and compact
- Tron AIS-SART and Tron SART20 use the same accessories:
  - Bulkhead bracket
  - Lifeboat bracket
  - Liferaft mounting pole

Technical specifications

PARAMETER	
Weight	480 g
Dimensions	H: 250 mm, W: 89 mm
Material housing	Glass reinforced polycarbonate
Frequency	161.975 and 162.025 MHz
Radiated power	1 W
Antenna height	Place at least 1 meter above sea/ground level
Indication	Visual and audible alarm
Temperature range	Operating: -20°C to +55°C Storage: -30°C to +65°C
Battery	7.2 V Primary lithium battery. 5 year service life
Operating life	96 hours continuous operation at -20°C
Standards	IEC 61097-14:2010, IEC60945, MSC.246(83), MSC.247 (83)

Proved performance

- Up to 10 nm from a SOLAS ship with AIS class A transponder
- Up to 40 nm from a SAR helicopter (altitude 1000 ft)
- Up to 130 nm from a SAR aircraft (altitude 20000 ft)

Accessories





Bulkhead bracket





Liferaft mounting pole





~~Lifeboat bracket~~

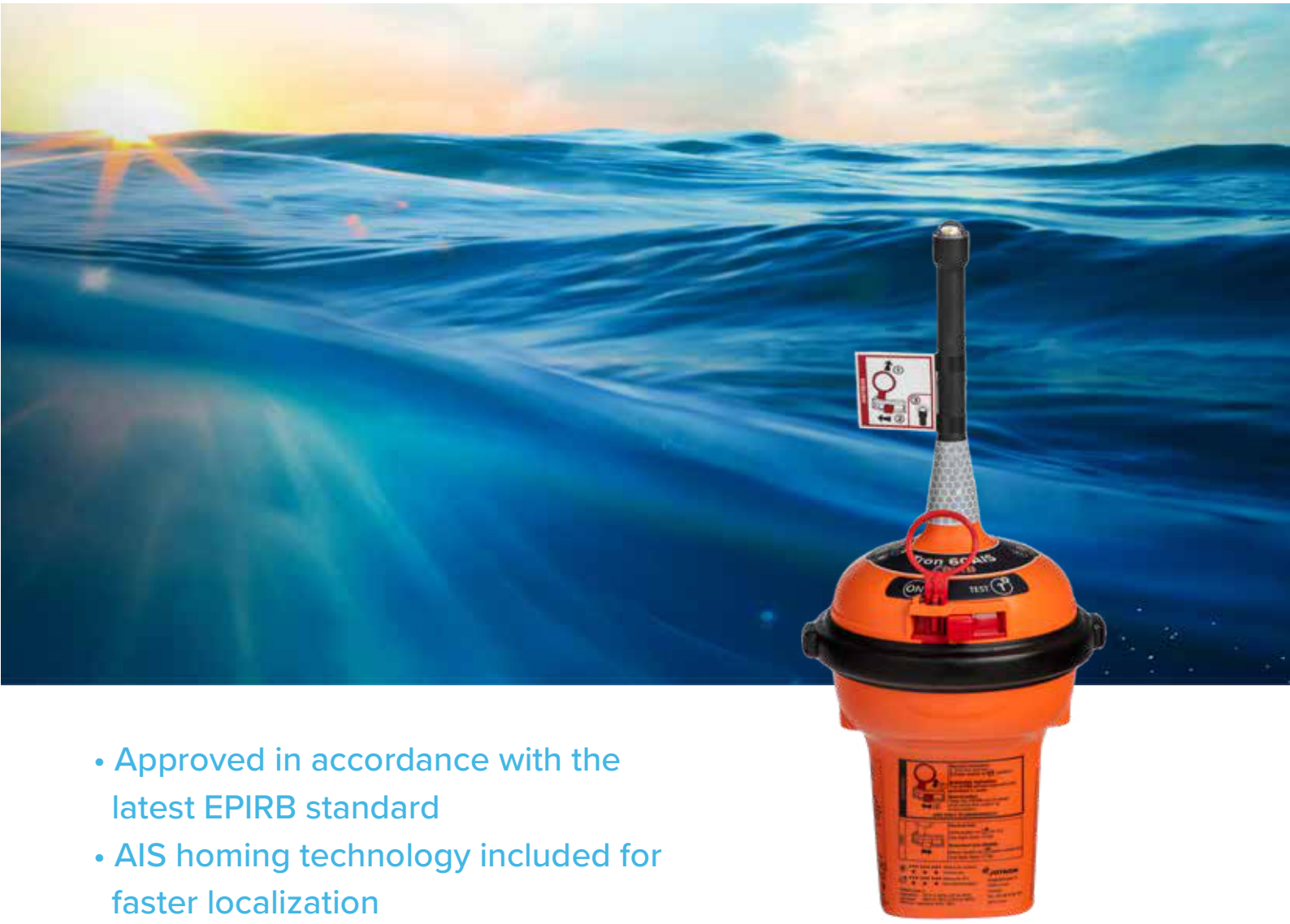
Approved:

2.2 NAVIGATION AIDS – EPIRB

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Tron 60AIS

EPIRB with float-free and manual bracket



- Approved in accordance with the latest EPIRB standard
- AIS homing technology included for faster localization
- Prepared for RLS through Galileo GNSS
- IR LED light for night vision devices and assisted SAR
- 11 year and 3 month total battery lifetime

JOTRON
Performance for Life

Tron 60AIS

The most technologically advanced EPIRB to date!

The Tron 60AIS is compliant with the mandatory International Maritime Organization (IMO) regulation (as of July 2022) and Safety of Life at Sea (SOLAS) regulation.

Tron 60AIS feature comparison

FEATURE	DESCRIPTION	Tron 60GPS	Tron 60AIS
IEC 61097-2 Ed.4	Approved in accordance with the latest EPIRB standard		✓
MSC.471(101)	Compliant with the latest IMO regulation for EPIRB (July 2022)		✓
AIS technology	Homing technology included for faster localization		✓
Return Link System	RLS through Galileo GNSS		✓
IR technology	IR LED light for use with night vison devices and assisted SAR		✓
Battery	11 year and 3 month total lifetime		✓
Cospas-Sarsat 406 MHz	Approved in accordance with Cospas-Sarsat	✓	✓
121.5 MHz homing	VHF/AM frequency for homing/ location purposes	✓	✓
GNSS (GPS, GLONASS, Galileo)	72 channels GNSS (Global Navigation Satellite System)	✓	✓
MEOSAR	Enhanced detection capability for accelerated rescue	✓	✓
Activation	Manual and/or water activation	✓	✓
Battery replacement	Maintenance according to IMO regulations and/or national flag state administration	✓	✓
Warranty	5 year full warranty	✓	✓
Wrist strap	Hands-free wrist strap	✓	✓
LED technology	Top mounted LED light securing 360 visibility coverage	✓	✓
Brackets	Float-free or manual	✓	✓

Features:

The Tron 60AIS has both regular LED light and infrared light emitting diode (IR LED) incorporated. This IR LED allows the use of night vision, which better assists SAR operations that occur at night or in the dark.

The Tron 60AIS offers Galileo Return Link System, Europe's Global Navigation Satellite System (operational since January 2020).

This EPIRB has been tested for operational and performance requirements in accordance with the international standard, IEC 61097-2 Ed.4 (April 2021).

Float-free and manual bracket



Approved:

v. 3 Jotron AS reserves the right to change any content herein without notice

2.3 NAVIGATION AIDS – GMDSS MARINE RADIO

2.3.1 Navigation Aids – GMDSS VHF Marine Portable Radio

THE SAILOR® SP3500 ATEX PORTABLES

Tough Job. Tough Conditions. Tough Equipment.

Product Sheet

Communication is vital for the safety and efficiency on board all vessels operating in hazardous environments, such as tankers, supply vessels and other offshore operations. Choosing a portable radio specially designed for this harsh environment is a must. Fully waterproof, the ATEX versions of the SAILOR SP3500 portable series is built specifically for use at sea, so it can be trusted to provide reliable communication whatever the conditions.

All SAILOR SP3500 ATEX versions are designed with the user in mind, and are ideal for work in hazardous marine environments. The unique SAILOR SP3540 VHF is both ATEX and GMDSS approved, so it can be used for on board communication and to fulfill safety requirements if an incident should occur.

With large tactile buttons and control knobs combined with a user-friendly interface, operation of the SAILOR SP3500 ATEX portables could not be simpler, and when in the middle of a vital operation, be it a bunkering operation, hazardous cargo transfer or an oil spill clean-up, complicated operation of your radio is the last thing you need. Every SAILOR SP3500 portable radio also comes with a large, easy to read display with a red backlight to protect your night vision.

Years of experience with maritime design have resulted in the innovative, user-friendly design of the SAILOR SP3500 ATEX portables, which is backed up by incredible value and a high quality worldwide service network – On Board Service Center.

The ATEX Family

The SAILOR ATEX portable series is part of the SAILOR SP3500 family, which features seven models covering all maritime applications. There are three high-quality, durable ATEX models specifically designed for use in the dangerous offshore and tanker environment, whilst at the same time offering superb value.

- SAILOR SP3530 Portable VHF ATEX
- SAILOR SP3540 Portable VHF ATEX GMDSS
- SAILOR SP3560 Portable UHF ATEX

All feature powerful transceivers and high quality audio ensuring that all parties can be heard loud and clear even when working in windy and noisy conditions. The SAILOR name gives you confidence that your portable VHF was built for the job at sea, with such features as:

- Robust design
- Waterproof (IP67)
- Large display
- Clear sound
- Large tactile buttons
- Ribbed grip
- Interface to external accessories – e.g. SAILOR 3595 Hand Microphone ATEX

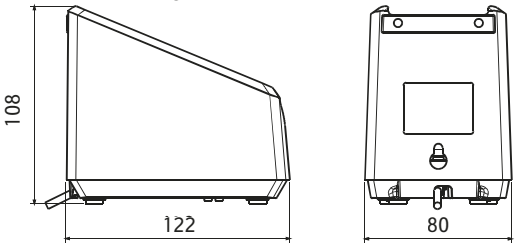
The SAILOR SP3500 ATEX versions conform to the 94/9/EC ATEX Directive. The approved rating is II 2 G Ex ib IIC T4. Accessories has been approved together with the SAILOR SP3500 ATEX radios.



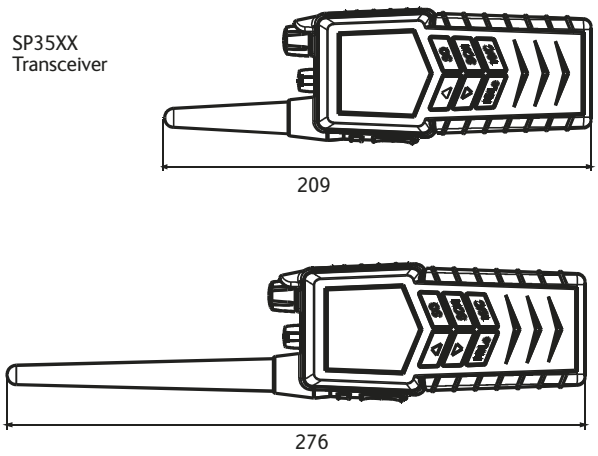
THE SAILOR® SP3500 ATEX PORTABLES

Tough Job. Tough Conditions. Tough Equipment

SP35XX Charger



SP35XX Transceiver



The complete package

The SAILOR SP3530/SP3540/SP3560 packages consist of:

- Transceiver and antenna
- Belt clip and lanyard
- Li-Ion rechargeable battery and charger*
- AC/DC converter/adaptor
- DC connection
- Operators manual
- The SAILOR SP3540 also includes a Lithium battery for GMDSS application.

Wide range of accessories

In addition to the standard package a range of accessories are available, making the SAILOR SP3500 portable series even more vital for all marine applications:

- SAILOR 3590 Hand Microphone with Interface for OTTO Engineering accessories
- SAILOR 3595 Hand Microphone ATEX* with interface for SAVOX and PELTOR accessories
- Interface cables for PELTOR and SAVOX accessories
- Service/programming cable
- Dual charger
- Leather carry and soft carry bags with shoulder strap

** SAILOR 3595 Hand Microphone ATEX is ATEX approved for SAILOR SP3530/SP3540/SP3560 ATEX Portables*

	SAILOR SP3530 VHF ATEX	SAILOR SP3540 VHF GMDSS ATEX	SAILOR SP3560 UHF ATEX
Approvals	R&TTE FCC IC	MED (Wheelmark) FCC IC	R&TTE FCC IC
CHANNELS AND FREQUENCIES			
Frequency range	149.3 - 174 MHz	149.3 - 174 MHz	440 - 470 MHz
Channel separation	25 and 12.5 kHz	25 kHz	25 and 12.5 kHz
Pre-programmed channels	Int., US, Canadian and BI	GMDSS	16 maritime
Additonal programmable channels	100	100	100
ATIS call sign programmable	X	X	X
FEATURES			
Squelch control	X	X	X
Transmitter power (Hi/Lo) (radiated)	2/1W	2/1W	2/1W
Dual watch, Tri-watch, scanning	X	X	X
Call Channel Program and Selection	X	X	X
Red back light with dimming	X	X	X
Keypad lock	X	X	X
Keypad beep On/Off	X	X	X
Backlit keypad	X	X	X
Light on key press or manual only	X	X	X
Display contrast	X	X	X
CTCSS	X		X
Scrambler	X		X
Battery save function	X	X	X
Battery level indicator	X	X	X
BATTERY			
1650mAh Rechargeable Li-Ion battery	X	X	X
GMDSS battery			X

For further information please contact:

satcom.maritime@cobham.com

Subject to change without further notice.

2.3.2 Navigation Aids – Marine Portable Radio Single Charger Kit

ATEX Single Charger Kit for SP3500

403536A

The SAILOR charger kit consist of:

- Li-Ion rechargeable battery
- Charger
- AC/DC converter
- DC connection

The charger is not waterproof.

The charger can be supplied from DC or from AC using an AC/DC converter.

- DC: Connect the 12-24VDC Connection Cable between the DC supply and the connector on the underside of the charger.
- AC: Connect the AC/DC converter to the connector on the underside of the charger. Then connect the AC/DC converter to the AC outlet.

Subject to change without further notice.

For further information please contact:

satcom.maritime@cobham.com

2.3.3 Navigation Aids – PTT Control Unit

SAVOX

SAVOX C-C440/Sailor Ex Com control unit



The SAVOX C-C440 com-control unit is a push-to-talk unit designed for use with your two-way radio in demanding environments. It offers easy and reliable communication for professionals requiring durable equipment when operating in harsh conditions, and is ideal for those who need to communicate hands-free and/or with their radio secured underneath protective clothing. With a headset it provides a hands-free way to stay connected with your team and ensure the efficiency and safety of your operations. Rugged to IP67 and available as an ATEX version. Ex variants can be recognized by their different PTT button color (dark blue).

Key benefits

- Dust proof and water submersible (IP67)
- Extra large push-to-talk button
- Excellent tactile feel and operation; suitable for wearing under clothing and with gloves
- Large 360° rotating clip

Market Segment	Public Safety	Product code	L443922
Size L	89.8 mm	Size W	30.9 mm
Size H	87.9 mm	Housing Colour	Black
Weight (text)	140 g	Operational Temperature Min	-40 °C (-40 °F)
Operational Temperature Max	85 °C (185 °F)	Ingress Protection	IP66, IP67
Storage Temperature Min	-25 °C (-13 °F)	Storage Temperature Max	70 °C (158 °F)
Protection Against Drop(fall)	1 meter, IEC 60068-2-31-2008	Headset Connector	QR4+1 female
Battery Life Time	No battery	Connectivity	Wired
Cable Type	Coiled	Use Voltage	3.0...10VDC (0VDC for dynamic microphone)
Electro Magnetic Compatibility (EMC)	EN	Ex/IS	ATEX / IECEx
Emergency Button	No	Attachment/Fastening	Clothing Clip
Price List Notes	EX II 2 G, Ex ib IIC T4 Gb, EX II 2 D, Ex IIIC T110 Db, ATEX and IECEx approved Sold only through Thrane & Thrane		

Savox Communications Oy Ab (Ltd)
Keilaranta 15 B
02150 Espoo, Finland

2.3.4 Navigation Aids – Headset



PELTOR™

3M™ Peltor™ Twin Cup Headset, ATEX

MT72H540P3E-50

Product description

The **Peltor™ Twin Cup Headset , ATEX** has high-attenuating shells with optimised acoustic design and excellent space for the ears. Noise compensated microphones for clear and reliable communication. The P3E-version is for helmet attachment and fits all 3M™ Peltor™ helmets and most other helmet brands on the market. ATEX approved.

Article number	Description	3M ID number
MT7H72H540P3E-50	Twin Cup headset, helmet attachment	XH001674254

Key Features:

- ATEX approved for use in areas where intrinsic safety is required
- Dynamic noise cancelling microphone
- Twin-Cup technique for increased attenuation



Application:

The Peltor™ Twin Cup headset, ATEX-approved, is designed to be used in industrial areas where intrinsic safety is required.

Accessories:

Article number	Description	3M Id number
HY13	Hygiene kit	XH001659297

Standard and Approval:

MT72H540P3E-50 is in conformity with the provisions set out in the PPE directive 89/686/EEC, the EMC directive 2004/108EC and the ATEX directive 94/9/EC. Thereby it fulfils the requirements for CE marking.
The product has been tested and approved in accordance with EN352-3:2002, EN352-6:2002, EN 60079-0:2006, EN60079-11:2007. The product has been verified according to: EN 61000:6-2:2005.

The product has been examined by:
FIOH, Finnish Institute of Occupational Health, Topeliuksenkatu 41 a A, FI-00250, Helsinki, Finland Notified body #0403
NEMKO, Gaustadalléen 30 N-0373 OSLO, NORWAY Notified Body #0470

The product has been approved for use in potentially explosive environment according to ATEX directive and IEC Ex.
Product marking: II 2G Ex ib IIC T4 -20°C ≤ Ta ≤ +50°C
IEC Ex certificate number: IECEx NEM 09.0005X

Technical Datasheet

Technical Data Specifications:
Materials:
Helmet attachment: stainless steel
Cups: ABS
Ear cushions: PVC covered PU foam

Microphone:
Type: noise cancelling dynamic microphone
Sensitivity: -60dB+-3dB (0dB=1V/Pa @ 1 kHz)
Impedance: 230 Ω +20% -10%

Cable and connector:
0.5–1.4-m cable curled PU with connector type TP-120

Storage:
Recommended storage conditions: -55º C - +55º C, <90% humidity
Recommended maximum shelf life: 5 years except the batteries: <1 year

Use limitation:
Never modify or alter this product

Warranty:
The warranty does not cover any damage caused by neglected maintenance or careless handling. For more information on maintenance, please see the user instruction. For full warranty condition, contact your dealer or local 3M office.

Attenuation

MT7H72H540P3E-50

Frequency(Hz)	125	250	500	1000	2000	4000	8000
Mean Attenuation (dB)	17,9	27,3	34,0	35,8	31,5	40,5	36,5
Standard Deviation (dB)	3,3	3,6	4,2	2,9	3,0	4,7	4,0
Assumed Protection (dB)	14,6	19,7	29,0	32,9	28,5	35,8	32,5

SNR=31dB H=31dB M=29 dB L=24 dB

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CDS1010032 Rev c Peltor™ Marketing Communication

3 RADIO SYSTEM

3.1 RADIO SYSTEM – DMR RADIO

3.1.1 Radio System – DMR UHF Portable Radio

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MOTOTRBO DP4000 Ex SERIES ATEX AND MED PORTABLE RADIOS

KEEPING YOU SAFER IN THE TOUGHEST ENVIRONMENTS

MOTOTRBO™ ATEX AND MED SOLUTIONS: THE PROFESSIONAL CHOICE FOR HAZARDOUS AREAS

In environments like production facilities and oil rigs your workers are confronted with explosive gases, combustable dust, and chemical vapours. Safe, reliable communication is absolutely critical in such dangerous environments. That's where the power and performance of MOTOTRBO digital radios stand out.

The MOTOTRBO DP4000 Ex Series combines the best of two-way radio functionality with the latest digital technology. It integrates voice and data seamlessly, offers enhanced features that are easy to use, and delivers increased capacity to efficiently connect all your crews. With exceptional voice quality, long battery life and ATEX-rated for safety, the radios keep your workers connected and productive, wherever the job takes them.

COMMUNICATE CLEARLY IN DIFFICULT CONDITIONS

DP4000 Ex SERIES

These high-performing portables have the highest ATEX gas explosion group rating. Ideal for hazardous work with loud noise, long shifts, rough weather and dangerous conditions including combustible dust, explosive chemicals, gas leaks, flammable hydrocarbons and more.

DP4401 Ex - Rugged, easy to use, non-display model for hazardous open environments

DP4801 Ex - Adds a full keypad and large colour display for access to advanced features like texting and caller ID



DP4401 Ex (Non-Display) **DP4801 Ex (Display)**

ATEX DUST PROTECTION:

- **II** Group II, other environments, (chemical industries, refineries, etc.)
- **2D** High protection, Category 2 equipment for Zone 21 and 22. D = Dust
- **Ex** Explosion-proof equipment, certified to European ATEX Directive and IECEx
- **IIIC** Enclosure certified for dust Zone 21 by IP rating
- **T130°C** Maximum enclosure surface temperature

ATEX GAS PROTECTION:

- **II** Group II 'other' environments
- **2** High Protection, Category 2 for Zone 1 and 2
- **G** Gas
- **Ex** Explosion-proof equipment, certified to European ATEX Directive and IECEx
- **ib** Type of ignition protection (Zones 1 and 2)
- **IIC** Protection in the most explosive gas environment (hydrogen)
- **T4** Device surface temperature will not exceed 135°C

ATEX MINING PROTECTION:

- **I** Group I
- **M2** Category Equipment is intended for use in underground mines as well as surface installation of such mines likely to be endangered by firedamp and/or combustible dust
- **Ex** Explosion-proof equipment
- **ib** Type of ignition protection (Zones 1 and 2)
- **I** Explosion Group, I = Methane



SO RUGGED, IT WITHSTANDS THE WORST

The DP4000 Ex Series is so rugged and durable, it meets the most stringent standards and has the highest ATEX rating. Whether working in an oil refinery, or chemicals factory, dust and water can damage radios, but the DP4000 Ex Series is designed to withstand the worst. It meets or exceeds MIL-STD-810 for exceptional durability and is IP67 rated[1] to keep out damaging water and dust. The design has also been subjected to Motorola Solutions unique Accelerated Life Test to simulate five years of hard use.

EASY TO OPERATE

The DP4000 Ex Series features large PTT, volume, channel knobs and programmable buttons that are easy to use, even when wearing gloves. The large, colour display (DP4801 Ex only) and bright LED show radio status information at a glance. Plus the prominent orange emergency button enables workers to quickly call for assistance when it is required.

KEEP CREWS COMMUNICATING, EVERYWHERE

MOTOTRBO has the ability to scale to meet your team's needs. Our IP Site Connect system uses the Internet to extend coverage to workers on up to 15 sites anywhere in the world, meaning remote teams can communicate like never before. Capacity Plus expands the capacity of your sites to over 1,500 users. Capacity Max can be implemented on networks up to 250 sites and can handle up 3,000 users per site, while offering DMR Tier III compatibility.

Use Motorola Solutions Application Developer Program to adapt the DP4000 Ex Series to your unique needs in the future – from location tracking using the built-in GPS receiver to text messaging or call logging and recording.

WORK SAFELY, FROM PIPELINE TO POWER PLANT

Everything about the DP4000 Ex Series is designed for worker safety. Loud, clear performance and innovative features like Intelligent Audio and Transmit Interrupt help ensure messages get through in the noisiest environments. And like the radio, Motorola Solutions audio and energy accessories meet the most stringent ATEX standards.

An integrated man-down and lone worker feature sends an instant alert if a mishap occurs. And the bright blue colour helps ensure workers can easily identify and carry only ATEX-approved radios into hazardous environments.

PUT YOUR RADIOS TO WORK

DIGITAL PERFORMANCE

The DP4000 Ex Series meets the ETSI DMR Standard to deliver integrated voice and data, clearer voice communications, with a longer battery life than analogue.

EXCEPTIONAL AUDIO

Hear and speak clearly in loud environments, negate background noise from heavy equipment, engines and trucks.

EASY TO USE

Ergonomically designed for ease of use, with customisable buttons and an intuitive user interface.

COMPLETE ATEX-CERTIFIED SOLUTION

IMPRES™ smart audio and energy accessories meet the same tough specs, for a complete system you can rely on.


PMLN6333


PMMN4094


~~PMMN4067~~


~~PMLN6803~~

EXTEND SAFETY TO LONG SHIFTS AND NOISY AREAS WITH ATEX-CERTIFIED ACCESSORIES

From the drilling platform to the oil refinery, you deal with extremes - that's why it is critical to use the only ATEX accessories designed to withstand the perils and work with these MOTOTRBO ATEX portables.

BE IN THE CLEAR WITH AN IMPRES RSM

The IMPRES Remote Speaker Microphone (RSM) ensures hassle free communication. Along with IMPRES audio, this microphone features Windporting which makes it easy to use in all weather conditions.

PELTOR™ HEADSETS HANDLE TOUGH SHIFTS, HEAD ON

This twin cup heavy-duty headset with helmet attachment offers two layers of hearing protection with extra high-attenuating twin shells, preventing you from having to wear both earplugs and hearing protection, while still receiving critical radio communication. ATEX certified for extreme conditions and comfortable for long shifts.

IMPRES™ BATTERIES AND CHARGERS

Our high-capacity IMPRES battery maximizes talk time and optimizes battery cycle life automatically.

Only IMPRES batteries can be charged 150 additional times as compared to a standard battery – a 43% increase in charge cycles. This means if you charge your radios two to three times a week, you'll get more than an extra year out of every IMPRES battery.

DURABLE CARRY CASES

High quality leather carry cases are designed to withstand harsh conditions in hazardous environments. Swivel belt loop cases keep the case secure while allowing the radio to swing freely as you move.

GENERAL SPECIFICATIONS

	DP4801 Ex DISPLAY	DP4401 Ex NON-DISPLAY
Frequency Band	UHF B1 (403-470MHz) and VHF (136-174MHz)	
Zone Capacity	250	4
Max. No. of Conv. Channels or Personality Capacity	1000	64
Dimensions (H x W x L) with Li-Ion battery	138.5 x 56.7 x 39.8mm	138.5 x 56.7 x 37.8mm
Weight with Li-Ion battery	482.5g	455.5g
Power Supply	7.4 V Nominal	
Programmable Buttons	5	3
Integrated GPS Receiver	Yes	
Gas Rating	ATEX: Class II 2G Ex ib IIC T4 Gb IECEx: Ex ib IIC T4 Gb	
Dust Rating	ATEX: Class II 2D Ex ib IIIC T130 °C Db IECEx: Ex ib IIIC T130°C Db	
Mining Rating	ATEX: I M2 Ex ib I Mb IECEx: Ex ib I Mb	
SOLAS / MED (UHF Models Only)	Marine Equipment Directive 2014/90/EU MED/5.20 Merchant Shipping (Marine Equipment) Regulations 2016 UK/5.20	
Battery Part Number	NNTN8359	
Typical[2] battery life Analogue	16 hrs	
Typical[2] battery life Digital	19 hrs	

RECEIVER

	ALL MODELS
Channel Spacing	12.5/20/25KHz
Frequency Stability	±0.5ppm
Digital Sensitivity (5% BER)	0.25uV
Analogue Sensitivity (12 dB SINAD) Typical	0.25uV
Intermodulation (TIA603C)	70dB
Adjacent Channel Selectivity (TIA603) - 1T	60dB @ 12.5kHz / 70dB @ 20/25kHz
Adjacent Channel Selectivity (TIA603C) - 2T	45dB @ 12.5kHz / 70dB @ 20/25kHz
Spurious Rejection (TIA603C)	70dB
Rated Audio	0.5W
Audio Distortion @ Rated Audio	5%, 3% (typical)
Hum and Noise	-40dB @ 12.5kHz -45dB @ 20/25kHz
Audio Response	TIA603C
Conducted Spurious Emission (ETSI)	-57dBm

TRANSMITTER

	ALL MODELS
Channel Spacing	12.5/20/25KHz
Frequency Stability	±0.5ppm
Power Output	1W
Modulation Limiting	±2.5kHz @ 12.5kHz ±4.0kHz @ 20kHz ±5.0kHz @ 25kHz
FM Hum and Noise	-40dB @ 12.5kHz / -45dB @ 20/25kHz
Conducted / Rated Emission (ETSI)	36 dBm < 1GHz, -30 dBm > 1GHz
Adjacent Channel Power	60dB @ 12.5kHz, 70dB @ 20/25kHz
Audio Response	TIA603C
Audio Distortion (per EIA)	3%
FM Modulation	12.5 kHz: 11K0F3E 25 kHz: 16K0F3E
4FSK Digital Modulation	12.5kHz Data: 7K60F1D & 7K60FXD 12.5kHz Voice: 7K60F1E & 7K60FXE Combination of 12.5kHz Voice & Data: 7K60F1W
Digital Protocol	ETSI TS 102 361-1, -2, -3 DMR Tier II and DMR Tier III

GPS

Accuracy specs are for long-term tracking (95th percentil values>5 satellites visible at nominal -130dBm signal strength)	
TTFF (Time To First Fix) - Cold Start	<60 seconds
TTFF (Time To First Fix) - Hot Start	<10 seconds
Horizontal Accuracy	<5 meters

ENVIRONMENTAL SPECIFICATIONS

	ALL MODELS
Operating Temperature	-20°C to +55°C
Storage Temperature	-40°C to +85°C
Thermal Shock	MIL STD 810D, E, F, G
Humidity	MIL STD 810D, E, F, G
ESD	IEC-801-2KV
Water Intrusion	IEC-60529 IP67
Packaging Test	MIL STD 810D, E, F, G
Ingress Protection (IP) Rating	IP67[1]

[1]DP4000 Ex Series radios are rated IP67 and are also certified to the highest ingress protection available under ATEX/IECEx test conditions - IP64
[2]Assuming 5/5/90 duty cycle, no option board, no GPS, conventional operation

For more information on how to communicate safely in hazardous locations, visit motorolasolutions.com/mototrbo or find your closest Motorola Solutions representative or authorised Partner at motorolasolutions.com/contactus.

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3.1.2 Radio System – UHF Portable Radio Single Unit Battery Charger

IMPRES™SINGLE UNIT CHARGER

WPLN4255



Innovative charging and reconditioning system that streamlines and automates battery maintenance. Talk time and cycle life are optimized as the need for manual maintenance programs is eliminated. Advanced conditioning features allow batteries to be left on the charger for extended periods of time with incurring heat damage. In addition, batteries left in the charger are kept fully charged so they are always ready when you need them.
Mix and match any MOTOTRBO IMPRES™ or non-IMPRES™ radio battery (except SL4000 battery) in these chargers.

3.1.3 Radio System – UHF Portable Radio Battery

2075mAh Li-ion IMPRES™ BATTERY

NNTN8359



MOTOROLA ATEX IMPRES BATTERY KEY FEATURES:

- Li-Ion battery
- Colour - black
- Operational time - 16 hours (max)
- Typical rated capacity - 2075mAh
- Minimum rated capacity - 1800mAh
- ATEX - Intrinsic safety standard

MOTOROLA ATEX IMPRES BATTERY COMPATIBLE DEVICES:

- Motorola DGP8050EX
- Motorola DGP8550EX
- Motorola DP4401
- Motorola DP4401EXS
- **Motorola DP4801EX**
- Motorola XIRP8600EX
- Motorola XIRP8608EX
- Motorola XIRP8668EX

3.1.4 Radio System – Remote Speaker

ANC REMOTE SPEAKER MICROPHONE

COMMUNICATE CLEARLY IN HARSH ENVIRONMENTS



PMMN4094



ANC REMOTE SPEAKER MICROPHONE

COMMUNICATE CLEARLY IN HARSH ENVIRONMENTS



In harsh environments, you want to talk and hear clearly above the noise. Whether you are in a noisy oil refinery or in the midst of fighting a fire, you can't afford to lose seconds struggling to get your message through. The Active Noise Cancelling (ANC) Remote Speaker Microphone (RSM) has been designed to withstand the toughest environments, while providing clear communications.

ATEX ACTIVE NOISE CANCELLING RSM





ENHANCED AUDIO

The active noise cancellation technology ensures your voice, not the surrounding noise, goes through clearly. Likewise, the speaker has been designed to let users hear above the noise, which can be difficult in harsh environments. The digital signal processing also reduces audio feedback, allowing users to work in close proximity with each other.

COMMUNICATE CLEARLY IN WINDY AND WET CONDITIONS

The ANC RSM incorporates the Windporting feature present in many of Motorola's remote speaker microphones. Windporting reduces the adverse effect of wind noise and provides intelligible audio for users working under windy conditions. This is especially beneficial for users working in inclement weather or in oil refineries that are located near windy sea shore conditions.

Firefighters don't need to worry any longer about water-clogged microphones or speaker grills that prevent communication from getting through. Water drains quickly from the ANC RSM, ensuring clear audio so that users can focus on critical tasks.

DESIGNED WITH THE RIGHT FIT AND FEEL

The ANC RSM is designed for ease of use in the toughest conditions. Exaggerated controls, including large glove friendly front and side Push-To-Talk buttons, allow you to transmit with ease even when wearing protective gear and other equipment that can make reaching for a side Push-To-Talk challenging.

The rugged housing includes emergency and volume controls that are large for quick access but protected to avoid accidental activation. Now you can focus on the job at hand without worrying about fumbling with your equipment.

VERSATILITY MEETS PERFORMANCE

The ANC RSM is equipped with two audio jacks, allowing you to use your RSM with compatible headsets. For users preferring a simple earpiece, a 3.5mm-plug earpiece is available with the ANC RSM. The RSM has a unique sliding cover that ensures the 3.5mm audio jack is protected when not in use, preventing any debris or liquids from entering the device.

Further, the Nexus-jack has an open ATEX/IECEx interface, enabling third party headsets with compatible interfaces, such as the Draeger FPS-Com-Plus, to be used safely. Select from a variety of Peltor™ Headsets that have been certified with the ANC RSM to ensure optimum performance and audio quality. Any ATEX/IECEx certified accessory with a matching set of input parameters published in the certificates can be safely connected.

COMPATIBLE AUDIO ACCESSORIES

~~PMLN6087~~	~~Peltor high attenuation headset with boom mic., headband~~
~~PMLN6088~~	~~Peltor Tactical XP headset with boom mic, helmet attachment~~
~~PMLN6090~~	~~Peltor Tactical XP headset with boom mic, headband~~
~~PMLN6002~~	~~Peltor high attenuation headset with boom mic., helmet attachment~~
PMLN6333	Peltor Twin Cup headset with boom mic, helmet attachment
~~PMLN7188~~	~~3.5 mm earpiece with clear acoustic tube~~



~~PMLN6002~~



~~PMLN6088~~



~~PMLN6090~~



~~PMLN6087~~



~~PMLN7188~~

ANC REMOTE SPEAKER MICROPHONE SPECIFICATIONS

COMPATIBLE RADIOS	
DP4401 Ex, DP4801 Ex. Requires Radio Firmware: R02.40.01 or later	
GENERAL	
Part Number	PMMN4094
Dimensions (RSM head only)	68mm (W) x 94mm (H) x 29mm (D) (without clip)
Weight (complete kit)	~290 grams
Clip	Swivel Clip with D-ring
Power Source	Radio Battery
Secondary Accessory Interfaces[1]	The Tx/Rx 4-pole Nexus-jack has the following certified ATEX/IECEx interface parameters: Uo = 7 V, Io = 0.160 A, Po = 0.275 W, Co = 1 µF, Lo = 1 mH The Rx-only 3.5mm jack with locking mechanism has the following certified ATEX/IECEx interface parameters: Uo = 8.4 V, Io = 0.142 A, Po = 0.243 W, Co = 1 µF, Lo = 1 mH
MICROPHONE	
Type	Electret Condenser Microphone
Sensitivity	-44 ± 3 dBV/Pa at 1 kHz
Distortion (THD)	<3% at 1 kHz
Intelligent Audio	Supported by RSM
IMPRES™	Yes
Noise Cancellation	Active Noise Cancelling
Windporting	Yes
SPEAKER	
Diameter	36mm
Impedance	20 ohm
Rated Output Level	90 dB SPL Typical at 0.5W, 30 cm
Maximum Output Level (at max radio volume)	94 dB SPL Typical, at 30 cm 97 dB phon Typical, at 30 cm
Distortion (THD)	<10% typical at 1 kHz, 0.5W, at 30cm
CONTROLS	
Top	Orange Programmable Button
Side	Side Push-To-Talk (PTT) (525 000 Cycles) and One Black Programmable Button
Front	Front Push-To-Talk (PTT) (525 000 Cycles)
Volume	Hi-Lo
CABLE	
Length	390mm (Resting Position), 1200 mm (Fully Stretch)
Flex Life	100,000 Cycles (Minimum), Bend 90° Left-Right and Front-Back with 2lbs Load
Pull Strength	40 lbs (Minimum)
Cable Jacket	UL94 V-0 Compliant
ENVIRONMENTAL	
Operating Temperature	-30°C to +60°C
Storage Temperature	-55°C to +85°C
Thermal Shock	-57°C to +80°C
Humidity	90% - 95% Relative Humidity at +50°C for 8 hours
Rain	MIL STD 810G Method 506.4
Salt Fog	MIL STD 810G Method 509.4 Procedure 1
Dust	MIL STD 810G Method 510.4 Procedure 1
Vibration	MIL STD 810G Method 514.5 Procedure 1 Category 24
Mechanical Shock	MIL STD 810G Method 516.5 Procedure 1
ESD	IEC / EN 61000-4-2
IP Rating	IP67
Impact Grill	1.25" diameter steel ball drop, 30cm to 100cm at 10cm intervals, 8 times at each height
ATEX / IECEX[1,2]	
Gas Rating	ATEX: Class II 2G Ex ib IIC T4 Gb; IECEx: Ex ib IIC T4 Gb
Dust Rating	ATEX: Class II 2D Ex ib IIIC T90°C Db; IECEx: Ex ib IIIC T90°C Db
Mining Rating	ATEX: Class I M1 Ex ia I Ma; IECEx: Ex ia I Ma
Ambient Temperature	Ta: -20°C to +55°C
ATEX/IECEx IP Rating	IP64, IP67

[1] When combining accessories and radios, the resulting ATEX/IECEx classification for the system is always the lowest classification of the system elements.

[2] ATEX Specifications: EN60079-0:2012, EN60079-11:2012. IECEx Specifications: IEC 60079-0:2011, IEC60079-11:2011.

Note: Specifications subject to change without notice.

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2.2
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EQUIPMENT and SPECIAL TOOLS LIST

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Base Load Power Hub (BLPH)

EQUIPMENT AND SPECIAL TOOLS LIST -TELECOM EQUIPMENT

Document Number: 1724000452-TL-LIS-00006

Document Class: 2

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Sign	Date
MARCO MASTROFORTI	04/10/2024

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1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log	X	X	X	X				
4	Equipment and Special Tools List	X	X	X	X				

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Revision / Change Log

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Item	Tag/Reference	Descrtiption	Model	Manufacturer
1	Y-89-73-TIR-001	Microvawe Motion Detector	6931P	Carrier
2	Y-89-73-TIR-002	Microvawe Motion Detector	6931P	Carrier
3	Y-89-73-TIR-003	Microvawe Motion Detector	6931P	Carrier
4	Y-89-73-TIR-004	Microvawe Motion Detector	6931P	Carrier
5	Y-89-73-TIR-005	Microvawe Motion Detector	6931P	Carrier
6	Y-89-73-TIR-006	Microvawe Motion Detector	6931P	Carrier
7	Y-89-73-TIR-007	Microvawe Motion Detector	6931P	Carrier
8	Y-89-73-TIR-008	Microvawe Motion Detector	6931P	Carrier
9	Y-89-73-TIR-009	Microvawe Motion Detector	6931P	Carrier
10	Y-89-73-TDC-001	Door Contact	DC108	Carrier
11	Y-89-73-TDC-002	Door Contact	DC108	Carrier
12	Y-89-73-TDC-003	Door Contact	DC108	Carrier
13	Y-89-73-TDC-004	Door Contact	DC108	Carrier
14	Y-89-73-TDC-005	Door Contact	DC108	Carrier
15	Y-89-73-TDC-006	Door Contact	DC108	Carrier
16	Y-89-73-TDC-007	Door Contact	DC108	Carrier
17	Y-89-73-TDC-008	Door Contact	DC108	Carrier
18	Y-89-73-TDC-009	Door Contact	DC108	Carrier
19	Y-89-73-TDC-010	Door Contact	DC108	Carrier
20	Y-89-73-TDC-011	Door Contact	DC108	Carrier
21	Y-89-73-TDC-012	Door Contact	DC108	Carrier
22	Y-89-73-TDC-013	Door Contact	DC108	Carrier
23	Y-89-73-TDC-014	Door Contact	DC108	Carrier
24	Y-89-73-TDC-015	Door Contact	DC108	Carrier
25	Y-89-73-TDC-016	Door Contact	DC108	Carrier
26	Y-89-73-TDC-017	Door Contact	DC108	Carrier
27	Y-89-73-TDC-018	Door Contact	DC108	Carrier
28	Y-89-24-TSA-001	Automatic Identification System Search and Rescue Transponder	Tron AIS-SART	JOTRON
29	Y-89-24-TSA-002	Automatic Identification System Search and Rescue Transponder	Tron AIS-SART	JOTRON
30	Y-89-24-TEP-001	Emergency Position Indicating Radio Beacon	Tron 60AIS	JOTRON
31	Y-89-24-TEP-002	Emergency Position Indicating Radio Beacon	Tron 60AIS	JOTRON
32	Y-89-25-THG-001	GMDSS VHF Marine Portable Radio (1)	SP3540	SAILOR
33	Y-89-25-THG-002	GMDSS VHF Marine Portable Radio (1)	SP3540	SAILOR
34	Y-89-25-TBC-001	Single unit charger for VHF Marine Radio (3) (4)	403536A	SAILOR
35	Y-89-25-TBC-002	Single unit charger for VHF Marine Radio (3) (4)	403536A	SAILOR
36	Y-89-25-TBC-003	Single unit charger for VHF Marine Radio (3)	403536A	SAILOR
37	Y-89-25-TBC-004	Single unit charger for VHF Marine Radio (3)	403536A	SAILOR
38	Y-89-25-THS-001	Twin cup headset for VHF Marine Portable Radio	MT72H540P3E-50	Peltor
39	Y-89-25-THS-002	Twin cup headset for VHF Marine Portable Radio	MT72H540P3E-50	Peltor
40	Y-89-06-THU-001	UHF DMR Portable Radio (2)	DP4801 Ex	MOTOROLA
41	Y-89-06-THU-002	UHF DMR Portable Radio (2)	DP4801 Ex	MOTOROLA
42	Y-89-06-TBC-001	IMPRES Single unit charger for UHF DMR Radio	WPLN4255	MOTOROLA
43	Y-89-06-TBC-002	IMPRES Single unit charger for UHF DMR Radio	WPLN4255	MOTOROLA
44	Y-89-06-THS-001	Twin cup headset for UHF DMR Portable Radio	PMLN6333	MOTOROLA
45	Y-89-06-THS-002	Twin cup headset for UHF DMR Portable Radio	PMLN6333	MOTOROLA

(1) SAILOR SP3540 package include: PTT Control Unit (SAVOX C-C440 Ex), transceiver and antenna, belt clip and lanyard a Lithium battery for GMDSS application (P/N 403503A).

(2) MOTOROLA DP4801 Ex package include: Remote Speaker (PMMN4094), Li-Ion battery (primary and spare), whip antenna, dust cover and belt clip.

(3) Single unit charger for VHF Marine Radio 403536A include: Single position Charger type CH3507 (P/N 403507B) and rechargable Lithium Battery (P/N 403504A)

(4) Single position Charger type CH3507 (P/N 403507B) and rechargeable Lithium Battery (P/N 403504A) are included in the same package of the VHF radio SP3540

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SECTION 3
-
PROJECT PROCEDURES

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3.1
-
FAT PROCEDURE

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Base Load Power Hub (BLPH)

FAT PROCEDURE – TELECOM EQUIPMENT

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Rev.	Date	Description	Prepared	Reviewed	Approved
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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

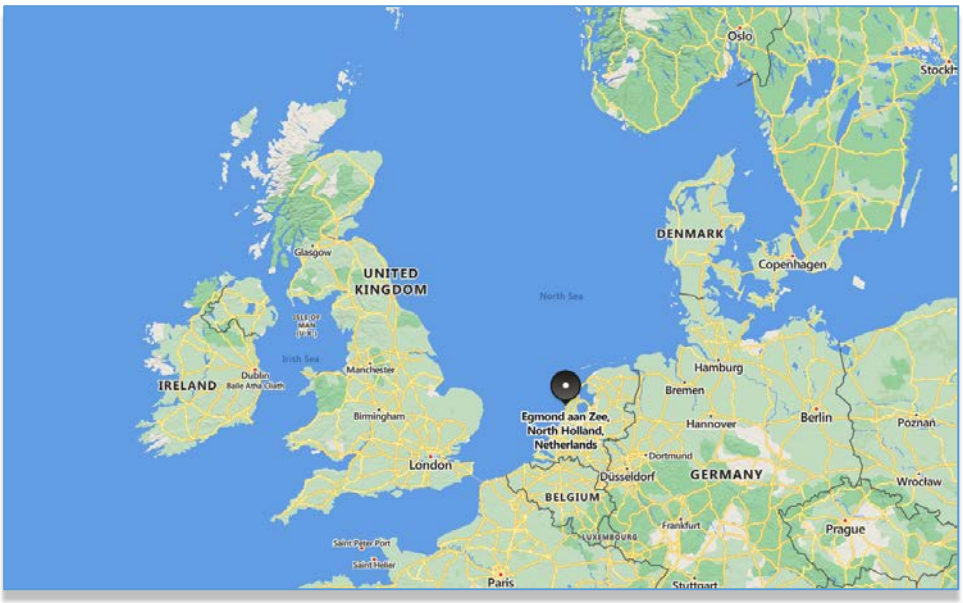


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

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Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

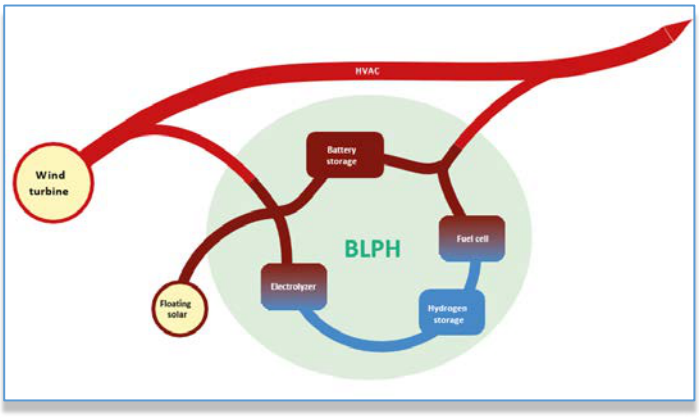


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power

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output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

The purpose of this procedure is to define the checks and tests that shall be carried out during Factory Acceptance Test (FAT) of Telecom equipment included in the Fores Engineering scope of supply.
FAT will be performed at Fores workshop, attended by Contractor and/or Company representatives, according to intervention points stated on the last revision of the ITP.

2.1 REFERENCES

Doc. No.	Description
1724000452-QC-ITP-00004	INSPECTION AND TEST PLAN – TELECOM EQUIPMENT
1724000452-TL-DS-00005	EQUIPMENT DATASHEETS – TELECOM EQUIPMENT
1724000452-TL-LIS-00006	EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT
1724000452-COM-LIS-00014	SPARE PARTS LIST – TELECOM EQUIPMENT

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 FACTORY ACCEPTANCE TEST

3.1 VISUAL AND DIMENSIONAL CHECK

3.1.1 IDCS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of IDCS material	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.1.1, 2.1.2, 2.1.3, 2.1.4 and 2.1.5	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 1 to 27 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	**Description**	**Acceptance Criteria**
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents
6	Certificated check	Compliance with Reference Documents

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3.1.2 NAVIGATION AIDS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of navigation aids material	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10 and 2.2.11	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 28 to 39 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard
7	Certificated check	Compliance with Reference Documents

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3.1.3 RADIO SYSTEM MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of UHF portable radio	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.3.1, 2.3.2, 2.3.3, 2.3.4 and 2.3.5	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 40 to 45 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard
7	Certificated check	Compliance with Reference Documents

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3.1.4 SPARE PARTS

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of spare parts	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.4.1 and 2.4.2	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-COM-LIS-00014 SPARE PARTS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items listed in the Spare Part List	
Requirements	/	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard

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3.2 POWER UP

3.2.1 VHF MARINE RADIO

Test Name / Test N°	RADIO POWER UP	
Test Scope	Verify the correct power up of the VHF Handheld Marine Radios.	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.2.12	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	
Procedure		

Step	Description	Acceptance Criteria
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing the used channel and the battery level

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3.2.2 DMR UHF RADIO

Test Name / Test N°	RADIO POWER UP	
Test Scope	Verify the correct power up of the DMR UHF Radios.	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.3.6	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 40 and 41 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing the used channel and the battery level

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3.3 FUNCTIONAL TEST

3.3.1 VHF MARINE RADIO COMMUNICATION TEST

Test Name / Test N°	RADIO COMMUNICATION TEST	
Test Scope	Verify the correct power up of the equipment and measure the most important radio-electric technical data of the VHF Handheld Marine Radios.	
ITP Reference	1724000452-QC-ITP-00004 – Step 2.2.13	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	VHF Radios are supposed to be already switched off	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	Both radios will be operating on the same simplex Marine channel.
2	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.
3	Connect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.
4	1) Pressing the external Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the external Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.
5	Disconnect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is disconnected to the radio, the right side of the display will not show a headset.
6	Connect only the Twin cup headset to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.
7	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.

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3.3.2 VHF MARINE RADIO RF CHARATERISTIC TEST

Test Name / Test N°	VHF MARINE FIXED RADIO TRANSMITTER RF CHARACTERISTIC TEST	
Test Scope	The scope of this test is to verify the TX RF Power Output in normal and emergency condition, and Tx Frequency	
ITP Reference	1724000452-QC-ITP-00004 – Step 2.2.13	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	Digital Radio Test Set	
Prerequisites	The Transmitter antenna port of VHF MARINE RADIO must be connected to Radio Test Tool at T/R Port VHF Radios are supposed to be already switched off	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	The VHF Radio displays the current working channel (e.g. channel 11)
2	Set the VHF marine Radio to transmit at high power (2 Watt)	The VHF marine radio does not show "Lo" on the display
3	Press PPT to transmit	The TX Power on the digital radio test shall be 32 dBM +/- 1 db. 32dbm = 33dbm (2Watt) – 1 db (loss value of the cable used for the measurement) TX Frequency reading shall be Frequency selected +/- 500Hz
4	Set the VHF marine Radio to transmit at low power (1 Watt)	the VHF marine radio shows "Lo" on the display
5	Press PPT to transmit	The TX Power on the digital radio test shall be 29 dBM +/- 1 db. 29 dbm = 30dbm (1Watt) – 1 db (loss value of the cable used for the measurement) TX Frequency reading shall be Frequency selected +/- 500Hz

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3.3.3 VHF MARINE RADIO ADDITIONAL FEATURES TEST

Test Name / Test N°	VHF MARINE RADIO ADDITIONAL FEATURES TEST	
Test Scope	The scope of this test is to verify some additional features of the VHF RADIO	
ITP Reference	1724000452-QC-ITP-00004 – Step 2.2.13	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements		
Prerequisites		
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Power up the VHF RADIO and verify that radio operates with channels according to the radio Regulations Channels : 6 12 17 67 73 78A 8 13 19A 68 74 79A 9 14 20A 69 75 L) 87 10 15 27A 71 76 L) 88 11 16 28A 72 77	Check that the channels are displayed on the screen
2	Locking the keypad: To lock the keypad, press and hold the Light/Lock button. To unlock the keypad, press and hold the Light/Lock button again.	The display shows a key symbol when the keypad is locked.
3	Using Squelch control To activate Squelch control, press the SQ key. To set the Squelch level, press ↑ (closing) or ↓(opening).	The display shows the Squelch level while it is adjusted, e.g. “SQ 5”.

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3.3.4 SART TEST MODE

Test Name / Test N°	SART TEST MODE	
Test Scope	This test ensures the best battery capacity available for a potential emergency. Although the Tron AIS-SART does not send an alarm via satellite, VHF or other radio communication, usage should be limited to short tests.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 28 and 29 in the Equipment List	
Requirements	The test must be conducted outdoors with a clear view to the sky to maximize the GPS location.	
Prerequisites	/	
Notes	/	

Procedure

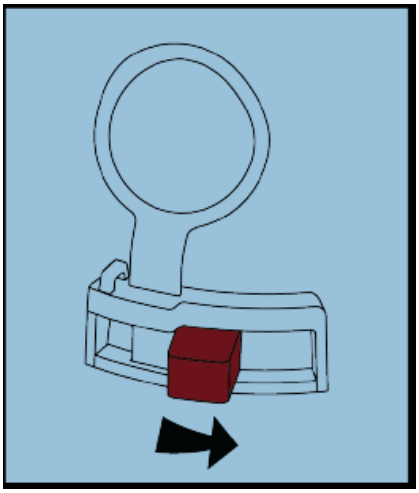
Step	Description	Acceptance Criteria
1	Move the switch to the TEST position and hold. 	Tron AIS-SART will now run through a self-test procedure. If a RED LED flashes, it indicates a critical fault. Refer to the error codes for more information
2	Release the switch when both LEDs start flashing. The unit will now search for the GPS position. It will only search for 15 minutes max. 	A successful test is indicated by a 15 sec BEEP and a GREEN LED. 

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3.3.5 EPIRB TEST MODE

Test Name / Test N°	EPIRB TEST MODE	
Test Scope	During the normal self-test, the main functionality of the EPIRB is tested. A test signal is transmitted on all frequencies (121.5 MHz, AIS and 406 MHz). These test signals will not be recognized as distress signals. While transmitting the test signals the battery and the transmitted signals are tested.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 30 and 31 in the Equipment List	
Requirements		
Prerequisites	/	
Notes	/	

Procedure

Description	**Acceptance Criteria**
To perform the extended self-test, do the following steps within a period of 3 seconds: 1. Move the switch to test position 2. Release to middle position 3. Move the switch to test position and release when the white test indicator lights up. 	The white test indicator LED will light up and the green GNSS indicator LED will start flashing in sequences of 3 fast flashes. This indicates that the EPIRB is searching for a validated position. When a valid position is found the green GNSS indicator LED will remain lit for approximately 1 second and a normal self-test will continue. The top light will flash once at the end of the text if the extended self-test is successful.

Test sequence	Position indicator	RLS indicator	Test indicator	Strobe light
Extended self-test started	-	-	On	-
Waiting for position	Triple flashes	-	-	-
Position achieved	On for 1 second	-	-	-
Self-test started	-	-	On	-
Signals transmitted	-	-	Multiple short off periods	-
RLS enabled *	-	On for 1 second	-	-
Extended self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			Multiple flashes**	

*For EPIRBs with RLS disabled the RLS indicator will remain off.
**See table in section 3.5.3 for on failure indications.

3.2

-

SAT PROCEDURE

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Base Load Power Hub (BLPH)

SAT PROCEDURE – TELECOM EQUIPMENT

Document Number: 1724000452-QC-PRO-00008

Document Class: 2

ROSETTI MARINO

1 X	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
Marco Mastroforti	14/05/2025

02	09/04/2025	Accepted for Construction (AFC)	GM.Rossini	GM.Rossini	S.Montanari
01	18/09/2024	Accepted for Construction (AFC)	GM.Rossini	GM.Rossini	M.Manenti
00	08/08/2024	Issue for Review (IFR)	L.Cavallini	L.Cavallini	M.Manenti
Rev.	Date	Description	Prepared	Reviewed	Approved
FORES ENGINEERING					

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)
02	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

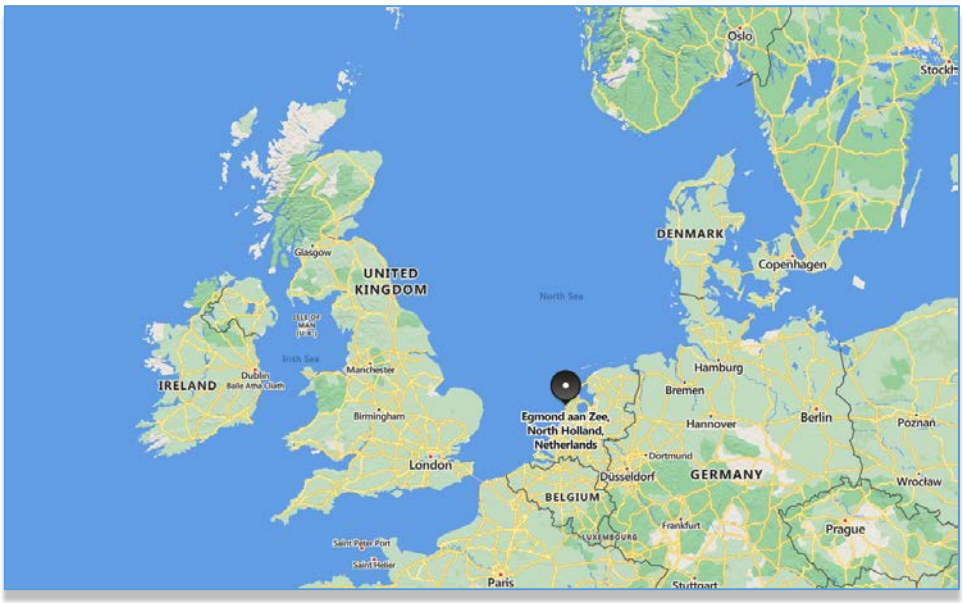


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

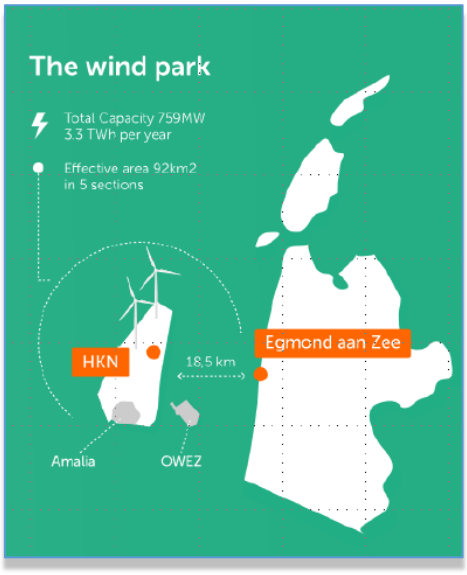


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

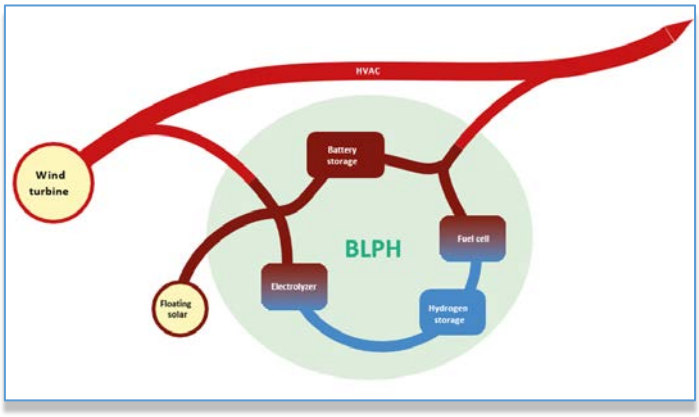


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power

output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

The purpose of this procedure is to define the checks and tests that shall be carried out during Site Acceptance Test (SAT) of Telecom equipment included in the Fores Engineering scope of supply.
SAT will be performed at Piomboni Yard (Ravenna, Italy), attended by Contractor and/or Company representatives.

2.1 REFERENCES

Doc. No.	Description
1724000452-QC-ITP-00004	INSPECTION AND TEST PLAN – TELECOM EQUIPMENT
1724000452-TL-DS-00005	EQUIPMENT DATASHEETS – TELECOM EQUIPMENT
1724000452-TL-LIS-00006	EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT
1724000452-COM-LIS-00014	SPARE PARTS LIST – TELECOM EQUIPMENT
1724000452-QC-PRO-00007	FAT PROCEDURE – TELECOM EQUIPMENT

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 SITE ACCEPTANCE TEST

3.1 VISUAL AND DIMENSIONAL CHECK

3.1.1 IDCS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of IDCS material	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 1 to 27 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List

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3.1.2 NAVAIDS EQUIPMENT

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of Navaids Equipment	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 28 to 39 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List

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3.1.3 RADIO SYSTEM MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of UHF portable radio	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 40 to 45 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List

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3.1.4 SPARE PARTS

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of spare parts	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-COM-LIS-00014 SPARE PARTS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items listed in the Spare Part List	
Requirements	/	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Visual dimensional check	Equipment in compliance with related Data sheet
2	Mechanical damage check	No mechanical damage
3	Equipment quality check	Equipment in compliance with related Data sheet
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List

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3.2 FUNCTIONAL TEST

3.2.1 DMR UHF RADIO POWER UP AND VERIFY CONFIGURATION UPLOADED

Test Name / Test N°	RADIO POWER UP AND VERIFY CONFIGURATION UPLOADED	
Test Scope	Verify the correct power up and the Configuration Uploaded of the DMR UHF Radios.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 40 and 41 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing “out of range” and the battery level
2	From the menu, select Utilities→Radio Info To check on the site information, select **Site Info**.	Site Alias and site ID are shown on the screen. Site Alias : **OFFSHORE** Site ID : **1**
3	From the menu, select Utilities→Radio Info To check on your radio ID and alias, select **My ID**.	Name and Number are shown on the screen. For UHF Radio mobile Y-89-06-THU-001: Name : **CW HKN – 5002** Number : **00005002** For UHF Radio mobile Y-89-06-THU-002: Name : **CW HKN – 5003** Number : **00005003**
4	From the menu, select Utilities→Radio Info To check on the firmware and Codeplug versions, select **Versions**	Firmware Version and CP version are shown on the screen Firmware Ver.: **R02.22.03.1001** CP Version **: 22.23.06**
5	To check on the latest software update information, select **SW Update**.	Updated Date and Updated Time are shown on the screen Updated Date: **2024-07-19** Updated Time: **08.53.07**

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3.2.2 VHF MARINE POWER UP AND COMMUNICATION TEST

Test Name / Test N°	RADIO POWER UP AND COMMUNICATION TEST	
Test Scope	Verify the correct power up and communication of the VHF Handheld Marine Radios.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	VHF Radios are supposed to be already switched off	
Notes	/	

Procedure

Step	Description	Acceptance Criteria
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	Both radios will be operating on the same simplex Marine channel.
2	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.
3	Connect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.
4	1) Pressing the external Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the external Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.
5	Disconnect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is disconnected to the radio, the right side of the display will not show a headset.

3.2.3 VHF MARINE RADIO ADDITIONAL FEATURES TEST

Test Name / Test N°	VHF MARINE RADIO ADDITIONAL FEATURES TEST	
Test Scope	The scope of this test is to verify some additional features of the VHF RADIO	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements		
Prerequisites		
Notes	/	

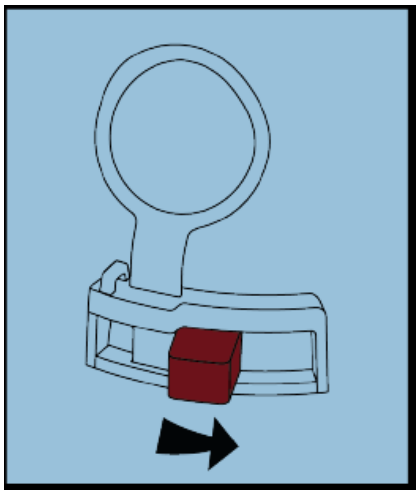
Procedure

Step	Description	Acceptance Criteria
1	Power up the VHF RADIO and verify that radio operates with channels according to the radio Regulations Channels : 6 12 17 67 73 78A 8 13 19A 68 74 79A 9 14 20A 69 75 L) 87 10 15 27A 71 76 L) 88 11 16 28A 72 77	Check that the channels are displayed on the screen
2	Locking the keypad: To lock the keypad, press and hold the Light/Lock button. To unlock the keypad, press and hold the Light/Lock button again.	The display shows a key symbol when the keypad is locked.
3	Using Squelch control To activate Squelch control, press the SQ key. To set the Squelch level, press ↑ (closing) or ↓(opening).	The display shows the Squelch level while it is adjusted, e.g. “SQ 5”.

3.2.4 EPIRB TEST MODE

Test Name / Test N°	EPIRB TEST MODE	
Test Scope	During the normal self-test, the main functionality of the EPIRB is tested. A test signal is transmitted on all frequencies (121.5 MHz, AIS and 406 MHz). These test signals will not be recognized as distress signals. While transmitting the test signals the battery and the transmitted signals are tested.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 30 and 31 in the Equipment List	
Requirements	This Test can be only done and passed if the EPIRB is programmed before Testing.	
Prerequisites	EPIRB must be configured before test and registered before use. This allows the SAR authorities to retrieve information about you and your emergency contacts in an emergency.	
Notes	/	

Procedure

Description	**Acceptance Criteria**
To perform the extended self-test, do the following steps within a period of 3 seconds: 1. Move the switch to test position 2. Release to middle position 3. Move the switch to test position and release when the white test indicator lights up. 	The white test indicator LED will light up and the green GNSS indicator LED will start flashing in sequences of 3 fast flashes. This indicates that the EPIRB is searching for a validated position. When a valid position is found the green GNSS indicator LED will remain lit for approximately 1 second and a normal self-test will continue. The top light will flash once at the end of the text if the extended self-test is successful.

Test sequence	Position indicator	RLS indicator	Test indicator	Strobe light
Extended self-test started	-	-	On	-
Waiting for position	Triple flashes	-	-	-
Position achieved	On for 1 second	-	-	-
Self-test started	-	-	On	-
Signals transmitted	-	-	Multiple short off periods	-
RLS enabled *	-	On for 1 second	-	-
Extended self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			Multiple flashes**	

*For EPIRBs with RLS disabled the RLS indicator will remain off.
**See table in section 3.5.3 for on failure indications.

Markup Details	Annotations	Comments
Consolidated May 14 10:45 AM Marco Mastroforti 14/05/25 10:45:41 (GMT +02:00)	Stamp 14 May, 2025 10:45:40 Page: 1	Stamp Template: Vendor Review Stamp Marco Mastroforti 14 May, 2025 10:45:40
	Line 14 May, 2025 10:45:40 Page: 1	
	Line 14 May, 2025 10:45:40 Page: 1	
	Text 14 May, 2025 10:45:40 Page: 1	Marco Mastroforti Marco Mastroforti 14 May, 2025 10:45:40
	Text 14 May, 2025 10:45:40 Page: 1	14/05/2025 Marco Mastroforti 14 May, 2025 10:45:40
Markup May 14 10:37 AM Marco Mastroforti 14/05/25 10:44:35 (GMT +02:00)	Stamp 14 May, 2025 10:39:07 Page: 1	Stamp Template: Vendor Review Stamp Marco Mastroforti 14 May, 2025 10:39:07
	Line 14 May, 2025 10:43:28 Page: 1	
	Line 14 May, 2025 10:43:40 Page: 1	
	Text 14 May, 2025 10:43:55 Page: 1	Marco Mastroforti Marco Mastroforti 14 May, 2025 10:43:55
	Text 14 May, 2025 10:44:20 Page: 1	14/05/2025 Marco Mastroforti 14 May, 2025 10:44:20

PART 2
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CERTIFICATION DOSSIER

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SECTION 1
-
DATABOOK AND CERTIFICATE

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1.1
-
EQUIPMENT
HAZARDOUS AREA
REGISTER and
CERTIFICATE

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Base Load Power Hub (BLPH)

EQUIPMENT HAZARDOUS AREA REGISTER and CERTIFICATE

Document Number: 1724000452-QC-CER-00013

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
MARCO MASTROFORTI	20/02/2025

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
02	29/01/2025	Accepted for Costruction (AFC)	L.Pizzigati	S.Montanari	S.Montanari
01	09/01/2025	Accepted for Costruction (AFC)	L.Pizzigati	S.Montanari	S.Montanari
00	11/09/2024	Issue for Review (IFR)	L.Pizzigati	M.Manenti	M.Manenti

FORES ENGINEERING

Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01	02					
1	Cover	X	X	X					
2	Table of Contents	X	X	X					
3	Revision / Change Log	X	X	X					
4	Equipment Hazardous Area Register	X	X	X					
5	Certificate Collection	X	X	X					
6	GMDSS VHF Marine Portable Radio	X	X	X					
14	PTT Control Unit	X	X	X					
19	Twin cup headset for VHF Marine Portable Radio	X	X	X					
23	UHF DMR Portable Radio	X	X	X					
37	Remote Speaker	X	X	X					
43	Twin cup headset for UHF DMR Portable Radio	X	X	X					

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Costruction (AFC)
02	Accepted for Costruction (AFC)

HOLDS LIST

No.	Description
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3.	
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CROSSWIND

FORES ENGINEERING

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

ROSETTI MARINO

Document Title: **EQUIPMENT HAZARDOUS AREA REGISTER and CERTIFICATE**

Date: 29/01/2025

Rev. 02

Number	PO_No	Supplier Name	AREA	Tag_No	Serial_No	Description	Manufacturer	Type / Model No	Area Classification ZONE	ATEX Category	ATEX Marking / Type of Protection	Gas Groups	Temp Class	IP Rating (IEC60529)	EPL	EU Type Examination Certificate No.	Special Conditions of safe use Applicable	Barrier Certificate Number	Barrier Calculation Ref.	Comments	Non-Electrical Equipment	System	Sub-System
1	1724000452	FORES ENGINEERING	N.A.	Y-89-25-THG-001	3800920071	GMDSS VHF Marine Portable Radio (1)	SAILOR	SP3540	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	TÜV 08 ATEX 353822 X	YES	N.A.	N.A.	(1) SAILOR SP3540 package include: PTT Control Unit (SAVOX C-C440 Ex)	N.A		
2	1724000452	FORES ENGINEERING	N.A.		05100049	PTT Control Unit	SAVOX	C-C440 Ex	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	EESF 18 ATEX 008X	YES	N.A.	N.A.		N.A		
3	1724000452	FORES ENGINEERING	N.A.	Y-89-25-THG-002	3906540303	GMDSS VHF Marine Portable Radio (1)	SAILOR	SP3540	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	TÜV 08 ATEX 353822 X	YES	N.A.	N.A.	(1) SAILOR SP3540 package include: PTT Control Unit (SAVOX C-C440 Ex)	N.A		
4	1724000452	FORES ENGINEERING	N.A.		05100030	PTT Control Unit	SAVOX	C-C440 Ex	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	EESF 18 ATEX 008X	YES	N.A.	N.A.		N.A		
5	1724000452	FORES ENGINEERING	N.A.	Y-89-25-THS-001	2224112069	Twin cup headset for VHF Marine Portable Radio	Peltor	MT72H540P3E-50	Zone 2	2G	Ex ib	IIC	T4	IP66	Gb	Nemko 09 ATEX 1119 X	YES	N.A.	N.A.		N.A		
6	1724000452	FORES ENGINEERING	N.A.	Y-89-25-THS-002	2224112070	Twin cup headset for VHF Marine Portable Radio	Peltor	MT72H540P3E-50	Zone 2	2G	Ex ib	IIC	T4	IP66	Gb	Nemko 09 ATEX 1119 X	YES	N.A.	N.A.		N.A		
7	1724000452	FORES ENGINEERING	N.A.	Y-89-06-THU-001	627TZD0512	UHF DMR Portable Radio (2)	MOTOROLA	DP4801 Ex	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	BS 12 ATEX E 117 X	YES	N.A.	N.A.	(2) MOTOROLA DP4801 Ex package include: Remote Speaker (PMMN4094)	N.A		
8	1724000452	FORES ENGINEERING	N.A.		CAB24TD1931	Remote Speaker	MOTOROLA	PMMN4094	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	BVS 15 ATEX E 054 X	YES	N.A.	N.A.		N.A		
9	1724000452	FORES ENGINEERING	N.A.	Y-89-06-THU-002	627TZB0584	UHF DMR Portable Radio (2)	MOTOROLA	DP4801 Ex	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	BS 12 ATEX E 117 X	YES	N.A.	N.A.	(2) MOTOROLA DP4801 Ex package include: Remote Speaker (PMMN4094)	N.A		
10	1724000452	FORES ENGINEERING	N.A.		CAB24TD2037	Remote Speaker	MOTOROLA	PMMN4094	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	BVS 15 ATEX E 054 X	YES	N.A.	N.A.		N.A		
11	1724000452	FORES ENGINEERING	N.A.	Y-89-06-THS-001	106577738	Twin cup headset for UHF DMR Portable Radio	MOTOROLA	PMLN6333	Zone 2	2G	Ex ib	IIC	T4	IP66	Gb	Nemko 09 ATEX 1119 X	YES	N.A.	N.A.		N.A		
12	1724000452	FORES ENGINEERING	N.A.	Y-89-06-THS-002	106792880	Twin cup headset for UHF DMR Portable Radio	MOTOROLA	PMLN6333	Zone 2	2G	Ex ib	IIC	T4	IP66	Gb	Nemko 09 ATEX 1119 X	YES	N.A.	N.A.		N.A		
13	1724000452	FORES ENGINEERING	N.A.	(3)	CAB24TD0999	Remote Speaker	MOTOROLA	PMMN4094	Zone 2	2G	Ex ib	IIC	T4	IP67	Gb	BVS 15 ATEX E 054 X	YES	N.A.	N.A.	(3) SPARE PART	N.A		
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CERTIFICATE COLLECTION

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GMDSS VHF Marine Portable Radio

-

SAILOR

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EU Declaration of Conformity

Hereby manufacturer,

Thrane & Thrane A/S
Lundtoftegaardsvej 93 D
2800 Kgs. Lyngby
Denmark

The object of the declaration described below is in conformity with the relevant Union harmonization legislation: Directive 2014/34/EU

Equipment

Model	Description	Part no.
SAILOR SP3540	ATEX Portable maritime VHF radiotelephone	623540A
SAILOR B3503	ATEX Primary Lithium Battery	403503A
SAILOR B3504	ATEX Rechargeable Li-ion Battery	403504A

Associated equipment for use in non-ATEX area

Model	Description	Part no.
SAILOR CH3505	Battery Compact Charger for ATEX	403505A
SAILOR CH3507	Battery Charger for ATEX	403507B
SAILOR CH3508	Dual Battery Charger for ATEX	403508B
	AC/DC Adapter	88-125538

Equipment Applicability

SAILOR SP3540 is a simplex/semi-duplex handheld ATEX / VHF radiotelephone designed for maritime communication within the Global Maritime Distress and Safety System, GMDSS.

SAILOR SP3540 is able to operate on all international VHF channels.

Declaration

The requirement with respect to the ATEX Directive 2014/34/EU is met by conforming to the harmonized EU standards EN IEC 60079-0:2018 and EN 60079-11:2012.

SAILOR SP3540 meets the ATEX requirement for gas environments of class II 2 G Ex ib IIC T4.

SAILOR SP3540 also meets the requirement for Ingress Protection to the level of IP67.

Certified by:

TÜV NORD	Notified Body Id. No. 0044	Certificate No. TÜV 08 ATEX 353822 X	Issue: 01
ExVeritas	Notified Body Id. No. 2804	Certificate No. ExVeritas 21PQAN0192	

Place and date

Pandrup, 25 October 2021

Program Director R&D
Peter Haslev

Document no.: 99-129012-H

0044
2804

Thrane & Thrane A/S trading as Cobham SATCOM. Registered no.: DK - 65 72 46 18. Registered address: Lundtoftegaardsvej 93 D, 2800 Kgs. Lyngby, Denmark
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Translation

(1) EC-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 94/9/EC**

(3)	**Certificate Number**	**TÜV 08 ATEX 353822 X**
(4)	for the equipment:	Radio Transceivers Type: SAILOR SP3540 VHF GMDSS
(5)	of the manufacturer:	**Thrane & Thrane A/S**
(6)	Address:	Porsvej 2 DK-9200 Aalborg SV, Denmark
	Order number:	8000353822
	Date of issue:	2008-12-29

(7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, notified body No. 0044 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 08 203 353822.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2006 **EN 60 079-11:2007**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

Ex II 2G Ex ib IIC T4

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body

Schwedt

Hannover office: Am TÜV 1, 30519 Hannover, phone +49 (0)511 986 1455, Fax +49 (0)511 986 1590

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Excerpts or changes shall be allowed by the TÜV NORD CERT GmbH

CERT A4 VU-H 06.05 5000 dia

(13) **S C H E D U L E**

(14) **EC-Type Examination Certificate No. TÜV 08 ATEX 353822 X**

(15) Description of equipment

The ATEX VHF radio transceiver type SP3540 VHF GMDSS are designed as intrinsically safe for use onboard ships and on land in classified areas Zone 1 and Zone 2.
The SP3540 is a special GMDSS approved radio for use in emergency situations onboard ships. SP3540 are orange and are supplied either from the ATEX Primary battery type B3503 or alternatively the Secondary battery type B3504. The ATEX Primary battery B3503 is orange and can not be charged. The ATEX Secondary battery B3504 is blue and is rechargeable. Charging takes place in the belonging non ATEX charger. Charging takes place outside protected ATEX area.
Both the primary and the secondary batteries are constructed with intrinsically safe connection facilities and they can be changed inside the hazardous area and fulfils Ex ib IIC T4 specifications.
The cabinet of the radio is designed to fulfil antistatic ATEX requirements even without the accessory leather case.

Technical data

The accessory interface connector on top of radio is intrinsically safe with the following entity parameters:

Uo: 8.4 V
Io: 0.45 A
Lo: 10 µH
Co: 150 nF

Only ATEX certified accessories matching the above mentioned entity parameters must be connected.

Approved accessories:

Charger CH3505	403505A
Charger CH3507	403507B
Charger CH3508	403508B
VHF Antenna	88-124370-A
VHF Antenna	62-124370
Lanyard	41-124375-A
Belt clips	62-124320
Leather case	403500-207
Service cable	403500-958

Ingress protection: IP 67

Permitted range of the ambient temperature - 20 °C to +55 °C

(16) Test documents are listed in the test report No. 08 203 353822.

(17) Special conditions for safe use the following 2 conditions should be added:

- Do not change the battery in wet or humid environments.
- Always keep battery connectors dry and clean.
- Use only with Sailor ATEX approved accessories.
  Alternatively ATEX approved accessories in compliance with the accessory connector ATEX specification may be used.
- Do not change accessories in wet or humid environments.
- Do not charge the battery in hazardous area.
- For charge of battery use
  Part no: 403505A - ATEX CH3505 Compact Charger,
  Part no: 403507B - ATEX CH3507 Single Position Charger or
  Part no: 403508B - ATEX CH3508 Dual Position Charger
- Use only battery type Sailor B3503 or B3504.
- Do not use a mechanically damaged radio.
- Unpacking of the radio and accessories and the removal of the protective film in front of the display window must not take place in the ATEX protected area.

(18) Essential Health and Safety Requirements

no additional ones

CERTIFICAT ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ 認證證書 ◆ CERTIFICATE ◆ ZERTIFIKAT

DANAK
PROD Reg.No. 7035
Member of EA MLA

TÜV SÜD
Danmark

Marine Equipment Directive
EC Type Examination Module B Certificate

This is to certify that TÜV SÜD DANMARK ApS did undertake the relevant type approval procedures for the equipment identified below, which was found to be in compliance with the Marine Equipment Directive (2014/90/EU) requirements, under the following Implementing Regulation for the listed types of equipment

Implementing Regulation	**(EU)2023/1667**
Certificate Holder and Manufacturer	**Thrane & Thrane A/S** **Lundtoftegaardsvej 93 D** **DK-2800 Kgs. Lyngby** **Denmark**
Product(s)	**SAILOR SP3540**
Product Sector	**Radio-communication equipment**
Product Type	**MED/5.17** **Portable survival craft two-way VHF radiotelephone apparatus**

and on the basis of the Technical Data and information detailed in the Annex to this certificate.

Valid from: 28 November 2023 (M J Hardy) M Hardy Expiry Date: 27 September 2028

This certificate has been issued in accordance with the TÜV SÜD Testing and Certification Regulations and constitutes page 1 of the combined Certificate and Annex.
The Conditions for the validity of this certificate are listed in the Annex.
For further details, related to this certification please contact BABT@tuvsud.com

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Issued by TÜV SÜD DANMARK ApS under document number DK-MED000162 Issue 01 Page 1 of 4

TÜV SÜD DANMARK ApS • Strandvejen 125 • 2900 Hellerup • Denmark

Danmark

1 Equipment Description

Portable VHF Survival Craft ATEX (GMDSS) Transceiver Note 1

1.1 Models

Model
SAILOR SP3540

1.1.1 System Components

Model	Part no.	Description
SAILOR SP3540	623540A	VHF Survival Craft ATEX (GMDSS)
SAILOR B3503	403503A	Primary Battery – Lithium

1.1.2 Optional Components

Model	Part no.	Description
SAILOR B3504	403504A	Secondary Battery – Rechargeable Li-Ion
SAILOR CH3505	403505A	Compact Charger
SAILOR CH3507	403507B	Single Position Charger ATEX
SAILOR CH3508	403508B	Dual Position Charger ATEX
-	88-125538	AC/DC Adapter

1.2 Software Note 2

Identity	Description
2.00.xx Note 3	Firmware for SP3500 Series

2 Assessed Requirements

2.1 Implementing Regulation (EU)2023/1667

2.2 Compliance Requirements for MED/5.17 Row 1 of 2

IMO Resolutions	International Testing Standards	
Resolution A694(17)	IEC 60945 (2002) inc. Corr.1 (2008)	Maritime navigation and radiocommunication equipment and systems – General requirements
	ETSI EN 301 843-2 v2.2.1 (2017-11)	ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Harmonised Standard for electromagnetic compatibility; Part 2: Specific conditions for VHF radiotelephone transmitters and receivers
IMO Res. MSC.149(77)	ETSI EN 300 225 V1.5.1 (2015-12)	Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and methods of measurement for survival craft portable VHF radiotelephone apparatus
ITU-R M.489-2 (10/95)		

3 Technical Documentation

3.1 Declaration of Conformity

99-153102-L Declaration of Conformity SAILOR SP3540 VHF GMDSS ATEX	Modified	2023-09-19

3.2 User Guide

98-124307-M SAILOR SP3540 Portable VHF ATEX GMDSS User Manual	Dated	2021-12-14

3.3 Test Reports

3.3.1 IEC 60945:2002 inc. Corr.1:2008

180514	Dated	2012-04-11
20082907200	Dated	2008-10-29
99788220	Dated	2007-04-05
99788230 Rev 2	Dated	2007-04-03
DANAK-19K0457	Dated	2009-06-15
E11128.00	Dated	2011-08-01
DANAK-19K0469	Dated	2007-09-18
99-185387	Dated	2023-11-17

3.3.2 ETSI EN 301 843-2 v2.2.1 (2017-11)

19/18030	Dated	2017-06-26
99-175132-A_	Dated	2020-11-25
180514	Dated	2012-04-11
20082907200	Dated	2008-10-29

3.3.3 ETSI EN 300 225 V1.5.1 (2015-12)

99788230 Rev 2.0	Dated	2007-04-03
99822231	Dated	2007-04-03
99-185388-A	Dated	2023-11-17

3.4 Build Status

3.4.1 Hardware

59-127182_BOM_list(G.05)	Modified	2023-09-19
TT93–127182–U	Dated	2018-11-12
38-127182-G01_ASB	Dated	2016-03-16
38-127182-G01_AST	Dated	2016-03-16

3.5 Notes

Note 1 ATEX approval is not a requirement of item MED/5.17 and has not been assessed as part of this Type Approval.

Note 2 This approval remains valid for equipment including subsequent minor software amendments which have been formally accepted in accordance with the TÜV SÜD Testing and Certification Regulations.

Note 3 The first two digits in the Software Version indicate Major revisions (1.0, 1.1, etc.), whereas “xx” represent minor revision numbers (0, 1, 2, etc.) with no impact on type approved functionality.

Danmark

4 Conditions of Validity

This certificate ceases to be valid if the manufacturer makes any changes or modifications to the approved type of equipment, which have not been notified to, and agreed with TÜV SÜD DANMARK ApS or a person appointed by TÜV SÜD DANMARK ApS to perform that role.

During the period of validity of this certificate the applicable regulations (international conventions and relevant resolutions and circulars of the IMO) and testing standards of the Commission Implementing Regulation may change, therefore the product conformity may need to be re-assessed by TÜV SÜD DANMARK ApS.

The Mark of Conformity may only be affixed to the above type approved equipment and a manufacturer's Declaration of Conformity issued when the production-control phase module (D, E, or F) of the directive is fully complied with and controlled by a written inspection agreement with a notified body.

Signature: M Hardy (M J Hardy)

Date: 28/11/2023

On behalf of TÜV SÜD DANMARK ApS

PTT Control Unit

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SAVOX

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1. # EU-TYPE EXAMINATION CERTIFICATE

2. **Equipment or Protective System Intended for use in Potentially explosive atmospheres Directive 2014/34/EU**

3. EU-Type Examination Certificate Number: **EESF 18 ATEX 008X Issue 1**

4. Product: **Com-Control Unit**

   Certified types: **C-C440/MTP850Ex, C-C440/DP4000X, C-C440/Waris Ex, C-C440/Sailor Ex, C-C440/PD79aEx, C-C440/E-Tech Ex, C-C440/TK2260 Ex and C-C440/S4 Ex**

5. Manufacturer: **Savox Communications Oy Ab**

6. Address: **Keilaranta 15 B, FI-02150 ESPOO, Finland**

   Additional manufacturing locations:

   1. **SAVOX Communications Oy Ab, Schaumanintie 26, FI-57230 SAVONLINNA, Finland**
   2. **Savox Communications (Shenzen) Co. Ltd, 7th Floor, Building #2, Hong Hui Industrial Park, Liu Xian 2nd Road, 68th Subdistrict, Baoan, Shenzen, China**

7. This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Eurofins Electric & Electronics Finland Oy, Notified Body number 0537, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

   The examination and test results are recorded in confidential report No. EUFI29-23003878-T1.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

   EN 60079-0 (2018) **EN 60079-11 (2011)**

10. If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11. This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12. The marking of the product shall include the following:

    II 2G Ex ib IIC T4 Gb
    II 2D Ex ib IIIC T110°C Db

Espoo, 11.10.2023
Eurofins Electric & Electronics Finland Oy

Jenni Hirvelä
Senior Expert

Kari Koskela
Senior Expert

This document is digitally signed.

This certificate, including the schedule, may only be reproduced in its entirety and without any change.

13. **Schedule**

14. **EU-Type Examination Certificate EESF 18 ATEX 008X Issue 1**

15. **Description of Product**

The SAVOX C-C440/MTP850Ex, C-C440/Sailor Ex, C-C440/DP4000X, C-C440/Waris Ex, C-C440/PD79aEx, C-C440/E-Tech Ex, C-C440/TK2260 and C-C440/S4 Ex Com-Control Units are to be used with intrinsically safe radio types according to unit type marking. Com-control unit type C-C440/PD79aEx is also compatible with certified PD71aEx, HD795Ex, PT790Ex and PT710Ex radios. The units consist of permanent cable, IP5X (according to EN 60079-0 and -11) enclosure with integrated PTT (Push-To-Talk) button and an electronics board. The plastic material of the enclosure is conductive.

Electrical data:

The maximum input values for types C-C440/MTP850Ex, C-C440/Sailor Ex, C-C440/Waris Ex, C-C440/PD79aEx and C-C440/TK2260 Ex are:

Ui = 9 V Ii = 3 A Pi = 6.75 W Ci = 0.1 µF Li = 10 µH

The maximum input values for type C-C440/DP4000X are:

Ui = 9 V Ii = 75 mA Pi = 314 mW Ci = 0.1 µF Li = 2 mH

The maximum input values for type C-C440/E-Tech Ex are:

Ui = 9 V Ii = 3 A Pi = 6.75 W Ci = 0.1 µF Li = 5 µH

The maximum input values for type C-C440/S4 Ex are:

Ui = 8.8 V Ii = 1.7 A Pi = 14.95 W Ci = 0.1 µF Li = 10 µH

Allowed plug-in accessories:

a) Savox TC-1 Ex or POA61-Ex
b) SAVOX MS-Com ATEX
c) SAVOX HC-1… ATEX or POA34-Ex
d) SAVOX HC-2… ATEX or POA100-Ex
e) SAVOX HC-E… ATEX or POA101-Ex
f) SAVOX L-H Ex or POA65-Ex
g) Peltor Adapter Cable Ex
h) FPS-COM-PLUS VA R-C* (ITS 11 ATEX 27318X)
i) FPS-COM 5000* (ITS 16 ATEX 28437X)
j) FPS-COM 7000* (ITS 16 ATEX 28340X)
k) MSA F1XF Communication Headset** (Not for Group III)
l) MT7H79F-50, MT7H79B-50, MT7H79P3E-50 (Not for Group III, Max Tamb +40 °C)
m) Dräger ANP-Com* (Not for Group III, Max Tamb +40 °C, VTT 17 ATEX 064X)
n) Savox NOISE-COM 400 Ex / Hytera IS Helmet N.C. headset (EESF 20 ATEX 087X)

**) S4 Ex excluded*
***) For Waris Ex and Sailor Ex only*

16. **Report Number:**

EUFI29-23003878-T1

17. **Specific Conditions of Use**

1. Allowed ambient temperature range is Tamb -20 °C to +55 °C.
2. When used with allowed plug-in accessories inside hazardous areas, the limited conditions in Clause 15 shall be observed.
3. Connection of SAVOX C-C440 Com-Control Units shall be done according to radio manufacturer's instructions.

4. Impact test was made according to low risk of mechanical danger. The device shall be protected from high-level impacts.

18. **Essential Health and Safety Requirements**

The Essential Health and Safety Requirements are covered by the standards listed at item 9.

19. **Drawings and Documents**

Title:	Drawing No.:	Rev.	Date:
*EX SAFETY DECLARATION FOR PRODUCT	D23313	H	20.9.2023
C-C440 /DP4000EX /MTP850EX /WARIS EX /SAILOR EX / PD79aEx/E-Tech Ex/TK2260 Ex / S4 Ex			
C-C440_ICOM S4 Ex Safety Calculations	D24477	C	6.8.2018
*EU DoC and Safety Guide Savox C-C440 VTT13 ATEX 040X	D23328	K	9.10.2023
Ex label C-C440/MTP850 Ex, Waris Ex, Sailor Ex, PD79aEx	D23321	D	3.9.2018
Ex label C-C440/DP4000 Ex	D23327	C	3.9.2018
Ex Label C-C440/E-Tech Ex	D23794	C	3.9.2018
C-C440_S4 Ex Label Instruction	D24461	B	3.9.2018
440AV / Generic Ex Component list (Product K16160_A)	D16160	A	28.10.2013
440AV ICOM S4 EX Part list (PCBA BoM)	D18289	A	24.8.2018
PCBA 440AV Sailor Ex Component list (Product K16161_B)	D16161	B	25.8.2014
PCBA 440AV DP4000Ex Component list (Product K16231_A)	D16231	A	28.10.2013
PCBA 440AV Waris Ex Component list (Product K16237_A)	D16237	A	28.10.2013
Schematic diagram Savox 440AV K15915	S15915	C	2.12.2013
PCB and Component layout, K15915_C_440AV	-	-	-
PCB Specification K15915_C_440AV	-	-	2.12.2013
Epoxy casting description for ATEX component boards	D21487	E	19.11.2014
C-C440 Main ASM Emergency Ex K14906	D14906	E	24.10.2014
Connector cable SAVOX C-C440/Sailor Ex, p/n: K16233	D16233	B	17.5.2016
Conn cable 440/MTP850 Ex SAVOX C-C440, p/n: K14060	D22319	B	25.6.2015
Connector cable Motorola DP4000 Ex SAVOX C-C440, p/n: K16221	D23332	A	22.10.2013
Conn cable 440/Waris Ex SAVOX C-C440, p/n: K14060	D22320	B	25.6.2015
Conn Cable E-Tech Cable	D17026	A	20.8.2015
Conn.Cable TK2260 Ex Cable	D16549	B	28.6.2016
PD790EX cable	D16219	B	5.9.2016
ICOM_S4_Ex_Cable	D18212	B	7.6.2018

*The accessory documents are listed in the document “Headset documents in PTT Ex certificates”. Doc.nr. D22115. Rev. Q. Date: 6.10.2023.

SAVOX C-C440/MTP850Ex complies with the Documentation Manual for Motorola ATEX, UC connector interface mentioned in Motorola documents:

- Accessory Interface Definition, Document 6866546D07_02_06, Rev B, date 27-Jun-08
- Specification of External Loudspeaker used at Accessory Interface, Document 6866546D07_02_07, Rev B, date 27-Jun-08

*) *New/ revised documents*

20. **Certificate History**

Issue	Date	Report No.	Change
-	19.12.2013	VTT-S-08630-13	Prime certificate
VTT 13 ATEX 040X Issue 1	29.6.2015	-	Minor changes. Compatibility with Ex radios of certified type C-C440/PD79aEx clarified.
VTT 13 ATEX 040X Issue 2	6.11.2015	VTT-S-05197-15	Certified type C-C440/E-Tech Ex added. New or revised documents.
VTT 13 ATEX 040X Issue 3	25.4.2016	VTT-S-03879-16	Certified type C-C440/TK2260 Ex added. New or revised documents.
VTT 13 ATEX 040X Issue 4	1.7.2016	-	List of accessories updated. New accessories assessed.

VTT 13 ATEX 040X Issue 5	5.10.2016	VTT-S-03879-16	Extend of compatibility with Ex radios of certified type C-C440/PD79aEx. Alternative names entered, New revisions, New doc. replaces D12666D
VTT 13 ATEX 040X Issue 6	15.8.2017	VTT-S-04121-17	Addition of FPS-COM 7000 plug-in accessory.
VTT 13 ATEX 040X Issue 7	10.7.2018	VTT-S-02835-18	Certified type C-C440/S4 added. Addition of SAVOX NOISE-COM 200 Ex and Dräger ANP-Com accessories.
EESF 18 ATEX 008X	19.9.2018	S-04487-18	NB name changed from VTT Expert Services to Eurofins Expert Services. Addition of SAVOX NOISE-COM 400 Ex or Hytera IS Helmet N.C. headset plug-in accessory. Manufacturers address changed.
Issue 1	11.10.2023	EUFI29-23003878-T1	Accessories list updated. Obsolete products removed and MSA F1XF Communication Headset added.

Twin cup headset for VHF Marine Portable Radio

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PELTOR

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[1] EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protected System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU.

[3] EU-Type Examination Certificate Number: **Nemko 09ATEX1119X** **Issue 5**

[4] Product: **Headset with microphone and speaker, twin cup.**

[5] Manufacturer: **3M Svenska AB**

[6] Address: **Malmstensgatan 19**
Box 2341
SE-33102 Värnamo
Sweden

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] Nemko Group AS, notified body number 0470, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report no. **PRJN-393177**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0: 2018, EN 60079-11: 2012

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

[11] This EU-Type Examination Certificate relates only to the technical design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate

[12] The marking of the product shall include the following:

II 2G **Ex ib IIC T4 Gb, Ta : -20°C to +50°C**

2023-02-16

Bernt Jonny Orderud
Certifier name

[13] Schedule

[14] EU-TYPE EXAMINATION CERTIFICATE No Nemko 09ATEX1119X Issue 5

[15] Description of Product:

The headset consists of two headphones and a microphone connected to a common plug (jack plug). This certificate covers two models, one with headband and one with helmet attachment.

Type Designations:
MT72H540A-50, MT72H540P3E-50

Intrinsic Safety Data
Ui: 14V, Ii: 450mA, Pi: 1,3W, Ci: Negligible, Li: 0,8mH

Ambient temperature:
-20°C to +50°C

Routine tests:
None.

[16] Report No. PRJN-393177

Descriptive Documents:

Number	Title	Rev	Date
P080137	Assembly Drawing MT72H540P3E-50	d	2023-01-19
P210148	Assembly Drawing MT72H540A-50	a	2023-01-19
P080139	Wiring Instruction MT72H540**-50	a	2008-02-22
P080436	Ex Label MT72H540P3E-50	f	2023-01-19
FP3768	Instruction Manual	d	Same as certificate

Certificate History and Associated Reports:

Issue	Date	Report No.	Description
0	2009-04-27	Nemko 126520	Prime Certificate released
1	2011-09-20	Nemko 187494	Increased the current in safety parameters for intrinsically safe connection and added a microphone, M01N-02.
2	2015-05-08	D0001834-0 / Nemko 284573	Update to new standards.
3	2018-10-04	D0001834-1 / Nemko 361471	Minor update of marking label and instructions due to PPE regulation 2016/425/EU.
4	2020-12-14	D0001834-02 / PRJN-200955-2020-PA-NOR	Update of datasheet for microphone and speaker. Model type MT72H540F-50 removed from certificate. Minor update of marking label and instructions manual. Upgrade to standard EN 60079-0: 2018.
5	2023-02-03	PRJN-393177	- Update of marking due to UKEX certification. - Included new variant of headset, MT72H540A-50. - Remove variant MT72H540F-50. - Minor updates of descriptive documents.

[17] Specific Conditions of Use:
Only for connection to a certified intrinsically safe circuit with a linear resistive output, that complies with the following values for the intrinsic safety parameters of MT72H540A-50 and MT72H540P3E-50:
Ui: 14V, Ii: 450mA, Pi: 1,3W, Ci: Negligible, Li: 0,8mH

[18] Essential Health and Safety Requirements:
Essential Health and Safety Requirements (EHSRs) are covered by the standards listed at item 9

[19] Remarks and additional Information:
None

UHF DMR Portable Radio

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MOTOROLA

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Translation

1 # EU-Type Examination Certificate

2 **Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014**

3 EU-Type Examination Certificate Number: **BVS 12 ATEX E 1117 X** Issue: **01**

4 Equipment: **Radio telephone type XPR ****Ex, type XiR P**** Ex, type DP**** Ex and type DGP**** Ex**

5 Manufacturer: **Motorola Solutions Systems Polska Sp.z.o.o.**

6 Address: **Ul. Czerwone Maki 82, 30-392 Krakow, Polen**

7 This product and any acceptable variations thereto are specified in the appendix to this certificate and the documents referred to therein.

8 DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential Report No. BVS PP 12.2167 EU.
This issue of the EU-Type Examination Certificate replaces the previous issue of the EU-Type Examination Certificate BVS 12 ATEX E 117 X including supplements 1 to 5.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

10 If the sign “X” is placed after the certificate number, it indicates that the product is subject to the “Specific Conditions of Use” listed under item 17 of this certificate.

11 This EU-Type Examination Certificate relates only to the technical design of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

II 2G Ex ib IIC T4 Gb
II 2D Ex ib IIIC T130°C Db
I M2 Ex ib I Mb

DEKRA Testing and Certification GmbH
Bochum, 2023-01-27

Signed: Dr. Rolf Krökel

Managing Director

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DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

13 **Appendix**

14 **EU-Type Examination Certificate**

BVS 12 ATEX E 117 X issue 01

15 **Product description**

15.1 **Subject and type**

Radio telephone type XPR ****Ex, type XiR P**** Ex, type DP**** Ex and type DGP**** Ex

The asterix (*) in the type designation is replaced by numbers per the list below :

Name	Model number	Type description
VHF version 136 to 174 MHz		
XPR 7550 Ex	PMUD3214ABCNAA	North American Full Keypad Model (NAG FKP)
DP4801 Ex	PMUD3214ABCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP
DP4801 Ex	PMUD3214BBCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUD3214BPCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUD3214ACCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 EX	PMUD3214APCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
XiR P8668 Ex	PMUD3214ABCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ABDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ABEAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ABFAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214BBCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214BBFAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214BBEAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214BBDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ACCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ACDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ACAAAA	Asia Pacific Full Keypad Model (APAC FKP)
DGP 8050 EX	PMUD3214ABALAA	Latin American Caribbean Region Full Keypad (LACR NKP)
DGP 8550 EX	PMUD3214ABCLAA	Latin American Caribbean Region Full Keypad (LACR FKP)
DGP 8550 EX	PMUD3214BBCLAA	Latin American Caribbean Region Full Keypad (LACR FKP)
DGP 8050 EX	PMUD3212BBALAA	Latin American Caribbean Region Non Keypad (LACR NKP)
XiR P8608 Ex	PMUD3212ABAAAA	Asia Pacific Non Keypad Model (APAC NKP)
XiR P8608 Ex	PMUD3212BBAAAA	Asia Pacific Non Keypad Model (APAC NKP)
XiR P8608 Ex	PMUD3212ACAAAA	Asia Pacific Non Keypad Model (APAC NKP)
DP4401 Ex	PMUD3211AAAEAA	Europe, the Middle East, Africa, Australia and New Zealand Non Keypad Model (EMEA NKP)
DP4401 Ex	PMUD3211BAAEAA	Europe, the Middle East, Africa, Australia and New Zealand Non Keypad Model (EMEA NKP)

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DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

UHF version 403 to 470 MHz

XPR 7550 Ex	PMUE3750ABCNAA	North American Full Keypad Model (NAG FKP)
DP4801 Ex	PMUE3750ABCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUE3750BBCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUE3750BPCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUE3750ACCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUE3750APCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
XiR P8668 Ex	PMUE3750ABCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ABDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ABEAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ABFAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750BBCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750BBFAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750BBEAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750BBDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ACCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ACDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ACAAAA	Asia Pacific Full Keypad Model (APAC FKP)
DGP 8550EX	PMUE3750ABCLAA	Latin American Caribbean Region Full Keypad (LACR FKP)
DGP 8550EX	PMUE3750BBCLAA	Latin American Caribbean Region Full Keypad (LACR FKP)
DGP 8050EX	PMUE3754ABALAA	Latin American Caribbean Region Non Keypad (LACR NKP)
DGP 8050EX	PMUE3754BBALAA	Latin American Caribbean Region Non Keypad (LACR NKP)
XiR P8608 Ex	PMUE3754ABAAAA	Asia Pacific Non Keypad Model (APAC NKP)
XiR P8608 Ex	PMUE3754BBAAAA	Asia Pacific Non Keypad Model (APAC NKP)
XiR P8608 Ex	PMUE3754ACAAAA	Asia Pacific Non Keypad Model (APAC NKP)
DP4401 Ex	PMUE3755AAAEAA	Europe, the Middle East, Africa, Australia and New Zealand Non Keypad Model (EMEA NKP)
DP4401 Ex	PMUE3755BAAEAA	Europe, the Middle East, Africa, Australia and New Zealand Non Keypad Model (EMEA NKP

15.2 **Description**

Reason for this issue

- Add models
- Changes in the part lists
- Circuit changes by the radio telephone
- Hardware changes by the radio telephone
- Layout changes

Description of Product

The radio telephone types XPR **** Ex, XiR P**** Ex, DP**** Ex and DGP ****EX are portable radios that serve communication in the VHF (136 to 174 MHz) and UHF (403 to 470 MHz) band.

The radios telephones are only used with the battery type NNTN8359A or type NNTN8359B or type NNTN8359C or type NNTN8359CR and the Dust Cover with the part number 15012157001 or one of the approved accessories listed in this certificate.

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DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

The antennas listed below can be connected to the radio telephones.

For use with the 136 – 174 MHz versions

Part No	Description
PMAD4126A	GPS helical antenna (136 – 147 MHz) Ex
PMAD4127A	GPS helical antenna (147 – 160 MHz) Ex
PMAD4128A	GPS helical antenna (160 – 174 MHz) Ex
PMAD4129A	Stubby antenna 11cm (136 – 147 MHz) Ex
PMAD4130A	Stubby antenna 11cm (147 – 160 MHz) Ex
PMAD4131A	Stubby antenna 11cm (160 – 174 MHz) Ex
PMAD4132A	Wideband antenna (136 – 174 MHz) Ex

For use with the 403 to 470 versions

Part No	Description
PMAE4081A	DMR folded monopole (403 – 433 MHz) Ex
PMAE4082A	DMR folded monopole (430 – 470 MHz) Ex
PMAE4083A	DMR stubby antenna (403 – 433 MHz) Ex
PMAE4084A	DMR stubby antenna (430 – 470 MHz) Ex
PMAE4085A	DMR whip antenna (403 – 470 MHz) Ex

The following carry devises can be used with the radio telephones:

Part No	Description
PMLN6086A	ATEX Belt Clip 2.5-Inch Belt Width
PMLN6096A	Hard Leather Carry Case 2.5-Inch Swivel Belt Loop for Non-Keypad Radio
PMLN6097A	Hard Leather Carry Case 2.5-Inch Swivel Belt Loop for Full-Keypad Radio
PMLN6098A	Soft Leather Carry Case 2.5-Inch Swivel Belt Loop for Non-Keypad Radio
PMLN6099A	Soft Leather Carry Case 2.5-Inch Swivel Belt Loop for Full-Keypad Radio
PMLN5610A	2.5-Inch Replacement Swivel Belt Loop

The following audio accessories, separately certified, can be connected to the radios:

Part No	Description	Certificate
PMMN4067B	ATEX CSA Remote Speaker Microphone	BVS 12 ATEX E 027 X
PMLN6047A	Audio Adapter with Molex jack	BVS 12 ATEX E 074 X

The Audio Adapter with Molex jack is only approved for use in gas hazardous (Group II) and dust hazardous (Group III) environments.

Furthermore, the following audio accessories, separately certified, with a secondary audio interface to allow the connection of headsets can be connected to the radios:

PMMN4094A	ANC RSM ATEX 20 Ohm Standard Cable	BVS 15 ATEX E 054X
PMNN4100A	ANC RSM ATEX 20 Ohm Long Cable	BVS 15 ATEX E 054X
PMMN4110A	OMNI RSM 20 Ohm Standard Cable	BVS 15 ATEX E 054X
PMMN4111A	OMNI RSM 20 Ohm Long Cable	BVS 15 ATEX E 054X
FL5263-34 (Motorola Part Number PMLN6368A)	PTT Adapter for use with Headset	Nemko 13 ATEX1521X (Issue 2)

Approved for use in Mining (Group I) and Gas hazardous (Group II) environments
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

FL4063-50-34 (Motorola Part Number PMLN6803A)	Small PTT adaptor	Nemko 13 ATEX1521X (Issue 2)

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Approved for use in Mining (Group I) and Gas hazardous (Group II) environments
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

Part No	Description	Certificate
AK6760T (Motorola Part Number PMLN7310ASP01)	Key Switch (PTT unit)	Presafe 15 ATEX 6928 (Issue 1)

Approved for use in Gas hazardous (Group II) environments.

The headsets listed below can be connected to the audio accessories.
Other accessories that have certified compatible interface parameters may also be connected.

MT7H79F-50 (Motorola Part Number PMLN6087A)	Standard Headset with microphone	Nemko 09 ATEX E 1114 X (Issue 2)

Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT7H79P3E-50 (Motorola Part Number PMLN6092A)	Standard Headset with microphone	Nemko 09 ATEX E 1114 X (Issue 2)

Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT72H540P3E-50 (Motorola Part Number PMLN6333A)	Standard Headset with microphone	Nemko 09 ATEX E 1119 X (Issue 2)

Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT7H79B-50 (Motorola Part Number PMLN7531A)	Headset series, Tactical XP	Nemko 09 ATEX1114X (Issue 2)

Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT1H7F2-07-51 (Motorola Part Number PMLN6090A)	Headset series, Tactical XP	Nemko 10 ATEX 1029 X (Issue 2)

Approved for use in Mining (Group I) and Gas hazardous (Group II) environments.
Ambient temperature range: -10 °C ≤ T_a ≤ +40 °C

MT1H7P3E2-07-51 (Motorola Part Number PMLN6089A)	Headset series, Tactical XP	Nemko 10 ATEX 1029 X (Issue 2)

Approved for use in Mining (Group I) and Gas hazardous (Group II) environments.
Ambient temperature range: -10 °C ≤ T_a ≤ +40 °C

MT1H7B2-07- 51 (Motorola Part Number PMLN7535A)	Headset series, Tactical XP	Nemko 10 ATEX 1029X (Issue 2)

Approved for use in Mining (Group I) and Gas hazardous (Group II) environments.
Ambient temperature range: -10 °C ≤ T_a ≤ +40 °C

The accessories, the antennas and the battery can only be connected or disconnected outside the potentially hazardous environment.

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The permissible ambient temperature range for the radio, the battery type NNTN8359A or type NNTN8359B or type NNTN8359C or type NNTN8359CR, the ATEX CSA Remote Speaker Microphone type PMMN4067B, the ANC RSMs type PMMN4094A and PMNN4100A, the OMNI RSM type PMMN4111A and PMMN4110A and the Audio Adapter with Molex Jack type PMLN6047A is -20 °C ≤ T_a ≤ +55 °C.

The battery type NNTN8359A, NNTN8359B, NNTN8359C and NNTN8359CR can only be charged outside the hazardous environment with chargers listed in the safety leaflet (document 68012007083).

15.3 **Parameters**

15.3.1 Electrical Data

15.3.1.1 Frequency range

VHF-version	136 – 174 MHz
UHF-version	403 – 470 MHz

15.3.1.2 Output power 2 W max. (ib)

15.3.1.3 Supply voltage

The radio is supplied by the battery type NNTN8359A or NNTN8359B or NNTN8359C or NNTB8359CR with the following supply voltage:

Nominal voltage:	7.6 V DC
Peak open voltage:	8.4 V DC

15.3.1.4 When the Audio Adapter PMLN6047A (BVS 12 ATEX E 074 X) is used with the radios and the battery types NNTN8359A or NNTN8359B or NNTN8359C or NNTN8359CR the following interface parameters must be considered for secondary audio devices connected to the Audio Adapter:

Max. output voltage:	U_o = 8.4 V
Max. output current:	I_o =75 mA
Max. output power:	P_o = linear characteristic
Effective internal capacitance:	C_i = negligible
Effective internal inductance:	L_i = negligible

Connectable values for the Group IIC and IIIC in combination:

Max. external capacitance:	C_o= 0.1 µF
Max. external inductance:	L_o = 2 mH

15.3.2 Ambient temperature range -20 °C ≤ T_a ≤ +55 °C

15.3.3 Ingress protection for the radio telephone and the battery IP64

16 **Report Number**

BVS PP 12.2167 EU, as of 2023-01-27

17 **Specific Conditions of Use**

17.1 The antennas can only be connected / disconnected to the radios outside the hazardous environment.

17.2 The ATEX CSA Remote Speaker Microphone type PMMN4067B can only be connected / disconnected outside the hazardous environment.

17.3 The Audio Adapter type PMLN6047A with Molex jack can only be connected / disconnected outside the hazardous environment.

17.4 The ANC RSM type PMMN4094A and type PMMN4100A can only be connected / disconnected outside the hazardous environment.

17.5 The OMNI RSM type PMMN4110A and type PMMN4111A can only be connected / disconnected outside the hazardous environment.

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17.6 The PPT Adapter type FL5263-34 PTT and type FL4063-50-34 can only be connected / disconnected outside the hazardous.

17.7 The Key Switch type AK6760T can only be connected / disconnected outside the hazardous environment.

17.8 For all separately certified accessories additional safety conditions listed in these certificates will apply.

17.9 When the Audio Adapter type PMLN6047A is connected, the radio can only be used in gas (Group II) or dust (Group III) hazardous environments.

17.10 When the PTT Adapter type FL5263-34 or the Small PPT Adapter type FL4063-50-34 with one of the approved headsets is connected, the radio can only be used in Mining (Group I) or Gas (Group II) hazardous environments.

17.11 When the Key Switch type AK6760T is connected, the radio can only be used in a gas (Group II) hazardous environment.

17.12 The battery type NNTN8359A or type NNTN8359B or type NNTN8359C or type NNTN8359CR can only be changed or charged outside the hazardous environment.

18 Essential Health and Safety Requirements

Met by compliance with the requirements mentioned in item 9.

19 Remarks and additional information

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2023-01-27
BVS-Ha/MGR A 20211108 / 342463200

Managing Director

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Translation

1 EU-Type Examination Certificate Supplement 5

2 **Equipment intended for use in potentially explosive atmospheres Directive 2014/34/EU**

3 EU-Type Examination Certificate Number: **BVS 12 ATEX E 117 X**

4 Product: **Radio telephone type XPR ****Ex, type XiR P**** Ex, type DP**** Ex and type DGP**** Ex**

5 Manufacturer: **Motorola Solutions Systems Polska**

6 Address: **Cezerwone Maki 83, 30-392 Krakow, Poland**

7 This supplementary certificate extends EU-Type Examination Certificate No. BVS 12 ATEX E 117 X to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

8 DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential Report No. BVS PP 12.2167 EU.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018	**General requirements**
EN 60079-11:2012	**Intrinsic Safety "i"**

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

II 2G Ex ib IIC T4 Gb
II 2D Ex ib IIIC T130°C Db
I M2 Ex ib I Mb

DEKRA Testing and Certification GmbH
Bochum, 2020-05-29

Signed: Jörg-Timm Kilisch

Managing Director

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13 **Appendix**

14 **EU-Type Examination Certificate**

BVS 12 ATEX E 117 X
Supplement 5

15 **Product description**

15.1 **Subject and type**

Radio telephone type XPR ****Ex, type XiR P**** Ex, type DP**** Ex and type DGP**** Ex

The asterix (*) in the type designation is replaced by numbers per the list below :

Name	Model number	Type description
VHF versions 136 to 174 MHz		
XPR 7550 Ex	PMUD3214ABCNAA	North American Full Keypad Model (NAG FKP)
DP4801 Ex	PMUD3214ABCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUD3214APCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUD3214ACCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
XiR P8668 Ex	PMUD3214ABCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ABFAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ABEAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ABDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ACCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUD3214ACDAAA	Asia Pacific Full Keypad Model (APAC FKP)
DGP 8550EX	PMUD3214ABCLAA	Latin American Caribbean Region Full Keypad (LACR FKP)
DGP 8050EX	PMUD3212ABALAA	Latin American Caribbean Region Non Keypad (LACR NKP)
XiR P8608 Ex	PMUD3212ABAAAA	Asia Pacific Non Keypad Model (APAC NKP)
XiR P8608 Ex	PMUD3212ACAAAA	Asia Pacific Non Keypad Model (APAC NKP)
DP4401 Ex	PMUD3211AAAEAA	Europe, the Middle East, Africa, Australia and New Zealand Non Keypad Model (EMEA NKP)
UHF versions 403 to 470 MHz		
XPR 7550 Ex	PMUE3750ABCNAA	North American Full Keypad Model (NAG FKP)
DP4801 Ex	PMUE3750ABCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUE3750APCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
DP4801 Ex	PMUE3750ACCEAA	Europe, the Middle East, Africa, Australia and New Zealand Full Keypad Model (EMEA FKP)
XiR P8668 Ex	PMUE3750ABCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ABFAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ABEAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ABDAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ACCAAA	Asia Pacific Full Keypad Model (APAC FKP)
XiR P8668 Ex	PMUE3750ACDAAA	Asia Pacific Full Keypad Model (APAC FKP)
DGP 8550EX	PMUE3750ABCLAA	Latin American Caribbean Region Full Keypad (LACR FKP)
DGP 8050EX	PMUE3754ABALAA	Latin American Caribbean Region Non Keypad (LACR NKP)
XiR P8608 Ex	PMUE3754ABAAAA	Asia Pacific Non Keypad Model (APAC NKP)
XiR P8608 Ex	PMUE3754ACAAAA	Asia Pacific Non Keypad Model (APAC NKP)
DP4401 Ex	PMUE3755AAAEAA	Europe, the Middle East, Africa, Australia and New Zealand Non Keypad Model (EMEA NKP)

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15.2 **Description**

Reason for the supplement:

- Mechanical drawing updates for front housing assembly (add screw torque spec and revise manufacturer's name)
- Add battery variant
- Mechanical drawing update for Assembly Housing for battery
- Mechanical drawing update for battery latch
- Mechanical drawing update for cover for battery
- Documentation updates

Description of Product

The radio telephones types XPR **** Ex, XiR P**** Ex, DP**** Ex and DGP ****EX are portable radios that serve communication in the VHF (136 to 174 MHz) and UHF (403 to 470 MHz) band.

The radios telephones are only used with the battery type NNTN8359A or type NNTN8359B or type NNTN8359C or type NNTN8359CR and the Dust Cover with the part number 15012157001 or one of the approved accessories listed in this certificate.

The antennas listed below can be connected to the radio telephones

For use with the 136 – 174 MHz versions

Part No	Description
PMAD4126A	GPS helical antenna (136 – 147 MHz) Ex
PMAD4127A	GPS helical antenna (147 – 160 MHz) Ex
PMAD4128A	GPS helical antenna (160 – 174 MHz) Ex
PMAD4129A	Stubby antenna 11cm (136 – 147 MHz) Ex
PMAD4130A	Stubby antenna 11cm (147 – 160 MHz) Ex
PMAD4131A	Stubby antenna 11cm (160 – 174 MHz) Ex
PMAD4132A	Wideband antenna (136 – 174 MHz) Ex

For use with the 403 to 470 versions

Part No	Description
PMAE4081A	DMR folded monopole (403 – 433 MHz) Ex
PMAE4082A	DMR folded monopole (430 – 470 MHz) Ex
PMAE4083A	DMR stubby antenna (403 – 433 MHz) Ex
PMAE4084A	DMR stubby antenna (430 – 470 MHz) Ex
PMAE4085A	DMR whip antenna (403 – 470 MHz) Ex

The following carry devises can be used with the radio telephones:

Part No	Description
PMLN6086A	ATEX Belt Clip 2.5-Inch Belt Width
PMLN6096A	Hard Leather Carry Case 2.5-Inch Swivel Belt Loop for Non-Keypad Radio
PMLN6097A	Hard Leather Carry Case 2.5-Inch Swivel Belt Loop for Full-Keypad Radio
PMLN6098A	Soft Leather Carry Case 2.5-Inch Swivel Belt Loop for Non-Keypad Radio
PMLN6099A	Soft Leather Carry Case 2.5-Inch Swivel Belt Loop for Full-Keypad Radio
PMLN5610A	2.5-Inch Replacement Swivel Belt Loop

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The following audio accessories, separately certified, can be connected to the radios:

Part No	Description	Certificate
PMMN4067B	ATEX CSA Remote Speaker Microphone	BVS 12 ATEX E 027 X
PMLN6047A	Audio Adapter with Molex jack	BVS 12 ATEX E 074 X

The Audio Adapter with Molex jack is only approved for use in gas hazardous (Group II) and dust hazardous (Group III) environments.

Furthermore the following audio accessories, separately certified, with a secondary audio interface to allow the connection of headsets can be connected to the radios:

PMMN4094A	ANC RSM ATEX 20 Ohm Standard Cable	BVS 15 ATEX E 054X
PMNN4100A	ANC RSM ATEX 20 Ohm Long Cable	BVS 15 ATEX E 054X
PMMN4110A	OMNI RSM 20 Ohm Standard Cable	BVS 15 ATEX E 054X
PMMN4111A	OMNI RSM 20 Ohm Long Cable	BVS 15 ATEX E 054X

FL5263-34 PTT Adapter for use with Headset — Nemko 13 ATEX1521X (Issue 2)
(Motorola Part Number PMLN6368A)
Approved for use in Mining (Group I) and Gas hazardous (Group II) environments
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

FL4063-50-34 Small PTT adaptor — Nemko 13 ATEX1521X (Issue 2)
(Motorola Part Number PMLN6803A)
Approved for use in Mining (Group I) and Gas hazardous (Group II) environments
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

AK6760T Key Switch (PTT unit) — Presafe 15 ATEX 6928 (Issue 1)
(Motorola Part Number PMLN7310ASP01)
Approved for use in Gas hazardous (Group II) environments.

The headsets listed below can be connected to the audio accessories.
Other accessories that have certified compatible interface parameters may also be connected.

MT7H79F-50 Standard Headset with microphone — Nemko 09 ATEX E 1114 X (Issue 2)
(Motorola Part Number PMLN6087A)
Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT7H79P3E-50 Standard Headset with microphone — Nemko 09 ATEX E 1114 X (Issue 2)
(Motorola Part Number PMLN6092A)
Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT72H540P3E-50 Standard Headset with microphone — Nemko 09 ATEX E 1119 X (Issue 2)
(Motorola Part Number PMLN6333A)
Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT7H79B-50 Headset series, Tactical XP — Nemko 09 ATEX1114X (Issue 2)
(Motorola Part Number PMLN7531A)
Approved for use in Gas hazardous (Group II) environments.
Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C

MT1H7F2-07-51 Headset series, Tactical XP — Nemko 10 ATEX 1029 X (Issue 2)
(Motorola Part Number PMLN6090A)
Approved for use in Mining (Group I) and Gas hazardous (Group II) environments.
Ambient temperature range: -10 °C ≤ T_a ≤ +40 °C

MT1H7P3E2-07-51 Headset series, Tactical XP — Nemko 10 ATEX 1029 X (Issue 2)
(Motorola Part Number PMLN6089A)
Approved for use in Mining (Group I) and Gas hazardous (Group II) environments.
Ambient temperature range: -10 °C ≤ T_a ≤ +40 °C

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MT1H7B2-07- 51 Headset series, Tactical XP Nemko 10 ATEX 1029X
(Motorola Part Number PMLN7535A) (Issue 2)
Approved for use in Mining (Group I) and Gas hazardous (Group II) environments.
Ambient temperature range: -10 °C ≤ T_a ≤ +40 °C

The accessories, the antennas and the battery can only be connected or disconnected outside the potentially hazardous environment.

The permissible ambient temperature range for the radio, the battery type NNTN8359A or type NNTN8359B or type NNTN8359C or type NNTN8359CR, the ATEX CSA Remote Speaker Microphone type PMMN4067B, the ANC RSMs type PMMN4094A and PMNN4100A, the OMNI RSM type PMMN4111A and PMMN4110A and the Audio Adapter with Molex Jack type PMLN6047A is -20 °C ≤ T_a ≤ +55 °C.

The battery type NNTN8359A, NNTN8359B, NNTN8359C and NNTN8359CR can only be charged outside the hazardous environment with chargers listed in the safety leaflet (document 68012007083).

15.3 **Parameters**

15.3.1 Electrical Data

15.3.1.1 Frequency range

VHF-versions	136 – 174 MHz
UHF-versions	403 – 470 MHz

15.3.1.2 Output power 2 W max. (ib)

15.3.1.3 Supply voltage

The radio is supplied by the battery type NNTN8359A or NNTN8359B or NNTN8359C or NNTB8359CR with the following supply voltage:

Nominal voltage:	7.6 V DC
Peak open voltage:	8.4 V DC

15.3.1.4 When the Audio Adapter PMLN6047A (BVS 12 ATEX E 074 X) is used with the radios and the batteries types NNTN8359A or NNTN8359B or NNTN8359C or NNTN8359CR the following interface parameters have to be considered for secondary audio devices connected to the audio adapter:

Max. output voltage:	U_o = 8.4 V
Max. output current:	I_o =75 mA
Max. output power:	P_o = linear characteristic
Effective internal capacitance:	C_i = negligible
Effective internal inductance:	L_i = negligible

Connectable values for the Group IIC and IIIC in combination:

Max. external capacitance:	C_o= 0.1 µF
Max. external inductance:	L_o = 2 mH

15.3.2 Ambient temperature range -20 °C ≤ T_a ≤ +55 °C

15.3.3 Ingress protection for the radio telephone and the battery IP64

16 **Report Number**

BVS PP 12.2167 EU, as of 2020-05-29

DAkkS Deutsche Akkreditierungsstelle D-ZE-17433-02-00
DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

17 Special Conditions for Use

17.1 The antennas can only be connected / disconnected to the radios outside the hazardous environment.

17.2 The ATEX CSA Remote Speaker Microphone type PMMN4067B can only be connected / disconnected outside the hazardous environment.

17.3 The Audio Adapter type PMLN6047A with Molex jack can only be connected / disconnected outside the hazardous environment.

17.4 The ANC RSM type PMMN4094A and type PMMN4100A can only be connected / disconnected outside the hazardous environment.

17.5 The OMNI RSM type PMMN4110A and type PMMN4111A can only be connected / disconnected outside the hazardous environment.

17.6 The PPT Adapter type FL5263-34 PTT and type FL4063-50-34 can only be connected / disconnected outside the hazardous.

17.7 The Key Switch type AK6760T can only be connected / disconnected outside the hazardous environment.

17.8 For all separately certified accessories additional safety conditions listed in these certificates will apply.

17.9 When the Audio Adapter type PMLN6047A is connected, the radio can only be used in gas (Group II) or dust (Group III) hazardous environments.

17.10 When the PTT Adapter type FL5263-34 or the Small PPT Adapter type FL4063-50-34 with one of the approved headsets is connected, the radio can only be used in Mining (Group I) or Gas (Group II) hazardous environments.

17.11 When the Key Switch type AK6760T is connected, the radio can only be used in a gas (Group II) hazardous environments.

17.12 The battery type NNTN8359A or type NNTN8359B or type NNTN8359C or type NNTN8359CR can only be changed or charged outside the hazardous environment.

18 Essential Health and Safety Requirements

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 Drawings and Documents

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, dated 2020-05-29
BVS-Ha/Mu A 20180233

Managing Director

DAkkS Deutsche Akkreditierungsstelle D-PE-17435-02-00

DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
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Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

Remote Speaker

-

MOTOROLA

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1 # EU-Type Examination Certificate

2 **Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014**

3 EU-Type Examination Certificate Number: **BVS 15 ATEX E 054 X** Issue: **01**

4 Equipment: **Remote speaker microphone type PMMN4***A**

5 Manufacturer: **Motorola Solutions Systems Polska Sp.z.o.o.**

6 Address: **Ul. Czerwone Maki 82, 30-392 Krakow, Poland**

7 This product and any acceptable variations thereto are specified in the appendix to this certificate and the documents referred to therein.

8 DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential Report No. BVS PP 15.2080 EU.
This issue of the EU-Type Examination Certificate replaces the previous issue of the EU-Type Examination Certificate BVS 15 ATEX E 054 X including supplement 1.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018	**General requirements**
EN 60079-11:2012	**Intrinsic Safety "i"**

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the "Specific Conditions of Use" listed under item 17 of this certificate.

11 This EU-Type Examination Certificate relates only to the technical design of the specified product in accordance with the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

II 2G Ex ib IIC T4 Gb
II 2D Ex ib IIIC T90°C Db
I M1 Ex ia I Ma

DEKRA Testing and Certification GmbH
Bochum, 2024-10-10

Managing Director

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DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

13 **Appendix**

14 **EU-Type Examination Certificate**

BVS 15 ATEX E 054 X issue 01

15 **Product description**

15.1 **Subject and type**

Remote speaker microphone type PMMN4***A

Model number	Name	Type description
PMMN4093A	ANC RSM Ex 16ohm Std Cbl	for MTP….Ex radios, Short cable
PMMN4094A	ANC RSM Ex 20ohm Std Cbl	for DP….Ex radios, short cable
PMMN4100A	ANC RSM Ex 20ohm Long Cbl	for DP….Ex radios, long cable
PMMN4101A	ANC RSM Ex 16ohm Long Cbl	for MTP….Ex radios, long cable
PMMN4109A	IMPRES EX OMNI RSM STD CBL/NEX/16Ohm	for MTP….Ex radios, short cable
PMMN4110A	IMPRESS EX OMNI RSM STD CBL/NEX/20Ohm	for DP….Ex radios, short cable
PMMN4111A	IMPRES EX OMNI RSM LONG CBL/NEX/20Ohm	for DP….Ex radios, long cable
PMMN4112A	IMPRESS EX OMNI RSM LONG CBL/NEX/16Ohm	for MTP…Ex radios, long cable

15.2 **Description**

The Remote Speaker Microphone types PMMN4093A, PMMN4094A, PMMN4100A, PMMN4101, PMMN4109A, PMMN4110A, PMMN4111A and PMMN4112A are audio accessories for connection to the Motorola ATEX certified radios of the series MTP….Ex and DP….Ex.

The Remote speaker microphones connect to the radios with the Motorola proprietary GCAI connector.

The Remote Speaker Microphones can only be connected or disconnected outside the potentially hazardous environment.

All versions feature two audio interfaces for connection additional ATEX certified accessories:

a) Nexus connector for connection of talk and listen accessories
b) 3.5 mm audio jack for connection of listen only accessories

to a)
The following separately certified accessories can be used by the Nexus connector with the accessories:

Type (Motorola reference number)	EC Type Examination Certificate
MT7H79F-50 (PMLN6087A) Standard Headset, with Microphone and Speaker (Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C)	Nemko 09 ATEX1114X Issue 2 (For Group II application)
MT1H7P3E2-07-51 (PMLN6089A) Headset Series, Tactical XP (Ambient temperature range: -20 °C ≤ T_a ≤ +40 °C)	Nemko 10 ATEX1029X Issue 2 (For Group I and II applications)
MT1H7F2-07-51 (PMLN6090A) Headset Series, Tactical XP (Ambient temperature range: -20 °C ≤ T_a ≤ +40 °C)	Nemko 10 ATEX1029X Issue 2 (For Group I and II applications)

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MT7H79P3E-50 (PMLN6092A) Standard Headset, with Microphone and Speaker (Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C)	Nemko 09 ATEX1114X Issue 2 (For Group II applications)
MT72H540P3E-50 (PMLN6333A) Headset with Microphone and Speaker, Twin cup (Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C)	Nemko 09 ATEX1119X Issue 2 (For Group II applications)
MT7H79B-50 (PMLN7531A) PELTOR Basic Headset Neckband (Ambient temperature range: -20 °C ≤ T_a ≤ +50 °C)	Nemko 09 ATEX1114X Issue 2 (For Group II applications)
MT1H7B2-07-51 (PMLN7535A) PELTOR Tactical Headset Neckband (Ambient temperature range: -20 °C ≤ T_a ≤ +40 °C)	Nemko 10 ATEX1029X Issue 2 (For Group I and II applications)
SAVOX HC-1 Ex (RMN5123A) Headset (Ambient temperature range: -20 °C ≤ T_a ≤ +55 °C)	listed in VTT15 ATEX 061 X Issue 1 (For Group II and III applications)
SAVOX HC-2 Ex (GMMN4580A) Headset (Ambient temperature range: -20 °C ≤ T_a ≤ +55 °C)	listed in VTT15 ATEX 061 X Issue 1 (For Group II and III applications)

to b) The earpiece type PMLN 7188A and type PMLN7188B can be connected to the 3.5 mm audio jack.

The accessories can only be connected or disconnected with the remote speaker microphone outside the potentially hazardous environment.

The ambient temperature range for the remote speaker microphone and the earpiece PMLN 7188A and PMLN7188B is -20 °C ≤ T_a ≤ +55 °C.

Reasons for this issue

- Manufacturer's address changed from Motorola Solutions Berlin to Motorola Solutions Krakow
- Update of the used standard IEC 60079-0:2011 to IEC 60079-0:2017
- Update of the CE marking label
- Update of the PMLN7188B label
- Additional regional flag label
- Change of the name of the encapsulation
- Add additional sources for electrical parts
- Change of the cable construction
- Documentation update

Listing of all components used referring to older standards
None

15.3 **Parameters**

15.3.1 Electrical data

15.3.1.1 Input parameter when the remote speaker microphone type PMMN4093A, PMMN4101A, PMMN4109A and PMMN4112A is used for Gb and Db (under 1 fault condition):

Max. Input voltage	U_i	8.4	V DC
Max. Input current	I_i	1.43	A
Max. Input power	P_i	2.83	W (linear characteristic)
Max. Internal effective capacitance	C_i	negligible	
Max. Internal effective inductance	L_i	120	uH

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15.3.1.2 Input Parameter when the remote speaker microphone type PMMN4094A, PMMN4100A, PMMN4110A and PMMN4111A is used for Gb and Db applications (under 1 fault condition):

Max. Input voltage	U_i	8.4	V
Max. Input current	I_i	2.2	A
Max. Input power	P_i	2.8	W (linear characteristic)
Max. Internal effective capacitance	C_i	negligible	
Max. Internal effective inductance	L_i	120	uH

15.3.1.3 Input Parameter when the remote speaker microphone type PMMN4094A, PMMN4100A, PMMN4109A, PMMN4110A, PMMN4111A, and PMMN4112A is used for Ma applications (under 2 fault conditions)

Max. Input voltage	U_i	8.4	V
Max. Input current	I_i	5.6	A
Max. Input power	P_i	2.8	W (linear characteristic)
Max. Internal effective capacitance	C_i	75	uF
Max. Internal effective inductance	L_i	120	uH

15.3.1.4 Input Parameter when the remote speaker microphone type PMMN4093A and PMMN4101A for Ma applications (under 2 fault conditions)

Max. Input voltage	U_i	8.4	V
Max. Input current	I_i	5.6	A
Max. Input power	P_i	2.8	W (linear characteristic)
Max. Internal effective capacitance	C_i	90	uF
Max. Internal effective inductance	L_i	120	uH

15.3.1.5 Remote speaker microphone has the following output parameters for Group I Ma, Group II Gb and Group III Db for:

15.3.1.5.1 Nexus Jack (under 2 fault conditions)

Max. Output voltage	U_o	7	V
Max. Output current	I_o	0.160	A
Max. Output power	P_o	0.275	W (linear characteristic)
Max. External capacitance	C_o	1	uF
Max. External inductance	L_o	1	mH

15.3.1.5.2 3.5mm Audio Jack (under 2 fault conditions)

Max. Output voltage	U_o	8.4	V
Max. Output current	I_o	0.142	A
Max. Output power	P_o	0.243	W (linear characteristic)
Max. External capacitance	C_o	1	uF
Max. External inductance	L_o	1	mH

15.3.2 Ambient Temperature Range $-20\ °C \leq T_a \leq +55\ °C$

15.3.3 IP protection grade RSM IP64/67 (EN/IEC 60079-0)

16 Report Number

BVS PP 15.2080 EU, as of 2024-10-10

17 Specific Conditions of Use

17.1 Connect and disconnect the Remote Speaker Microphones or the optional plug in accessories only outside the potentially hazardous area.

17.2 For group I application the connection of the Remote Speaker Microphones type PMMN4093A, PMMN4094A, PMMN4100A, PMMN4101A, PMMN4109A, PMMN4110A, PMMN4111A und PMMN4112A with the headsets type MT1H7P3E2-07-51 (PMLN6089A) and MT1H7F2-07-51 (PMLN6090A) are in the scope of this certification. The ambient temperature range for these headsets is -20 °C ≤ Ta ≤ +40 °C.

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17.3 The connection of the SAVOX HC-1 Ex (RMN5123A) und SAVOX HC-2 Ex (GMMN4580A) to the Remote Speaker Microphones type PMMN4093A, PMMN4094A, PMMN4100A, PMMN4101A, PMMN4109A, PMMN4110A, PMMN4111A und PMMN4112A is subject of this certificate.

17.4 The PMMN4093A, PMMN4094A, PMMN4100A, PMMN4101A, PMMN4109A, PMMN4110A, PMMN4111A, PMMN4112A, PMLN7188A, PMLN7188B and the accessories connected to the Nexus and 3.5mm jack are only protected to low risk of mechanical danger when used in Group I potentially hazardous area.

18 Essential Health and Safety Requirements

Met by compliance with the requirements mentioned in item 9.

19 Remarks and additional information

Drawings and documents are listed in the confidential report.

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Twin cup headset for UHF DMR Portable Radio

-

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[1] EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protected System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU.

[3] EU-Type Examination Certificate Number: **Nemko 09ATEX1119X** **Issue 5**

[4] Product: **Headset with microphone and speaker, twin cup.**

[5] Manufacturer: **3M Svenska AB**

[6] Address: **Malmstensgatan 19**
Box 2341
SE-33102 Värnamo
Sweden

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] Nemko Group AS, notified body number 0470, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report no. **PRJN-393177**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0: 2018, EN 60079-11: 2012

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

[11] This EU-Type Examination Certificate relates only to the technical design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate

[12] The marking of the product shall include the following:

II 2G **Ex ib IIC T4 Gb, Ta : -20°C to +50°C**

2023-02-16



Bernt Jonny Orderud
Certifier name

[13] Schedule

[14] EU-TYPE EXAMINATION CERTIFICATE No Nemko 09ATEX1119X Issue 5

[15] Description of Product:

The headset consists of two headphones and a microphone connected to a common plug (jack plug). This certificate covers two models, one with headband and one with helmet attachment.

Type Designations:
MT72H540A-50, MT72H540P3E-50

Intrinsic Safety Data
Ui: 14V, Ii: 450mA, Pi: 1,3W, Ci: Negligible, Li: 0,8mH

Ambient temperature:
-20°C to +50°C

Routine tests:
None.

[16] Report No. PRJN-393177

Descriptive Documents:

Number	Title	Rev	Date
P080137	Assembly Drawing MT72H540P3E-50	d	2023-01-19
P210148	Assembly Drawing MT72H540A-50	a	2023-01-19
P080139	Wiring Instruction MT72H540**-50	a	2008-02-22
P080436	Ex Label MT72H540P3E-50	f	2023-01-19
FP3768	Instruction Manual	d	Same as certificate

Certificate History and Associated Reports:

Issue	Date	Report No.	Description
0	2009-04-27	Nemko 126520	Prime Certificate released
1	2011-09-20	Nemko 187494	Increased the current in safety parameters for intrinsically safe connection and added a microphone, M01N-02.
2	2015-05-08	D0001834-0 / Nemko 284573	Update to new standards.
3	2018-10-04	D0001834-1 / Nemko 361471	Minor update of marking label and instructions due to PPE regulation 2016/425/EU.
4	2020-12-14	D0001834-02 / PRJN-200955-2020-PA-NOR	Update of datasheet for microphone and speaker. Model type MT72H540F-50 removed from certificate. Minor update of marking label and instructions manual. Upgrade to standard EN 60079-0: 2018.
5	2023-02-03	PRJN-393177	- Update of marking due to UKEX certification. - Included new variant of headset, MT72H540A-50. - Remove variant MT72H540F-50. - Minor updates of descriptive documents.

[17] Specific Conditions of Use:
Only for connection to a certified intrinsically safe circuit with a linear resistive output, that complies with the following values for the intrinsic safety parameters of MT72H540A-50 and MT72H540P3E-50:
Ui: 14V, Ii: 450mA, Pi: 1,3W, Ci: Negligible, Li: 0,8mH

[18] Essential Health and Safety Requirements:
Essential Health and Safety Requirements (EHSRs) are covered by the standards listed at item 9

[19] Remarks and additional Information:
None

EU DECLARATION

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EU Declaration of Conformity (DoC-16041400281-M)

This declaration of conformity is issued under the sole responsibility of the manufacturer. The object of the declaration is in conformity with the relevant Union harmonization legislation:

2014/53/EU Radio Equipment Directive (RED)
2014/34/EU Equipment for Explosive Atmospheres Directive (ATEX)
2012/19/EU Waste Electrical and Electronic Equipment Directive (WEEE)
2011/65/EU Restriction of Hazardous Substances Directive (RoHS)
2013/35/EU Electromagnetic Fields Directive (EMF)
2014/90/EU Marine Equipment Directive (MED)

Object of the Declaration: MOTOTRBO DP** Ex ATEX Portable Radios Series
DP4401 Ex, PBE502BEEx, 403-470MHz, TX 1W, plain
DP4801 Ex, PBE502HEGEx, 403-470MHz, TX 1W, full keypad, Display
National Licensed Frequencies Only

This DoC supersedes DOC-16041400281-L

Placed On The Market By: Motorola Solutions Systems Polska Sp. z o.o. , Ul.Czerwone Maki 82, 30-392 Krakow, Poland

Conformity is shown by compliance with the applicable requirements of the following standards:

EN 300 086 V2.1.2
EN 300 113 V2.2.1
EN 300 219 V2.1.1
EN 303 413 V1.1.1
EN 300 720 V2.1.1

EN 301 489-1 V2.2.3
EN 301 489-5 V2.1.1
EN 60945:2002-10

EN62368-1:2014 + AC: 2015 + A11: 2017
Compliant with the ICNIRP (1998) Occupational / Controlled Exposure Limits
EN 50566:2017

EN IEC 60079-0:2018, EN 60079-11:2012

Others:

TUV SUD DANMARK ApS, NB# 2443, has performed the type examination based on Module B of Marine Equipment Directive 2014/90/EU, Item MED/5.20 and issued the EC Type-examination certificate: DK-MED000154.
TUV SUD DANMARK ApS, NB# 2443, has undertaken the relevant assessment procedures based on Module D of Marine Equipment Directive 2014/90/EU, Item MED/5.20 and issued the Certificate: DK-MED005727-H1.

ATEX Notified Body Number 0158; DEKRA Testing, and Certification GmbH, Dinnendahlstr. 9, 44809 Bochum, Germany
EU Type Examination Certificate: BVS 12 ATEX E1117 X
ATEX classification: II 2G Ex ib IIC T4 Gb; II 2D Ex ib IIIC T130deg.C Db; I M2 Ex ib I Mb, Tamb.: -20°C to +55°C
For the combination of the radios and accessories, refer to the safety manual 68012007083 for the combined Ex rating

KRAKOW, 12-APR-2023

Elektronicznie podpisany przez Jacek Drabik
Data: 2023.04.17 13:48:27 +02'00'

Jacek Drabik
Country Manager Motorola Solutions Poland,
Ul.Czerwone Maki 82, 30-392 Krakow, Poland

Dr. Jeevan Kanesalingam
Product Safety and Regulatory Compliance,
Motorola Solutions Malaysia Sdn Bhd,
Plot 2A, 11900 Bayan Lepas, Penang, Malaysia

MOTOROLA SOLUTIONS

Rev. 1 Addendum to EU Declaration of Conformity (DoC-16041400281-M)

The listed accessories are approved for use with the object of this declaration.

PART NUMBER

AUDIO

PMLN6047A	PMLN6087A	PMLN6089A
PMLN6090A	PMLN6092A	PMLN6333A
PMLN7188B	PMLN7310ASP01	PMLN7531A
PMLN7535A	PMMN4067B	PMMN4094A
PMMN4110A		

BATTERY

NNTN8359A	NNTN8359C

BODYWORN

PMLN5610A	PMLN6086A	PMLN6096A
PMLN6097A	PMLN6098A	PMLN6099A

OTHERS

15012157001	PMAE4081A	PMAE4082A
PMAE4083A	PMAE4084A	PMAE4085A
PMLN6368A	PMLN6803A	

SOFTWARE

R02.22.01.0114 Codeplug version: 22.21.03

EU Declarations of Conformity are available at: https://www.motorolasolutions.com/emea-compliance

Declaration of Conformity

We, the undersigned Manufacturer:

Company	Jotron AS
Address	Ringdalskogen 8, 3270 Larvik
Country	Norway
Telephone number	+47 33139700
Telefax number	+47 33126780
E-mail	sales@jotron.com

Certify and declare under our responsibility that the following product(s):

Product Description	AIS Search and Rescue Transmitter
Manufacturer	Jotron AS
Brand Name	Jotron
MED - Number and item designation	MED/4.55 - Search and rescue locating devices (SRLD): AIS SART equipment
UK – Number and item designation	UK/4.55 - Search and rescue locating devices (SRLD): AIS SART equipment
Model/Type	Tron AIS-SART, Consist of; 82615 Battery SART20/AIS-SART 5 Year Maint.kit

Are tested to and conform with the following standards:

Standard	Issue date	Certificate No.
IEC 61097-14 Ed.1.0	2010	DK-MED000156 Issue 01 MEDD0000296 Rev.04 BABT-UKMA000059 Issue 1 MERD0000296 Rev.0
IEC 60945 ed.4.0 including IEC 60945 Corrigendum 1	2002 Corr. 2008	
IEC 63000	2018	
ISO 14001	2015	Certificate no. 901317
ISO 9001	2015	Certificate no. 900022
ISO 45001	2018	Certificate no. 907920
ISO 27001	2017	Certificate no. 904109

The product(s) also meet the requirements set out in the following SOLAS 74 Regulations and IMO Resolutions:

SOLAS 74 Reg. III/4
SOLAS 74 Reg. IV/14
SOLAS 74 Reg. III/6
SOLAS 74 Reg. III/26

SOLAS 74 Reg. IV/7
IMO Res. MSC.246(83)
ITU-R M.1371-5:2014

And therefore, complies with the essential requirements of the following directives:

Directive Name	Directive number	Further identification
MED	2014/90/EU	Directive 2014/90/EU repealing Directive 96/98/EC, Applies also to Implementing Regulation (EU)2023/1667
RoHS	2011/65/EU	Restriction of Hazardous Substances Applies also to Directive (EU) 2015/863

The product(s) are also in conformity with the relevant UK conformity approval and UK conformity mark for marine equipment:

Regulation Name	Regulation number
Merchant Shipping (Marine Equipment) Regulations 2016	SI 2016/1025 Applies also to MSN 1874(M+F) Amendment 8
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012	2012 No 3032

The following Notified Bodies have been consulted in the Conformity Assessment procedure (whenever applicable):

Notified Body number	Name and address	Directive
2443	TÜV SÜD DANMARK ApS Strandvejen 125 2900 Hellerup, Denmark	MED-B
0575	DNV AS P.O.Box 300 Veritasveien 1 1322 HOVIK, Norway	MED-D
0168	TÜV SÜD BABT, Octagon House, Concorde Way, Segensworth North, Fareham,Hampshire, PO15 5RL, UK	MER-B
0097	DNV UK LIMITED 30 Stamford Street, Vivo Building, London, SE1 9LQ, UK	MER-D

The technical documentation as required by the conformity assessment procedure is kept at the following address for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection:

Company	Jotron AS
Address	Ringdalskogen 8, 3270 Larvik
Country	Norway
Telephone number	+47 33139700

Telefax number	+47 33126780
Web page	jotron.com

	Drawn up in	Norway
	Date	28.02.2024
	Signature and company stamp:	Frank Løke, Certification Manager

CERTIFICAT ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ 認證證書 ◆ CERTIFICATE ◆ ZERTIFIKAT

DANAK
PROD Reg.No. 7035
Member of EA MLA

TÜV SÜD
Danmark

Marine Equipment Directive
EU Type Examination Module B Certificate

This is to certify that TÜV SÜD DANMARK ApS did undertake the relevant type approval procedures for the equipment identified below, which was found to be in compliance with the Marine Equipment Directive (2014/90/EU) requirements, under the following Implementing Regulation for the listed types of equipment

Implementing Regulation	**(EU)2022/1157**
Certificate Holder and Manufacturer	**Jotron AS** **Ringdalskogen 8** **3270 Larvik** **Norway**
Product(s)	**Tron AIS-SART**
Product Sector	**Navigation equipment**
Product Type	**MED/4.55 Search and rescue locating devices (SRLD):AIS SART equipment**

and on the basis of the Technical Data and information detailed in the Annex to this certificate.

Valid from: 23 May 2023 (Signature) M Hardy Expiry Date: 21 November 2027

This certificate has been issued in accordance with the TÜV SÜD Testing and Certification Regulations and constitutes page 1 of the combined Certificate and Annex.
The Conditions for the validity of this certificate are listed in the Annex.
For further details, related to this certification please contact BABT@tuvsud.com

2443

Issued by TÜV SÜD DANMARK ApS under document number: DK-MED000156 Issue 01 Page 1 of 3

Danmark

1 Equipment Description

AIS SART equipment

1.1 Models

Model
Tron AIS-SART

1.1.1 System Components

Model	Description
85037	Tron AIS-SART
82615	Battery SART20/AIS-SART 5 Year maint.kit (SAFT LSH 14 light)
82749	Wall Bracket

1.2 Software Note 1

Identity	Description
01.01.XX	Tron AIS-SART

2 Assessed Requirements

2.1 Implementing Regulation (EU)2022/1157

2.2 Compliance Requirements for MED/4.55

IMO Resolutions	International Testing Standards	
Resolution A694(17)	IEC 60945:2002 inc. Corr.1:2008	Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results
IMO Res.MSC.246(83)	IEC 61097-14:2010	Global maritime distress and safety system (GMDSS) - Part 14: AIS Search and Rescue Transmitter (AIS-SART) - Operational and performance requirements, methods of testing and required test results
ITU-RM.1371-5:2014		

3 Technical Documentation

3.1 Declaration of Conformity

12.04.2023_v.27_Tron AIS-SART_DoC Dated 2023-04-12

3.2 User Guide

User-Manual-Tron-AIS-SART 85355 Rev. H Dated 2021-11-22

3.3 Test Reports

3.3.1 IEC 60945:2002 inc. Corr.1:2008

126928/03	Dated	2009-11-09
Jotron Test report Tron AIS-SART	Dated	2009-07-06
Waiver of solar, oil and water	Dated	2009-08-22
Statement Tron AIS-SART - IEC 60945 § 6	Dated	2022-11-25

3.3.2 IEC 61097-14:2010

BSH/4615/4361270/09/S3140	Dated	2009-12-08
126928/03	Dated	2009-11-09
BSH/4543/001/4142886/15	Dated	2015-01-26

3.4 Build Status

3.4.1 Hardware

ais-sart-blockdiagram X-84201	Dated	2009-07-06
Mainboard Tron AIS SART – 84201	Dated	2006-04-05
KP-BTM-84202r1006	Dated	2007-08-10
KP-TOP-84202r1006	Dated	2007-08-10
84201SMDMainboardTronAISSART 221027-123301	Modified	2022-10-27

3.5 Notes

Note 1 This approval remains valid for equipment including subsequent minor software amendments which have been formally accepted in accordance with the TÜV SÜD Testing and Certification Regulations. XX in the software version denotes software changes which do not have an impact on this Type Approval

4 Conditions of Validity

This certificate ceases to be valid if the manufacturer makes any changes or modifications to the approved type of equipment, which have not been notified to, and agreed with TÜV SÜD DANMARK ApS or a person appointed by TÜV SÜD DANMARK ApS to perform that role.

During the period of validity of this certificate the applicable regulations (international conventions and relevant resolutions and circulars of the IMO) and testing standards of the Commission Implementing Regulation may change, therefore the product conformity may need to be re-assessed by TÜV SÜD DANMARK ApS.

The Mark of Conformity may only be affixed to the above type approved equipment and a manufacturer's Declaration of Conformity issued when the production-control phase module (D, E, or F) of the directive is fully complied with and controlled by a written inspection agreement with a notified body.

Signature: M Hardy (M J Hardy) Date: 23/05/2023

On behalf of TÜV SÜD DANMARK ApS

JOTRON
Performance for Life

Declaration of Conformity

We, the undersigned Manufacturer:

Company	Jotron AS
Address	Ringdalskogen 8, 3270 Larvik
Country	Norway
Telephone number	+47 33139700
Telefax number	+47 33126780
E-mail	sales@jotron.com

Certify and declare under our responsibility that the following product(s):

Product Description	Float free EPIRB (Emergency Position Indicating Radio Beacon)
Manufacturer	Jotron AS
Brand Name	Jotron
MED - Number and item designation	MED/5.6 - 406 MHz EPIRB (COSPAS-SARSAT)
UK – Number and item designation	UK/5.6 - 406 MHz EPIRB (COSPAS-SARSAT)
Model/Type	Tron 60AIS, Consist of: - 103170 Tron 60AIS with float free bracket - 103180 Tron 60AIS with manual bracket - 103570 Tron 60AIS SBM kit - 85621 Spare FB-60 Bracket with Protective cover - 86218 HRU-kit w/H20, HAMMAR hydrostatic release mechanism

Are tested to and conform with the following standards:

Standard	Issue date	Certificate No.	
IEC 61097-2 Ed.4.0	2021	TUV SUD - 75950996-07 TUV SUD - 75950996-09 (Annex D) Nemko - Report No. E21143.01	DK-MED000145 Issue 02
IEC 60945 ed.4.0 including IEC 60945 Corrigendum 1	2002 Corr. 2008	TUV SUD - 75950996-07 TUV SUD - 75950996-02	MEDD0000296 Rev.04
EN 60945 – Exposure Calculation Report	2002 Corr. 2008	TUV SUD - 75950996-11	BABT-UKMA000025 Issue 01
ETSI EN 301 489-1 V2.2.3	2019-11	TUV SUD - 75950996-02	MERD0000296 Rev.0
ETSI EN 301 489-19 V2.2.0	2020-09	TUV SUD - 75950996-02	
ETSI EN 300 330 V2.1.1	2017-02	TUV SUD - 75950996-06	
Cospas Sarsat T.007	2021	TUV SUD – 75950996-01	
FCC 47 CFR Part 80, Part 2, Part 15B	2019	TUV SUD - 75950996-03 TUV SUD - 75950996-04	

		TUV SUD - 75950996-05
ISED RSS-GEN Issue 5 and A1 + A2	2018 + 2019 + 2021	TUV SUD - 75950996-03 TUV SUD - 75950996-04 TUV SUD - 75950996-05
ISED RSS-182 Issue 5	2012	TUV SUD - 75950996-04
ISED RSS-287 Issue 2	2014	TUV SUD - 75950996-05
RTCM 11000.5	2021	TUV SUD - 75950996-10
IEC 63000	2018	
ISO 14001	2015	Certificate no. 901317
ISO 9001	2015	Certificate no. 900022
ISO 45001	2018	Certificate no. 907920
ISO 27001	2017	Certificate no. 904109

The product(s) also meet the requirements set out in the following SOLAS 74 Regulations and IMO Resolutions:

SOLAS 74 Reg. IV/14
SOLAS 74 Reg. X/3
SOLAS 74 Reg. IV/7
IMO Res. MSC.36(63)-(1994 HSC Code) 14
IMO Res. MSC.97(73)-(2000 HSC Code) 14
IMO Res A.662(16)
IMO Res. A.694(17)
IMO Res.MSC471(101)
IMO Res MSC/Circ 862
IMO COMSAR/Circ.32,
ITU-R M.633-4 (12/10)
ITU-R M.690-3 (03/15)

And therefore, comply with the essential requirements of the following directives:

Directive Name	Directive number	Further identification
MED	2014/90/EU	Directive 2014/90/EU repealing Directive 96/98/EC Applies also to Implementing Regulation (EU)2023/1667
RoHS	2011/65/EU	Restriction of Hazardous Substances Applies also to Directive (EU) 2015/863

The product(s) are also in conformity with the relevant UK conformity approval and UK conformity mark for marine equipment:

Regulation Name	Regulation number
Merchant Shipping (Marine Equipment) Regulations 2016	SI 2016/1025 Applies also to MSN 1874(M+F) Amendment 8
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012	2012 No 3032

The following Notified Bodies have been consulted in the Conformity Assessment procedure (whenever applicable):

Notified Body number	Name and address	Directive
0575	DNV AS P.O.Box 300 Veritasveien 1 1322 HOVIK, Norway	MED-D
2443	TÜV SÜD DANMARK ApS Strandvejen 125 2900 Hellerup, Denmark	MED-B
0168	TÜV SÜD BABT, Octagon House, Concorde Way, Segensworth North, Fareham,Hampshire, PO15 5RL, UK	MER-B
0097	DNV UK LIMITED 30 Stamford Street, Vivo Building, London, SE1 9LQ, UK	MER-D

The technical documentation as required by the conformity assessment procedure is kept at the following address for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection:

Company	Jotron AS
Address	Ringdalskogen 8, 3270 Larvik
Country	Norway
Telephone number	+47 33139700
Telefax number	+47 33126780
Web page	jotron.com

Drawn up in	Norway
Date	04.04.2024
Signature and company stamp:	Frank Løke, Certification Manager

CERTIFICAT ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ 認證證書 ◆ CERTIFICATE ◆ ZERTIFIKAT

DANAK
PROD Reg.No. 7035
Member of EA MLA

TÜV SÜD
Danmark

Marine Equipment Directive
EU Type Examination Module B Certificate

This is to certify that TÜV SÜD DANMARK ApS did undertake the relevant type approval procedures for the equipment identified below, which was found to be in compliance with the Marine Equipment Directive (2014/90/EU) requirements, under the following Implementing Regulation for the listed types of equipment

Implementing Regulation	**(EU)2022/1157**
Certificate Holder and Manufacturer	**Jotron AS** **Ringdalskogen 8** **3270 Larvik** **Norway**
Product(s)	**Tron 60AIS**
Product Sector	**Radiocommunications Equipment**
Product Type	**MED/5.6 406MHz EPIRB (Cospas-Sarsat)**

and on the basis of the Technical Data and information detailed in the Annex to this certificate.

Valid from: 04 May 2023 (Signature) Expiry Date: 30 June 2027

This certificate has been issued in accordance with the TÜV SÜD Testing and Certification Regulations and constitutes page 1 of the combined Certificate and Annex.
The Conditions for the validity of this certificate are listed in the Annex.
For further details, related to this certification please contact BABT@tuvsud.com

2443

Issued by TÜV SÜD DANMARK ApS under document number: DK-MED000145 Issue 02 Page 1 of 4

Danmark

1 Equipment Description

Float free EPIRB (Emergency Position Indicating Radio Beacon)

1.1 Models

Model
Tron 60AIS

1.1.1 Main Components Note 1, 2 & 3

Part No.	Description
103170	Tron 60AIS with float free bracket
103180	Tron 60AIS with manual bracket

1.1.2 Optional Components

Part No.	Description
103570	Tron 60AIS SBM kit
104204	Spare FB-60 Bracket with Protective cover
86218	HRU-kit w/H20, HAMMAR hydrostatic release mechanism

2 Assessed Requirements

2.1 Implementing Regulation (EU)2022/1157

2.2 Compliance Requirements for MED/5.6 Note 4

IMO Resolutions	International Testing Standards	
IMO Res. A.694(17)	IEC 60945 (2002) inc Corr.1 (2008)	General Requirements for Marine Navigation Equipment
IMO Res.MSC471(101) IMO Res MSC/Circ 862 IMO Res A.662(16) ITU-R M.633-4 (12/10) ITU-R M.690-3 (03/15)	IEC 61097-2 (2021) inc. Corr 1 (2021)	Global maritime distress and safety system (GMDSS) - Part 2: COSPAS-SARSAT EPIRB - Satellite emergency position indicating radio beacon operating on 406 MHz

3 Technical Documentation

3.1 Declaration of Conformity

Tron60AIS_DoC	Modified	2023-04-11

3.2 User Guide

Tron 60AIS Float-free EPIRB User Manual, Rev D	Modified	2021-10-22

3.3 Test Reports

3.3.1 IEC 61097-2 (2021) inc. Corr.1

E21143.01	Dated	2021-09-28
104751643LHD-001a Issue 1	Dated	2021-10-22
BSH/454.GNSS/TUVSUDLtd/6	Dated	2021-11-15
75960996-08 Issue 03	Dated	2022-03-31
75950996-09 Issue 01	Dated	2022-01-28
75950996-01 Issue 04	Dated	2021-12-15
75950996-07 Issue 02	Dated	2022-03-15
11-11, 2012-01-04	Dated	2012-01-04

3.3.2 IEC 60945 (2002) inc. Corr.1

75950996-07 Issue 02	Dated	2022-03-15
75950873-07 Issue 02	Dated	2022-03-15
E21042	Dated	2021-03-05
P109335	Dated	2021-03-01
75950996-02 Issue 02	Dated	2022-04-28
75950996-06 Issue 01	Dated	2022-01-11
75950996-11 Issue 01	Dated	2022-03-02

3.4 Build Status

3.4.1 Hardware

Hardware Version: Revision 2021		
Schematic:102920	Modified	2022-01-18
Statement Modification States	Dated	2022-02-11

3.4.2 Software [Note 5]

Tron 60AIS Software Version: Revision 1.2

3.5 Notes

Note 1 These units are tested and assessed to Class 2 temperature requirements.

Note 2 These units are supplied together with an auto-release housing (FB-60) or a manual bracket (MB-60).

Note 3 The MB-60 manual bracket is for protected/indoor use only.

Note 4 Marine COSPAS-SARSAT 406MHz EPIRBs form a distress alerting component of the Global Maritime Distress & Safety System (GMDSS). These beacons have been granted COSPAS-SARSAT Type Approval Certification; TAC No.351 and TAC No. 1351 dated 06 January 2022, and TAC No.375 and TAC No. 1375 dated 02 March 2023.

Note 5 This approval remains valid for equipment including subsequent minor software amendments which have been formally accepted in accordance with the TÜV SÜD Testing and Certification Regulations.

Danmark

4 Conditions of Validity

This certificate ceases to be valid if the manufacturer makes any changes or modifications to the approved type of equipment, which have not been notified to, and agreed with TÜV SÜD DANMARK ApS or a person appointed by TÜV SÜD DANMARK ApS to perform that role.

During the period of validity of this certificate the applicable regulations (international conventions and relevant resolutions and circulars of the IMO) and testing standards of the Commission Implementing Regulation may change, therefore the product conformity may need to be re-assessed by TÜV SÜD DANMARK ApS.

The Mark of Conformity may only be affixed to the above type approved equipment and a manufacturer's Declaration of Conformity issued when the production-control phase module (D, E, or F) of the directive is fully complied with and controlled by a written inspection agreement with a notified body.

Signature: T. J. Twynam Date: 2023-05-04

(Thomas J. Twynam)

On behalf of TÜV SÜD DANMARK ApS

EU Declaration of Conformity

Hereby manufacturer,

Thrane & Thrane A/S
Lundtoftegaardsvej 93 D
2800 Kgs. Lyngby
Denmark

declares that this DoC is issued under sole responsibility and that the following Radio Equipment

Model	Description	Part no.
SAILOR SP3540	SAILOR SP3540 VHF Survival Craft ATEX (GMDSS)	623540A

with the associated accessories

Model	Description	Part no.
SAILOR B3503	Primary Battery – Lithium	403503A
SAILOR B3504	Secondary Battery – Rechargeable Li-Ion	403504A
SAILOR CH3505	Compact Charger	403505A
SAILOR CH3507	Single Position Charger ATEX	403507B
SAILOR CH3508	Dual Position Charger ATEX	403508B
	AC/DC Adapter	88-125538
TT-3595A	SAILOR 3595 Hand Microphone ATEX	403595A

are in conformity with the **Marine Equipment Directive 2014/90/EU** – under Implementing Regulation **(EU)2023/1667** including Compliance Requirements for **MED/5.17**.

The equipment complies with:

SOLAS 74 as amended, Regulation III/6, IV/14,X/3
IMO Res. MSC.36(63)-(1994 HSC code) 8
IMO Res. MSC.36(63)-(1994 HSC code) 14
IMO Res. MSC.97(73)-(2000 HSC code) 8
IMO Res. MSC.97(73)-(2000 HSC code) 14
IMO Res.A.694(17)
IMO Res.A.809(19)
IMO Res. MSC.149(77)
ITU-R M.489-2 (10/95)
EN 60945 (2002) incl. IEC 60945 Corr. 1 (2008)
ETSI EN 300 225 V1.5.1 (2015-12)
ETSI EN 301 843-2 v2.2.1 (2017-11)
EN 61097-12 (1996) + A1:2017

Module B
Certified by TÜV SÜD DANMARK Aps with Notified Body number 2443 – Certificate number DK-MED0000162 Issue 1
Expiry date: 27 September 2028

Module D
QS Certificate of Assessment - EC by DNV Notified Body number 0575 – Certificate number MEDD000002Z
Expiry date: 15 December, 2025

Place and date

Aalborg, 21 May 2024

Program Director R&D
Peter Haslev

Document no.: 99-153102-M

Thrane & Thrane A/S trading as Cobham Satcom. Registered no.: DK - 65 72 46 18. Registered address: Lundtoftegaardsvej 93 D, 2800 Kgs. Lyngby, Denmark
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EU Declaration of Conformity

3M DECLARES THAT THE EQUIPMENT DESCRIBED HEREAFTER IS IN CONFORMITY WITH THE FOLLOWING EUROPEAN DIRECTIVES.

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Type of product/model **HEADSET, TWIN CUP, HEADBAND MT72H540A-50 (7100271680 / UU011743018)**

Manufacturer and additional information

3M Svenska AB

Box 2341, Malmstensgatan 19, SE 331 02, Värnamo, Sweden

Telephone No: +46 (0)370 69 42 00, Telefax No: +46 (0)370 151 30

Production facility

3M Svenska AB

Box 2341, Malmstensgatan 19, SE 331 02, Värnamo, Sweden

Directive(s)

EMC (Electromagnetic compatibility)

(EN) The EMC Directive sets requirements for electromagnetic emission and immunity limits for electric/electronic products liable to generate electromagnetic disturbance, or the performance of which are liable to be affected by such disturbance.

This equipment is in conformity with the provisions of directive **2014/30/EU** and, where such is the case, with the harmonized standards or in other technical specifications No. **EN 55032:2015+A11:2020+A1:2020, EN IEC 61000-6-2:2019**.

ATEX (Equipment and protective systems intended for use in potentially explosive atmospheres)

(EN) ATEX applies to all kind of, electrical or non-electrical equipment, machines and industrial installations, placed in potential explosive atmospheres.

This equipment is in conformity with the provisions of directive **2014/34/EU** and, where such is the case, with the harmonized standards or in other technical specifications No. **EN 60079-11:2012, EN IEC 60079-0:2018**.

The notified body **NEMKO Group AS (Notified Body No. 0470)** performed the EU type-examination and issued the EU type-examination certificate **09ATEX1119X**.

RoHS (Restriction of the use of certain hazardous substances)

(EN) The object of the declaration described above is in conformity with Directive **2011/65/EU** of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

To meet the Directive **2011/65/EU**, risk assessments have been conducted according to the harmonized standard **EN IEC 63000:2018**.

PPE (Personal Protective Equipment)

(EN) The PPE Regulation applies to personal protective equipment, equipment designed and manufactured to be worn or held by a person for protection against one or more risks to that person's health or safety.

The PPE of this declaration is in conformity with the provisions of Council Regulation **2016/425** and harmonized standard(s) No. **EN 352-1:2020, EN 352-6:2020**.

The notified body **Allgemeine Unfallversicherungsanstalt - Sicherheitstechnische Prüfstelle (Notified Body No. 0511)** performed the EU type examination and issued the EU type examination certificate **2022-6151**. The PPE is subject to the conformity assessment procedure based on quality assurance of the production process (Module D) under surveillance of the notified body **SGS FIMKO OY (Notified Body No. 0598)**.

Notified bodies

NEMKO Group AS (Notified Body No. 0470), Philip Pedersens vei 11, 1366, Lysaker, Norway

Allgemeine Unfallversicherungsanstalt - Sicherheitstechnische Prüfstelle (Notified Body No. 0511), Vienna Twin Towers Wienerbergstrasse 11, A-1100, Wien, Austria

SGS FIMKO OY (Notified Body No. 0598), Takomotie 8, 00380, HELSINKI, Finland

Värnamo, October 6, 2024



Pär Rundqvist, Regulatory teamlead and specialist

1.2
-
EQUIPMENT
MANUFACTURER
USER MANUALS

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MOTOROLA SOLUTIONS

MOTOTRBO™

PROFESSIONAL DIGITAL TWO-WAY RADIO

DP4801 Ex, DP4401 Ex Portable Radio User Guide

FEBRUARY 2024

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Legal and Support

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Customers or end users in EU and UK countries should contact their local equipment supplier representative or service center for information about the waste collection system in their country.

Disclaimer

Please note that certain features, facilities, and capabilities described in this document may not be applicable to or licensed for use on a specific system, or may be dependent upon the characteristics of a specific mobile subscriber unit or configuration of certain parameters. Please refer to your Motorola Solutions contact for further information.

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Legal and Compliance Statements

Important Safety Information

RF Energy Exposure and Product Safety Guide for Portable Two-Way Radios

CAUTION:
This radio is restricted to Occupational use only. Before using the radio, read the RF Energy Exposure and Product Safety Guide that comes with the radio. This guide contains operating instructions for safe usage, RF energy awareness, and control for compliance with applicable standards and regulations.

Warranty and Service Support

Limited Warranty

MOTOROLA SOLUTIONS COMMUNICATION PRODUCTS

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Motorola Solutions, Inc. ("Motorola Solutions") warrants the Motorola Solutions manufactured Communication Products listed below ("Product") against defects in material and workmanship under normal use and service for a period of time from the date of purchase as scheduled below:

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8. Rechargeable batteries if the damage or defect is caused by charging or using the battery in equipment or service other than the Product for which it is specified.
9. Freight costs to the repair depot.
10. A Product which, due to illegal or unauthorized alteration of the software/firmware in the Product, does not function in accordance with Motorola Solutions published specifications or the FCC certification labeling in effect for the Product at the time the Product was initially distributed from Motorola Solutions.

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This Warranty is governed by the laws of the State of Illinois, U.S.A.

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Our goods come with guarantees that cannot be excluded under the Australia Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Motorola Solutions Australia's limited warranty above is in addition to any rights and remedies you may have under the Australian Consumer Law. If you have any queries, please call Motorola Solutions Australia at 1800 457 439. You may also visit our website: http://www.motorolasolutions.com/XA-EN/Pages/Contact_Us for the most updated warranty terms.

Chapter 1

Read Me First

This user guide covers the basic operations of the radio models offered in your region.

Notations Used in This Manual

Throughout the text in this publication, you notice the use of **Warning**, **Caution**, and **Notice**. These notations are used to emphasize that safety hazards exist, and the care that must be taken or observed.

WARNING: An operational procedure, practice, or condition, and so on, which may result in injury or death if not carefully observed.

CAUTION: An operational procedure, practice, or condition, and so on, which may result in damage to the equipment if not carefully observed.

NOTE: An operational procedure, practice, or condition, and so on, which is essential to emphasize.

Special Notations

The following special notations are used throughout the text to highlight certain information or items:

Table 1: Special Notations

Example	Description
Menu key or **PTT** button	Bold words indicate a name of a key, button, or soft menu item.
Your radio shows `Bluetooth On`.	Typewriter words indicate the MMI strings or messages displayed on your radio.
<required ID>	The courier, bold, italic, and angle brackets indicate user input.
Setup → Tone → All Tones	Bold words with the arrow in between indicate the navigation structure in the menu items.

Feature and Service Availability

Your dealer or administrator may have customized your radio for your specific needs.

NOTE:

- Not all features in the manual are available in your radio. Contact your dealer or administrator for more information.

You can consult your dealer or system administrator about the following:

- What are the functions of each button?
- Which optional accessories may suit your needs?
- What are the best radio usage practices for effective communication?
- What maintenance procedures promote longer radio life?

1.1

Software Version

All the features described in the following sections are supported by the software version:

R02.24.01.1000 or later.

Contact your dealer or administrator for more information.

Chapter 2

Introduction

This user guide is written as per the highest tier model offered to the region.

The following table describes ways to access features for different radio models. You receive different indications depending on the radio model.

Table 2: The Feature Access and Indications of Different Radio Model

	Full Keypad	Non-Keypad
Radio Model	**Figure 1: DP4801 Ex** 	**Figure 2: DP4401 Ex** 
Feature Access	• Menu • Programmable Button	Programmable Button
Feature Indication	• Tone • LED indicator • Display • Voice Announcement or Text-to-Speech	• Tone • LED indicator • Voice Announcement or Text-to-Speech

NOTE: To understand which feature is available with the **Programmable Button**, you can refer to the Programmable Buttons on page 24 topic.

Chapter 3

Radio Care

This section describes the basic handling precaution of the radio.

Table 3: IP Specification

IP Specification	Description
IP67	Allows your radio to withstand adverse field conditions such as being submersed in water between 15 cm and 1 m for 30 minutes or dust tight for 2–8 hours.

CAUTION: Do not disassemble your radio. This could damage radio seals and result in leak paths into the radio. Radio maintenance should only be done in service depot that is equipped to test and replace the seal on the radio.

- If your radio has been submersed in water, shake your radio well to remove any water that may be trapped inside the speaker grille and microphone port. Trapped water could cause decreased audio performance.
- If your radio's battery contact area has been exposed to water, clean and dry battery contacts on both your radio and the battery before attaching the battery to radio. The residual water could short-circuit the radio.
- If your radio has been submersed in a corrosive substance (for example, saltwater), rinse radio and battery in fresh water then dry radio and battery.
- To clean the exterior surfaces of your radio, use a diluted solution of mild dishwashing detergent and fresh water (for example, one teaspoon of detergent to one gallon of water).
- Never poke the vent (hole) located on the radio chassis below the battery contact. This vent allows for pressure equalization in the radio. Doing so may create a leak path into radio and your radio's submersibility may be lost.
- Never obstruct or cover the vent, even with a label.
- Ensure that no oily substances come in contact with the vent.
- Your radio with antenna attached properly is designed to be submersible to a maximum depth of 1 m (3.28 ft) and a maximum submersion time of 30 minutes. Exceeding either maximum limit or use without antenna may result in damage to your radio.
- When cleaning your radio, do not use a high pressure jet spray on radio as this will exceed the 1 m depth pressure and may cause water to leak into your radio.

Chapter 4

Getting Started

This chapter provides instructions on how to prepare your radio for use.

4.1 Charging the Battery

For best performance, your radio is powered by a Motorola Solutions-approved Lithium-Ion (Li-Ion) battery.

Prerequisites: Turn off your radio when charging.

Procedure:

- To avoid damage and comply with warranty terms, charge the battery using a Motorola Solutios charger exactly as described in the charger user guide.
- Charge your battery only in non-hazardous areas. After battery is charged, allow your radio to rest for at least 3 minutes.
- If battery is attached to your radio, ensure that your radio remains powered off while charging.
- Charge a new battery 14 to 16 hours before initial use for best performance.
- Always charge your IMPRES battery with an IMPRES charger for optimized battery life and valuable battery data.

  IMPRES batteries charged exclusively with IMPRES chargers receive a 6-month capacity warranty extension over the standard Motorola Solutions Premium battery warranty duration.

4.2 Attaching the Battery

Procedure:

1. Align the battery with the rails on the back of the radio.
2. Press the battery firmly, and slide upwards until the latch snaps into place.
3. Slide battery latch into lock position.

Postrequisites:

NOTE:
If the radio is attached with the wrong battery, your radio shows the following indications:

- A low pitched warning tone sounds.
- The red LED blinks.
- The display shows `Wrong Battery`
- The Voice Announcement or Text-to-Speech sounds if loaded using CPS.

If the radio is attached with an unsupported battery, your radio shows the following indications:

- An alert tone sounds.
- The display shows `Unknown Battery`.
- Battery icon is disabled.

The certification of the radio is voided if you attach a UL battery to an FM approved radio or vice versa.

If your radio is attached with an unsupported, wrong, or unrecognized battery, immediately swap with the correct battery.

4.3 Removing the Battery

Prerequisites: Ensure that your radio is turned off.

Procedure:

Move the battery latch into unlock position and hold, and slide the battery down and off the rails.

4.4 Attaching the Antenna

Procedure:

1. Set the antenna in the receptacle.
2. Turn the antenna clockwise.

NOTE: Fastening the antenna blocks water and dust from entering the radio.

CAUTION: To prevent damages, replace the faulty antenna with only MOTOTRBO antennas.

4.5 Removing the Antenna

Procedure:

1. Turn the antenna counterclockwise.
2. Remove the antenna from the receptacle.

4.6
Attaching the Belt Clip

Procedure:

1. Align the grooves on the clip with the grooves on the battery.
2. Press the belt clip downward until you hear a click sound.

4.7
Removing the Belt Clip

Procedure:

1. Press the belt clip tab away from the battery using a key.
2. Slide the clip upward and away from the radio.

4.8
Attaching the Universal Connector Cover

Procedure:

1. Insert the slanted end of the cover into the slots above the universal connector.
2. Press downwards on the cover to seat the cover properly on the universal connector.
3. Secure the connector cover to the radio by turning the thumbscrew clockwise.

4.9
Removing the Universal Connector Cover

Procedure:

1. Turn the thumbscrew counterclockwise.
2. Slide the connector cover up and out of the slanted end of the universal connector.

Postrequisites: Replace the dust cover when the universal connector is not in use.

4.10
Turning the Radio On

Procedure:

Turn the **On/Off/Volume** knob clockwise until a click sounds.

Result:
If your radio is turned on, your radio shows the following indications:

- A tone sounds.

  NOTE: If the Tones/Alerts function is disabled, no tone sounds.

- The green LED illuminates.
- The Home screen lights up.

- If voice announcement type is set to **Voice Announcement (VA)**, the Power Up Status Announcement is enabled and Voice Announcement File is attached, the voice announcement sounds the battery level, and other service announcements.
- If voice announcement type is set to **Text-to-Speech (TTS)**, and the Power Up Status Announcement is enabled, the voice announcement sounds the battery level, radio alias, and other service announcements.

NOTE:
If your radio fails to turn on although your battery is charged and properly attached, contact your dealer for assistance.

4.11 Turning the Radio Off

Procedure:

Turn the **On/Off/Volume** knob counterclockwise until a click sounds.

Result: The display shows `Powering Down`.

4.12 Adjusting the Volume

Procedure:

Perform one of the following actions:

- To increase the volume, turn the **On/Off/Volume** knob clockwise.
- To decrease the volume, turn the **On/Off/Volume** knob counterclockwise.

NOTE:
Your radio can be programmed to have a minimum volume offset where the volume level cannot be lowered past the programmed minimum volume.

Chapter 5

Radio Overview

Radio overview explains the buttons, icons, and LED indications of your radio.

Figure 3: Full Keypad Model



Table 4: Callout Legend

Label	Button Name	Description
1	Channel Selector knob	To select channel.
2	On/Off/Volume knob	To turn your radio on or off and adjust volume.
3	LED Indicator	The red, green, and orange light-emitting diodes indicate operating status.
4, 6	Side buttons	These buttons are field programmable using the Customer Programming Software (CPS).
5	Push-To-Talk (PTT) button	To execute voice operations (for example, Group Call and Private Call).
7	Menu Navigation buttons	Five buttons to provide menu navigation and selection interface.
8	Keypad	Twelve keys that allow the user to input characters for various text-based operations.

Label	Button Name	Description
9	Liquid Crystal Display (LCD)	132 x 90 highly transflective color display provides visual information about many radio features.
10	Microphone	Allows the voice to be sent when PTT or voice operations are activated.
11	Speaker	Outputs all tones and audio that are generated by the radio (for example, features like keypad tones and voice audio).
12	Universal Connector	Interface point for all accessories to be used with the radio. It has 12 points to which specific accessories will connect and be activated.
13	Emergency button	To turn on and off the Emergency Operations.
14	Antenna	Provides the needed RF amplification when transmitting or receiving.

Figure 4: Non-Keypad Model



Table 5: Callout Legend

Label	Button Name	Description
1	Channel Selector knob	To select channel.
2	On/Off/Volume knob	To turn your radio on or off and adjust volume.
3	LED Indicator	The red, green, and orange light-emitting diodes indicate operating status.

Label	Button Name	Description
4, 6	Side buttons	These buttons are field programmable using the Customer Programming Software (CPS).
5	Push-To-Talk (PTT) button	To execute voice operations (for example, Group Call and Private Call).
7	Microphone	Allows the voice to be sent when PTT or voice operations are activated.
8	Speaker	Outputs all tones and audio that are generated by the radio (for example, features like keypad tones and voice audio).
9	Universal Connector	Interface point for all accessories to be used with the radio. It has 12 points to which specific accessories will connect and be activated.
10	Emergency button	To turn on and off the Emergency Operations.
11	Antenna	Provides the needed RF amplification when transmitting or receiving.

5.1

Keypad Overview

Figure 5: Keypad Overview

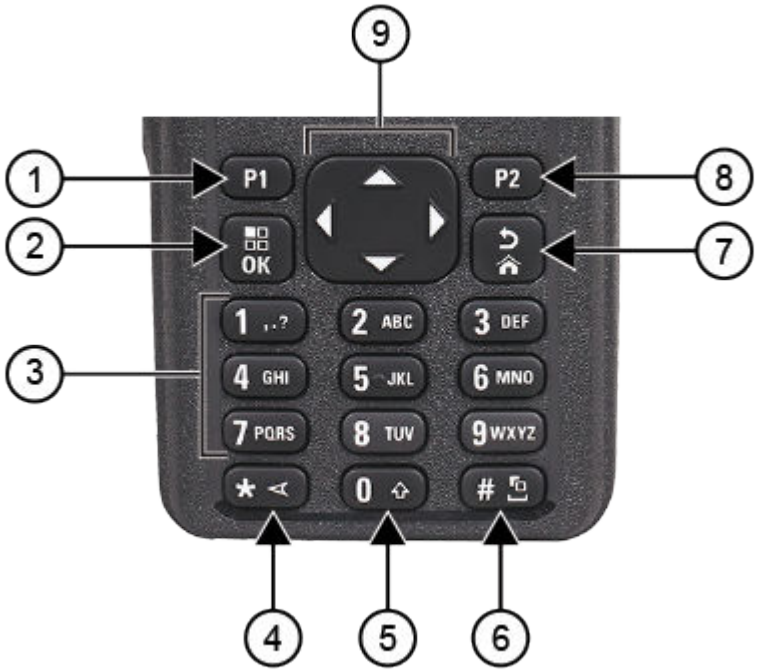


Table 6: Keypad Overview

Label	Button Name	Description
1	Programmable Button 1 (P1)	This button is field programmable using the Customer Programming Software (CPS).
2	Menu/OK button	Press to access Menu feature.
		In the menu, use this key to select.
3	Number keys	Press these keys repeatedly until the desired letter, number, punctuation, or symbol appears.
4	* or delete key	During numeric entry, press this key to enter *.
		During text entry, press this key to delete a character.
5	0 key	Press to enter 0.
		Press and hold to enable or disable Caps Lock.
6	# or space key	During numeric entry, press this key to enter #.
		During text entry, press this key to insert a space.
		Press and hold this key to change text entry method.
7	Back/Home button	Press to return to previous screen.
		Press and hold to return to home screen.
8	Programmable Button 2 (P2)	This button is field programmable using the CPS.
9	4-Way Navigation buttons	Press up, down, left, and right to navigate through your options.

5.2 Programmable Buttons

You can program the programmable buttons as shortcuts to the following radio functions through Customer Programming Software (CPS).

NOTE: Contact your dealer for more information.

Table 7: Assignable Radio Functions

Function	Description
Acoustic Feedback (AF) Suppressor	Allows you to toggle the AF Suppressor feature to on or off.
All Alert Tones	Allows you to toggle all tones and alerts to on or off.
Audio Profiles	Allows you to select the preferred audio profiles.
Audio Routing	Allows you to toggle the audio routing between internal and external speakers.
Backlight	Allows you to toggle the display backlight to on or off.

Function	Description
Backlight Brightness	Allows you to adjust brightness level.
Battery Indicator	Allows you to check the current status of the battery level.
Brightness	Allows you to adjust the brightness level.
Call Forwarding	Allows you to toggle the Call Forwarding to on or off.
Call Log	Allows you to select the call log list.
Cancel	Allows the user to cancel an ongoing call, if call type is Group Call, then only call initiator can use this button to cancel an ongoing call; if call type is Private Call, then both the call initiator and receiver can use this button to cancel an ongoing call.(applicable to Display model only).
Channel Announcement	Allows you to play zone and channel announcement voice messages in the current channel.
Contacts	Provides direct access to the contacts list.
Display Mode	Allows you to toggle to day or night mode
Emergency Off	Allows you to terminate an outgoing emergency call.
Emergency On	Allows you to set up an emergency call.
GNSS (Global Navigation Satellite System (GNSS) On or Off	Allows you to toggle the satellite navigation system on or off.
Intelligent Audio	Allows you to toggle intelligent audio to on or off.
Job Ticket	Allows you to access the Job Tickets folder.
Keypad Lock	Allows you to toggle the keypad to lock or unlock.
Manual Dial	Allows you to initiate Private Call by entering the subscriber ID.
Manual Site Roam	Allows you to start the manual site search.
Mic AGC	Allows you to toggle the internal microphone automatic gain control (AGC) to on or off.
Monitor	Allows you to monitor a channel.
Mute Mode	Allows you to turn Mute Mode on or off.
Notifications	Allows you to direct access to the notification list.
Nuisance Delete	Allows you to temporarily remove an unwanted channel from the scan list, except the Selected Channel. The nuisance deleted channel will be restored into the scan list, for instance, when radio is powered off and back on again.
One Touch Access	Allows you to direct access to the predefined call features.

Function	Description
Option Board Feature	Allows you to toggle the option board feature(s) to enable or disable the option board-enabled channels.
Permanent Monitor	Allows you to monitor a selected channel for all radio traffic until function is disabled.
Phone	Allows you to direct access to the phone contact list.
Phone Exit	Allows the user to terminate a phone call (applicable to Non-Display or Numeric Display model, Digital mode only).
Power Level	Allows you to toggle the transmit power to high or low.
Privacy	Allows you to toggle the privacy to on or off.
Radio Check	Allows you to check if the radio is active in the system.
Radio Enable or Disable	Allows a target radio to be remotely enabled or disabled.
Radio Name	Displays the radio alias on the radio display.
Remote Monitor	Allows you to turn on the microphone of a target radio without giving any indications.
Repeater or Talkaround	Allows you to toggle between using a repeater and directly communicating with another radio.
Reset Home Channel	Allows you to select a new home channel.
Scan	Allows you to toggle the scan to on or off.
Silence Home Channel Reminder	Allows you to mute the Home Channel Reminder.
Site Info	Allows you to view the current Capacity Max or Other Systems site name and ID.
Site Lock	Allows you to enable the site lock to search only in current site or disable the site lock to search in other sites as well.
Status	Allows you to select the status list menu.
Telemetry Control	Allows you to control the output pin on a local or remote radio.
Text Message	Allows you to select the text message menu.
Toggle Call Priority Level	Allows you to enable your radio to enter Call Priority Level High or Normal.
Transmit Interrupt	Allows you to stop an on-going voice call by dekeying the transmitting radio or terminate the repeater call hang time in order to free up the channel. This button can also be used to end a Remote Monitor session.
Trill Enhancement	Allows you to toggle the trill enhancement to on or off.

Function	Description
Unassigned	Indicates that the button function has not yet assigned.
Voice Announcement	Allows you to toggle the voice announcement to on or off.
Voice Operating Transmission (VOX)	Allows you to toggle the VOX to on or off.
Zone Selection	Allows you to select from a list of zones.
Zone Toggle	Allows you to switch between 2 zones.

5.3
Icons

Icons are only available for radio with display.

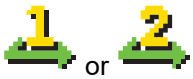
Your radio display shows the radio status, text entries, and menu entries.

5.3.1
Display Icons

The following icons appear on the status bar at the top of the radio display. The icons are arranged left most in order of appearance or usage, and are channel-specific.

Table 8: Display Icons

Icon	Description
	Battery
	Call Log
	Contact
	DGNA
	Emergency
	GNSS Available
	GNSS Not Available
	High Volume Data
	Message

Icon	Description
	Monitor
	Mute Mode
	Notification
	Option Board
	Option Board Non-Function
	Over-the-Air Programming Delay Timer
	Power Level
 or	Priority Talkgroup 1 or 2
	Received Signal Strength Indicator (RSSI)
	Response Inhibit
	Ring Only
	Scan [1]
 or	Scan Priority 1 or 2 [1]
	Service & Support
	Shared Frequency
	Sign In to Remote Server[2]
	Sign Out from Remote Server[2]
	Secure

[1] Not Applicable in Capacity Plus.
[2] Only available for Full Keypad.

Icon	Description
	Silent Ring
	Site Roaming [3]
	Status
	Talkaround [1]
	Tones Disable
	Unsecure
	Vote Scan

5.3.2
Advanced Menu Icons

The following icons appear beside menu items that offer a choice between two options or as an indication that there is a sub-menu offering two options.

Table 9: Advanced Menu Icons

Icon	Description
	Checkbox (Checked)
	Checkbox (Empty)
	Solid Black Box

5.3.3
Call Icons

The following icons appear on the display during a call. These icons also appear in the Contacts list to indicate alias or ID type.

[3] Not applicable in Capacity Plus-Single-Site.

Table 10: Call Icons

Icon	Description
	Call Priority High
	DGNA Call
	Group Call/All Call
	Phone Call as Group or All Call
	Phone Call as Private Call
	Private Call

5.3.4

Job Tickets Icons

The following icons appear momentarily on the display in the Job Ticket folder.

Table 11: Job Ticket Icons

Icon	Description
	All Jobs
	New Jobs
	In Progress
	Send Failed
	Sent Successfully
	Priority 1
	Priority 2

Icon	Description
	Priority 3

5.3.5

Mini Notice Icons

The following icons appear momentarily on the display after an action to perform a task is taken.

Table 12: Mini Notice Icons

Icon	Description
	Failed Transmission (Negative)
	Successful Transmission (Positive)
	Transmission in Progress (Transitional)

5.3.6

Sent Items Icons

The following icons appear at the top right corner of the display in the Sent Items folder.

Table 13: Sent Item Icons

Icon	Description
	In Progress
	Individual or Group Message Read
	Individual or Group Message Unread
	Send Failed
	Sent Successfully

5.4

LED Indications

The LED Indicator shows the operational status of your radio.

A qualified technician can permanently disable the LED indication by preprogramming it.

Table 14: LED Indications

Indication	Status
Blinking Red	• The radio is indicating a battery mismatch. • The radio has failed the self-test upon powering up. • The radio is receiving an emergency transmission. • The radio is transmitting in low battery state. • The radio has moved out of range if Auto-Range Transponder System is configured. • Mute Mode is enabled.
Solid Yellow	• The radio is in Bluetooth Discoverable Mode. • The radio is monitoring a conventional channel. • Indicates fair battery capacity when the programmed **Battery Indicator** button is pressed.
Blinking Yellow	• The radio has yet to respond to a Call Alert. • The radio is scanning for activity. • All Capacity-Plus–Multi-Site channels are busy.
Double Blinking Yellow	• The radio has Auto Roaming enabled. • The radio is actively searching for a new site. • The radio has yet to respond to a Group Call Alert. • The radio is locked. • The radio is not connected to the repeater while in Capacity Plus. • All Capacity-Plus channels are busy.
Solid Green	• The radio is powering up. • The radio is transmitting. • The radio is sending a Call Alert or an emergency transmission. • Indicates full battery capacity when the programmed **Battery Indicator** button is pressed.
Blinking Green	• The radio is receiving a call or data. • The radio is retrieving the Over-the-Air Programming transmissions. • The radio is detecting activity over the air. **NOTE:** The activity may or may not affect the programmed channel of the radio due to the nature of the digital protocol.
Double Blinking Green	The radio is receiving a privacy-enabled call or data.

Chapter 6

System Overview

System overview explains what type of systems and modes available in the radio.

6.1 Capacity Max

Capacity Max is MOTOTRBO control channel based trunked radio system.

MOTOTRBO digital radio products are marketed by Motorola Solutions primarily to business and industrial users. MOTOTRBO uses the European Telecommunications Standards Institute (ETSI) Digital Mobile Radio (DMR) standard, that is, two-slot Time Division Multiple Access (TDMA), to pack simultaneous voice or data in a 12.5 kHz channel (6.25 kHz equivalent).

6.2 Other Systems

Other Systems include Conventional Analog and Digital modes, IP site connect, and Capacity Plus.

6.2.1 Conventional Analog and Digital Modes

Each channel in your radio can be configured as a conventional analog or conventional digital channel.

Certain features are unavailable when switching from digital to analog mode and analog to digital mode, whereas some are available in both.

There are minor differences on how each feature works but they do not affect the performance of your radio.

6.2.2 IP Site Connect

This feature allows your radio to extend conventional communication beyond the reach of a single site by connecting to different available sites by using an Internet Protocol (IP) network. This is a conventional multi-site mode.

When the radio moves out of range from one site and into the range of another, the radio connects to the repeater of the new site to send or receive calls or data transmissions. This is done either automatically or manually depending on your settings.

In an automatic site search, the radio scans through all available sites when the signal from the current site is weak or when the radio is unable to detect any signal from the current site. The radio then locks on to the repeater with the strongest Received Signal Strength Indicator (RSSI) value.

In a manual site search, the radio searches for the next site in the roam list that is currently in range but which may not have the strongest signal and locks on to the repeater.

NOTE: Each channel can only have either Scan or Roam enabled, not both at the same time.

Channels with this feature enabled can be added to a particular roam list. The radio searches the channels in the roam list during the automatic roam operation to locate the best site. A roam list supports a maximum of 16 channels, including the selected channel.

NOTE: You cannot manually add or delete an entry in the roam list. Contact your dealer for more information.

6.2.3
Capacity Plus

Capacity Plus is a cost effective and entry-level digital trunked system. It expands the capacity and extends the coverage for single and multi-sites. The single and multi-sites dynamic trunking offers better capacity and coverage.

NOTE: If you try to access a feature not applicable to Capacity Plus–Single-Site or Capacity Plus–Multi-Site by using a programmable button, you hear a negative indicator tone.

Capacity Plus–Single-Site

Capacity Plus–Single-Site is a single-site trunking configuration of the MOTOTRBO radio system, which uses a pool of channels to support hundreds of users and up to 254 groups.

This configuration allows your radio to efficiently utilize the number of available programmed channels while in Repeater Mode.

Your radio also has features that are available in conventional digital mode, IP Site Connect, and Capacity Plus.

Capacity Plus–Multi-Site

Capacity Plus–Multi-Site is a multi-channel trunking configuration of the MOTOTRBO radio system, combining the best of both Capacity Plus and IP Site Connect configurations. It is also known as Linked Capacity Plus.

It allows your radio to extend trunking communication beyond the reach of a single site, by connecting to different available sites which are connected with an IP network. It also provides an increase in capacity by efficiently utilizing the combined number of available programmed channels supported by each of the available sites.

When your radio moves out of range of one site and into the range of another, it connects to the repeater of the new site to send or receive calls or data transmissions. Depending on your settings, this is done automatically or manually.

Automatically
Your radio scans through all available sites when the signal from the current site is weak or unable to detect any signal and locks on to the repeater with the strongest RSSI value.

Manually
Your radio searches for the next site in the roam list that is currently in range which may not have the strongest signal, and locks on to it.

Any channel with Capacity Plus Multi-Site enabled can be added to a roam list. Your radio searches these channels during the automatic roam operation to locate the best site.

NOTE: You cannot manually add or delete an entry in the roam list.

Chapter 7

Registration

Supported systems:

☑ Capacity Max ☐ Other Systems

Your radio may receive registration-related messages from your Capacity Max system.

Registration

Your radio sends registration message to a system when you turn on your radio, change talkgroup, or site roam. If your radio fails to register on site, your radio automatically attempts to roam to another site, and temporarily removes the registration site attempted from the roaming list.

When site searches successfully, your radio shows the following indications:

- A tone sounds.
- The yellow LED double blinks.
- The display shows `Registering`.

When site registered successfully, your radio shows `Site` ***<Number>***.

Out of Range

When your radio unable to detect a signal from the system or from the current site, your radio shows the following indications:

- A repetitive tone sounds.
- The RED blinks.
- The display shows `Out of range`.

Talkgroup Affiliation Failed

When your radio fails to attempt affiliation to the talkgroup specified in the channels or Unified Knob Position (UKP) during registration, your radio shows `UKP Alias`.

Registration Denied

When registration with the system is not accepted, your radio shows the following indications:

- The yellow LED double blinks.
- The display shows `Registration Denied`.

Chapter 8

Zone and Channel Selections

Supported systems:

☑ Capacity Max ☑ Other Systems

A zone is a group of channels. You can program each channel with different features that support different groups of users.

Table 15: Number of Supported Zones and Channels

Model	Zones	Channels	Channels per Zone
Full Keypad and Limited Keypad	250	1000	160
Non-Keypad	4	64	16

8.1 Selecting Zones

Procedure:

From the menu, select **Zone** → ***<required Zone>***.

Result: The display shows ***<Zone>*** `Selected`.

8.2 Selecting Zones Using Alias Search

Procedure:

1. From the menu, select **Zone**.
2. Enter the required characters for the alias.

Result:
The display shows ***<Zone>*** `Selected`.

NOTE: The alias search is case-insensitive. If there are two or more entries with the same name, the display shows the entry listed first in the list.

.

8.3
Selecting Channels

Procedure:

Turn the **Channel Selector** knob.

NOTE: If **Virtual Channel Stop** is enabled, your radio stops proceeding beyond the first or the last channel, and a tone is heard.

Result: Your radio switches to your preferred channel.

8.4
Selecting Channels Using Direct Channel Dial

Procedure:

At the home screen, enter the ***<required channel number>*** → **Menu/OK**.

Chapter 9

Site Overview

A site provides coverage for a specific area.

In a multi-site network, the system will automatically search for a new site when the signal level from the current site drops to an unacceptable level.

9.1 Site Restriction

Supported systems:

☑ Capacity Max ☐ Other Systems

For site restriction, your radio dealer has the ability to decide which network sites to be used by your radio.

Your radio does not need to be reprogrammed to change the list of allowed and disallowed sites.

If your radio attempts to register at a disallowed site, your radio receives indication that the site is denied and then searches for a different network site.

When experiencing site restrictions, your radio shows the following indications:

- The yellow LED blinks double indicating site search.
- The display shows `Register Denied` or `Site <Number> Not Allowed`.

9.2 Site Trunking

Supported systems:

☑ Capacity Max ☐ Other Systems

Site Trunking is only available with Capacity Max system. A site must be able to communicate with the Trunk Controller to be considered as System Trunking.

If the site cannot communicate with the Trunk Controller in the system, a radio enters Site Trunking mode. While in Site Trunking, the radio provides a periodic audible and visual indication to the user to inform the user of their limited functionality.

When a radio is in Site Trunking, the radio displays `Site Trunking` and a repetitive tone sounds.

When a radio is in Site Trunking, a repetitive tone sounds.

The radios in Site Trunking are still able to make group and individual voice calls as well as send text messages to other radios within the same site. Voice consoles, logging recorders, phone gateways, and data applications cannot communicate to the radios at the site.

Once in Site Trunking, a radio that is involved in calls across multiple sites will only be able to communicate with other radios within the same site. Communication to and from other sites would be lost.

NOTE: If there are multiple sites that cover the current location of the radio and one of the sites enters Site Trunking, the radio roams to another site if within coverage.

9.3
Turning the Site Lock On

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Site Roaming** → **Site Lock** → **On**.

9.4
Turning the Site Lock Off

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Site Roaming** → **Site Lock** → **Off**.

9.5
Enabling the Manual Site Search

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Site Roaming** → **Active Search**.

Result: Your radio shows the following indications:

- A tone sounds.
- The green LED blinks.
- The display shows `Finding Site`.

If your radio finds a new site, your radio shows the following indications:

- A positive tone sounds.
- The LED extinguishes.
- The display shows `Site <Number> Found`.

If your radio fails to find a new site, your radio shows the following indications:

- A negative tone sounds.
- The LED extinguishes.
- The display shows `Out of Range`.

If a new site is within the range, but your radio is unable to connect to it, your radio shows the following indications:

- A negative tone sounds.

- The LED extinguishes.
- The display shows `Channel Busy`.

9.6 Accessing Neighbor Sites List

Supported systems:

☑ Capacity Max ☐ Other Systems

Procedure:

From the menu, select **Utilities** → **Radio Info** → **Neighbor Sites**.

Chapter 10

Types of Radio Calls

Supported systems:

☑ Capacity Max ☑ Other Systems

There are several ways that you can make a call with your radio depending on the types of calls and system available on your radio.

Table 16: Types of Radio Calls

Call Type	Capacity Max	Other System
Group Call A Group Call is a point-to-multipoint call operation. Your radio must be configured as a member of the group for you to communicate with each other.	✓	✓
Broadcast Call A Broadcast Call is a one-way voice call from any user to an entire talkgroup. The Broadcast Call feature allows only the call initiating user to transmit to the talkgroup, while the recipients of the call cannot respond.	✓	✓
Private Call A Private Call is a call from an individual radio to another individual radio. There are two types of Private call which are: • Off Air Call Set-Up (OACSU) [4] • Full Off Air Call Set-Up (FOACSU) [5]	✓	✓
All Call An All Call is a call from an individual radio to every radio on the site or every radio at a group of sites. It is used to make important announcement.	✓	✓
Selective Call A Selective Call is a call from an individual radio to another individual radio. It is a Private Call on an analog system.	✗	✓

[4] OACSU sets up the call after performing a radio presence check and completes the call automatically.

[5] FOACSU sets up the call after performing a radio presence check. FOACSU calls require user acknowledgment to complete the call and allows the user to either Accept or Decline the call.

Call Type	Capacity Max	Other System
Unaddressed Call An Unaddressed Call is a group call to one of the 16 predefined group IDs.	✗	✓
Open Voice Chanel Mode (OVCM) An OVCM is a call from a radio that is not pre-configured to work in a particular system during a group or individual call. The OVCM group call supports broadcast calls.	✗	✓

When a call is interrupted, you hear a continuous Talk Prohibit Tone. Releasing the **PTT** button allows you to receive the call.

Channel Free Indication feature can be programmed on your radio by your dealer. If the Channel Free Indication feature is enabled, you hear a short alert tone when the recipient releases the **PTT** button, indicating the channel is free for you to respond.

10.1

Making Calls on the Radio

Procedure:

Perform one of the following actions based on the type of calls:

Option	Actions
Making group calls, private calls, unaddressed calls, or selective calls	**a.** Select a channel with an active ID or alias. **b.** To call, press and hold the **PTT** button. **c.** Wait for the Talk Permit Tone to end, and speak into the microphone. **d.** To listen, release the **PTT** button.
Making broadcast calls, all calls, or OVCM calls	**a.** Select a channel with an active group ID or alias. **b.** To call, press and hold the **PTT** button. **c.** Wait for the Talk Permit Tone or PTT Side-tone to end, and speak into the microphone.

If your radio does not detect voice activity for a predetermined period, the call ends.

10.2
Making Calls with Contact List

Procedure:

Perform one of the following actions based on the type of calls:

Option	Actions
Making group calls or private calls with Contact List	**a.** From the menu, select **Contacts**. **b.** Perform one of the following actions: • To do alias search, enter the required characters for the alias. • To search for the alias manually, scroll down the contact list with the **4-Way Navigation** button. **c.** To call, press and hold the **PTT** button. **d.** Wait for the Talk Permit Tone to end, and speak into the microphone. **e.** To listen, release the **PTT** button.
Making broadcast calls or all calls with Contact List	**a.** From the menu, select **Contacts**. **b.** Perform one of the following actions: • To do alias search, enter the required characters for the alias. • To search for the alias manually, scroll down the contact list with the **4-Way Navigation** button. **c.** To call, press and hold the **PTT** button. **d.** Wait for the Talk Permit Tone to end, and speak into the microphone.

10.3
Making Calls with Manual Dial

The following steps are applicable to Private Call only.

Procedure:

1. From the menu, select **Contacts** → **Manual Dial** → **Radio Number**.
2. To enter or edit the ID, enter the required numbers.
3. To call, press and hold the **PTT** button.
4. Wait for the Talk Permit Tone to end, and speak into the microphone.
5. To listen, release the **PTT** button.

10.4
Making Calls with Programmable Number Keys

Procedure:

Perform one of the following actions based on the type of calls:

Option	Actions
Making group calls or private calls with Programmable Number Keys	**a.** From the home screen, to make a call to the predefined alias, press and hold the programmed number key. **b.** To call, press and hold the **PTT** button. **c.** Wait for the Talk Permit Tone to end, and speak into the microphone. **d.** To listen, release the **PTT** button.
Making broadcast calls or all calls with Programmable Number Keys	**a.** From the home screen, to make a call to the predefined alias, press and hold the programmed number key. **b.** To call, press and hold the **PTT** button. **c.** Wait for the Talk Permit Tone to end, and speak into the microphone.

10.5
Receiving and Responding to Calls on the Radio

When you receive calls, your radio shows the following indications:

- The green LED blinks.
- Your radio unmutes and the incoming call sounds through the speaker.
- The display shows the ID and alias and call status.

NOTE: You cannot respond to a Broadcast Call or All Call. For Broadcast Call, the display shows `Talkback Prohibit` and the Talkback Prohibit tone sounds when the **PTT** button is pressed.

Procedure:

1. To respond, press and hold the **PTT** button.
2. Wait for the Talk Permit Tone to end, and speak into the microphone.
3. To listen, release the **PTT** button.

10.6
Accepting or Declining Private Calls

When you receive Private Calls configured as Full Off Air Call Set-Up (FOACSU), your radio shows the following indications:

- The green LED blinks.

- The display shows the alias and the Private Call icon.

Accepting Private Calls

Procedure:

1. To accept Private Calls, perform one of the following actions:
   - Select **Accept**.
   - Press and hold the **PTT** button.
2. Wait for the Talk Permit Tone to end, and speak into the microphone.
3. To listen, release the **PTT** button.

Declining Private Calls

Procedure:

To decline Private Calls, perform one of the following actions:

- Select **Reject**.
- Select the **Back/Home** button.
- For Non-Keypad radio, press the programmed **Cancel** button.

Chapter 11

Phone Calls

Supported systems:

☑ Capacity Max ☑ Other Systems

A Phone Call is a call in between an individual radio or a group of radios and a telephone.

Depending on how the radio is configured, the following features may or may not be made available:

- Access code.
- Dual Tone Multi Frequency (DTMF) tone.
- De-access code.
- Displaying of caller alias or ID on receiving a phone call.
- Ability to reject or accept a phone call.

The Phone Call capability can be enabled by assigning and setting up phone numbers on the system. Contact your dealer to determine how your radio has been programmed.

11.1 Making Phone Calls

Procedure:

1. From the menu, select **Phone** → ***<required ID>*** → ***<Access Code>***.
2. To call, press and hold the **PTT** button.
3. To listen, release the **PTT** button.
4. While you are in the Phone call, you can perform any of the following actions if required:
   - Enter extra digits by using the **Keypad**.
   - To end the call, select the **Back/Home** button.
   - To deaccess a code, enter the deaccess code by using the **Keypad** when the display shows `De-Access Code:`.

Result: If the call ends successfully, your radio shows the following indications:

- A tone sounds.
- The display shows `Call Ended`.

11.2 Making Phone Calls with Contact List

Procedure:

1. From the menu, select **Contacts**.
2. Perform one of the following actions:
   - To do alias search, enter the required characters for the alias.

- To search for the alias manually, scroll down the contact list with the **4-Way Navigation** button.

3. Select **Call Phone** → ***<Access Code>***.
4. To call, press and hold the **PTT** button.
5. To listen, release the **PTT** button.
6. While you are in the Phone call, perform one of the following actions:
   - Enter extra digits by using the **Keypad**.
   - To end the call, select the **Back/Home** button.
   - To deaccess a code, enter the deaccess code when the display shows `De-Access Code:`.

Result: If the call ends successfully, your radio shows the following indications:

- A tone sounds.
- The display shows `Call Ended`.

11.3 Making Phone Calls with Manual Dial

Procedure:

1. From the menu, select **Contacts** → **Manual Dial** → **Phone Number**.
2. Enter the phone number and ***<Access Code>***.
3. To call, press and hold the **PTT** button.
4. To listen, release the **PTT** button.
5. While you are in the Phone call, perform one of the following actions:
   - Enter extra digits by using the **Keypad**.
   - To end the call, select the **Back/Home** button.
   - To deaccess a code, enter the deaccess code when the display shows `De-Access Code:`.

Result: If the call ends successfully, your radio shows the following indications:

- The display shows `Call Ended`.

11.4 Dual Tone Multi Frequency

Supported systems:

☑ Capacity Max ☑ Other Systems

The Dual Tone Multi Frequency (DTMF) feature allows your radio to operate in a radio system with an interface to the telephone systems.

11.4.1 Initiating the DTMF Tone

Procedure:

1. Press and hold the **PTT** button.

2. To initiate a DTMF tone, perform one of the following actions:
   - Enter the ***<desired number>***.
   - Press the * or # button.

   NOTE: Disabling all radio tones and alert will automatically turn off the DTMF tone.

11.5 Receiving and Responding to Phone Calls

When you receive a phone call, your radio shows the following indications:

- The green LED blinks.
- Your radio unmutes and the incoming call sounds through the speaker.
- The display shows the Phone Call icon and the call status.

Procedure:

1. To respond to the phone call, press and hold the **PTT** button.
2. Wait for the Talk Permit Tone to end, and speak into the microphone.
3. To listen, release the **PTT** button.
4. To end the call, select the **Back/Home** button.

   NOTE: Your radio is not able to terminate a phone call as a group call. The telephone user must end the call. The recipient user is only allowed to talk back during the call.

Result: If the call ends successfully, your radio shows the following indications:

- A tone sounds.
- The display shows `Call Ended`.

Chapter 12

Call Preemption

Supported systems:

☑ Capacity Max ☐ Other Systems

Call Preemption allows your radio to interrupt any ongoing calls and initiate a higher priority call.

With the Call Preemption feature, the system interrupts any ongoing calls whereby trunked channels are unavailable.

Thus your radio initiates a higher priority call such as an emergency call or all call. If no other Radio Frequency (RF) channels are available, emergency call will interrupt all call as well.

Chapter 13

Voice Interrupt

Supported systems:

☑ Capacity Max ☐ Other Systems

Voice Interrupt allows your radio to end any ongoing calls.

The Voice Interrupt feature uses the reverse channel signaling to interrupt any ongoing calls. You are allowed to make a voice transmission during the interruption.

The Voice Interrupt feature improves the probability of delivering a new call to the recipients when a call is in progress.

Voice Interrupt is accessible if this feature has been programmed in your radio. Contact your dealer for more information.

13.1 Enabling the Voice Interrupt

Procedure:

1. To interrupt the transmission during an on-going call, press and hold the **PTT** button.
2. Wait for the Talk Permit Tone to end, and speak into the microphone.

Chapter 14

Initiating Transmit Interrupt

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

To interrupt an ongoing call, perform one of the following actions:

- Press the **PTT** button.
- Press the **Emergency** button.
- For Other Systems, perform data transmission.
- For Other Systems, press the programmed **TX Interrupt Remote Dekey** button.

Chapter 15

Advanced Features

This chapter explains the operations of the features available in your radio.

15.1 Analog Message Encode

Supported systems:

☐ Capacity Max ☑ Other Systems

Your radio can send preprogrammed messages from the Message list to a radio alias or the dispatcher.

15.1.1 Sending MDC Encode Messages to Dispatchers

Procedure:

From the menu, select **Message** → **Quick Text** → ***<required message>***.

Result:
If the request is successful, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.

If the request is unsuccessful, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows a negative mini notice.

15.1.2 Sending 5-Tone Encode Messages to Contacts

Procedure:

From the menu, select **Message** → **Quick Text** → ***<required message>*** → ***<required contact>***.

Result:
If the request is successful, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.

If the request is unsuccessful, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows a negative mini notice.

15.2
Analog Status Update

Supported systems:

☐ Capacity Max ☑ Other Systems

Your radio can send preprogrammed messages from the Status List indicating your current activity to a radio contact (for 5-Tone systems) or the dispatcher (for Motorola Data Communication systems).

For Motorola Data Communication (MDC) systems, the last acknowledged message is kept at the top of the Status list. The other messages are arranged in alphanumeric order.

15.2.1
Sending Status Updates to Predefined Contacts

Procedure:

Perform one of the following actions:

- For Motorola Data Communication (MDC) systems, from the menu, select **Status** → ***<required status>*** → **Set as Default** → **Menu/OK**.
- For 5-Tone systems, from the menu, select **Status** → ***<required status>*** → **Set as Default**.

For 5-Tone systems, if you press the **PTT** button while in the Status List, you radio sends the selected status update and returns to the home screen to start a voice call.

Result:
For MDC systems, if the request is successful, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.

For MDC systems, if the request is unsuccessful, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows a negative mini notice.

For 5-Tone systems, if the request is successful, your radio display shows a ✓ beside the acknowledged status.

For 5-Tone systems, if the request is unsuccessful, your radio display shows a ✓ beside the previous status.

15.2.2
Viewing 5-Tone Status Details

Prerequisites: Purchase the Software License Key.

Procedure:

From the menu, select **Status** → ***<required status>*** → **View Details**.

Result: The display shows details of the selected status.

15.2.3
Editing 5-Tone Status Details

Procedure:

1. From the menu, select **Status** → ***<required status>*** → **Edit**.
2. To edit the status details, use the following keys:
   - To move the cursor to the left or right, select the **4-Way Navigation** buttons.
   - To delete characters, select the * key.
   - To change the text entry method, select and hold the **#** key.
3. When editing is completed, select the **Menu/OK** button.

Result: The display shows a positive mini notice.

15.3
Auto-Range Transponder System

Supported systems:

☐ Capacity Max ☑ Other Systems

The Auto-Range Transponder System (ARTS) is an analog-only feature designed to inform you when your radio is out-of-range of other ARTS-equipped radios.

ARTS-equipped radios transmit or receive signals periodically to confirm that they are within range of each other.

Your radio provides indications as follows:

Table 17: Auto-Range Transponder System Indications

Indication	Description
First-Time Alert	• A tone sounds. • The display shows `In Range` after the channel alias.
ARTS-in-Range Alert	• A tone sounds, if programmed. • The display shows `In Range` after the channel alias.
ARTS-Out-of-Range Alert	• A tone sounds. • The red LED rapidly blinks. • The display shows `Out of Range` alternating with the Home screen.

15.4
Call Alert Operation

Supported systems:

☑ Capacity Max ☑ Other Systems

Call Alert paging enables you to alert the recipient to call you back when they can. This feature is applicable for subscriber aliases or IDs only.

For Capacity Max, the Call Alert feature allows radio users or dispatchers to alert recipients to call back the caller when available. Voice communication is not involved in this feature. Off Air Call Set-Up (OACSU) private calls allows you to respond immediately. Full Off Air Call Set-Up (FOACSU) private calls requires you to acknowledge the call. OACSU type calls are recommended for the Call Alert feature.

15.4.1
Making Call Alerts

Procedure:

Perform one of the following actions:

Option	Actions
Making Call Alerts with Contact List	From the menu, select **Contacts** → ***<required ID or alias>*** → **Call Alert**.
Making Call Alerts with Manual Dial	**a.** From the menu, select **Contacts** → **Manual Dial** → **Radio Number**. **b.** Enter the ID. **c.** Select **Call Alert**.

Result:
If the request is successful, the display shows a positive mini notice.

If the request is unsuccessful, the display shows a negative mini notice.

15.4.2
Responding to Call Alerts

When you receive a Call Alert, your radio shows the following indications:

- A repetitive tone sounds.
- The yellow LED blinks.
- The display shows a notification list of the Call Alert and the ID of the caller.

Procedure:

Depending on the configuration by your dealer, perform one of the following actions:

- Respond to the caller with a Private Call by pressing the **PTT** button.
- Continue with Talkgroup communication by pressing the **PTT** button. To respond to the Call Alert, navigate to the Missed Call log in the Call Log menu.

15.5
Call Indicator Settings

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature allows you to configure call or text message tones.

15.5.1

Activating or Deactivating Call Ringers

You can activate or deactivate call ringers for Private Calls, Text Messages, Call Alerts, Telemetry Status with Text (for Capacity Max and other systems), and Selective Calls (for other systems).

Activating Call Ringers

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Tones/Alerts** → **Call Ringers**.
2. Select one of the following options:
   - **Call Alert**
   - **Private Call**
   - **Telemetry**
   - **Messages**
3. Select the required tone.

Result:
If you activate call ringers, your radio display shows a ✓ and the selected tone.

Deactivating Call Ringers

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Tones/Alerts** → **Call Ringers**.
2. Select one of the following options:
   - **Call Alert**
   - **Private Call**
   - **Telemetry**
   - **Messages**
3. Perform one of the following actions:
   - If you want to deactivate call ringers for Telemetry option, select **Turn Off**.
   - If you want to deactivate call ringers for other options, select **Off**.

Result:
If you deactivate call ringers, your radio display shows a ✓ beside `Off`.

15.5.2
Assigning Ring Styles

You can program your radio to play one of the 11 predefined ring tones when receiving Private Calls, Call Alerts, or Text Messages.

Procedure:

From the menu, select **Contacts** → ***<required ID or alias>*** → **View/Edit** → **Ringer** → ***<required tone>***.

Result:
The display shows a positive mini notice.

15.5.3
Escalating Alarm Tone Volume

You can program your radio to continually alert you when the radio calls remain unanswered. This alert automatically increases the alarm tone volume over time. This feature is called Escalert.

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Tones/Alerts** → **Escalert**.

Result:
If Escalert is enabled, the display shows a ✓ beside `Enabled`.

If Escalert is disabled, the ✓ disappears beside `Enabled`.

15.6
Call Log Features

Supported systems:

☑ Capacity Max ☑ Other Systems

Your radio tracks all recent outgoing, answered, and missed Private Calls. The call log feature is used to view and manage recent calls.

Missed Call Alerts can be included in call logs depending on the system configuration on your radio. You can perform the following tasks in each call list:

- View Details
- Delete Calls
- Store Aliases or IDs to Contacts (for Capacity Max and Other Systems)

15.6.1
Viewing Recent Calls

Procedure:

1. From the menu, select **Call Log**.
2. Select one of the following lists:
   - **Missed**
   - **Answered**

- **Outgoing**

3. View calls by scrolling through the list.

Result: The display shows the most recent entry.

15.6.2
Storing Aliases or IDs from the Call List

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Call Log** → ***<required list>*** → ***<required ID or alias>*** → **Store**.
2. When you see a blinking cursor, enter the rest of the characters of the alias.

   You can store an ID without an alias.

Result:
The display shows a positive mini notice.

15.6.3
Deleting Calls from the Call List

Procedure:

From the menu, select → **Call Log** → ***<required list>*** → ***<required ID or alias>*** → **Delete Entry?** → **Yes**.

NOTE: If you select **No**, your radio returns to the previous screen. If the list is empty, a tone sounds and the display shows `List Empty`.

Result: The display shows `Entry Deleted`.

15.6.4
Viewing Details from the Call List

Procedure:

From the menu, select → **Call Log** → ***<required list>*** → ***<required ID or alias>*** → **View Details**.

15.7
Call Queue

Supported systems:

☑ Capacity Max ☐ Other Systems

When there are no resources available to process a call, Call Queue enables the call request to be placed in the system queue for the next available resources.

15.7.1
Receiving Call Queues

Procedure:

Press and hold the **PTT** button until you hear the Call Queue Tone.

Result:
A tone is heard and the display shows `Call in Queue`.

If the call is successful, your radio shows the following indications:

- A positive indicator tone sounds.
- The green LED blinks.
- The display shows the call type icon, ID, or alias.

You have up to 4 seconds to press and hold the **PTT** button to begin voice transmission.

If the call is unsuccessful, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows the failure notice screen.
- Radio terminates the call and exits the call setup.

15.8
Contacts Settings

Supported systems:

☑ Capacity Max ☑ Other Systems

The Contacts menu provides an address book function on your radio. Each entry corresponds to an ID for making calls. The entries are alphabetically sorted.

Each entry supports different call types depending on your settings. The contact entries display Call Type, Call Alias, and Call ID information.

You can assign entries to programmable number keys as quick dial. You see a check mark before each number key that is assigned to an entry. If the check mark is before the `Empty` interface, a number key is not assigned to the entry.

Personal Computer (PC) Calls and Dispatch Calls are data-related. These calls are only available with an application.

15.8.1
Adding New Contacts

Procedure:

1. From the menu, select **Contacts** → **New Contact** → ***<required contact type>***.

   The contact type options are **Radio Contact** or **Phone Contact**.
2. Enter the contact number.

3. Enter the contact name.
4. Select the required ringer type.

Result:
A positive tone sounds. The display shows a positive mini notice. For Connect Plus, the display shows `Contact Saved`.

15.8.2
Setting Default Contacts

Procedure:

From the menu, select → **Contacts** → ***<required ID or alias>*** → **Set as Default**.

Result:
If the setting is successful, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.
- The display shows a ✓ beside the selected contact.

15.8.3
Assigning Entries to Programmable Number Keys

Procedure:

1. From the menu, select **Contacts** → ***<required ID or alias>*** → **Program Key**.
2. Select the chosen number key.
3. If the chosen number key is already assigned to an entry, perform one of the following actions:
   - To overwrite the existing number key assignment, select **Yes**.
   - To retain the existing number key, select **No** and select another number key.

   If you overwrite the existing number key assignment, your radio shows the following indications:
   - A positive tone sounds.
   - The display shows `Contact Saved` and a positive mini notice.

15.8.4
Removing Associations Between Entries and Programmable Number Keys

Procedure:

1. From the menu, select **Contacts** → ***<required ID or alias>*** → **Program Key** → **Empty**.

   The display shows `Clear from all keys`.
2. Select **Yes**.

Result:

A positive tone sounds. The display shows `Contact Saved` and then automatically returns to the previous menu.

NOTE: When an entry is deleted, the association between the entry and programmed number key is removed.

15.9
Dynamic Caller Alias

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature allows you to dynamically edit a Caller Alias from your radio front panel.

When in a call, the receiving radio displays the Caller Alias of the transmitting radio.

The Caller Aliases list can store up to 500 Caller Aliases of transmitting radio. You can view or make Private Calls from the Caller Aliases list. When you turn off your radio, the history of receiving Caller Aliases is removed from the Caller Aliases list.

15.9.1
Editing the Caller Alias

Procedure:

Perform one of the following actions:

Option	Actions
Editing the Caller Alias while turning on the radio	**a.** Turn on your radio. **b.** Enter the new ***<Caller Alias>*** → **Menu/OK**.
Editing the Caller Alias from the menu	**a.** From the menu, select **Utilities** → **Radio Info.** → **My ID** → **Menu/OK** → **Edit** → **Menu/OK**. **b.** Enter the new ***<Caller Alias>***.

Result: The display shows a positive mini notice.

15.9.2
Viewing the Caller Aliases List

You can access the Caller Aliases list to view the transmitting Caller Alias details.

Procedure:

From the menu, select **Caller Aliases** → ***<preferred list>*** → **View Details**.

15.9.3
Initiating Private Calls From the Caller Aliases List

Procedure:

1. From the menu, select **Caller Aliases** → ***<required Caller Alias>***.
2. To call, press and hold the **PTT** button.

15.10
Dynamic Group Number Assignment

Supported systems:

☑ Capacity Max ☐ Other Systems

Dynamic Group Number Assignment (DGNA) is a feature that allows the third-party console to assign and remove talkgroup dynamically to a radio from over the air.

When the console assigns DGNA to your radio, your current channel is in DGNA mode and shows the followings:

- A tone sounds.
- The display shows `<DGNA Talkgroup Alias> Assigned` momentarily before returning to the home screen.
- The DGNA icon appears in the status bar.
- The home screen displays DGNA talkgroup alias.

When the console removes DGNA from your radio, your radio restores the previous talkgroup and shows the followings:

- A tone sounds.
- The display shows `<DGNA Talkgroup Alias> Removed` momentarily before returning to the home screen.
- The DGNA icon disappears from the status bar.
- The home screen displays the previous talkgroup alias.

Depending on how your radio is programmed, you can view, edit, and listen to the original scan lists channels and the non-DGNA talkgroups.

When your radio is in DGNA mode, press and hold the **PTT** button action allows you to communicate only with the current DGNA talkgroup. To communicate with the previous non-DGNA talkgroup, program the programmed **One Touch Access** button.

NOTE: Check with your dealer or system administrator to determine how your radio has been programmed.

15.10.1
Making DGNA Calls

Prerequisites: Ensure your current channel is in DGNA mode.

Procedure:

To call, press and hold the **PTT** button.

Result: Your radio shows the following indications:

- A DGNA tone sounds.
- The display shows the DGNA icon and the alias.

15.10.2
Making Non-DGNA Calls

Procedure:

Perform one of the following actions:

- If your radio is in DGNA mode, press the programmed **One Touch Access** button.

  NOTE:
  If your radio is not in DGNA mode and you press the **One Touch Access** button, your radio sounds a negative tone, indicating error. The display remains unchanged.

- If your radio is not in DGNA mode, press and hold the **PTT** button.

  NOTE:
  When a PTT button is press before a negative tone sounds, your radio returns to the home screen. When your radio is in the home screen, a PTT press makes a call to the DGNA talkgroup.

Result:
Your radio shows the following indications:

- A positive tone sounds.
- Voice Announcement sounds.
- The display shows `<Talkgroup Alias>` and `Press PTT` momentarily.

15.10.3
Receiving and Responding to DGNA Calls

When you receive a DGNA call, your radio shows the following indications:

- A DGNA tone sounds.
- The display shows the DGNA icon and aliases.
- Your radio unmutes and the incoming call sounds through the speaker.

Procedure:

1. To call, press and hold the **PTT** button.
2. To listen, release the **PTT** button.

15.11
Emergency Operation

Supported systems:

☑ Capacity Max ☑ Other Systems

Emergency Alarms are used to indicate critical situations. You can initiate an Emergency Alarm at any time even when there is activity on the current channel.

You can only assign one type of Emergency Mode to the Emergency button for each channel. Your radio supports the following Emergency Modes:

Table 18: Emergency Modes

Emergency Mode	Description
Emergency Alarm	An Emergency Alarm is not a voice call. This alarm is an emergency notification sent to radios that are programmed to receive them.
Emergency Alarm with Call	Your radio transmits an Emergency Alarm. When the Emergency Alarm is acknowledged, the group of radios can communicate over the assigned emergency channel. Press and hold the **PTT** button to talk.
Emergency Alarm with Voice to Follow	Your radio transmits an Emergency Alarm. When the Emergency Alarm is acknowledged, your radio microphone is automatically activated which is known as Hot Mic. Hot Mic allows you to communicate with the group of radios without pressing the **PTT** button. **NOTE:** • If the Emergency Cycle Mode is enabled, repetitions of Hot Mic and receiving period are made for a programmed duration. • If you press and hold the **PTT** button during the programmed Hot Mic receiving period, your radio proceeds to make a call and stops Hot Mic receiving period timer. Your radio remains in emergency mode. Once **PTT** button is released, Hot Mic receiving period timer restarts. • If the Emergency Alarm request fails, the radio does not retry to send the request, and enters the Hot Mic directly.
Silent Emergency Alarm	Your radio transmits an emergency notification without any audio or visual indicators.
Silent Emergency Alarm with Call	Your radio transmits an emergency notification without any audio or visual indicators. Your radio suppresses all audio and visual indicators of the emergency until you press and hold the **PTT** button to talk.
Silent Emergency Alarm with Voice to Follow	Your radio transmits an emergency notification without any audio or visual indicators. When the Emergency Alarm is acknowledged, the Hot Mic is activated. You can communicate with the group of radios without pressing the **PTT** button. **NOTE:** The indicators only appear when you press the **PTT** button.

Your dealer can set the Emergency On or Off function and button-press duration of the Emergency button. Contact your dealer for more information.

Your dealer can program the Emergency Search tone. When the tone is programmed, the Emergency Search tone sounds. The tone mutes when your radio transmits or receives voice, and stops when your radio exits Emergency mode.

15.11.1
Sending Emergency Alarms

Procedure:

Press the programmed **Emergency On** button.

Result:
If the alarm is successfully sent, your radio shows the following indications:

- The Emergency tone sounds.

- The green LED blinks.
- The display shows `Alarm Sent`.

If the alarm is unsuccessful after all retries, your radio shows the following indications:

- A negative tone sounds.
- The display shows `Alarm Failed`.

15.11.2
Sending Emergency Alarms with Call

Procedure:

1. Press the programmed **Emergency On** button.

   If the alarm is successfully sent, your radio shows the following indications:

   - The Emergency tone sounds.
   - The green LED blinks.
   - The display shows `Alarm Sent`.

2. To call, press and hold the **PTT** button.
3. Wait for the Talk Permit Tone to end, and speak into the microphone.
4. To listen, release the **PTT** button.

   If your radio does not detect voice activity for a predetermined period, the call ends.

15.11.3
Sending Emergency Alarms with Voice to Follow

Procedure:

1. Press the programmed **Emergency On** button.

   If the alarm is successfully sent, the Emergency tone sounds and Hot Mic is activated.

2. Speak into the microphone without pressing the **PTT** button.

   Your radio automatically stops transmitting when:

   - The cycling duration between hot mic and receiving calls expires if Emergency Cycle Mode is enabled.
   - The hot mic duration expires if Emergency Cycle Mode is disabled.

15.11.4
Responding to Emergency Alarms

The recipient can only support one Emergency Alarm at a time. If more than one alarm is received, the second Emergency Alarm overrides the first alarm.

When you receive an Emergency Alarm, your radio shows the following indications:

- A tone sounds.
- The red LED blinks.
- The display shows the Emergency Alarm List, Emergency Talkgroup ID, and ID of the transmitting radio.

Prerequisites: Enable the Emergency Alarm Indication.

Procedure:

1. When the Emergency Alarm List appears, select the required ID.
2. Transmit non-emergency voice to the same group that the Emergency Alarm targeted by pressing the **PTT** button.

   NOTE: Only the sender of the emergency alarm can transmit emergency voice. All recipients and other radios transmit non-emergency voice to allow other radios to send and receive Emergency Alarms in the same group.
3. Wait for the Talk Permit Tone to end, and speak into the microphone.
4. To listen, release the **PTT** button.

Result:
When the sender of the emergency responds, your radio shows the following indications:

- For Capacity Max, the red LED blinks.
- For Other Systems, the green LED blinks.
- The display shows the **Group Call** icon, Emergency Talkgroup ID, and the ID of the transmitting radio.

NOTE: For Capacity Max, if the Emergency Call Indication is enabled, the display shows the Emergency Call icon instead.

15.11.5
Responding to Emergency Alarms with Call

When you receive an Emergency Alarm with Call, your radio shows the following indications:

- If the Emergency Call Indication and Emergency Call Decode Tone are enabled, the Emergency Call Tone sounds.
- The display shows the Emergency Call icon, Emergency Talkgroup ID, and ID of the transmitting radio.
- Your radio unmutes and plays the incoming call through the speaker.

Procedure:

1. Press and hold the **PTT** button.
2. Wait for the Talk Permit Tone to end, and speak into the microphone.
3. To listen, release the **PTT** button.

Result:
When the sender of the emergency responds, your radio shows the following indications:

- For Capacity Max, the red LED blinks.
- The display shows the **Group Call** icon, Emergency Talkgroup ID, and the ID of the transmitting radio.

15.11.6
Reinitiating the Emergency Mode

Procedure:

Perform one of the following actions:

- Change the channel while the radio is in Emergency mode.

  NOTE: You can reinitiate emergency mode only if you enable emergency alarm on the new channel.

- Press the programmed **Emergency On** button during an emergency initiation or transmission state.

Result: The radio exits the Emergency mode, and reinitiates Emergency.

15.11.7
Exiting the Emergency Mode

Your radio automatically exits emergency mode when you are having the following scenarios:

- An acknowledgment is received from the system (for emergency alarms only).
- All retries to send the alarm are exhausted.
- Turning off your radio. When you turn on your radio, the emergency will not reinitiate automatically.
- Change your current channel to a channel with no Emergency.

Procedure:

Press the programmed **Emergency Off** button.

Result:
If you exited the Emergency successfully, your radio shows the following indications:

- The tone ceases.
- The red LED extinguishes.
- For Capacity Max, when acknowledgment is received, the display of the transmitting radio shows `Cancel Emer Success`, else `Cancel Emer Failed`.

  NOTE: If the Cancel Emergency configuration is enabled on the transmitting radio, the emergency alarm in your receiving radio ceases and the status is added to the Alarm List of the receiving radio.

15.12
Fall Alert

Supported systems:

☑ Capacity Max ☑ Other Systems

The Fall Alert feature enables your radio to alert others when you are in danger.

If your radio tilts at a specified angle, is moving, or is stationary for a time, it prompts you with an Alert Tone. If you do not respond to the prompt before the predefined reminder timer expires, your radio automatically sends an Emergency Alarm or Emergency Call.

To prevent your radio from sending an Emergency Alarm or Emergency Call, you can take the following measures:

- For Tilt Alarm, you must restore the radio to the vertical position.

- For Movement Alarm, you must stop your radio from moving.
- For Anti-Movement Alarm, you must move your radio.

If more than one Fall Alert Alarm is enabled, your radio plays the Alert Tone when it detects the first movement violation.

15.12.1
Turning the Fall Alert Feature On

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Fall Alert** → **Enable**.

15.12.2
Turning the Fall Alert Feature Off

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Fall Alert** → **Disable**.

15.13
Entering the Front Panel Programming

Supported systems:

☑ Capacity Max ☑ Other Systems

You can customize certain feature parameters in the Front Panel Programming (FPP) to enhance the use of your radio.

Procedure:

1. From the menu, select **Utilities** → **Program Radio**.
2. Enter your current eight-digit password.
3. Select the required setting.

15.14
Home Channel Reminder

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature provides a reminder when the radio is not set to the home channel for a while.

When this feature is enabled and your radio is not set to the home channel for some time, the following indications occur periodically:

- A tone and the Home Channel Reminder announcement sounds.
- The display shows `Non Home Channel`.

15.14.1

Muting the Home Channel Reminder

When the Home Channel Reminder sounds, you can temporarily mute the reminder.

Procedure:

Press the programmed **Silence Home Channel Reminder** button.

Result:
The display shows `HCR Silenced`.

15.14.2

Setting New Home Channels

When the Home Channel Reminder occurs, you can set new home channels.

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Home Channel** → ***<required channel>***.

Result:
The display shows a ✓ beside the selected home channel alias.

15.15

Job Tickets

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature allows your radio to receive messages from the dispatcher listing out tasks to perform.

NOTE: This feature can be customized through the radio programming softwares according to user requirements. Contact your dealer for more information.

There are two folders that contain different Job Tickets:

My Tasks folder
Personalized Job Tickets assigned to your signed in user ID.

Shared Tasks folder
Shared Job Tickets assigned to a group of individuals.

You can respond to Job Tickets in order to sort into Job Ticket Folders. By default, the folders are **All**, **New**, **Started**, and **Completed**.

Job Tickets are retained even after the radio turns off and on again.

All Job Tickets are located in the **All** folder. Depending on how your radio is programmed, Job Tickets are sort by their priority level followed by time received. New Job Tickets, Job Tickets with recent changes in state, and Job Tickets with the highest priority are listed first.

After reaching the maximum number of Job Tickets, the next Job Ticket automatically replaces the last Job Ticket in your radio. Depending on your radio model, your radio supports a maximum of 100 or 500 Job Tickets. Your radio automatically detects and discards duplicated Job Tickets with the same Job Ticket ID.

Depending on the importance of the Job Tickets, the dispatcher adds a Priority Level to them. There are three priority levels. Priority 1 has the highest priority and Priority 3 has the lowest priority. There are also Job Tickets with no priority.

Your radio updates accordingly when dispatcher makes the following changes:

- Modify content of Job Tickets.
- Add or edit Priority Level of Job Tickets.
- Move Job Tickets from folder to folder.
- Canceling of Job Tickets.

15.15.1
Accessing the Job Tickets Folder

Procedure:

From the menu, select **Job Tickets** → ***<required folder>*** → ***<required Job Ticket>***.

15.15.2
Logging In the Remote Server

You can log in or out the remote server with your user ID.

Procedure:

From the menu, select **Log In**.

If you are already logged in, the menu displays **Log Out**.

Result:
If the log in is successful, your radio shows the following indications:

- A positive tone sounds.
- The display shows a positive mini notice.

If the log in is unsuccessful, your radio shows the following indications:

- A negative tone sounds.
- The display shows a negative mini notice.

15.15.3
Creating Job Tickets

Your radio can create Job Tickets that are based on a Job Ticket template, and send out tasks that must be performed. The Customer Programming Software (CPS) is required to configure the Job Ticket template.

Procedure:

From the menu, select **Job Tickets** → **Create Ticket**.

15.15.4
Sending Job Tickets Using Job Tickets Templates

Prerequisites: At the **Create Ticket** screen, depending on your configuration, choose the correct Job Tickets Template.

Procedure:

Perform one of the following actions:

Option	Actions
Sending Job Tickets using a single Job Ticket Template	**a.** Enter the required room number. **b.** Select **Room Status** → ***<required option>*** → **Send**.
Sending Job Tickets using a multiple Job Tickets Template	Select ***<required option>*** → **Send**.

Result:
If the request is successful, your radio shows the following indications:

- A positive tone sounds.
- The display shows a positive mini notice.

If the request is unsuccessful, your radio shows the following indications:

- A negative tone sounds.
- The display shows a negative mini notice.

15.15.5
Responding to Job Tickets

Procedure:

1. From the menu, select **Job Tickets** → ***<required folder>*** → ***<required Job Ticket>***.
2. Access the sub-menu by pressing the **Menu/OK** button and select the required job ticket.

   Alternatively, you can also press the corresponding number key **1** to **9**, for Quick Reply.

Result:
If the respond is successful, your radio shows the following indications:

- A positive tone sounds.
- The display shows a positive mini notice.

If the respond is unsuccessful, your radio shows the following indications:

- A negative tone sounds.
- The display shows a negative mini notice.

15.15.6
Deleting Job Tickets

Procedure:

1. From the menu, select **Job Tickets** → ***<required folder>*** → **All**.
2. Perform one of the following actions:
   - To delete the required Job Ticket, select the ***<required Job Ticket>*** → **Menu/OK** → **Delete**.
   - To delete all Job Tickets, select **Delete All** → **Yes**.

Result:
If the request is successful, your radio shows the following indications:

- A positive tone sounds.
- The display shows a positive mini notice.

If the request is unsuccessful, your radio shows the following indications:

- A negative tone sounds.
- The display shows a negative mini notice.

15.16
Lone Worker

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature prompts an emergency if there is no user activity (button press or channel selector activation) for a predefined time.

When there is no user activity for a predefined time, the radio prewarns you using an audio indicator once the inactivity timer expires.

If there is no acknowledgment from you before the predefined reminder timer expires, the radio initiates an emergency condition as programmed by the dealer.

15.17
Monitor Feature

Supported systems:

☐ Capacity Max ☑ Other Systems

The feature allows you to remotely activate the microphone of a target radio. You can use this feature to monitor any audible activity surrounding the target radio.

NOTE: This feature is not applicable in Capacity Plus–Single-Site and Capacity Plus–Multi-Site.

15.17.1
Monitoring Channels

Procedure:

1. Press and hold the programmed **Monitor** button.

   Your radio shows the following indications:

   - You hear the radio activity.
   - The yellow LED illuminates.
   - The display shows the **Monitor** icon.

2. To call, press and hold the **PTT** button.
3. To listen, release the **PTT** button.

15.17.2

Permanent Monitor

The Permanent Monitor feature is used to continuously monitor a selected channel for activity.

15.17.2.1

Setting the Permanent Monitor

Procedure:

Press the programmed **Permanent Monitor** button.

Result:
When your radio enters the mode, your radio shows the following indications:

- An alert tone sounds.
- The yellow LED illuminates.
- The display shows `Permanent Monitor On` and the Monitor icon.

When your radio exits the mode, your radio shows the following indications:

- An alert tone sounds.
- The yellow LED extinguishes.
- The display shows `Permanent Monitor Off`.

15.18

Priority Monitor

Supported systems:

☑ Capacity Max ☐ Other Systems

Priority Monitor allows your radio to receive transmission from talkgroups with higher priority during talkgroup call. This feature is only applicable to members in Receive Group List.

NOTE: This feature can only be accessed when Talkgroup Scan feature is enabled.

Priority talkgroups are Priority 1 (P1) and Priority 2 (P2). Your radio receives transmission according to the following priority:

1. Emergency Call for P1 Talkgroup.
2. Emergency Call for P2 Talkgroup.
3. Emergency Call for non-priority Talkgroup in the Receive Group List.
4. All Call.
5. P1 Talkgroup Call.
6. P2 Talkgroup Call.
7. Non-priority Talkgroup in the Receive Group List.

15.18.1
Receive Group List

Receive Group List allows you to create and assign members on the talkgroup scan list. You can have a maximum of 16 members in a list.

NOTE: To add member into the list, the talkgroup must first be configured in the radio.

For Capacity Max, when your radio is programmed to edit the scan list, you can perform the following actions:

- Add, remove, and edit priority for talkgroups.
- Add, remove, and edit affiliation talkgroups.
- Replace the existing scan list with a new scan list.

If a talkgroup is programmed as Permanent Talkgroup, you are unable to edit the talkgroup from the scan list.

NOTE: This feature can only be accessed when Talkgroup Scan feature is enabled.

15.19
Remote Monitor

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature is used to turn on the microphone of a target radio with a subscriber ID. You can use this feature to remotely monitor any audible activity surrounding the target radio.

Both your radio and the target radio must be programmed to allow you to use this feature.

The Remote Monitor microphone selection of the target radio follows the programmed Hot Mic setting. There are two Hot Mic sources:

Hot Mic Source	Microphone Selection
Radio Microphone	The Bluetooth microphone is used for Remote Monitor. If there is no Bluetooth microphone connected, the radio microphone is used.
Wired Accessory Microphone	The wired accessory microphone is used for Remote Monitor. If there is no wired accessory microphone connected, the Bluetooth microphone is used. If there is no Bluetooth microphone connected, the radio microphone is used.

If initiated, the green LED blinks once on the target radio. This feature automatically stops after a programmed duration or when there is user operation on the target radio.

For Other Systems, Remote Monitor comprises of two types:

- Remote Monitor without Authentication
- Remote Monitor with Authentication

When your radio turns on the microphone of a target radio with user authentication, a passphrase is required. The passphrase is programmed into the target radio through the radio programming softwares.

15.19.1
Initiating the Remote Monitor

Procedure:

1. Perform one of the following actions:

Option	Actions
Initiating Remote Monitor with Contact List	From the menu, select **Contacts** → ***<required ID or alias>*** → **Remote Mon.**.
Initiating Remote Monitor with Manual Dial	**a.** From the menu, select **Contacts** → **Manual Dial** → **Radio Number**. **b.** Either enter the ID or alias, or edit the previous dialed ID. **c.** Select **Remote Mon.**.

2. For Other Systems, enter the passphrase if required.

Result:
If the request is successful, your radio shows the following indications:

- A positive tone sounds.
- The display shows a positive mini notice.
- The audio from the monitored radio starts playing for a programmed duration, and the display shows `Rem. Monitor`. When the timer expires, an alert tone sounds and the LED turns off.

If the request is unsuccessful, your radio shows the following indications:

- A negative tone sounds.
- The display shows a negative mini notice.

15.20
Mute Mode

Supported systems:

☑ Capacity Max ☑ Other Systems

Mute Mode provides an option to silence all audio indicators on your radio.

When Mute Mode is initiated, all audio indicators are muted except higher priority features such as emergency operations.

When Mute Mode is exited, your radio resumes playing ongoing tones and audio transmissions.

Mute Mode can be enabled for a predefined duration by setting the Mute Mode Timer. The duration of the timer is configured through the radio menu and can range between 0.5–6 hours. Mute Mode is exited once the timer expires.

If the timer is left at **0**, the radio remains in Mute Mode for an indefinite period until the radio is moved to a face-up position or the programmed **Mute Mode** button is pressed.

IMPORTANT: You can only enable either Face Down or Fall Alert one at a time. Both features cannot be enabled together.

This feature is applicable to DP4800e/DP4801e, DP4600e/DP4601e, DP4400e/DP4401e only.

15.20.1
Turning the Mute Mode On

Procedure:

Perform one of the following actions:

- Place the radio in a face-down position momentarily.

  NOTE: Face Down feature is applicable to SL4000e/SL4010e only.

- Press the programmed **Mute Mode** button.

Result:
If Mute Mode is enabled, your radio shows the following indications:

- A positive tone sounds.
- The red LED blinks and continues blinking until Mute Mode is exited.
- The display shows `Mute Mode On`.
- The home screen shows the Mute Mode icon.
- Your radio mutes.
- If the Mute Mode Timer has been set, the timer begins counting down the duration that it is configured.

15.20.2
Setting the Mute Mode Timer

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Mute Timer**.
2. Edit the numeric value of each digit.

15.20.3
Exiting the Mute Mode

When the Mute Mode Timer expires, your radio automatically exits Mute Mode. You can also exit Mute mode manually.

Procedure:

Exit Mute Mode manually by performing one of the following actions:

- Press the programmed **Mute Mode** button.
- Press and hold the **PTT** button and speak into the microphone.
- Place your radio in a face-up position momentarily.
- Switch to any unprogrammed channel.

Result:

If Mute Mode is disabled, your radio shows the following indications:

- A negative tone sounds.
- The blinking red LED extinguishes.
- The display shows `Mute Mode Off`.
- The Mute Mode icon disappears from the home screen.
- Your radio unmutes and restores the speaker state.
- The Mute Mode Timer stops even if the timer has not expired.

15.21
Notification List

Supported systems:

☑ Capacity Max ☑ Other Systems

Your radio has a Notification list that collects all unread events on the channel, such as text messages, telemetry messages, missed calls, and call alerts.

The display shows the Notification icon when the Notification list has one or more events.

The list supports a maximum of 40 unread events. When the list is full, the next event automatically replaces the oldest event. After the events are read, they are removed from the Notification list.

The maximum number of notifications are 30 text messages and 10 missed calls or call alerts. This maximum number depends on individual feature (job tickets, text messages, missed calls, or call alerts) list capability.

15.21.1
Accessing the Notification List

Procedure:

From the menu, select **Notification**.

Result: The display shows all the available events.

15.22
Over-the-Air Programming

Your dealer can remotely update your radio through Over-the-Air Programming (OTAP) without any physical connection. Some settings can also be configured by using OTAP.

When your radio undergoes OTAP, the green LED blinks.

When your radio receives high volume data, your radio shows the following indications:

- If you press the **PTT** button, a negative tone sounds.
- The display shows the High Volume Data icon.
- The channel becomes busy.

When OTAP completes, your radio shows one of the following responses depending on the configuration:

- A tone sounds. The display shows `Updating Restarting`. Your radio restarts.
- Your radio displays the **Restart Now** or **Postpone** options. If you select **Postpone**, your radio returns to the previous screen. The display shows the OTAP Delay Timer icon until the automatic restart occurs.

When your radio turns on after automatic restart, your radio shows the following indications:

- If the program update is successful, the display shows `Sw Update Completed`.
- If the program update is unsuccessful, a tone sounds, the red LED blinks once, and the display shows `Sw Update Failed`.

NOTE:
If the programming update is unsuccessful, the update failure indications appear every time you turn on your radio. Contact your dealer to reprogram your radio with the latest software to eliminate the update failure indications.

15.23
Scan

Supported systems:

☑ Capacity Max ☑ Other Systems

Depending on the supported system available on your radio, your radio may have different behavior on Scan.

Talkgroup Scan

Talkgroup Scan is available for Capacity Max.

This feature allows your radio to monitor and join calls for groups defined by a Receive Group List.

When scan is enabled, your radio unmute to any member in its Receive Group List. When scan is disabled, your radio does not receive transmission from any members of the Receive Group List, except for All Call, Permanent Talkgroup, and the selected Talkgroup.

Channel Scan

Channel Scan is available for Other Systems.

When you start a scan, your radio scans through the programmed scan list for the current channel looking for voice activity. If you are on a digital channel, and your radio locks onto an analog channel, your radio automatically switches from digital mode to analog mode during the call and the same behavior occurs if you are on analog channel.

Table 19: Scan Methods

Method	Description
Main Channel Scan (Manual)	Your radio scans all the channels or groups in your scan list. When scanning, your radio may, depending on the settings, automatically start on the last scanned active channel or group, or on the channel where scan was initiated.
Auto Scan (Automatic)	Your radio automatically starts scanning when you select a channel or group that has Auto Scan enabled.

When you miss a call from a talkgroup or a channel that is in your scan list, you might be having the following situations:

- Scan feature is not on.
- Scan list member has been disabled through the menu.
- You are already participating in another call.

- For Multi-site system, no member of the scanned group is registered at your current site.

NOTE: If your radio joins a call for a Zone Scan List member from a different Zone and Call Hang Timer expires before you are able to respond, you must navigate to the Zone and Channel of the Scan List Member and start a new call to respond.

15.23.1
Turning the Scan On

Procedure:

From the menu, select **Scan** → **Turn On**.

Result:
If scan is turned on, your radio shows the following indications:

- A positive indicator tone sounds.
- The yellow LED blinks.
- The display shows `Scan On` and the scan icon.

15.23.2
Turning the Scan Off

Procedure:

From the menu, select **Scan** → **Turn Off**.

Result:
If scan is turned off, your radio shows the following indications:

- A negative indicator tone sounds.
- The LED extinguishes.
- The display shows `Scan Off` and the scan icon disappears.

15.23.3
Scan Talkback

Supported systems:

☑ Capacity Max ☐ Other Systems

The Talkback feature allows you to respond to a transmission while scanning.

Depending on how you configure the Scan Talkback feature, you will see two different scenarios if you press the PTT button when your radio scans into a call from the selectable group scan list.

Table 20: Scan Talkback Type

Type	Description
Scan Talkback Disabled	During an ongoing scanned call, if the **PTT** button is pressed, the scanned call is terminated and a new call is launched.

Type	Description
Scan Talkback Enabled	During an ongoing scanned call, if the **PTT** button is pressed, you can talkback to the scanned call.

NOTE:
If you face the following scenarios:

1. Scan into a call for a group that is not assigned to a channel position in the currently selected zone.
2. Miss the Hang Time of the call.

Perform the following actions:

1. Switch to the proper zone.
2. Select the channel position of the group to talk back to that group.

15.23.4
Nuisance Channels

Supported systems:

☐ Capacity Max ☑ Other Systems

Nuisance Channel is a channel that generates unwanted call continually.

You can temporarily remove the unwanted channel from the scan list and restore it back later on. This capability does not apply to the channel designated as the Selected Channel.

15.23.4.1
Deleting Nuisance Channels

Prerequisites: Your radio is scanned into the Nuisance Channel.

Procedure:

1. Press the programmed **Nuisance Delete** button until you hear a tone.
2. Release the programmed **Nuisance Delete** button.

15.23.4.2
Restoring Nuisance Channels

Procedure:

Perform one of the following actions:

- Restart your radio.
- Turn off and then turn on the scan.
- Change the channel using the **Channel Selector** knob.

15.23.5
Vote Scan

Supported systems:

☐ Capacity Max ☑ Other Systems

Vote Scan provides wide coverage in areas with multiple base stations transmitting identical information on different analog channels.

Your radio scans analog channels of multiple base stations, and performs a voting process to select the strongest received signal.

During a vote scan, your radio shows the following indications:

- The yellow LED blinks.
- The display shows the Vote Scan icon.

15.23.6

Scan Lists

You can create and assign individual channels or groups in Scan Lists. Your radio scans for voice activity by cycling through the channel or group sequence specified in the scan list for the current channel or group. Scan List also known as Receive Group List.

Your radio can support up to 250 scan lists, with a maximum of 16 members in a list. Each scan list supports a mixture of analog and digital entries.

The Priority icon on the left of member ID indicates whether the member is on Priority 1 or Priority 2 channel list. You cannot have multiple Priority 1 and Priority 2 channels in a scan list. There is no icon if the priority is set to **None**.

NOTE: This feature is not applicable to Capacity Plus.

15.23.6.1

Editing the Scan List

Procedure:

1. From the menu, select **Scan** → **View/Edit List** → ***<required group name>***.
2. Perform one of the following actions:
   - To enable the group in the scan list, select **Enable**.
   - To disable the group in the scan list, select **Disable**.

15.23.6.2

Editing Priority for the Scan List

Procedure:

1. To view and edit the priority of the talkgroup, from the menu, select **Scan** → **View/Edit List** → ***<required alias>*** → **Edit Priority**.
2. Perform one of the following actions:
   - To edit the required alias as Priority 1, select **Priority 1**.
   - To edit the required alias as Priority 2, select **Priority 2**.
   - To edit the required alias as no priority, select **None**.
3. If another talkgroup has been assigned to Priority 1 or Priority 2, you can overwrite the current priority when the display shows `Overwrite Existing?`.

- To overwrite, select **Yes**.
- To return to previous screen, select **No**.

15.23.6.3
Viewing the Scan List

Procedure:

1. From the menu, select **Scan** → **Scan List**.
2. Perform one of the following actions:
   - To do alias search, enter the required characters for the alias.
   - To search for the alias manually, scroll down the contact list with the **4-Way Navigation** button.

15.23.6.4
Adding New Entries to the Scan List

Procedure:

1. From the menu, select **Scan** → **Scan List** → **Add Member** → ***<required alias>***.
2. Perform one of the following actions:
   - To add the new alias as Priority 1, select **Priority 1**.
   - To add the new alias as Priority 2, select **Priority 2**.
   - To add the new alias as no priority, select **None**.
3. If another talkgroup has been assigned to Priority 1 or Priority 2, you can overwrite the current priority when the display shows `Overwrite Existing?`.
   - To overwrite, select **Yes**.
   - To return to previous screen, select **No**.
4. Perform one of the following actions:
   - To add another, select **Yes**.
   - To save the current list, select **No**.

15.23.6.5
Deleting Entries from the Scan List

Procedure:

1. From the menu, select **Scan** → **Scan List** → ***<required alias>*** → **Delete**.
2. Perform one of the following actions:
   - To delete the alias, select **Yes**.
   - To return to previous screen, select **No**.

15.23.7

Flexible Receive List

The Flexible Receive List feature allows you to create and assign members on the receive talkgroup list.

Your radio can support a maximum of 16 members in the list.

NOTE: This feature is only applicable to Capacity Plus.

15.23.7.1

Turning the Flexible Receive List On

Procedure:

From the menu, select **Radio Settings** → **Flexible Rx List** → **Turn On**.

Result: Your radio shows the following indicators:

- A positive tone sounds.
- The display shows `Flexible Rx List On`.

15.23.7.2

Turning the Flexible Receive List Off

Procedure:

From the menu, select **Radio Settings** → **Flexible Rx List** → **Turn Off**.

Result: Your radio shows the following indicators:

- A negative tone sounds.
- The display shows `Flexible Rx List Off`.

15.23.7.3

Adding New Entries to the Flexible Receive List

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Flexible Rx List** → **View/Edit List** → **Add Member** → ***<required ID or alias>***.

   Your radio prompts `Add Another?`.

2. Perform one of the following actions:
   - To add another new entry, select **Yes**.
   - To save current entry, select **No**.

15.23.7.4

Deleting Entries from the Flexible Receive List

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Flexible Rx List** → **View/Edit List**.
2. Search for an alias by performing one of the following actions:

- Enter the characters of the alias.
- Scroll through the list with the **4-Way Navigation** button.

3. Select **Delete**.
4. Perform one of the following actions:
   - To delete the ID or alias, select **Yes**.
   - To return to the previous screen, select **No**.

15.23.8
Multi-Talkgroup Affiliation

Supported systems:

☑ Capacity Max ☐ Other Systems

Your radio can be configured for up to seven talkgroups at a site.

Up to seven talkgroups can be assigned as affiliation talkgroups from the 16 talkgroups in the Receive Group List. The selected talkgroup and the priority talkgroups are automatically affiliated.

15.23.8.1
Adding the Talkgroup Affiliation

Procedure:

1. From the menu, select **Scan** → **View/Edit List** → ***<required ID or alias>*** → **Edit Affiliation**.
2. To add the Talkgroup Affiliation, select **On**.

Result:
If affiliation is successfully added to the system, the display shows positive mini notice.

If maximum of seven talkgroups are selected for affiliation, the display shows `List Full`.

NOTE:
In the **View/Edit List**, ● beside the talkgroups indicates registration in progress or adding talkgroup affiliation has failed.

The ✓ beside the talkgroups indicates the talkgroup affiliation is successful.

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15.23.8.2
Removing the Talkgroup Affiliation

Procedure:

1. From the menu, select **Scan** → **View/Edit List** → ***<required ID or alias>*** → **Edit Affiliation**.
2. To remove the Talkgroup Affiliation, select **Off**.

Result: In the **View/Edit List**, ✓ disappears beside the selected Talkgroup ID.

15.24
Priority Call

Supported systems:

☑ Capacity Max ☐ Other Systems

Priority Call allows the system to preempt one of the ongoing non-priority calls and initiate the requested high priority call when all channels are busy.

With all channels occupied with high priority calls, the system does not preempt any calls, and places the requesting high-priority call into call queue. If the system fails to place the requesting high-priority call into call queue, it declares failure.

The default settings for Priority Call are preconfigured. When the following features are used, the call priority level reverts automatically to the preconfigured setting.

- All voice calls
- DMR III Text Message/Text Message
- Job Ticket
- Remote monitor

15.24.1
Switching the Priority Call Level

Procedure:

Press the programmed **Toggle Call Priority Level** button.

Result:
If High Priority is enabled, your radio shows the following indications:

- A voice announcement sounds.
- The display shows `Next Call: High Priority`.
- The Call Priority High icon appears on the home screen.

If Normal Priority is enabled, your radio shows the following indications:

- A voice announcement sounds.
- The display shows `Next Call: Normal Priority`.
- The Call Priority High icon disappears on the home screen.

15.25
Radio Check

Supported systems:

☑ Capacity Max ☑ Other Systems

If enabled, this feature allows you to determine if another radio is active in a system without disturbing the user of that radio. No audible or visual notification is shown on the target radio.

This feature is only applicable for subscriber IDs.

15.25.1
Sending Radio Checks

Procedure:

From the menu, select **Contacts** → ***<required ID or alias>*** → **Radio Check**.

Result:
If the target radio is active in the system, your radio shows the following indications:

- A tone sounds.
- The display shows `Target Radio Available`.

If the target radio is inactive in the system, your radio shows the following indications:

- A tone sounds.
- The display shows `Target Radio Not Available`.

15.26
Radio Kill

Supported systems:

☑ Capacity Max ☐ Other Systems

This feature is an enhanced security measure to restrict unauthorized access to a radio.

Radio Kill causes a radio to be rendered inoperable. For example, you may want to kill a stolen or misplaced radio to prevent unauthorized usage.

When powered on, a killed radio displays `Radio Killed` on the screen momentarily to indicate the killed state.

NOTE: A killed radio can only be revived at a Motorola Solutions service depot. Contact your dealer for more information.

15.27
Received Signal Strength Indicator

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature allows you to view the Received Signal Strength Indicator (RSSI) values.

The display shows the RSSI icon at the top right corner.

15.27.1
Viewing RSSI Values

Procedure:

At the home screen, within 5 s, select the **Left** button three times and **Right** button three times.

Result: The display shows the current RSSI values.

15.28
Response Inhibit

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature helps prevent your radio from responding to any incoming transmissions.

NOTE: Contact your dealer for more information.

If enabled, your radio does not generate any outgoing transmissions in respond to incoming transmissions, such as Radio Check, Call Alert, Radio Disable, Remote Monitor, Automatic Registration Service (ARS), and responding to Private Messages.

Your radio cannot receive Confirmed Private Calls when this feature is enabled. However, your radio is able to manually send transmission.

15.28.1
Setting the Response Inhibit

Procedure:

Press the programmed **Response Inhibit** button.

Result:
If the Response Inhibit is successfully turned off, your radio shows the following indications:

- A positive tone sounds.
- The display shows a momentary positive mini notice.

If the Response Inhibit fails to turn off, your radio shows the following indications:

- A negative tone sounds.
- The display shows a momentary negative mini notice.

15.29
Rental Timer

The Rental Timer feature allows the radio rental dealer to set the permitted rental period of your radio and automatically disable the radio beyond the duration specified on the timer.

The radio can be programmed with a maximum rental period of 999 hours and a maximum rental period extension of 99 hours.

The timer calculates the radio usage time and disables the radio when the usage time reaches the predetermined rental period.

After the rental period expires, the radio ceases to function until the dealer resets the rental timer.

15.29.1
Accessing Rental Timer Information

Procedure:

From the menu, select **Utilities** → **Rental Timer** → **Information**.

Result: The display shows the hours.

15.29.2
Rental Expiry Reminder

The Rental Expiry Reminder feature provides a reminder when the rental period is expiring.

The radio provides a display and an audio reminder of the timer expiry.

For the audio reminder frequency, the voice announcement sounds as the followings:

- Every 1 hour after the first reminder, until the last 2 hours before the rental period expires.
- Twice for the last 2 hours before the rental period expires.
- Twice during the last 3 minutes, 2 minutes and 1 minute before the rental period expires.

For the display reminder, your radio display shows a momentary notice reminder referring to the number of hours before before the rental period expires.

For the last 3 minutes before expiry, your radio display shows a momentary notice reminder referring to the number of minutes before the rental period expires.

15.29.3
Extending the Rental Period

The radio can be programmed with a maximum of 99 hours rental period extension.

Procedure:

Perform one of the following actions:

Options	Actions
Extending the rental period through the menu	**a.** From the menu, select **Utilities** → **Rental Timer** → **Extension**. **b.** Press the **Menu/OK** button. **NOTE:** You can only extend the rental period once. The extension check box is greyed out after you enable the feature.
Extending the rental period through the button	Press the **Side Button 2** six times continuously. **NOTE:** You can only extend the rental period once. A negative indicator tone sounds if you press the button again.

15.30
Security

Supported systems:

☐ Capacity Max ☑ Other Systems

This feature allows you to stun or revive any radio in the system.

For example, you may disable stolen radio to prevent unauthorized users from using and revive or enable the radio when it is recovered.

When a radio is stunned, the radio cannot request nor receive any user initiated services on the system that performed the stun procedure. However, the radio can switch to another system. The radio continues to send GNSS location reports and can be monitored remotely when it was stunned or disabled.

For Other Systems, you can stun or revive a radio with or without authentication.

Authenticated Radio Disable is a selling feature and requires verification when you enable or disable a radio. When your radio disables a target radio with user authentication, a passphrase is required. The passphrase is preprogrammed in the target radio through the Customer Programming Software (CPS).

NOTE: Contact your dealer to enable this feature.

15.30.1
Disabling Radios

Procedure:

1. Perform one of the following actions:

Option	Actions
Disabling the Radio with Contact List	From the menu, select **Contacts** → ***<required ID or alias>*** → **Radio Disable**.
Disabling the Radio with Manual Dial	**a.** From the menu, select **Contacts** → **Manual Dial**. **b.** Enter the ID. **c.** Select **Radio Disable**.

2. Enter the passphrase if required.

Result:
If the request is successful, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.

If the request is unsuccessful, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows a negative mini notice.

15.30.2
Enabling Radios

Procedure:

1. Perform one of the following actions:

Option	Actions
Enabling the Radio with Contact List	From the menu, select **Contacts** → ***<required ID or alias>*** → **Radio Enable**.
Enabling the Radio with Manual Dial	**a.** From the menu, select **Contacts** → **Manual Dial**. **b.** Enter the ID. **c.** Select **Radio Enable**.

2. Enter the passphrase if required.

Result:
If the request is successful, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.

If the request is unsuccessful, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows a negative mini notice.

15.31
Service and Support

Supported systems:

☑ Capacity Max ☑ Other Systems

You can identify the types of service and support that your radio needs through the service code.

For Full Keypad and Limited Keypad models, your radio shows the notification alert and service code on the radio display.

For Non-Keypad model, respective service code messages are only available through Voice Announcement.

NOTE: If the Voice Announcement feature is not enabled in the radio programming software, service mode and service-related announcements are not available for your Non-Keypad model.

For more information about the Service Code, refer to the MOTOTRBO™ Radios Service Codes Troubleshooting Guide, MN009539A01 at https://learning.motorolasolutions.com.

15.31.1
Accessing Notifications

You can identify the types of service and support that your radio needs through the notifications.

Procedure:

Perform one of the following actions:

Option	Actions
Accessing Single Notification Alert	If you receive a notification alert and the respective service code, perform one of the following actions: • To delete the service code, press **Menu/OK** → **Yes**. • To return to the previous screen, press the **Back/Home** button.
Accessing Multiple Notification Alert	If you receive a notification alert and a selection of notifications, perform the following actions: **a.** To view the service code details, select the ***<relevant notification>***. **b.** Perform one of the following actions. • To delete the service code, press **Menu/OK** → **Yes**. • To return to the previous screen, press the **Back/Home** button.

15.31.2

Accessing Service and Support

You can identify the types of service and support that your radio needs through the service code.

Procedure:

Perform one of the following actions:

Option	Actions
Accessing The Service Codes From the **Service & Support** Menu	**a.** From the menu, select **Service & Support** → ***< type of service code>*** → ***<relevant notification>***. **b.** Perform one of the following actions: • To delete the service code, press **Menu/OK** → **Yes**. • To return to the previous screen, press the **Back/Home** button.
Viewing The Get Support Link	**a.** From the menu, select **Service & Support** → **Get Support**. **b.** Type the URL into a web browser.

Option	Actions
Accessing Service Mode **NOTE:** Only applicable for Non-Keypad model.	**a.** Press and hold the **Side Button 1** for 5 seconds within 10 seconds after your radio is turned on. **b.** Perform one of the following actions: • To listen to all service messages, press the **Side Button 1** again. • To delete all service messages, press and hold the **Side Button 2** until you hear a valid tone indicating successful deletion of all service messages. **c.** To exit service mode, perform radio power cycle. **NOTE:** When the radio is in the service mode, normal radio operations are disabled.

15.31.3
Viewing Service Contact

Viewing Service Contact feature is only available for radio models with display.

Procedure:

From the menu, select **Service & Support** → **Service Contact**.

Result: Your radio shows the service contact details.

15.32
Stun or Revive

Supported systems:

☑ Capacity Max ☐ Other Systems

This feature allows you to stun or revive any radio in the system. For example, you may want to stun a stolen radio to prevent unauthorized usage, and revive the radio when it is recovered.

A radio can be stunned or revived either through the console or through a command initiated by another radio.

When a radio is stunned, the radio cannot request nor receive any user initiated services on the system that performed the Stun procedure. However, the radio can switch to another system. The radio continues to send GNSS location reports and can be monitored remotely when it was stunned.

15.32.1
Stunning Radios

Procedure:

1. Perform one of the following actions:

Option	Actions
Stunning or disabling radios with Contact List	From the menu, select **Contacts** → ***<required ID or alias>*** → **Radio Disable**.
Stunning or disabling radios with Manual Dial	**a.** From the menu, select **Contacts** → **Manual Dial** → **Private Call**. **b.** Enter the ID. **c.** Select **Radio Disable**.

2. For Other Systems, enter the passphrase if required.

Result:
The green LED blinks and the display shows `Radio Disable: <ID>`.

If the radio is successfully stunned, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.

If the radio is unsuccessfully stunned, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows a negative mini notice.

15.32.2
Reviving Radios

Procedure:

1. Perform one of the following actions:

Option	Actions
Reviving or enabling radios with Contact List	From the menu, select **Contacts** → ***<required ID or alias>*** → **Radio Enable**.
Reviving or enabling radios with Manual Dial	**a.** From the menu, select **Contacts** → **Manual Dial** → **Private Call**. **b.** Enter the ID. **c.** Select **Radio Enable**.

2. For Other Systems, enter the passphrase if required.

Result:
The green LED illuminates and the display shows `Radio Enable: <ID>`.

If the radio is revived successfully, your radio shows the following indications:

- A positive indicator tone sounds.
- The display shows a positive mini notice.

If the radio is revived unsuccessfully, your radio shows the following indications:

- A negative indicator tone sounds.
- The display shows a negative mini notice.

15.33
Status Message

Supported systems:

☑ Capacity Max ☐ Other Systems

This feature allows your radio to send status messages to other radios.

The Quick Status list is configured using the radio programming softwares and comprises up to a maximum of 99 statuses.

The maximum length for each status message is 16 characters.

Contact your dealer for more information.

NOTE: Every status has a corresponding digital value ranging from 0–99. An alias can be specified to each status for ease of reference.

15.33.1
Viewing Status Messages

Procedure:

From the menu, select **Status** → **Inbox** → ***<required status message>***.

Result: Your radio displays the content of the selected status message.

15.33.2
Sending Status Messages

Procedure:

Perform one of the following actions:

Option	Actions
Sending a Status Message	From the menu, select **Status** → **Quick Status** → ***<required status message>*** → ***<required ID or alias>***.
Sending a Status Message with Contact List	From the menu, select **Contacts** → ***<required ID or alias>*** → **Send Status** → ***<required status message>***.

Option	Actions
Sending a Status Message with Manual Dial	a. From the menu, select **Contacts** → **Manual Dial** → **Radio Number**. b. Enter the ID or alias and press the **Menu/OK** button. c. Select **Send Status** → ***<required status message>***.

Result:
If your status message is sent successfully, your radio shows the following indications:

- A positive indicator tone sounds.
- The LED extinguishes.
- The display shows a positive mini notice and a ✓ beside the sent status message.

If your status message is fails, your radio shows the following indications:

- A negative indicator tone sounds.
- The LED extinguishes.
- The display shows a failure notice.

15.33.3
Responding to Status Messages

Procedure:

From the menu, select **Status** → **Inbox** → ***<required status message>*** → **Reply** → ***<required status message>***.

15.33.4
Deleting Status Messages

Procedure:

1. From the menu, select **Status**.
2. Perform one of the following actions:
   - To delete a status message, select **Inbox** → ***<required status message>*** → **Menu/OK** → **Delete** → **Yes**.
   - To delete all status messages, select **Inbox** → **Delete All** → **Yes**.

15.34
Text Messaging

Supported systems:

☑ Capacity Max ☑ Other Systems

Your radio is able to receive data from another radio or a text message application.

There are two types of text messages, Digital Mobile Radio (DMR) Short Text Message and text message. The maximum length of a DMR Short Text Message is 23 characters. The maximum length of a text message

is 280 characters, including the subject line. The subject line only appears when you receive messages from e-mail applications.

NOTE:
The maximum character length is only applicable for models with the latest software and hardware. For radio models with older software and hardware, the maximum length of a text message is 140 characters. Contact your dealer for more information.

15.34.1
Viewing Text Messages

Procedure:

1. From the menu, select **Messages**.
2. Perform one of the following actions:
   - For Text Messages or Telemetry Status, select **Inbox** → ***<required messages>***.
   - For Sent Text Messages, select **Sent Items** → ***<required messages>***.

Result:
If the Inbox, Drafts, or Sent Items folder is empty:

- If the Keypad Tone is enabled, a tone sounds.
- The display shows `List Empty`.

If the Inbox, Drafts, or Sent Items folder is not empty, the display shows a subject line if the message is from an email application.

For Telemetry Status, you cannot reply to the message and your display shows `Telemetry: <Status Text Message>`.

15.34.2
Composing Text Messages

Procedure:

1. From the menu, select **Messages** → **Compose**.
2. Compose your message.
3. Perform one of the following actions:
   - To save a text message, select **Back/Home** → **Save**.
   - To discard a text message, select **Back/Home** → **Discard**.

   NOTE: If you accidentally select the **Back/Home** button, you can select `Edit` to continue composing your text message.

   If your text message is saved, you can view and edit your text message in the Draft folder.

   If your text message is discarded, your text message is deleted.

15.34.3
Sending Text Messages

Prerequisites: Compose your message.

Procedure:

Perform one of the following actions:

Option	Actions
Sending Text Messages	1. From your composed message, select the **Menu/OK** button. 2. Perform one of the following actions: ○ Select the ***<required ID or alias>***. ○ Select **Manual Dial** and enter the ID.
Sending Sent Text Messages	From your sent message, select **Menu/OK** → **Resend**.
Sending Quick Text Messages	1. From the menu, select **Messages** → **Quick Text**. 2. Perform one of the following actions: ○ Select the ***<required ID or alias>***. ○ Select **Manual Dial** and enter the ID.
Resending Text Messages	Select **Resend**.

Result:

If your text message is successfully sent, your radio shows the following indications:

- A tone sounds.
- The display shows positive mini notice.

If your text message fails to send, the display shows the following options:

- `Resend`
- `Forward`
- `Edit`

15.34.4

Responding to Text Messages

When you receive a text message, your radio displays the following items:

- The Notification List with the ID or alias of the sender.

- The Message icon.

NOTE: If you press the **PTT** button, your radio exits the Text Message alert screen and makes a Private or Group Call to the sender.

Procedure:

Perform one of the following actions:

Option	Actions
Responding to Text Messages from the Notification List	Perform one of the following actions: • To read the text message, select **Read**. • To read the text message later, select **Read Later**. • To delete the text message, select **Delete**. • To reply, perform the following actions: **a.** Press **Menu/OK** button twice. **b.** Select the ***<required message>***.
Responding to Text Messages	From the menu, select **Messages** → **Inbox** → ***<required message>*** → **Reply**.
Responding to Text Messages with Quick Text	From the menu, select **Messages** → **Inbox** → ***<required message>*** → **Reply** → **Quick Reply**.

15.34.5

Forwarding Text Messages

Procedure:

1. From the **Resend** option screen, select **Messages**.
2. To forward a Text Message from the Inbox or Sent Item folder, select ***<required message>*** → **Forward**.
3. To forward a Text Message by Using the Manual Dial, perform one of the following actions:
   - Select the ***<required ID or alias>***.
   - Select Manual Dial and enter the ID.

Result:
If your text message is successfully forwarded, your radio shows the following indications:

- A positive tone sounds.
- The display shows positive mini notice.

If your text message fails to forward, the display shows the following indications:

- A negative tone sounds.
- The display shows negative mini notice.

15.34.6

Deleting Text Messages

Procedure:

1. From the menu, select **Messages**.
2. Perform one of the following actions:
   - To delete text messages, select **Inbox** → ***<required text message>*** → **Menu/OK** → **Delete**.
   - To delete all text messages, select **Inbox** → **Delete All**.
   - To delete sent text messages, select **Sent Items** → ***<required text message>*** → **Menu/OK** → **Delete**.
   - To delete all sent text messages, select **Sent Items** → **Delete All**.
   - To delete saved text messages, select **Drafts** → ***<required text message>*** → **Menu/OK** → **Delete**.
   - To delete all saved text messages, Select **Drafts** → **Delete All**.

15.34.7

Setting Text Message Alert Tones

Procedure:

1. From the menu, select **Contacts** → ***<required ID or alias>*** → **Message Alert**.
2. Perform one of the following actions:
   - To have momentary tone, select **Momentary**.
   - To have repetitive tone, select **Repetitive**.

Chapter 16

Utilities

This chapter explains the operations of the utility functions available in your radio.

16.1 Talkaround

Supported systems:

☐ Capacity Max ☑ Other Systems

This feature allows you to continue communicating when your repeater is non-operational, or when your radio is out of range from the repeater but within the talk range of other radios.

The talkaround setting is retained even after powering down.

NOTE: This feature is not applicable in Capacity Plus–Single-Site, Capacity Plus–Multi-Site, and Citizens Band channels that are in the same frequency.

16.1.1 Toggling Between Repeater and Talkaround Mode

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Talkaround**.
2. Select the **Menu/OK** button to toggle between Talkaround or Repeater mode.

Result:
When Talkaround mode is enabled, a ✓ appears beside `Enabled`.

When Talkaround mode is disabled, the ✓ disappears beside `Enabled`.

16.2 Setting Radio Tones and Alerts

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Tones/Alerts**.
2. Select one of the following options:
   - **All Tones**
   - **Talk Permit**
   - **Keypad Tone**
   - **Power Up Tone**

- **Vol.Offset** → ***<required volume>***.

Result: A ✓ appears beside the setting.

16.3
Setting Power Levels

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Power**.
2. Perform one of the following actions:
   - To enable communication with radios located at a considerable distance from you, select **High**.
   - To enable communication with radios in closer proximity, select **Low**.

16.4
Adjusting Display Settings

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Display**.
2. Select one of the following options:
   - **Day Mode/Night Mode**
   - **Brightness**
   - **Backlight Auto**
   - **Backlight Timer**
   - **Menu Timer**
   - **Intro Screen**

16.5
Setting Squelch Levels

Supported systems:

☐ Capacity Max ☑ Other Systems

You can adjust the squelch level to filter out unwanted calls with low signal strength or channels with noise higher than normal background.

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Squelch**.

2. Perform one of the following actions:
   - For a normal squelch level, select **Normal Squelch**.
   - To filter out unwanted calls or background noise, select **Tight Squelch**.

16.6 Keypad Lock Options

Supported systems:

☑ Capacity Max ☑ Other Systems

With this feature, you can avoid accidentally pressing buttons or changing channels when your radio is not in use. You can choose to either lock your keypad, channel selector knob, or both; depending on your requirements.

Your dealer can configure one of the following options with the radio programming softwares:

- Lock Keypad
- Lock Channel Selector Knob
- Lock Keypad and Channel Selector Knob

Contact your dealer to determine how your radio has been programmed.

16.6.1 Locking or Unlocking the Keypad

Procedure:

Perform one of the following actions:

- To lock the keypad, from the menu, select **Utilities** → **Radio Settings** → **Keypad Lock**.
- To unlock the keypad, press **Menu/OK** → *** or delete key**.

Result:
If the keypad is locked, the display shows a ✓ beside `Enabled`.

If the keypad is unlocked, the ✓ disappears beside `Enabled`.

16.7 Setting Languages

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Languages** → ***<required language>***.

Result: A ✓ appears beside the selected language.

16.8
Setting LED Indicators

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **LED Indicator**.
2. Perform one of the following actions:
   - To enable LED Indicator, select **Menu/OK** button.
   - To disable LED Indicator, select **Menu/OK** button.

Result:
If the LED Indicator is enabled, a ✓ appears beside `Enabled`.

If the LED Indicator is disabled, your radio shows the following indications:

- The ✓ disappears beside `Enabled`.
- The display backlight and keypad backlight are automatically turned off.

16.9
Password Lock

Supported systems:

☑ Capacity Max ☑ Other Systems

You can set a password to restrict access to your radio. Each time you turn on your radio, you must enter the password.

Your radio supports a four-digit password input.

Your radio is unable to receive calls in locked state.

16.9.1
Accessing Radios with Password

Prerequisites: Turn on your radio.

Procedure:

1. Enter your four-digit password.
2. Select the **Menu/OK** button.

Result:
If you enter the password correctly, your radio turns on.

If you enter the password incorrectly, a tone sounds, the yellow LED illuminates, and the display shows `Wrong Password`.

NOTE:
You may repeat the steps to enter the password. You are given three attempts before your radio enters into a locked state for 15 minutes. The display shows `Radio Locked`.

During locked state, your radio responds to inputs from the **On/Off/Volume knob** and the programmed **Backlight** button only.

If you restart your radio during the locked state, the timer restarts.

16.9.2
Unlocking Radios in Locked State

Procedure:

To unlock your radio in locked state, perform one of the following actions:

Option	Actions
Unlocking Radios in Locked State if your radio is turned on	**a.** Wait for 15 minutes. **b.** Access the radio by following the steps in Accessing Radios with Password.
Unlocking Radios in Locked State if your radio is turned off	**a.** Turn on your radio. **NOTE:** Your radio restarts the 15 minutes timer for locked state. **b.** Wait for 15 minutes. **c.** Access the radio by following the steps in Accessing Radios with Password.

16.9.3
Setting the Password Lock

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Passwd Lock** → ***<required password>***.

   NOTE: When using this feature for the first time, the display shows `New Password Setup` to set a new password. You must set a new password before setting the Password Lock feature.

2. Perform one of the following actions:
   - To enable Password Lock, select **Turn On**.
   - To disable Password Lock, select **Turn Off**.

16.9.4
Changing Passwords

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Passwd Lock** → ***<required password>*** → **Change PWD**.

2. Enter a new four-digit password.
3. To confirm the new password, re-enter the same four-digit password.

Result:
If the password is successfully changed, the display shows `Password Changed`.

If the password change is unsuccessful, the display shows `Password Do Not Match` and returns to the previous menu.

16.10
Voice Announcement

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature enables the radio to audibly indicate the current Zone or Channel assigned. This audio indicator can be customized per customer requirements.

16.10.1
Setting the Voice Announcement

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Voice Announcement**.
2. Perform one of the following actions:
   - To enable Voice Announcement, select the **Menu/OK** button.
   - To disable Voice Announcement, select the **Menu/OK** button.

Result:
If the Voice Announcement is enabled, a ✓ appears beside `Enabled`.

If the Voice Announcement is disabled, the ✓ disappears beside `Enabled`.

16.11
Text-to-Speech

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature enables the radio to audibly indicate the following features:

- Current Channel
- Current Zone
- Programmed button feature on or off
- Content of received text messages
- Content of received Job Tickets

NOTE:
If Text-to-Speech is enabled, the Voice Announcement feature is automatically disabled. If Voice Announcement is enabled, then the Text-to-Speech feature is automatically disabled.

16.11.1
Setting the Text-to-Speech

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Text-to-Speech**.
2. Select one of the following options:
   - **All**
   - **Messages**
   - **Job Tickets**
   - **Channel**
   - **Zone**
   - **Program Button**

Result: A ✓ appears beside the selected setting.

16.12
Setting the Microphone Automatic Gain Control

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings**
2. Perform one of the following actions:
   - For Analog Microphone Automatic Gain Control, select **Mic AGC-A**.
   - For Digital Microphone Automatic Gain Control, select **Mic AGC-D**.
3. Perform one of the following actions:
   - To enable Mic AGC, select the **Menu/OK** button.
   - To disable Mic AGC, select the **Menu/OK** button.

Result:
If the Mic AGC is enabled, a ✓ appears beside `Enabled`.

If the Mic AGC is disabled, the ✓ disappears beside `Enabled`.

16.13
Setting the Microphone Distortion

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Mic Distortion**.
2. Perform one of the following actions:

- To enable Mic Distortion, select the **Menu/OK** button.
- To disable Mic Distortion, select the **Menu/OK** button.

Result:
If the Mic Distortion is enabled, a ✓ appears beside `Enabled`.

If the Mic Distortion is disabled, the ✓ disappears beside `Enabled`.

16.14
Setting the Text Entry

Supported systems:

☑ Capacity Max ☑ Other Systems

You can configure different text entries on your radio.

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Text Entry**.
2. Perform one of the following actions:

Option	Actions
Setting your radio to learn common word sequences that you often enter	Select **Word Predict**.
Setting your radio to perform word correction	Select **Word Correct**.
Setting your radio to capitalize the first letter in the first word for every new sentence	Select **Sentence Cap**.
Setting custom words	• To view custom words, select **My Words** → **List of Words**. • To edit a custom word, select **My Words** → **Edit**. • To add a custom word, select **My Words** → **Add New Word**. • To delete a custom word, select **My Words** → ***<required word>*** → **Delete**. • To delete all custom words, select **My Words** → **Delete All**.

Result:

- If you select **Word Predict**, **Word Correct**, or **Sentence Cap**, a ✓ appears beside `Enabled`.
- If you select **My Words**, the display shows a transitional mini notice.

16.15
Privacy

Supported systems:

☑ Capacity Max ☑ Other Systems

This feature prevents eavesdropping by unauthorized users on a channel by the use of a software-based scrambling solution. The signaling and user identification portions of a transmission are clear.

Your radio must have privacy enabled on the channel to send a privacy-enabled transmission, although this is not a requirement for receiving a transmission.

Some radio models may not offer Privacy feature, or may have different configuration. Contact your dealer for more information.

NOTE:
Only one type of privacy can be assigned at a time.

This feature is not applicable in Citizens Band channels that are in the same frequency.

The following table describes the type of privacy and the settings that appear on your radio.

Table 21: Privacy Types and Settings

Type	Setting
Basic Privacy	`Privacy`
Enhanced Privacy	`Enhanced Privacy`

16.15.1
Setting Privacy

Procedure:

1. From the menu, select **Utilities** → **Radio Settings**.
2. Depending on the configured type of privacy, select your privacy setting.
3. Perform one of the following actions:
   - To enable Privacy, select the **Menu/OK** button.
   - To disable Privacy, select the **Menu/OK** button.

Result:
If Privacy is enabled, a ✓ appears beside `Enabled`.

If Privacy is disabled, the ✓ disappears beside `Enabled`.

16.16
Voice Operating Transmission

Supported systems:

☐ Capacity Max ☑ Other Systems

Voice Operating Transmission (VOX) allows you to initiate hands-free voice-activated calls on a programmed channel. When your VOX-capable accessory detects voice, your radio automatically transmits for a programmed period.

NOTE:
This feature is not applicable in Citizen Band channels that are in the same frequency.

Contact your dealer or administrator for more information.

16.16.1

Setting the Voice Operating Transmission

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **VOX**
2. Perform one of the following actions:
   - To enable VOX, select **On**.
   - To disable VOX, select **Off**.

Result: If VOX is turned on, the display shows a ✓ beside `On`.

16.17

Setting the Audio Ambience

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Audio Ambience**.
2. Perform one of the following actions:
   - For default factory settings, select **Default**.
   - To increase the volume of the speaker in noisy surroundings, select **Loud**.
   - To reduce the acoustic feedback when communicating with a group of radios that are near each other, select **Work Group**.

Result:
The display shows a ✓ beside the selected setting.

16.18

Setting the Audio Profiles

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Audio Profiles**.
2. Perform one of the following actions:
   - To disable the previous selected audio profile and return to the default factory settings, select **Default**.
   - For audio profiles that compensate noice-induced hearing loss in adults above 40 years old, select **Level 1**, **Level 2**, or **Level 3**.
   - If you prefer audio profiles with tinnier, more nasal, or deeper sounds, select **Treble Boost**, **Mid Boost**, or **Bass Boost**.

Result:

The display shows a ✓ beside the selected setting.

16.19
Setting the Acoustic Feedback Suppressor

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **AF Suppressor**.
2. Perform one of the following actions:
   - To enable AF Suppressor, select the **Menu/OK** button.
   - To disable AF Suppressor, select the **Menu/OK** button.

16.20
Setting the Global Navigation Satellite System

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **GNSS**.
2. Perform one of the following actions:
   - To enable GNSS, select the **Menu/OK** button.
   - To disable GNSS, select the **Menu/OK** button.

Result:
When GNSS is enabled, a ✓ appears beside `Enabled`.

When GNSS is disabled, a ✓ disappears beside `Enabled`.

16.21
Setting the Automatic Call Forwarding

Supported systems:

☐ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Call Forward**.
2. Perform one of the following actions:
   - To enable Call Forwarding, select the **Menu/OK** button.
   - To disable Call Forwarding, select the **Menu/OK** button.

Result:
If the Call Forwarding is enabled, a ✓ appears beside `On`.

16.22
Setting the Option Board

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

Press the programmed **Option Board** button.

Result:
If the option board is enabled, your radio shows option board enabled icon.

If the option board is disabled, your radio shows option board disabled icon.

16.23
Setting the Intelligent Audio

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Intelligent Audio**.
2. Perform one of the following actions:
   - To enable Intelligent Audio, select **On**.
   - To disable Intelligent Audio, select **Off**.

   NOTE:
   Your radio automatically adjusts the audio volume to overcome current background noise in the environment.

   Intelligent audio feature is a receive-only feature.

   This feature is not applicable during a Bluetooth session.

16.24
Setting the Trill Enhancement

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Settings** → **Trill Enhance**.
2. Perform one of the following actions:
   - To enable Trill Enhancement, select **On**.
   - To disable Trill Enhancement, select the **Off**.

16.25

Accessing the Radio Information

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

1. From the menu, select **Utilities** → **Radio Info**.
2. To access the radio information, perform one of the following actions:
   - To check on battery information, select **Battery Info**.
   - To check on your radio ID and alias, select **My ID**.
   - To check on the firmware and Codeplug versions, select **Versions**.
   - To check on the GNSS information, select **GNSS Info**.
   - To check on the site information, select **Site Info**.
   - To check on the latest software update information, select **SW Update**.

16.26

Identifying the Cable Type

Supported systems:

☑ Capacity Max ☑ Other Systems

Procedure:

From the menu, select **Utilities** → **Radio Settings** → **Cable Type**.

Result:
The display shows a ✓ beside the current cable.

16.27

Switching Audio Route between Internal Radio Speaker and Wired Accessory

Supported systems:

☑ Capacity Max ☑ Other Systems

Prerequisites:
Attach a wired accessory with speaker to your radio.

Ensure that the audio is not routed to an external Bluetooth accessory.

Procedure:

Switch the audio route between the internal speaker of your radio and the speaker of the wired accessory by pressing the programmed **Audio Toggle** button.

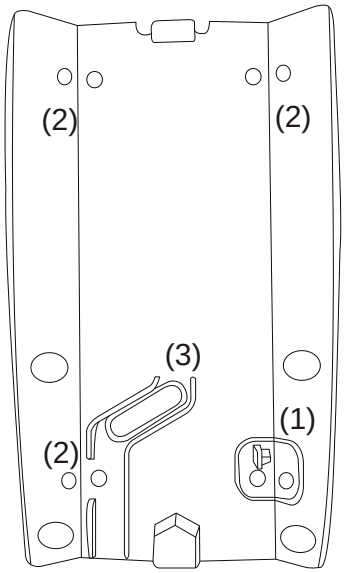
NOTE: Turning off your radio or detaching the accessory resets the audio routing to the internal speaker of your radio.

Result:
If the audio route is switched, a tone sounds.

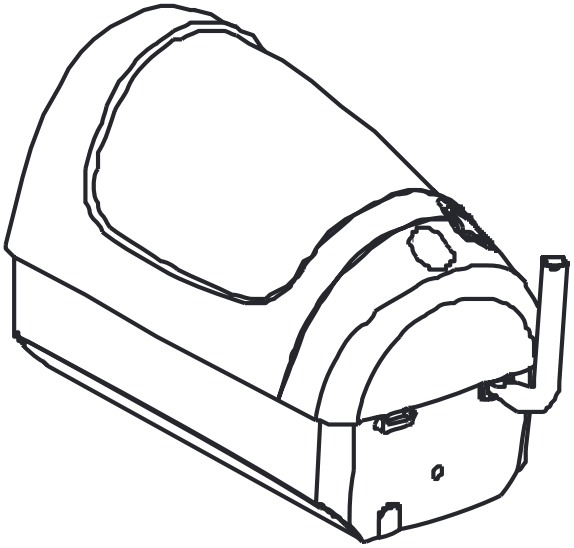
6931P Mini Outdoor Dual Tech Detector Installation Sheet

EN DE ES FR IT NL PL PT SV

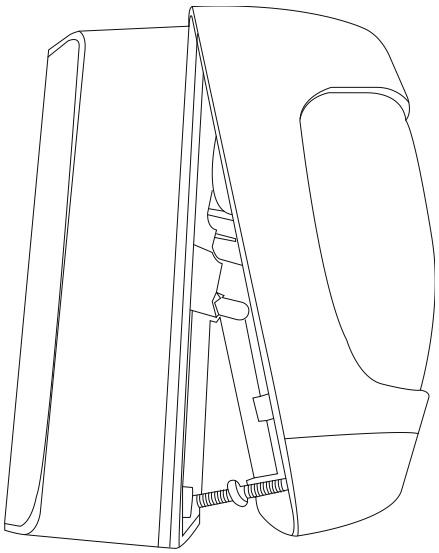
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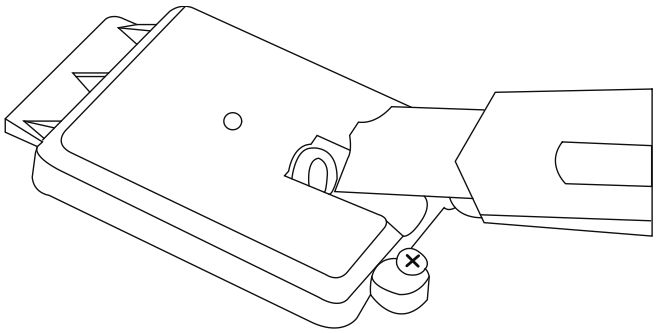
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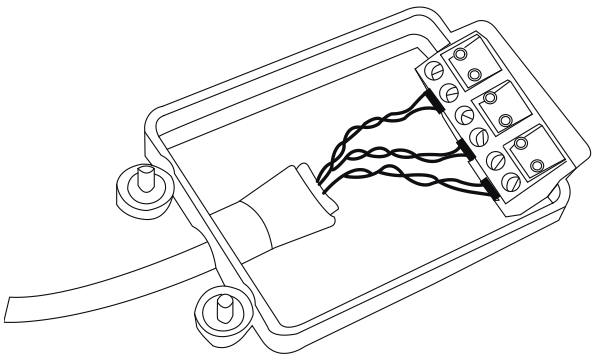
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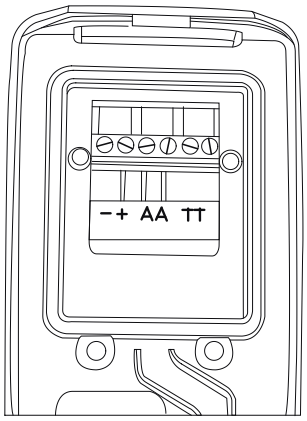
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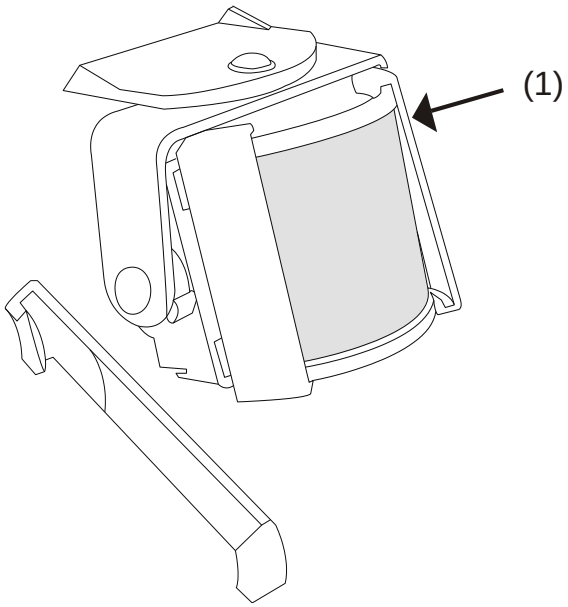
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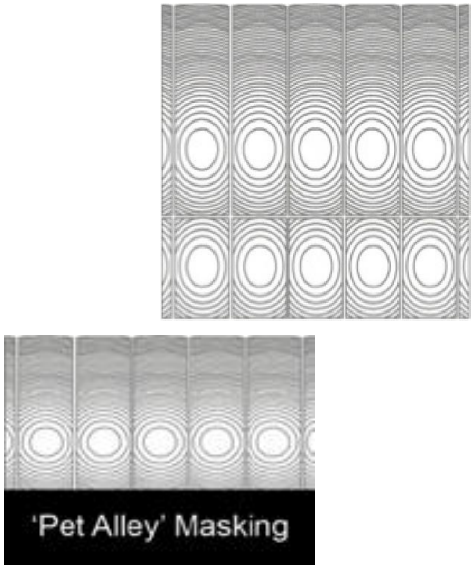
6


−+ AA TT

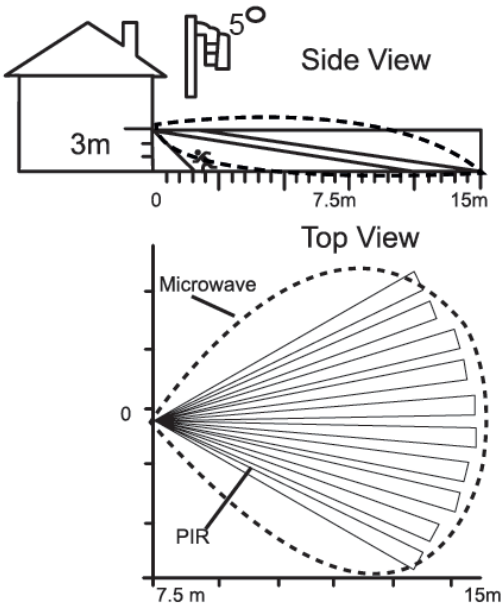
7


(1)

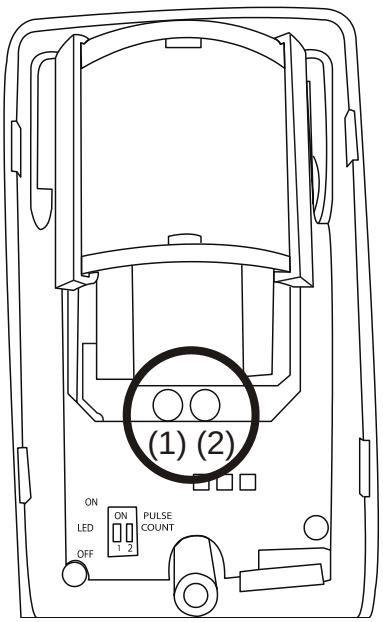
8


'Pet Alley' Masking

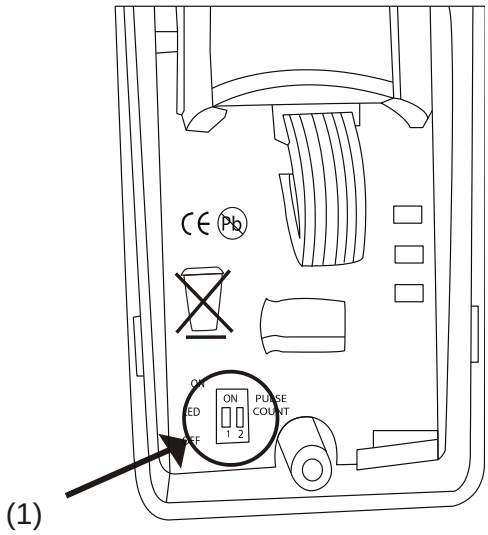
9


5°
Side View
3m
0
7.5m
15m
Top View
Microwave
0
PIR
7.5 m
15m

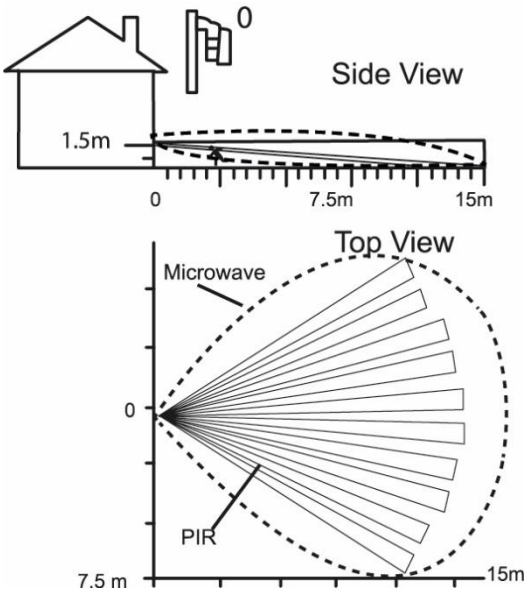
10


(1) (2)
ON
LED
OFF
ON
PULSE
COUNT
1 2

11



12



EN: Installation Sheet

Package

The package contains:

- 1 x Mini Dual Tech
- 1 x drilling template for fixing holes
- 2 x 3.5mm x 25mm wall plugs
- 2 x 3.5mm x 25mm screws
- 1 x opening tool
- 1 x lens mask
- 2 x additional curtain shutters
- 1 x installation sheet
- 1 x plug on 6-way terminal block

Description

The Mini Outdoor Dual Tech Detector is an outdoor motion detector and alarm trigger that uses a quad pyro (two independent passive infrared sensor circuits) combined with a low power microwave sensor module.

All three sensors must trigger to cause the detector to alarm ensuring precise and reliable presence detection.

Mounting the unit

During installation, protect the electronics against water, as trapped moisture can affect or damage the unit.

Note: When locating the detector, please ensure the detector's field of view is unobstructed.

To mount the detector:

1. Drill the wall to accept the two fixing screws and the cable entry using the drilling template provided. Leave a minimum of 10 cm clearance above the top of the detector housing to allow the cover and the detector to be positioned correctly.

   Note: The recommended optimum mounting height for the detector is 3 m. Whilst it is possible to mount the unit higher, this will give a reduced detection range and will require the detection subject to move further through the already reduced detection area before an activation is signaled.

2. Remove the back wall fixing plate. Screw the back plate to the wall. Always ensure that one of the fixing screws is used to secure the rear tamper plate to the wall (Figure 1, item 1) as well as using the other screw fixing points (Figure 1, item 2). In the case of a rear cable entry use the cable knockout (Figure 1, item 3). Fit the detector main body to the back plate.

3. Remove the cover assembly by loosening the locking screw. Use the opening tool as shown in Figure 2 to carefully lever the front cover away from the detector base. The cover hinges from the top and lifts out of the location slot (Figure 3).

4. Remove the 2 securing screws and open the terminal block cover. Use a razor knife to open the rubber seal to allow the cabling into the unit (Figure 4). Feed standard six / eight-core alarm cable though the wall and directly into the cable entry. Bare the wires and connect to the removable terminal block, which is found in the kit bag (Figure 5). Push the terminal block onto the pin header ensuring a tight fit. Replace the cable entry cover and secure the 2 fixing screws.

   Caution: Ensure the cable is located within the cable guide.

5. When the detector is aligned and connected, fit the cover to the detector main body and tighten the locking screw.

Connecting the unit

Table 1: Connections

Terminal	Label	Description
1,2	− + 12 V DC	12 VDC power supply
3, 4	A A	Alarm relay, normally closed
5, 6	T T	Tamper relay, normally closed

Figure 6 shows the terminal configuration.

Multibeam alignment and masking

The multifunction lens fitted to the Mini detector produces five long-range beams and five medium- to short-range curtain PIR beams. The PIR circuitry detects changes in heat and movement in the beam pattern; therefore items such as trees, shrubs, ponds, boiler flues, and animals should be considered when positioning the detector. The microwave module detects actual movement towards or away from the detector and is programmed to ignore any objects that move outside of the range.

The detector module is fitted with two sliding shutters to reduce the detection angle of the PIR sensor only.

The curtains are fitted to the pan and tilt module as shown in Figure 7. Each section of the detector lens gives a coverage pattern of approximately 14 degrees.

When coverage exceeds the desired detection area, adjust the module as required and mask off any beams, either vertically or horizontally, to avoid unwanted detection.

Use portions of the self-adhesive silver mask applied to the rear, smooth side of the lens. As an example, for pet alley masking refer to Figure 8. To replace the lens, begin by sliding one side of the lens into the clips on the pan and tilt module. After one side is secure, do the same for the opposite side ensuring the lens is the correct orientation with the smooth side facing in and the two rows of circles to the bottom.

Always replace the lens the correct way up to ensure exact beam pattern coverage as shown in Figure 8.

Table 2 below summarizes typical alignment and masking configurations.

Table 2: Beam alignment & masking configuration

Configuration	Height (m)	Tilt (°)	Max. range (m)
Multibeam, optimum	3	5	15
Pet immunity [1]	1.5	−2	15

[1] Black area should be masked for pet alley applications up to 15 meters.

Figure 9 shows the pattern for the maximum range in the optimum position.

LEDs

LEDs are shown on Figure 10.

Figure 10

Item	Colour	Description
1	Orange	Microwave active
2	Red	PIR active
1+2	Red + Orange	Detection alarm

Selectable options

Figure 11 shows the DIL switch position (1).

Pulse count

Pulse count is the number of times the detector must detect a presence before signalling an alarm.

Switch 2 OFF = Pulse count 2

Switch 2 ON = Pulse count 1 (most sensitive)

Detection LED

Switch 1 ON = Both LEDs Enabled

Switch 1 OFF = Both LEDs Disabled

Walk test & settling time

Allow 3 minutes for the electronics to settle when power is applied before commencing the walk test.

To enable the LEDs to carry out a walk test turn Switch 1 to ON.

The detection LEDs will individually light each time the PIR or microwave sensor is activated and will both light when both PIR and microwave circuits are active; thus confirming an alarm detection.

After walk test is complete turn Switch 1 to OFF if the LED indication is not required.

Note: When you conduct a walk test, make sure that the front cover is in place. Do not conduct walk tests with the cover removed.

The range of the detector increases without the protective front cover. Therefore the front cover must be fitted to establish the correct beam pattern. Pan and tilt the lens module over the field of view to obtain the correct coverage area.

Specifications

Coverage	14° to 70° detection angle, 15 m x 13 m coverage max.
Adjustment	90° pan, 45° tilt
Fresnel lens	20 zones for each detection element, which can be masked with the curtain sliders
Customised optics	Double silicon shielded quad element eliminates 50,000 Lux of white light
LEDs	Orange: Microwave activated Red: PIR activated Orange + Red: Detector alarm
Operating frequency	24 GHz
Radar frequency band	8 500 to 10 600 MHz
Maximum power output	27 dBm E.I.R.P.
Outputs	Silent, solid state, magnetically immune
NC	Volt free relay, signal contact 24 VAC/DC at 50 mA with an integral 25 Ω series resistor. Alarm time 5 seconds
Power input	9 to 15 VDC
Current	8 mA (12 V nominal)
Pulse count	1 or 2
Temperature compensation	Analogue (thermistor) and digital sensitivity adjustment
Control	Digital microprocessor with non-volatile memory
Walk test	Output test mode with LED indication. Option to disable LEDs
Operating temperature	−30 to +65°C
Housing	High impact ABS plastic with HDPE cover, UV stabilised

Dimensions W x H x D	70 mm x 120 mm x 95 mm
Weight	225 g Net, 325 g Gross
Mounting height	Variable up to 6 m Optimum height 3 m for full range

Regulatory information

Manufacturer	PLACED ON THE MARKET BY: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA AUTHORIZED EU REPRESENTATIVE: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Netherlands
Product warnings and disclaimers	THESE PRODUCTS ARE INTENDED FOR SALE TO AND INSTALLATION BY QUALIFIED PROFESSIONALS. CARRIER FIRE & SECURITY CANNOT PROVIDE ANY ASSURANCE THAT ANY PERSON OR ENTITY BUYING ITS PRODUCTS, INCLUDING ANY “AUTHORIZED DEALER” OR “AUTHORIZED RESELLER”, IS PROPERLY TRAINED OR EXPERIENCED TO CORRECTLY INSTALL FIRE AND SECURITY RELATED PRODUCTS. For more information on warranty disclaimers and product safety information, please check https://firesecurityproducts.com/policy/product-warning/ or scan the QR code.
Certification	CE
EN	This product meets the requirements of EMC Testing to the following standards: EN 50130-4:2011 EN 61000-6-3:2007 ETSI EN 300 440-1:2009 ETSI EN 301 489-1:2001 This product meets the environmental requirements of EN 50130-5.
Electrical Safety	This product meets the requirements of Low Voltage Directive (LVD): 2006/95/EC Harmonised Standards: EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Environmental class	IP65
European Union directives	Carrier Fire & Security hereby declares that this device is in compliance with the applicable requirements and provisions of all applicable rules and regulations, including but not limited to the Directive 2014/53/EU. For more information see: firesecurityproducts.com
	2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info

Contact information

firesecurityproducts.com or www.aritech.com

DE: Installationsanleitung

Lieferumfang

Im Lieferumfang ist Folgendes enthalten:

- 1 x Mini Dual Tech
- 1 x Bohrschablone für Befestigungslöcher
- 2 x 3,5 mm x 25 mm Dübel
- 2 x 3,5 mm x 25 mm Schrauben
- 1 x Öffnungswerkzeug
- 1 x Objektivmaske
- 2 x zusätzliche Vorhangblenden
- 1 x Installationsanleitung
- 1 x Stecker auf einer 6-fach Klemmleiste

Beschreibung

Beim Mini Außen Dual Tech-Bewegungsmelder handelt es sich um einen Bewegungsmelder für den Außenbereich, in dem eine Quad-PIR-Technologie (zwei getrennte passive Infrarotsensorschaltkreise) in Kombination mit einem Mikrowellensensormodul geringer Leistung eingesetzt wird.

Alle drei Sensoren müssen ausgelöst werden, damit der Bewegungsmelder einen Alarm ausgibt. So kann eine genaue und zuverlässige Anwesenheitserfassung sichergestellt werden.

Montage des Geräts

Schützen Sie die Elektronik während der Installation vor Wasser, da eingeschlossene Feuchtigkeit das Gerät negativ beeinflussen oder beschädigen kann.

Hinweis: Stellen Sie bei der Positionierung des Bewegungsmelders ein freies Sichtfeld sicher.

Montage des Bewegungsmelders:

1. Bohren Sie mithilfe der bereitgestellten Bohrschablone Löcher für die beiden Befestigungsschrauben und die Kabeldurchführung in die Wand. Lassen Sie mindestens 10 cm Platz über dem Bewegungsmeldergehäuse frei, damit Abdeckung und Melder ordnungsgemäß positioniert werden können.

   Hinweis: Die empfohlene optimale Montagehöhe für den Bewegungsmelder beträgt 3 m. Das Gerät kann zwar höher montiert werden, dies führt jedoch zu einem kleineren Erfassungsbereich. Zudem müssen sich zu erfassende Objekte weiter in den bereits verkleinerten Erfassungsbereich hinein bewegen, bevor ein Aktivierungssignal ausgelöst wird.

2. Entfernen Sie die Rückplatte zur Wandbefestigung. Schrauben Sie die Rückplatte an der Wand fest. Neben den anderen Schraubenbefestigungspunkten (Abbildung 1, Komponente 2) muss stets eine der Befestigungsschrauben zum Anbringen der Sabotagerückplatte an der Wand (Abbildung 1, Komponente 1) verwendet werden. Verwenden Sie im Fall einer rückseitigen Kabeldurchführung die Kabelausstanzung (Abbildung 1, Komponente 3). Bringen Sie das Hauptgehäuse des Bewegungsmelders an der Rückplatte an.

3. Entfernen Sie die Abdeckung, indem Sie die Sicherungsschraube lockern. Verwenden Sie das Öffnungswerkzeug wie in Abbildung 2 dargestellt, um vorsichtig die Gehäusefront von dem Meldergehäuse heraus zu hebeln. Die Abdeckung weist an der oberen Seite Scharniere auf und wird vom Montageort abgehoben (Abbildung 3).
4. Entfernen Sie die beiden Befestigungsschrauben, und öffnen Sie die Abdeckung der Anschlussklemmleiste. Öffnen Sie die Gummidichtung mithilfe einer Rasierklinge, um die Kabel in das Gerät führen zu können (Abbildung 4). Verlegen Sie Standardalarmkabel mit sechs oder acht Adern durch die Wand und direkt in die Kabeldurchführung. Entfernen Sie die Drahtisolierung, und verbinden Sie die Drähte mit der entfernbaren Anschlussklemmleiste aus dem Ausstattungskit (Abbildung 5). Drücken Sie die Anschlussklemmleiste so auf die Stiftleiste, dass diese fest sitzt. Bringen Sie die Abdeckung der Kabeldurchführung wieder an, und ziehen Sie die beiden Befestigungsschrauben fest.

   Achtung: Stellen Sie sicher, dass sich das Kabel innerhalb der Kabelführung befindet.
5. Nach Ausrichtung und Anschluss des Bewegungsmelders:

   a. Bringen Sie die Abdeckung am Hauptgehäuse des Bewegungsmelders an.
   b. Ziehen Sie die Sicherungsschraube an.

Anschaltung des Melders

Tabelle 1: Verbindungen

Klemme	Etikett	Beschreibung
1,2	− + 12 V DC	12 V Gleichstrom-Netzteil
3, 4	A A	Alarmrelais, normal geschlossen
5, 6	T T	Sabotagerelais, normal geschlossen

In Abbildung 6 wird die Anschlusskonfiguration dargestellt.

Ausrichtung und Maskierung von Mehrfachstrahlen

Das am Mini-Bewegungsmelder angebrachte Multifunktionsobjektiv erzeugt fünf Strahlen mit langer Reichweite und fünf PIRVorhangsstrahlen mit mittlerer bis kurzer Reichweite. Der PIRSchaltkreis erkennt Temperaturänderungen und Bewegungen im Erfassungsbereich. Beim Positionieren des Bewegungsmelders sollten daher Objekte wie Bäume, Sträucher, Teiche, Heizkesselkamine und Tiere berücksichtigt werden. Vom Mikrowellenmodul werden die tatsächlichen Abstandsänderungen zum Bewegungsmelder erfasst. Das Modul ist so programmiert, dass Objekte außerhalb des Erfassungsbereiches ignoriert werden.

Das Bewegungsmeldermodul ist mit zwei verschiebbaren Blenden ausgestattet, die nur zum Verkleinern des Erfassungswinkels des PIR-Sensors dienen. Die Vorhänge werden wie in Abbildung 7 dargestellt am Schwenk- und Neigemodul befestigt. Jeder Abschnitt des Bewegungsmelderobjektivs ergibt ein Abdeckungsmuster von ca. 14 Grad.

Wenn die Abdeckung den gewünschten Erfassungsbereich übersteigt, passen Sie das Modul nach Bedarf an und maskieren alle Strahlen (entweder vertikal oder horizontal), um eine unerwünschte Erfassung zu vermeiden.

Bringen Sie hierzu Teile der selbstklebenden silbernen Maske auf der glatten Rückseite des Objektivs auf. Ein Beispiel für die Haustier-Maskierung ist in Abbildung 8 dargestellt. Zum Ersetzen des Objektivs schieben Sje zunächst eine Objektivseite auf die Clips am Schwenkund Neigemodul. Nachdem eine Seite sicher eingerastet ist, wiederholen Sie dies für die gegenüberliegende Seite und stellen die ordnungsgemäße Ausrichtung des Objektivs sicher (glatte Seite nach innen und die beiden Kreisreihen nach unten).

Ersetzen Sie das Objektiv stets mit der richtigen Seite nach oben, um genau die in Abbildung 8 dargestellte Strahlenabdeckung zu erhalten.

Eine Zusammenfassung der typischen Einstellungs- und Maskierungskonfigurationen ist in der nachstehenden Tabelle 2 aufgeführt.

Tabelle 2: Erfassungsstrahleinstellung & Maskierungskonfiguration

Konfiguration	Höhe (m)	Neigung (°)	Max. Reichweite (m)
Mehrfachstrahl, Optimum	3	5	15
Nichterfassung von Haustieren [1]	1.5	−2	15

[1] Bei Anwendungen im Haustierbereich sollte der schwarze Bereich für bis zu 15 Meter maskiert werden.

In Abbildung 9 wird das Muster für die maximale Reichweite bei optimaler Positionierung dargestellt.

LEDs

Die LEDs werden in Abbildung 10 dargestellt.

Abbildung 10: Legende

Komponente	Farbe	Beschreibung
1	Orange	Mikrowelle aktiv
2	Rot	PIR aktiv
1+2	Rot + Orange	Erfassungsalarm

Auswählbare Optionen

In Abbildung 11 wird die Position des DIL-Schalters dargestellt (1).

Impulszähler

Beim Impulszählerwert handelt es sich um die Anzahl der Erfassungen, die in einem Bewegungsmelder vorliegen müssen, bevor ein Alarmsignal ausgelöst wird.

Schalter 2 AUS = Impulszähler 2

Schalter 2 EIN = Impulszähler 1 (größte Empfindlichkeit)

Erfassungs-LED

Schalter 1 EIN = Beide LEDs aktiviert

Schalter 1 AUS = Beide LEDs deaktiviert

Gehtest und Initialisierungsdauer

Warten Sie vor dem Beginn des Gehtests 3 Minuten, damit sich die Elektronik nach dem Einschalten der Stromversorgung „initialisieren“ kann.

Zum Aktivieren der LEDs für einen Gehtest stellen Sie Schalter 1 auf EIN. Die Erfassungs-LEDs leuchten jedes Mal, wenn der PIR- oder Mikrowellensensor aktiviert wird. Wenn beide LEDs leuchten und daher sowohl der PIR- als auch Mikrowellenstromkreis aktiv ist, bestätigt dies einen erfassten Alarm.

Stellen Sie Schalter 1 nach Abschluss des Gehtests auf AUS, falls die LED-Anzeige nicht beötigt wird.

Hinweis: Stellen Sie beim Durchführen eines Gehtests sicher, dass die Vorderabdeckung angebracht ist. Bei abgenommener Abdeckung sollten keine Gehtests stattfinden.

Ohne die schützende Vorderabdeckung weist der Bewegungsmelder eine größere Reichweite auf. Zum Aufbau des ordnungsgemäßen Strahlenmusters muss die Vorderabdeckung daher angebracht werden. Schwenken und neigen Sie das Objektivmodul über das Sichtfeld, um den richtigen Abdeckungsbereich zu erhalten.

Technische Daten

Erfassungsbereich	Erfassungswinkel: 14° bis 70° Max. Abdeckung 15 m x 13 m
Einstellung	90° Schwenkung, 45° Neigung
Fresnel-Objektiv	20 Erfassungszonen für jedes Erfassungsobjekt, maskierbar mit Vorhangblenden
Angepasste Optik	Doppelt mit Silizium abgeschirmte Quad-Komponente, unterdrückt 50.000 Lux Weißlicht
LEDs	Orange: Mikrowelle aktiviert Rot: PIR aktiviert Orange + Rot: Melderalarm
Betriebsfrequenz	24 GHz
Radar-Frequenzband	8 500 MHz-10 600 MHz
Maximale Ausgangsleistung	27 dBm E.I.R.P.
Ausgänge	Still, Solid State Relais, magnetisch unempfindlich
NC	Spannungsfreies Relais, Signalkontakt 24 V AC/DC bei 50 mA mit integriertem seriellen 25-Ω-Widerstand, Alarmzeit: 5 Sekunden
Eingangsspannung	9 bis 15 V DC
Schaltstrom	8 mA (12 V Nennspannung)
Impulszähler	1 oder 2
Temperaturausgleich	Analog (Thermistor) und digitale Empfindlichkeitsanpassung
Steuerung	Digitaler Mikroprozessor mit nichtflüchtigem Speicher
Gehtest	Ausgangstestmodus mit LED-Anzeige, Option zum Deaktivieren der LEDs
Betriebstemperatur	−30 °C bis +65 °C
Gehäuse	Schlagfester ABS-Kunststoff mit Abdeckung aus hochdichtem Polyethylen, UV-stabilisiert
Abmessungen (B x H x T)	70 mm x 120 mm x 95 mm
Gewicht	225 g Netto, 325 g Brutto
Montagehöhe	Variabel, bis zu 6 m Optimale Höhe für volle Reichweite: 3 m

Rechtliche Hinweise

Hersteller	INVERKEHRBRINGER: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA BEVOLLMÄCHTIGTER EU REPRÄSENDANT: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Niederlande
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Zertifizierung	CE
EN	Dieses Produkt erfüllt die EMV Testanforderung gemäß der folgenden Normen: EN 50130-4:2011 EN 61000-6-3:2007 ETSI EN 300 440-1:2009 ETSI EN 301 489-1:2001 Dieses Produkt erfüllt die Umweltschutzvorschriften gemäß EN 50130-5.
Elektrische Sicherheit	Dieses Produkt erfüllt die Anforderungen der Niederspannungsrichtlinie: 2006/95/EG Harmonisierte Normen: EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Umgebungsklasse	IP65
EU-Richtlinien	Carrier Fire & Security erklärt hiermit, dass dieses Gerät den geltenden Anforderungen und Bestimmungen aller anwendbaren Regeln und Vorschriften entspricht - einschließlich, aber nicht beschränkt auf die Richtlinie 2014/53/EU. Für weitere Informationen siehe firesecurityproducts.com
	2012/19/EU (WEEE): Produkte die mit diesem Symbol gekennzeichnet sind, dürfen nicht als unsortierter städtischer Abfall in der europäischen Union entsorgt werden. Für die korrekte Wiederverwertung bringen Sie dieses Produkt zu Ihrem lokalen Lieferanten nach dem Kauf der gleichwertigen neuen Ausrüstung zurück, oder entsorgen Sie das Produkt an den gekennzeichneten Sammelstellen. Weitere Informationen hierzu finden Sie auf der folgenden Website: www.recyclethis.info

Kontaktinformationen

firesecurityproducts.com oder www.aritech.com

ES: Hoja de instalación

Paquete

El paquete contiene:

- 1 Dual Tech mini
- 1 plantilla de perforación para los orificios de anclaje
- 2 tacos de 3,5 mm x 25 mm
- 2 tornillos de 3,5 mm x 25 mm
- 1 máscara de lente
- 1 abriendo herramienta
- 2 obturadores de cortina adicionales
- 1 manual de instalación
- 1 bloque terminal de 6 patillas

Descripción

El detector Dual Tech mini para exteriores es un detector de movimiento para exteriores y un activador de alarmas que utiliza un sensor piroeléctrico Quad (dos circuitos de sensores infrarrojos independientes pasivos) combinado con un módulo de sensor de microondas de baja potencia.

Los tres sensores deben accionarse para activar la alarma del detector y garantizar una detección de presencia precisa y fiable.

Montaje de la unidad

Durante la instalación, proteja la electrónica del agua, ya que la humedad que quede en el interior podría afectar o dañar la unidad.

Nota: Al ubicar el detector, asegúrese de que su campo de visión no esté tapado.

Para montar el detector:

1. Perfore la pared para que entren los dos tornillos de sujeción y la entrada de cable utilizando la plantilla de perforación incluida. Deje un espacio de 10 cm como mínimo por encima de la parte superior de la carcasa del detector para poder colocar correctamente la tapa y el detector.

   Nota: La altura de montaje recomendada para el detector es de 3 m. Aunque se puede montar la unidad a mayor altura, esto ofrecería un alcance de detección reducido y requeriría que el sujeto de detección se moviera más por la ya reducida área de detección antes de que se comunique una activación.

2. Retire la placa de fijación trasera de la pared. Atornille la placa trasera a la pared. Asegúrese siempre de que uno de los tornillos de fijación se utilice para sujetar la placa de tamper trasera a la pared (Figura 1, elemento 1), así como de usar los otros puntos de fijación de tornillos (Figura 1, elemento 2). En el caso de una entrada de cable trasera, utilice el troquel para cable (Figura 1, elemento 3). Coloque el cuerpo del detector en la placa trasera.
3. Retire la tapa aflojando el tornillo de bloqueo. Utilize la herramienta de apertura como muestra la Figura 2, tenga precaución al hacer palanca en la tapa frontal de la base del detector. La tapa está suspendida de la parte superior y se puede levantar (Figura 3).
4. Retire los 2 tornillos de sujeción y abra la tapa del bloque terminal. Utilice una cuchilla para abrir el cierre de goma y permitir que el cableado entre en la unidad (Figura 4). Introduzca un cable de alarma estándar de seis a ocho hilos por la pared y directamente hacia la entrada de cable. Pele los cables y conéctelos al bloque terminal extraíble, que se encuentra en la bolsa del kit (Figura 5). Coloque correctamente el bloque terminal en el cabezal de la patilla garantizando una buena sujeción. Sustituya la tapa de entrada de cable y apriete los 2 tornillos de sujeción.

   Precaución: Asegúrese de que el cable se coloca dentro de la guía.

5. Cuando el detector esté alineado y conectado:

   a. Coloque la tapa en el cuerpo del detector.
   b. Apriete el tornillo de ajuste.

Cómo conectar la unidad

Tabla 1: Conexiones

Terminal	Etiqueta	Descripción
1,2	− + 12 V CC	Alimentación eléctrica de 12 VCC
3, 4	A A	Relé de alarma, normalmente cerrado
5, 6	T T	Relé de tamper, normalmente cerrado

La Figura 6 muestra la configuración del terminal.

Enmascaramiento y alineación multihaz

La lente multifunción del detector mini produce cinco haces de largo alcance y cinco haces PIR de cortina de medio a corto alcance. El circuito PIR detecta los cambios de temperatura y el movimiento en el patrón de haces. De este modo, los elementos como los árboles, los arbustos, los estanques, los tanques de agua y los animales se tienen en cuenta al posicionar el detector. El módulo de microondas detecta el movimiento real hacia o desde del detector y se programa para omitir los objetos que se muevan fuera del rango.

El módulo del detector se coloca con dos obturadores deslizantes a fin de reducir el ángulo de detección del sensor PIR solamente. Las cortinas se colocan en el módulo de ajuste horizontal y vertical, como se indica en la Figura 7. Cada sección de la lente del detector ofrece un patrón de alcance de aproximadamente 14 grados. Cuando el alcance supere la zona de detección deseada, ajuste el módulo según proceda y enmascare los haces, vertical u horizontalmente, a fin de evitar detecciones accidentales.

Utilice trozos de máscara plateada autoadhesiva y aplíquela a la parte trasera y lisa de la lente. Como ejemplo para el enmascaramiento de pequeñas mascotas consulte la Figura 8. Para cambiar la lente, empiece deslizando un lateral de la misma en las abrazaderas del módulo de ajuste vertical y horizontal. Una vez que uno de los lados esté sujeto, haga lo mismo con el lado opuesto, asegurándose de que la lente tenga la orientación correcta, con la parte lisa al frente y las dos filas de círculos en la parte inferior.

Cambie siempre la lente de la forma correcta a fin de garantizar el alcance del patrón de haces exacto que se muestra en la Figura 8.

Tabla 2 a continuacion resume el tipico alineamiento y configuarcion antimasking.

Tabla 2: Alineamiento del haz y configuración del antimasking

Configuración	Altura (m)	Inclinación (°)	Alcance máx. (m)
Multihaz, óptimo	3	5	15
Inmunidad para animales domésticos [1]	1,5	−2	15

[1] La zona negra debe enmascararse para aplicaciones de paso para mascotas hasta 15 metros.

La Figura 9 muestra el patrón para el alcance máximo en la posición óptima.

LED

Los LED se muestran en la Figura 10.

Figura 10

Artículo	Color	Descripción
1	Naranja	Microonda activa
2	Rojo	PIR activo
1+2	Rojo + Naranja	Alarma de detección

Opciones seleccionables

La Figura 11 muestra la posición del interruptor DIL (1).

Contador de impulsos

El contador de impulsos es el número de veces que el detector debe detectar una presencia antes de comunicar una alarma.

Interruptor 2 OFF = Contador de impulsos 2

Interruptor 2 ON = Contador de impulsos 1 (más sensible)

LED de detección

Interruptor 1 ON = Ambos LED activados

Interruptor 1 OFF = Ambos LED desactivados

Prueba de detección y tiempo de estabilización

Deje 3 minutos para que la electrónica se asiente al encender la corriente, antes de comenzar la prueba de detección.

Para permitir que los LED lleve a cabo una prueba de detección, coloque el Interruptor 1 en la posición de ON. Los LED de detección se encenderán individualmente cada vez que el sensor PIR o de microondas se active; y ambos se encenderán cuando los dos circuitos PIR y de microondas estén activos, confirmando así una detección de alarma.

El LED de detección se enciende cada vez que el PIR mini detecta su presencia.

Una vez finalizada la prueba de detección, coloque el Interruptor 1 en la posición de OFF, si la indicación del LED no es necesaria.

Nota: Cuando vaya a realizar una prueba de detección asegúrese de que la tapa frontal esté colocada en su sitio. No realice pruebas de detección sin la tapa.

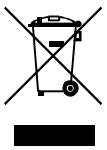
El alcance del detector aumenta sin la tapa frontal protectora. Por lo tanto, la tapa frontal debe colocarse para establecer el patrón de haces correcto. Ajuste horizontal y verticalmente el módulo de la lente por el campo de visión a fin de obtener el área de cobertura correcta.

Especificaciones

Alcance	Ángulo de detección de 14° a 70° Cobertura máxima de 15 m x 13 m
Ajuste	90° horizontal, 45° vertical
Lentes Fresnel	20 zonas para cada elemento de detección, que puede enmascararse con los controles deslizantes de cortina
Óptica personalizada	El elemento trenzado con doble apantallado de silicio elimina 50 000 lux de luz blanca
LED	Naranja: Microonda activada Rojo: PIR activado Naranja + Rojo: Alarma del detector
Frecuencia de funcionamiento	24 GHz
Banda frecuencia microondas	8 500 MHz-10 600 MHz
Maxima potencia de salida	27 dBm E.I.R.P.
Salidas	Silencio, estado sólido, magnéticamente inmune
NC	Relé libre de tensión, contacto de señal de 24 V CA/CC a 50 mA con una resistencia en serie de 25 Ω integral. Tiempo de alarma de 5 segundos
Entrada de alimentación	De 9 a 15 VCC
Corriente	8 mA (12 V nominal)
Contador de impulsos	1 ó 2
Compensación de temperatura	Ajuste de la sensibilidad analógico (termistor) y digital
Control	Microprocesador digital con memoria no volátil
Prueba de detección	Modo de prueba de salida con indicación LED. Opción para desactivar los LED
Temperatura de funcionamiento	De −30° a +65°C
Carcasa	Plástico ABS resistente a los golpes con tapa HDPE, estabilizado a los UV
Dimensiones (An x Al x Pro)	70 mm x 120 mm x 95 mm
Peso	225 g netos, 325 g brutos
Altura de montaje	Variable hasta 6 m. Altura óptima de 3 m para rango completo

Información normativa

Fabricante	COLOCADO EN EL MERCADO POR: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, EE. UU. REPRESENTANTE AUTORIZADO DE LA UE: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Países Bajos

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Certificación	CE
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Seguridad eléctrica	Este producto cumple los requisitos de la directiva sobre baja tensión (LVD, por sus siglas en inglés): 2006/95/EC Normativa armonizada: EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Clase medioambiental	IP65
Directivas de la Unión Europea	Carrier Fire & Security declara por este medio que este dispositivo cumple con los requisitos y disposiciones aplicables de todas las reglas y regulaciones aplicables, incluyendo pero no limitado a la Directiva 2014/53/EU. Para mas información consulte firesecurityproducts.com
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Información de contacto

firesecurityproducts.com o www.aritech.com

FR: Fiche d’installation

Contenu

La boîte contient :

- 1 mini détecteur Dual Tech
- 1 gabarit de perçage pour l’installation
- 2 prises secteur de 3,5 mm x 25 mm
- 2 vis de 3,5 mm x 25 mm
- 1 masque pour objectif
- 1 outil d'ouverture
- 2 volets pour rideaux supplémentaires
- 1 fiche d’installation
- 1 prise pour terminal à six entrées

Description

Le mini détecteur Dual Tech est un détecteur de mouvement et un déclencheur d’alarme utilisable en extérieur, doté de deux circuits imprimés infrarouges passifs (Quad Pyro), combinés à un module de détection hyperfréquence à faible puissance.

Les trois capteurs doivent être déclenchés pour activer une alarme. Ainsi, la détection d’intrus reste fiable et précise.

Montage de l’unité

Lors de l’installation, protégez les composants électroniques des infiltrations d’eau. Celles-ci peuvent avoir des conséquences négatives sur l’unité ou endommager cette dernière.

Remarque : lorsque vous positionnez le détecteur, assurez-vous que son champ de vision n’est pas obstrué.

Pour monter le détecteur :

1. À l’aide du gabarit de perçage, percez le mur pour y placer les vis de fixation et créer l’orifice d’entrée du câble. Laissez au moins 10 cm au-dessus du boîtier du détecteur afin de faciliter l’installation du couvercle et du détecteur lui-même.

   Remarque : la hauteur d’installation recommandée du détecteur est de 3 mètres. Vous pouvez l’installer plus haut. Cependant, la portée s’en trouverait réduite et les intrus seraient uniquement détectés sur une portée plus éloignée.

2. Retirez le panneau de fixation arrière. Fixez celui-ci au mur à l’aide d’une vis. Assurez-vous toujours que l’une des vis de fixation maintienne le panneau d’autoprotection arrière au mur (figure 1, élément 1) et que les autres points de fixation soient utilisés (figure 1, élément 2). Servez-vous de l’entrée sectionnable (figure 1, élément 3) pour positionner l’orifice d’entrée du câble. Placez le détecteur sur le panneau arrière.

3. Desserrez la vis de blocage pour retirer le couvercle. Utiliser l'outil d'ouverture comme indiqué à la Figure 2 pour séparer délicatement la face avant du couvercle de la base du détecteur. Le couvercle sort de ses gonds et s’élève alors légèrement (figure 3).

4. Retirez les deux vis de sécurité et ouvrez le terminal. Ouvrez le joint en caoutchouc à l’aide d’une lame de rasoir pour faire passer le câble dans l’unité (figure 4). Branchez le câble d’alarme standard à six/huit connexions

directement dans l'orifice prévu à cet effet. Dénudez les fils et connectez-les au terminal amovible fourni avec les accessoires (figure 5). Faites pression sur le terminal jusqu'à ce qu'il soit parfaitement emboîté dans l'embase. Remettez le couvercle de l'orifice en place et fixez les deux vis de fixation.

Attention : vérifiez que le câble est bien positionné dans sa gaine.

5. Une fois le détecteur aligné et connecté :

   a. Recouvrez le détecteur de son couvercle.
   b. Serrez les vis de blocage.

Connexion de l'unité

Tableau 1: Connexions

Terminal	Référence	Description
1,2	− + 12 V CC	Alimentation 12 V CC
3, 4	A A	Relais d'alarme (normalement fermé)
5, 6	T T	Relais d'autoprotection (normalement fermé)

La configuration du terminal est illustrée sur la figure 6.

Masquage et alignement multifaisceaux

Les objectifs multifonctions intégrés au mini détecteur permettent de bénéficier de cinq faisceaux IRP longue portée et de cinq faisceaux de courte à moyenne portée, conçus pour une installation aux fenêtres. Le système IRP détecte les fluctuations de chaleur et les mouvements rencontrés par les faisceaux. Par conséquent, tous les éléments situés à proximité, tels que les arbres, arbustes, mares ou animaux doivent être pris en compte lors de l'installation du détecteur. Le module hyperfréquence détecte les mouvements s'effectuant en direction ou à distance du détecteur. Il est en outre programmé pour ignorer tout objet se déplaçant hors du champ.

Le module du détecteur est doté de deux §volets coulissants permettant de réduire l'angle de détection du détecteur IRP uniquement. Les rideaux sont installés sur le module de réglage horizontal/vertical, comme illustré par la figure 7. Chaque section de l'objectif du détecteur couvre un angle d'environ 14 degrés. Si l'angle couvert est trop important, ajustez le module et masquez les faisceaux horizontaux ou verticaux que vous souhaitez neutraliser.

Pour ce faire, utilisez le masque argenté auto-adhésif se trouvant sur la face arrière et lisse de l'objectif. Pour un exemple de masquage contre le passage d'animaux se référer à la figure 8. Pour réajuster l'objectif, faites glisser un premier côté dans les clips du module de réglage horizontal/vertical. Répétez ensuite l'opération pour l'autre côté tout en vérifiant que l'orientation de l'objectif est correcte (le côté lisse doit être tourné vers l'intérieur et les deux rangées de cercles doivent se trouver sur la partie inférieure).

La précision des faisceaux dépend de la bonne orientation de l'objectif, comme illustré par la figure 8.

Le tableau 2 ci desous résume les configurations typiques pour l'alignement et le masquage.

Tableau 1 : Configuration du masquage et de l'alignement du faisceau

Configuration	Hauteur (m)	Inclinaison (°)	Portée max. (m)
Multifaisceaux, optimum	3	5	15
Insensible aux animaux [1]	1,5	−2	15

[1] La zone noire doit être masquée pour les installations adaptées au animaux domestiques et couvrant une portée de 15 mètres maximum.

La portée maximale obtenue avec les masquages positionnés de manière optimale est illustrée par la figure 9.

Voyants

Les voyants lumineux sont illustrés sur la figure 10.

Figure 10

Élément	Couleur	Description
1	Orange	Détecteur hyperfréquence activé
2	Rouge	Détecteur IRP activé
1+2	Rouge + Orange	Détection d'alarme

Options réglables

La figure 11 permet de localiser l'interrupteur de réglage (1).

Compteur d'impulsions

Le compteur d'impulsions indique le nombre de détections nécessaires avant le déclenchement d'une alarme.

Interrupteur 2 désactivé : deux impulsions

Interrupteur 2 activé : une impulsion (réglage le plus sensible)

Voyant de détection

Interrupteur 1 activé : les deux voyants sont activés

Interrupteur 1 désactivé : les deux voyants sont désactivés

Test de marche et temps de stabilisation

Patientez trois minutes après la mise sous tension pour que les composants électroniques soient stabilisés avant de démarrer le test de marche.

Activez l'interrupteur 1 avant le début du test. Les voyants de détection s'allument individuellement à chaque fois que le détecteur IRP ou hyperfréquence est activé. Ils s'allument en même temps lorsque les circuits IRP et hyperfréquence sont actifs, et signalent ainsi une détection d'alarme.

Vous pouvez désactiver l'interrupteur 1 une fois le test terminé.

Remarque : assurez-vous que le couvercle avant du détecteur est en place avant d'effectuer un test de marche. S'il ne l'est pas, ne démarrez pas le test de marche.

En effet, la portée du détecteur serait alors accrue. Positionnez le couvercle avant à l'emplacement prévu pour obtenir la portée correcte des faisceaux. Ajustez l'objectif horizontalement et verticalement pour obtenir le champ de vision souhaité.

Caractéristiques techniques

Couverture	Angle de détection de 14 à 70°, couverture de 15 m x 13 m max.
Réglage	90° horizontal, 45° vertical
Lentilles de Fresnel	20 zones pour chaque élément de détection pouvant être masquées à l'aide des volets de masquage
Optiques personnalisées	Élément quad à double couche de silicium protégé éliminant 50 000 lux de lumière blanche
Voyants	Orange : détecteur hyperfréquence activé Rouge : détecteur IRP activé Orange et rouge : détection d'alarme
Fréquence de fonctionnement	24 GHz
Bande de fréquences radar	8 500 MHz-10 600 MHz
Sortie de puissance maximum	27 dBm E.I.R.P.
Sorties	Silencieuses, à semiconducteurs, insensibles au magnétisme
NC	Relais sans tension, signal 24 V CA/CC à 50 mA avec résistance intégrée 25 Ω. Durée de l'alarme : 5 secondes
Entrée d'alimentation	9 à 15 V CC
Courant	8 mA (12 V nominal)
Compteur d'impulsions	1 ou 2
Compensation de température	Réglage de sensibilité numérique et analogique (thermistance)
Contrôle	Microprocesseur numérique avec mémoire non volatile
Test de marche	Mode de test de sortie avec voyant. Option de désactivation des voyants.
Température de fonctionnement	−30° à +65°C
Boîtier	Boîtier ABS en plastique, résistant aux chocs, avec couvercle en PEHD ; résistant aux UV
Dimensions (L x H x P)	70 mm x 120 mm x 95 mm
Poids	225 g net, 325 g brut
Hauteur de montage	Jusqu'à 6 m Hauteur optimale de 3 m pour portée maximale

Information réglementaire

Fabricant	MISE SUR LE MARCHÉ PAR : Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA REPRÉSENTANT DE L'UNION EUROPÉENNE AUTORISÉ : Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Pays-Bas
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EN	Ce produit répond aux critères établis par EMC Testing selon les normes suivantes : EN 50130-4:2011 EN 61000-6-3:2007 ETSI EN 300 440-1:2009 ETSI EN 301 489-1:2001 Ce produit respecte les conditions environnementales établies par la norme EN 50130-5.
Sécurité électrique	Ce produit respecte les conditions de la directive Basse tension (DBT) : 2006/95/EC Normes harmonisées : EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Classe environnementale	IP65
Directives européennes	Carrier Fire & Security déclare par la présente que cet appareil est conforme aux exigences applicables et aux dispositions de toutes les règles et règlements applicables, y compris, mais sans s'y limiter, de la Directive 2014/53/EU. Pour plus d'informations, voir firesecurityproducts.com.
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Informations de contact

firesecurityproducts.com ou www.aritech.com

IT: Istruzioni d'installazione

Confezione

La confezione contiene:

- 1 unità Mini Dual Tech
- 1 dima per i fori di fissaggio
- 2 tasselli da 3,5 x 25 mm
- 2 viti da 3,5 x 25 mm
- 1 maschera per la lente
- 1 strumento per l'apertura

- 2 alette supplementari
- 1 manuale di installazione
- 1 connettore per morsettiera a 6 vie

Descrizione

Il rilevatore per estern Mini Dual Tech è un rilevatore di movimento e attivazione di allarme per uso in estern che si avvale di un elemento quad-pyro (due circuiti di sensori a infrarossi passivi indipendenti) in combinazione con un sensore a microonde a bassa potenza.

Affinché il rilevatore metta in funzione l'allarme, tutti i sensori devono attivarsi; questo garantisce un rilevamento della presenza preciso ed affidabile.

Installazione dell'unità

Durante l'installazione, proteggere i componenti elettronici dall'acqua, poiché l'umidità all'interno può danneggiare l'unità o influire sul suo funzionamento.

Nota: quando si posiziona il rilevatore, verificare che il suo campo visivo sia libero.

Per installare il rilevatore procedere come segue:

1. Forare la parete per inserire i due tasselli di fissaggio e realizzare il foro di ingresso del cavo utilizzando la dima di foratura in dotazione. Lasciare almeno 10 cm di spazio sopra la parte superiore dell'alloggiamento del rilevatore per posizionare correttamente il coperchio ed il rilevatore.

   Nota: l'altezza di installazione ideale per il rilevatore è di 3 metri. È possibile installare l'unità più in alto ma così facendo il campo di rilevamento sarà più piccolo e il soggetto da rilevare dovrà muoversi di più attraverso la già ridotta area di rilevamento affinché l'allarme venga attivato.

2. Rimuovere la piastra posteriore di fissaggio alla parete. Fissare la piastra posteriore alla parete con le viti. Utilizzare sempre una delle viti di fissaggio che assicuri il fissaggio della piastra posteriore antimanomissione alla parete (Figura 1, punto 1) ed utilizzare anche gli altri punti di fissaggio a vite (Figura 1, punto 2). In caso di ingresso dei cavi dalla parte posteriore, usare il foro di ingresso per il cavo (Figura 1, punto 3). Fissare il corpo principale del rilevatore sulla piastra posteriore.

3. Rimuovere il coperchio allentando la vite di fissaggio. Utilizza lo strumento per l'apertura come mostrato in Figura 2 e con attenzione fare leva nella fessura sotto il coperchio anteriore. Il coperchio è incernierato nella parte superiore e si solleva dalla sede in cui è posizionato (Figura 3).

4. Rimuovere le due viti di fissaggio e aprire il coperchio della morsettiera. Utilizzando una lama affilata, incidere la guarnizione di gomma per consentire l'ingresso del cavo nell'unità (Figura 4). Inserire un cavo di allarme standard a sei/otto fili dalla parete, direttamente nel foro di ingresso del cavo. Spellare i fili e collegarli alla morsettiera estraibile, che si trova nel kit a corredo (Figura 5). Inserire la morsettiera sul connettore verificando che aderisca saldamente. Riposizionare il coperchio del foro ingresso cavo e serrare le due viti di fissaggio.

   Attenzione: verificare che il cavo si trovi all'interno della guida.

5. Una volta che il rilevatore è allineato e collegato:

   a. Fissare il coperchio al corpo principale del rilevatore.
   b. Serrare la vite di fissaggio.

Collegamento dell'unità

Tabella 1: Collegamenti

Morsetto	Denominazione	Descrizione
1,2	− + 12 V CC	Alimentazione 12 V CC
3, 4	A A	Relè allarme, normalmente chiuso
5, 6	T T	Relè antimanomissione, normalmente chiuso

Nella Figura 6 è riportata la configurazione dei morsetti.

Allineamento multifascio e mascheramento

La lente multifunzione montata sul rilevatore Mini crea cinque fasci a lunga portata e cinque a media-breve portata. Il circuito PIR rileva le variazioni di temperatura e di movimento nel campo del fascio, pertanto nel posizionare il rilevatore è opportuno tenere in considerazione elementi come alberi, cespugli, laghetti, scarichi di caldaie e animali. Il modulo a microonde rileva il movimento effettivo in avvicinamento o in allontanamento rispetto al rilevatore ed è programmato per ignorare eventuali oggetti che si muovono all'esterno dell'area da controllare.

Il modulo del rilevatore è dotato di due alette scorrevoli per ridurre l'angolo di rilevamento solo del sensore PIR. Le alette sono fissate al modulo, come illustrato nella Figura 7. Ogni sezione della lente sul rilevatore genera un'area di copertura di circa 14 gradi. Se la copertura è superiore all'area di rilevamento desiderata, regolare il modulo in base alle esigenze e mascherare eventuali fasci, in verticale ed in orizzontale, per evitare rilevamenti indesiderati.

Utilizzare parti della maschera argentata autoadesiva applicandole sulla parte posteriore della lente, sul lato liscio. In figura 8 un esempio di mascheramento per l'immunità agli animali. Per sostituire la lente, iniziare facendo scorrere un lato della stessa nelle clip che si trovano sul modulo. Dopo aver fissato un lato, eseguire la stessa operazione sul lato opposto, verificando che la lente sia orientata correttamente, con la parte liscia rivolta verso l'interno e le due file di cerchi in basso.

Sostituire sempre la lente con l'orientamento corretto, per garantire la copertura esatta nel campo del fascio, come mostrato nella Figura 8.

La tabella 2 sotto riassume l'allineamento tipico e le configurazioni per il mascheramento.

Tabella 2: Allineamento fascio e configurazione mascheramento

Configurazione	Altezza (m)	Inclinazione (°)	Portata max. (m)
Multifascio, ottimale	3	5	15
Immunità animali domestici [1]	1,5	−2	15

[1] L'area nera deve essere mascherata per le applicazioni relative agli animali domestici fino a 15 metri.

Nella Figura 9 è illustrata la copertura che consente di ottenere la portata massima nella posizione ottimale.

LEDs

I LED sono visibili nella Figura 10.

Figura 10

Led	Colore	Descrizione
1	Arancio	Microonda attivo
2	Rosso	PIR attivo
1+2	Rosso + arancio	Allarme di rilevamento

Opzioni selezionabili

La Figura 11 mostra la posizione del Dip Switch (1).

Conteggio impulsi

Il conteggio degli impulsi indica quante volte il rilevatore deve rilevare una presenza prima di attivare un allarme.

Interruttore 2 OFF = Conteggio impulsi 2

Interruttore 2 ON = Conteggio impulsi 1 (più sensibile)

LED di rilevamento

Interruttore 1 ON = Entrambi i LED attivati

Interruttore 1 OFF = Entrambi i LED disattivati

Test di copertura e tempo di inizializzazione

Dopo aver alimentato l'unità, attendere tre minuti per consentire l'inizializzazione dei componenti elettronici, prima di iniziare il test di copertura.

Per abilitare i LED al test di copertura, portare l'interruttore 1 in posizione ON. I LED di rilevamento si illuminano singolarmente ogni volta che viene attivato il sensore PIR o la microonda e si illuminano entrambi quando sia il circuito PIR, che il circuito a microonda sono attivi, confermando così il rilevamento.

Dopo aver concluso il test di copertura, portare l'interruttore 1 in posizione OFF, se l'indicazione del LED non è necessaria.

Nota: quando si esegue il test di copertura, verificare che il coperchio anteriore sia in posizione. Non eseguire il test di copertura se il coperchio è stato rimosso.

Senza il coperchio protettivo anteriore, la portata del rilevatore aumenta. Il coperchio anteriore deve quindi essere installato, affinché il campo del fascio sia corretto. Regolare il modulo in senso orizzontale e verticale sul campo visivo per ottenere l'area di copertura corretta.

Specifiche

Copertura	Angolo di rilevamento: da 14° a 70° Copertura max: 15 m x 13 m.
Regolazione	Orizzontale: 90°. Inclinazione: 45°
Lente di Fresnel	20 zone per ciascun elemento di rilevamento, che si possono mascherare con le alette scorrevoli
Ottica personalizzata	L'elemento quadruplo con doppia schermatura al silicone elimina 50.000 lux di luce bianca
LED	Arancio: rilevazione microonda Rosso: rilevazione PIR Arancio + rosso: allarme rilevatore
Frequenza di funzionamento	24 GHz
Frequenza di banda Radar	8 500 MHz-10 600 MHz
Massima potenza in uscita	27 dBm E.I.R.P.
Uscite	Silenziose, allo stato solido, immuni all'influenza magnetica
NC	Relè a potenziale zero, 24 V CA/CC a 50 mA con resistenza integrale in serie da 25 Ω. Durata allarme: 5 secondi
Alimentazione	Da 9 a 15 V CC
Assorbimento	8 mA (12 V nominali)
Conteggio impulsi	1 o 2
Termocompensazione	Analogica (termistore) e regolazione della sensibilità digitale
Controllo	Microprocessor con memoria non volatile
Test copertura	Modalità di test in uscita con indicazione a LED. Possibilità di disabilitare i LED.
Temperatura di funzionamento	Da −30°C a +65°C
Contenitore	Plastica ABS ad alta resistenza con coperchio HDPE, stabilizzata verso i raggi UV
Dimensioni (L x A x P)	70 mm x 120 mm x 95 mm
Peso	225 g netto, 325 g lordo
Altezza di montaggio	Fino a 6 m Altezza ottimale per la portata massima: 3 m

Certificazione e conformità

Costruttore	MESSO SUL MERCATO DA: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA AUTORIZZATO RAPPRESENTANTE UE: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Netherlands
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EN	Questo prodotto è conforme ai requisiti di EMC Testing delle seguenti norme: EN 50130-4:2011 EN 61000-6-3:2007 ETSI EN 300 440-1:2009 ETSI EN 301 489-1:2001 Questo prodotto è conforme ai requisiti ambientali previsti dalla norma EN 50130-5.
Sicurezza elettrica	Questo prodotto è conforme ai requisiti della Direttiva Bassa Tensione (LVD): 2006/95/CE Norme armonizzate: EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Classe ambientale	IP65
Direttive Unione Europea	Carrier Fire & Security dichiara che questo dispositivo è conforme ai requisiti applicabili e alle disposizioni di tutte le norme e regolamenti applicabili, inclusi ma non limitati alla direttiva 2014/53/EU. Per ulteriori informazioni, vedere firesecurityproducts.com
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Informazioni di contatto

firesecurityproducts.com o www.aritech.com

NL: Installatieblad

Pakket

Het pakket bevat:

- 1 x Mini Dual Tech
- 1 x boorsjabloon voor bevestigingsgaten
- 2 x 3,5mm x 25mm wandpluggen
- 2 x 3,5mm x 25mm schroeven
- 1 x lensmaskering
- 1 x opening gereedschap
- 2 x extra gordijnsluiters
- 1 x installatieblad
- 1 x plug op 6-wegs aansluitingsblok

Beschrijving

De Mini Outdoor Dual Tech-detector is een bewegingsdetector en alarmactivering voor buiten die gebruikmaakt van een quadpyro (twee onafhankelijke, passieve, infrarood sensorcircuits) in combinatie met een laagspanningsradar sensormodule.

Alle drie de sensoren moeten worden geactiveerd voordat de detector een alarm signaleert. Dit zorgt voor een nauwkeurige en betrouwbare aanwezigheidsdetectie.

Montage van de unit

Bescherm tijdens de installatie de elektronica tegen water, omdat vocht de unit kan beïnvloeden of beschadigen.

Opmerking: Zorg er bij het plaatsen van de detector voor dat het kijkveld van de detector geen obstructies bevat.

Ga als volgt te werk om de detector te monteren:

1. Boor in de wand gaten voor de twee bevestigingsschroeven en de kabeldoorgang met behulp van de meegeleverde boorsjabloon. Laat ten minste 10 cm ruimte vrij aan de bovenzijde van de detectorbehuizing zodat de kap en de detector correct kunnen worden geplaatst.

   Opmerking: De aanbevolen optimale montagehoogte voor de detector is 3 m. Hoewel het mogelijk is om de unit hoger te monteren, levert dit een kleiner detectiebereik op en zal het te detecteren object verder door het beperktere detectiegebied moeten bewegen voordat er een activering wordt gesignaleerd.

2. Verwijder de wandbevestigingsplaat. Schroef de achterplaat tegen de wand. Zorg er altijd voor dat een van de bevestigingsschroeven wordt gebruikt om de achterste sabotageplaat aan de wand te bevestigen (afbeelding 1, item 1) en de andere voor de andere schroefbevestigingspunten (afbeelding 1, item 2). Bij een kabeldoorgang aan de achterzijde, gebruikt u de kabeluitduwplaatjes (afbeelding 1, item 3). Bevestig de detectorunit aan de achterplaat.

3. Verwijder de kap door de borgschroef los te schroeven. Gebruik het opening gereedschap zoals getoond in figuur 2, hevel de front cover weg van de detector base. De kap scharniert aan de bovenzijde en kan uit de locatiesleuf worden getild (afbeelding 3).

4. Verwijder de twee borgschroeven en open de klep van de aansluitingsblok. Gebruik een scherp mesje om de rubberen afdichting te openen, zodat de kabel in de unit kan worden gevoerd (afbeelding 4). Voer een standaard zes-/achtaderige alarmkabel door de wand en rechtstreeks in de kabeldoorvoer. Leg de draden bloot en sluit deze aan op het verwijderbaar aansluitingsblok. Dit bevindt zich in het pakket (afbeelding 5). Duw het aansluitingsblok op het pinhoofd zodat deze stevig vast zit. Plaats de kap op de kabeldoorgang en zet de 2 bevestigingsschroeven vast.

   Let op: Zorg ervoor dat de kabel zich binnen de kabelgeleiding bevindt.

5. Wanneer de detector is uitgelijnd en aangesloten, doet u het volgende:

   a. Plaats de kap op de detectorunit.
   b. Zet de borgschroef vast.

De module aansluiten

Tabel 1: Aansluitingen

Terminal	Label	Beschrijving
1,2	− + 12 V DC	Voeding van 12 VDC*
3, 4	A A	Alarmrelais, normaal gesloten
5, 6	T T	Sabotagerelais, normaal gesloten

Afbeelding 6 toont de terminalconfiguratie.

Multibeam-uitlijning en -maskering

De multifunctionele lens waarover de Mini-detector beschikt, produceert vijf beams met een lang bereik, en vijf gordijn-PIRbeams met een gemiddeld tot kort bereik. Het PIR-circuit detecteert temperatuurschommelingen en bewegingen in het beampatroon. Houd dus bij het plaatsen van de detector rekening met items zoals bomen, struiken, water, boileruitlaten en dieren. De radarmodule detecteert daadwerkelijke bewegingen van de detector weg en naar de detector toe, en is geprogrammeerd om objecten te negeren die buiten het bereik bewegen.

De detectormodule is uitgerust met twee bewegende sluiters om alleen de detectiehoek van de PIR-sensor te verkleinen. De gordijnen zijn bevestigd aan de draai- en kantelmodule, zoals wordt weergegeven in afbeelding 7. Elk deel van de detectorlens geeft een dekkingspatroon van ongeveer 14 graden. Wanneer de dekking het gewenste detectiegebied overschrijdt, past u de module naar wens aan en maskeert u eventuele beams, verticaal of horizontaal, om ongewenste detectie te voorkomen.

Breng stukjes zilverkleurige maskeringstape aan op de gladde kant van de lens aan de achterzijde. Als voorbeeld voor diervriendelijke maskering, gebruik afbeelding 8. Als u de lens wilt vervangen, schuift u eerst één deel van de lens in de klemmen op de draai- en kantelmodule. Nadat één zijde goed is bevestigd, doet u hetzelfde voor de andere kant, waarbij u ervoor zorgt dat de lens in de juiste positie wordt geplaatst met de gladde zijde naar binnen en de twee rijen cirkels naar beneden.

Zorg dat de lens altijd op de goede manier naar boven wordt vervangen, om de juiste beam-patroondekking te verkrijgen zoals wordt weergegeven in afbeelding 8.

Tabel 2 hier onder geeft een overzicht van typische uitlijning en maskering opties.

Tabel 2: Beam africhten en maskering configuratie

Configuratie	Hoogte (m)	Kanteling (°)	Max. bereik (m)
Multibeam, optimaal	3	5	15
Ongevoelig voor huisdieren [1]	1.5	−2	15

[1] Zwart gebied moet worden gemaskeerd voor huisdiertoepassingen tot 15 meter.

Afbeelding 9 toont het patroon voor het maximale bereik in de optimale positie.

LED's

LED's worden weergegeven in afbeelding 10.

Afbeelding 10

Item	Kleur	Beschrijving
1	Oranje	Radar actief
2	Rood	PIR actief
1+2	Rood + Oranje	Detectie-alarm

Selecteerbare opties

Afbeelding 11 toont de positie van de DIL-schakelaar (1).

Pulsteller

De pulstelling is het aantal keer dat de detector een aanwezigheid moet detecteren voordat een alarm wordt gesignaleerd.

Schakelaar 2 UIT = Pulstelling 2

Schakelaar 2 AAN = Pulstelling 1 (meest gevoelig)

Detectie-LED

Schakelaar 1 AAN = Beide LED's ingeschakeld

Schakelaar 1 UIT = Beide LED's uitgeschakeld

Looptest & opstarttijd

Houd 3 minuten aan als opstarttijd voor de elektronica wanneer de stroom wordt ingeschakeld, voordat u start met de looptest.

Als u de LED's wilt inschakelen voor het uitvoeren van een looptest, stelt u Schakelaar 1 in op AAN. De detectie-LED's gaan afzonderlijk branden telkens wanneer de PIR- of radarsensor wordt geactiveerd, en gaan allebei branden wanneer de PIR- en radarcircuits zijn geactiveerd, waarmee een alarmdetectie wordt bevestigd.

Nadat de looptest is voltooid, stelt u Schakelaar 1 in op UIT indien de LED-aanduiding niet is vereist.

Opmerking: Wanneer u een looptest uitvoert, moet u ervoor zorgen dat de kap aan de voorkant is geplaatst. Voer geen looptesten uit wanneer de kap is verwijderd.

Het bereik van de detector neemt toe zonder de beschermkap. Daarom moet de kap aan de voorzijde zijn geïnstalleerd om het juiste beam-patroon te verkrijgen. Draai en kantel de lensmodule over het kijkveld om het juiste dekkingsgebied te verkrijgen.

Specificaties

Dekking	14° tot 70° detectiehoek, 15 m x 13 m x 4,2 cm
Aanpassing	90° draaiing, 45° kanteling
Matglaslens	20 zones voor elk detectieelement, die kunnen worden gemaskeerd met gordijnsluiters
Aangepaste optiek	Met dubbel silicone afgeschermd quad-element elimineert 50.000 Lux aan wit licht
LED's	Oranje: Radar geactiveerd Rood: PIR geactiveerd Oranje + Rood: Detector alarm
Bedrijfsfrequentie	24 GHz
Radar frequentie band	8 500 MHz–10 600 MHz
Maximale vermogen	27 dBm E.I.R.P.
Uitgangen	Stil, halfgeleider, magnetische immuun
NC	Voltvrij relais, signaalcontact 24 VAC/DC bij 50 mA met een geïntegreerde 25 Ω-weerstand. Alarmtijd 5 seconden
Voeding	9 tot 15 VDC
Stroom	8 mA (12 V nominaal)
Pulsteller	1 of 2
Temperatuur-compensatie	Analoge (thermistor) en digitale gevoeligheidsaanpassing

Centrale	Digitale microprocessor met niet-vluchtig geheugen
Looptest	Uitgang testmodus met LED-indicatie. Optie voor het uitschakelen van LED's.
Bedrijfstemperatuur	−30° tot +65°C
Behuizing	Stootvast ABS-plastic met HDPE-kap, UV-stabiel
Afmetingen B x H x D	70 mm x 120 mm x 95 mm
Gewicht	225 g netto, 325 g bruto
Montagehoogte	Variabel tot maximaal 6 m. Optimale hoogte 3 m voor volledige bereik

Algemene Informatie

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Contact informatie

firesecurityproducts.com of www.aritech.com

PL: Arkusz instalacyjny

Zestaw

Opakowanie zawiera następujące elementy:

- 1 x czujka Mini Dual Tech
- 1 x szablon do wiercenia otworów mocujących
- 2 x kołki ścienne 3,5 mm x 25 mm
- 2 x wkręty 3,5 mm x 25 mm
- 1 x osłona obiektywu
- 1 x otwieracz
- 2 x dodatkowe zasłony kurtynowe
- 1 x arkusz instalacyjny
- 1 x złącze na 6-wejściowym bloku styków

Opis

Czujka Mini Dual Tech to przeznaczona do stosowania na zewnątrz budynków czujka ruchu i wyzwalacz alarmów, oparta na poczwórnej czujce piroelektrycznej (z dwoma niezależnymi, pasywnymi obwodami czujek na podczerwień) połączonym z modułem czujki mikrofalowej o małej mocy.

W celu zapewnienia dokładnego, niezawodnego wykrywania obiektów ruchomych alarm czujki musi zostać wyzwolony przez wszystkie trzy czujniki.

Montaż urządzenia

Podczas instalacji należy chronić elementy elektroniczne przed działaniem wody, ponieważ uwięziona wilgoć może spowodować nieprawidłowe działanie urządzenia lub jego uszkodzenie.

Uwaga: Czujkę należy umieścić tak, aby jej pola widzenia nie zasłaniały żadne przeszkody.

Aby zamontować czujkę:

1. Za pomocą dostarczonego szablonu wywierć dwa otwory na wkręty mocujące i doprowadzenie kabla. Nad górną częścią obudowy pozostaw co najmniej 10 cm odstępu, aby umożliwić zamontowanie osłony i czujki w prawidłowym położeniu.

   Uwaga: Zalecana optymalna wysokość montażu czujki wynosi 3 m. Mimo że urządzenie można zamontować na większej wysokości, w takiej sytuacji zasięg wykrywania zmniejszy się, a do aktywacji alarmu będzie wymagany dłuższy ruch intruza w już ograniczonym obszarze wykrywania.

2. Zdejmij tylną płytę montażową i przykręć ją do ściany. Jednym z wkrętów mocujących przykręć do ściany zabezpieczenie antysabotażowe (rysunek 1, pozycja 1), a drugi przykręć do ściany w jednym z trzech punktów mocowania wkrętów (rysunek 1, pozycja 2). W przypadku doprowadzenia kabla należy usunąć zaślepkę (rysunek 1, pozycja 3). Zamocuj korpus czujki do płyty montażowej.
3. Zdejmij zespół pokrywy, luzując śrubę blokującą. Użyj załączonego otwieracza w celu ostrożnego odchylenia pokrywy od korpusu czujki. Pokrywa odchyli się od góry i wysunie z gniazda (rysunek 3).
4. Odkręć dwie śruby zabezpieczające i otwórz pokrywę bloku styków. Za pomocą nożyka przetnij gumowe uszczelnienie, aby umożliwić doprowadzenie okablowania do urządzenia (rysunek 4). Poprowadź standardowy 6- lub 8-żyłowy kabel alarmu przez ścianę bezpośrednio do miejsca wprowadzenia kabla. Zdejmij izolację z przewodów i podłącz je do bloku styków znajdującego się w torbie z zestawem (rysunek 5). Wciśnij blok styków we wtyk, aby go solidnie zamocować. Załóż z powrotem pokrywę bloku styków i przykręć dwie śruby mocujące.

   Uwaga: Upewnij się, że przewód znajduje się w prowadnicy.
5. Gdy czujka jest dopasowana i podłączona, zamocuj pokrywę na korpusie czujki i dokręć śrubę blokującą.

Podłączanie urządzenia

Tabela 1: Połączenia

Styk	Etykieta	Opis
1,2	− + 12 V DC	Zasilanie 24 V DC
3, 4	A A	Wyjście przekaźnikowe alarmu, normalnie zamknięte
5, 6	T T	Wyjście przekaźnikowe sabotażu, normalnie zamknięte

Na rysunku 6 przedstawiono konfigurację styków.

Regulowanie wielu wiązek i maskowanie

Soczewka wielofunkcyjna czujki Mini generuje pięć wiązek PIR dalekiego zasięgu i pięć wiązek PIR średniego lub krótkiego zasięgu. Obwód PIR wykrywa zmiany temperatury i ruchu we wzorcu wiązki, zatem podczas umieszczania czujki należy wziąć pod uwagę takie obiekty, jak drzewa, krzewy, zbiorniki wodne, przewody kominowe i zwierzęta. Moduł mikrofalowy wykrywa faktyczny ruch do lub od czujki i jest zaprogramowany tak, aby obiekty poruszające się poza zasięgiem były ignorowane.

Moduł czujki jest wyposażony w dwie przesuwane zasłony, które ograniczają kąt wykrywania samej czujki PIR. Zasłony są zamocowane do modułu pochylania w poziomie i pionie, co zostało przedstawione na rysunku 7. Każda część obiektywu czujki zapewnia pokrycie wynoszące około 14 stopni. Gdy zasięg przekracza żądany obszar wykrywania, należy odpowiednio wyregulować moduł i zamaskować wszelkie zbędne wiązki (pionowo lub poziomo) w celu uniknięcia niepożądanego wykrywania obiektów.

W tym celu należy zastosować odpowiednio przycięte kawałki srebrnej osłony samoprzylepnej, nakładając je na tylny, gładki koniec soczewki. Przykład maskowania ścieżki dla zwierząt domowych można znaleźć na rysunku 8. Aby wymienić soczewkę, należy wsunąć jej jedną stronę w zaczepy modułu pochylania poziomego i pionowego. Po zabezpieczeniu jednej strony należy wykonać te same czynności z drugiej strony, upewniając się, że orientacja obiektywu jest prawidłowa (strona gładka skierowana do wewnątrz, dwa rzędy okręgów u dołu).

Soczewki należy zawsze umieszczać w prawidłowy sposób, aby zapewnić dokładne odwzorowanie wiązek, jak pokazano na rysunku 8.

W tabeli 2 poniżej przedstawiono typowe ustawienia i konfiguracje maskowania.

Tabela 2: Regulowanie wiązek i konfiguracja maskowania

Konfiguracja	Wysokość (m)	Pochylenie (°)	Maks. zasięg (m)
Wiele wiązek, optymalnie	3	5	15
Pomijanie małych zwierząt [1]	1,5	−2	15

[1] Obszar czarny powinien być zamaskowany w przypadku trybu nieczułości na małe zwierzęta (Pet Alley) o zasięgu do 15 metrów.

Na rysunku 9 przedstawiono wzorzec dla maksymalnego zasięgu w położeniu optymalnym.

Diody LED

Diody LED pokazano na rysunku 10.

Rysunek 10

Element	Kolor	Opis
1	Pomarańczowa	Czujka mikrofalowa aktywna
2	Czerwona	Czujka PIR aktywna
1+2	Czerwona + Pomarańczowa	Alarm wykrywania

Opcje do wyboru

Na rysunku 11 przedstawiono położenie przełącznika DIL (1).

Liczba impulsów

Liczba impulsów oznacza liczbę operacji wykrycia obecności wymaganych do zasygnalizowania alarmu.

Przełącznik 2 WYŁ. = liczba impulsów 2

Przełącznik 2 WŁ. = liczba impulsów 1 (największa czułość)

Dioda LED wykrywania

Przełącznik 1 WŁ. = obie diody LED włączone

Przełącznik 1 WYŁ. = obie diody LED wyłączone

Test przejścia i czas oczekiwania

Przed rozpoczęciem testu przejścia należy odczekać 3 minuty po włączeniu zasilania systemu elektronicznego.

Aby włączyć diody LED w celu przeprowadzenia testu przejścia, należy ustawić przełącznik 1 w położeniu WŁ.

Diody LED wykrywania będą świecić pojedynczo przy każdej aktywacji czujki PIR lub czujki mikrofalowej oraz świecić jednocześnie, gdy oba te obwody są aktywne, co oznacza potwierdzenie wykrycia alarmu.

Jeśli po wykonaniu testu wskazania diody LED nie są potrzebne, należy ustawić przełącznik 1 w położeniu WYŁ.

Uwaga: Podczas wykonywania testu przejścia przednia pokrywa musi być założona. Nie wolno przeprowadzać testów przejścia przy zdjętej pokrywie.

Przy zdjętej osłonie przedniej zasięg czujki jest większy. W związku z tym w celu uzyskania poprawnego wzorca wiązek przednia pokrywa musi być zamocowana. Przechyl (poziomo i pionowo) moduł soczewki względem pola widzenia, aby uzyskać poprawny obszar pokrycia.

Dane techniczne

Zasięg	Kąt wykrywania od 14° do 70°, Maks. pokrycie 15 m x 13 m
Regulacja	90° w poziomie, 45° w pionie
Soczewka Fresnela	20 stref dla każdego elementu wykrywającego, które można zamaskować za pomocą przesuwanych kurtyn
Niestandardowa optyka	Poczwórny element z podwójną powłoką silikonową eliminujący światło białe o wartości 50 000 luksów
Diody LED	Pomarańczowa: czujka mikrofalowa aktywna Czerwona: czujka PIR aktywna Czerwona + pomarańczowa: alarm czujki
Częstotliwość pracy	24 GHz
Zakres częstotliwości radaru	8 500 MHz-10 600 MHz
Maksymalna moc wyjściowa	27 dBm E.I.R.P.
Wyjścia	Ciche, półprzewodnikowe, odporne na fale magnetyczne
NC	Beznapięciowe wyjście przekaźnikowe, styk sygnałowy 24 V AC/DC przy 50 mA ze zintegrowanym opornikiem szeregowym 25 Ω. Czas alarmu: 5 sekund
Zasilanie wejściowe	Od 9 do 15 V DC
Prąd	8 mA (12 V znamionowo)
Liczba impulsów	1 lub 2
Kompensacja temperatury	Regulacja czułości: analogowo (za pomocą termistora) i cyfrowo
Sterowanie	Mikroprocesor cyfrowy z pamięcią nieulotną
Test przejścia	Tryb testowania wyjść z sygnalizacją za pomocą diod LED. Opcja wyłączenia diody LED.
Temperatura pracy	Od −30° do +65°C
Obudowa	Wytrzymałe na uderzenia tworzywo sztuczne ABS z osłoną HDPE, stabilizowane promieniami UV
Wymiary (szer. x wys. x gł.)	70 mm x 120 mm x 95 mm
Waga	225 g netto, 325 g brutto
Wysokość montażu	Zmienna do 6 m Optymalna wysokość dla pełnego zasięgu: 3 m

Informacje prawne

Producent	WPROWADZONE NA RYNEK PRZEZ: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA AUTORYZOWANY PRZEDSTAWICIEL NA TERENIE UE: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Holandia
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Certyfikacja	CE
EN	Produkt jest zgodny z wymaganiami testów zgodności elektromagnetycznej w ramach następujących norm: EN 50130-4:2011 EN 61000-6-3:2007 ETSI EN 300 440-1:2009 ETSI EN 301 489-1:2001 Produkt jest zgodny z wymaganiami środowiskowymi normy EN 50130-5.
Bezpieczeństwo elektryczne	Produkt jest zgodny z wymaganiami dyrektywy niskonapięciowej (LVD): 2006/95/WE Normy zharmonizowane: EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Klasa środowiskowa	IP65
Dyrektywy Unii Europejskiej	Carrier Fire & Security niniejszym deklaruje zgodność urządzenia ze wszystkimi wymaganiami wszystkich stosownych dyrektyw, łącznie z, lecz nie ograniczając się do, Dyrektywą 2014/53/EU. Więcej informacji na stronie firesecurityproducts.com.
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Informacje kontaktowe

firesecurityproducts.com lub www.aritech.com

PT: Ficha de Instalação

Embalagem

A embalagem contém:

- 1 x Mini Dual Tech
- 1 x modelo de perfuração para furos de fixação
- 2 x tomadas de parede de 3,5 mm x 25 mm
- 2 x parafusos de 3,5 mm x 25 mm
- 1 x máscara de lente
- 1 x ferramenta de abertura
- 2 x obturadores tipo cortina adicionais
- 1 x ficha de instalação.
- 1 x tomada no bloco de terminais de 6 vias

Descrição

O Detector Mini Outdoor Dual Tech é um dispositivo para detecção de movimentos e accionamento de alarmes para exteriores, que utiliza um elemento piroeléctrico quádruplo (dois circuitos de sensores de infra-vermelhos passivos independentes) em combinação com um módulo de sensor de microondas de baixa potência.

Os três sensores têm de disparar para o detector entrar em alarme, assegurando uma detecção de presença fiável e precisa.

Instalação da unidade

Durante a instalação, o sistema electrónico deve ser protegido contra a entrada de água, já que a presença de humidade pode afectar ou danificar a unidade.

Nota: ao localizar o detector, certifique-se de que o campo de visão do mesmo está desobstruído.

Para montar o detector:

1. Perfure a parede para aceitar os dois parafusos de fixação e a entrada de cabos, utilizando o modelo de perfuração fornecido para o efeito. Deixe uma folga mínima de 10 cm acima do topo da caixa do detector para permitir o posicionamento correcto da tampa e do detector.

   Nota: a altura de montagem optimizada recomendada para o detector é 3 m. Embora seja possível montar a unidade a uma altura superior, tal irá proporcionar um alcance de detecção reduzido, e o sujeito da detecção terá de se mover mais pela área de detecção, já de si reduzida, antes de ser assinalada uma activação.

2. Retire a placa traseira de fixação à parede. Aparafuse a placa traseira à parede. Certifique-se sempre de que um dos parafusos de fixação é utilizado para fixar a placa traseira anti-tamper à parede (Figura 1, item 1), além de utilizar os outros pontos de fixação de parafusos (Figura 1, item 2). No caso de uma entrada traseira para cabos, utilize o recorte para cabos (Figura 1, item 3). Monte o corpo principal do detector na placa traseira.

3. Retire o conjunto da tampa, desapertando para tal o parafuso de bloqueio. Utilize a ferramenta de abertura, conforme apresentado na Figura 2. Encaixe a ferramenta de abertura na ranhura e faça pressão de forma a que a tampa se afaste da base do detector. A tampa articula-se a partir de cima e levanta-se da ranhura (Figura 3).

4. Retire os 2 parafusos de fixação e abra a tampa do bloco de terminais. Utilize um x-acto para abrir o vedante de borracha, de modo a permitir a passagem dos cabos para dentro da unidade (Figura 4). Passe um cabo de alarme 6/8 core standard pela parede e directamente para dentro da entrada de cabos. Descarne os cabos e ligue ao bloco de terminais amovível, o qual se encontra no saco do kit (Figura 5). Encaixe o bloco de terminais na régua de pinos, empurrando até ficar bem encaixado. Volte a colocar a tampa da entrada de cabos e atarraxe os dois parafusos de fixação.

   Cuidado: certifique-se de que o cabo está localizado dentro do guia de cabos.

5. Quando o detector estiver alinhado e ligado:

   a. Instale a tampa no corpo principal do detector.
   b. Aperte o parafuso de bloqueio.

Ligar a unidade

Tabela 1: Ligações

Terminal	Etiqueta	Descrição
1,2	− + 12 VCC	Fonte de alimentação 12 VCC
3, 4	A A	Relé de alarme, normalmente fechado
5, 6	T T	Relé de tamper, normalmente fechado

A Figura 6 mostra a configuração do terminal.

Alinhamento e máscara multi-feixe

A lente multi-funções instalada no Mini detector produz cinco feixes de longo alcance e cinco feixes PIR tipo cortina de médio a curto alcance. O circuito PIR detecta alterações térmicas e de movimento no padrão de feixe; deste modo, devem ser tidos em consideração elementos como árvores, arbustos, pequenos lagos artificiais, tubos de caldeiras e animais ao posicionar o detector. O módulo de microondas detecta movimentos reais de aproximação ou afastamento do detector, estando programado para ignorar os objectos que se movem fora do alcance.

O módulo do detector está equipado com dois obturadores deslizantes para reduzir o ângulo de detecção do sensor PIR apenas. As cortinas são instaladas no módulo pan e tilt conforme mostrado na Figura 7. Cada secção da lente do detector fornece um padrão de cobertura de aproximadamente 14 graus.

Quando a cobertura exceder a área de detecção pretendida, ajuste o módulo conforme necessário e aplique a máscara a eventuais feixes, na vertical ou na horizontal, para evitar a detecção indesejada.

Aplique porções da máscara prateada auto-aderente ao lado posterior liso da lente. Consulte a Figura 8 para ver o exemplo da mascara para criação de um corredor para animais. Para substituir a lente, comece por deslizar um dos lados da lente para dentro das pinças do módulo pan e tilt. Depois de um dos lados estar fixo, faça o mesmo relativamente ao outro lado, assegurando que a lente se encontra correctamente orientada, com o lado liso virado para dentro e as duas filas de círculos viradas para baixo.

Substitua sempre a lente da forma correcta para assegurar uma cobertura exacta do padrão de feixes, conforme mostrado na Figura 8.

A Tabela 2 abaixo, resume as configurações típicas de alinhamento e de mascaramento.

Tabela 2: Alinhamento do beam & configuração da mascara

Configuração	Altura (m)	Inclinação (°)	Alcance máx. (m)
Multi-feixe, optimizado	3	5	15
Imunidade pet [1]	1,5	−2	15

[1] A área a preto deve ser mascarada para aplicações "pet alley" até 15 metros.

A Figura 9 mostra o padrão para um alcance máximo na posição optimizada.

LEDs

Os LEDs são mostrados na Figura 10.

Figura 10

Item	Cor	Descrição
1	Laranja	Microondas activo
2	Vermelho	PIR activo
1+2	Vermelho + Laranja	Alarme de detecção

Opções seleccionáveis

A Figura 11 mostra a posição dos interruptores DIL (1).

Contador Pulsos

A contagem de pulsos é o número de vezes que o detector tem de detectar uma presença antes de assinalar um alarme.

Interruptor 2 OFF (desligado) = Contagem de pulsos 2

Interruptor 2 ON (ligado) = Contagem de pulsos 1 (a mais sensível)

LEDs de detecção

Interruptor 2 ON (ligado) = Ambos os LEDs activados

Interruptor 2 OFF (desligado) = Ambos os LEDs desactivados

Walk test e tempo de estabilização

Ao fornecer energia ao sistema electrónico, permita um tempo de estabilização de 3 minutos antes de iniciar o walk test.

Para activar os LEDs para executar um walk test, o interruptor 1 deve ser colocado na posição ON (ligado). Os LEDs de detecção acendem-se individualmente de cada vez que o sensor PIR ou de microondas é activado, e acendem-se ambos quando o circuito PIR e o circuito de microondas estão activos, confirmando-se assim uma detecção de alarme.

Após o walk test, coloque o interruptor 1 na posição OFF (desligado) caso não seja necessária a indicação do LED.

Nota: ao executar um walk test, certifique-se de que a tampa frontal está colocada. Não execute walk tests com a tampa removida.

O alcance do detector aumenta sem a tampa frontal de protecção. Deste modo, a tampa frontal tem de estar instalada para se poder estabelecer o padrão correcto de feixes. Execute movimentos de rotação panorâmica e inclinação (pan e tilt) com o módulo da lente sobre o campo de visão, para obter a área de cobertura correcta.

Especificações

Cobertura	Ângulo de detecção de 14° a 70°, cobertura máx. 15 m x 13 m
Ajuste	90° pan, 45° tilt
Lente Fresnel	20 zonas para cada elemento de detecção, que podem ser mascaradas com os deslizadores tipo cortina
Óptica personalizada	Elemento quádruplo com dupla blindagem de silicone que elimina 50000 Lux de luz branca
LEDs	Laranja: Activado por microondas Vermelho: Activado por PIR Laranja + vermelho: Alarme de detector
Frequência de operação	24 GHz
Banda de frequência do radar	8 500 MHz–10 600 MHz
Potência máxima de saída	27 dBm E.I.R.P.
Saídas	Estado sólido silencioso, imunidade magnética
NC	Relé sem tensão, contacto de sinal 24 VCA/CC a 50 mA com uma resistência série 25 Ω total. Tempo de alarme: 5 segundos
Entrada de alimentação	9 a 15 VCC
Corrente	8 mA (12 V nominal)
Contador pulsos	1 ou 2
Compensação de temperatura	Ajuste de sensibilidade analógico (termistor) e digital
Controlo	Microprocessador digital com memória não volátil
Walk test	Modo de teste de saída com indicação LED. Opção de desactivação dos LEDs
Temperatura de funcionamento	−30° a +65°C
Caixa	Plástico ABS com alta resistência ao impacto com tampa HDPE, estabilizado contra raios UV
Dimensões (L x A x P)	70 mm x 120 mm x 95 mm
Peso	Peso líquido 225 g, peso bruto 325 g
Altura da instalação	Variável até 6 m. Altura optimizada 3 m para alcance total

Informação reguladora

Fabricante	COLOCADO NO MERCADO POR: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA REPRESENTANTE EU AUTORIZADO: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Netherlands

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EN	Este produto cumpre os requisitos de testes CEM (compatibilidade electromagnética) em conformidade com as normas seguintes: EN 50130-4:2011 EN 61000-6-3:2007 ETSI EN 300 440-1:2009 ETSI EN 301 489-1:2001 Este produto cumpre os requisitos ambientais da norma EN 50130-5.
Segurança eléctrica	Este produto cumpre os requisitos da directiva de baixa tensão (LVD): 2006/95/CE Normas harmonizadas: EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Classificação ambiental	IP65
Directivas da União Europeia	A Carrier Fire & Security declara que este dispositivo se encontra em conformidade com os requisitos e disposições aplicáveis, e com todas as regras e regulamentos aplicáveis, incluindo, entre outros, a Diretiva 2014/53/EU. Para mais informações consulte firesecurityproducts.com
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Informação de contacto

firesecurityproducts.com ou www.aritech.com

SV: Installationsblad

Förpackning

Förpackningen innehåller:

- 1 st Mini Dual Tech
- 1 st borrmall för fästhål
- 2 x 3,5 mm x 25 mm väggpluggar
- 2 x 3,5 mm x 25 mm skruvar
- 1 st linsmask
- 1 st öppningsverktyg
- 2 st ytterligare ridågaller
- 1 st installationsblad
- 1 st plugg på 6-vägs anslutningsplint

Beskrivning

Mini utomhus-Dual-Tech-detektorn är en utomhusrörelsedetektor och larmgivare som använder en quad pyro (två oberoende passiva infraröda sensorkretsar) kombinerat med en lågeffekts mikrovågssensormodul.

Alla tre sensorerna måste utlösas för att detektorn ska larma för att säkerställa exakt och tillförlitlig detektering.

Montera enheten

Skydda elektroniken mot vatten under installationen, eftersom fukt kan påverka eller skada enheten.

OBS: Se till att detektorn synfält är ostört när detektorn ställs in.

Montering av detektorn:

1. Borra hålen för de två fästskruvarna och kabelöppningen med hjälp av den medföljande borrmallen.. Lämna minst 10 cm fritt utrymme ovanför överdelen av detektorn för att möjliggöra att höljet och detektorn placeras korrekt.

   OBS: Den rekommenderade optimala monteringshöjden för detektorn är 3 m. Det går att montera detektorn högre, men det ger en reducerad detekteringsräckvidd och kräver att objektet rör sig ännu längre genom det redan reducerade detekteringsområdet innan ett larm utlöser.

2. Ta bort bakre väggen med fästplattan. Skruva fast bakplåten i väggen. Säkerställ alltid att en av fästskruvarna används för att säkra den bakre sabotageplåten i väggen (Figur 1, objekt 1) såväl som att de andra skruvfästpunkterna används (Figur 1, objekt 2). I händelse av en bakre kabelöppning, använd kabeluttaget (Figur 1, objekt 3). Passa in detektorns huvuddel på bakplåten.

3. Ta bort höljet genom att lossa låsskruvarna. Använd öppningsverktyget som visas i Figur 2 för att varsamt avlägsna framstycket från fästplattan. Höljet hängs från ovansidan och lyfts ut ur placeringsfickan (Figur 3).

4. Ta bort de 4 säkringsskruvarna och öppna striftblockshöljet. Använd en vass kniv för att öppna gummitätningen för att möjliggöra att kabeln infogas i enheten (Figur 4). Mata standard sex/åtta-ledarlarmkabel genom väggen och direkt ini kabelöppningen. Frilägg ledningarna och anslut den flyttbara anslutningsplinten, som återfinns i kitpåsen (Figur 5). Skjut anslutningsplinten på plats på stiftkontakten och se till att det sitter åt ordentligt. Återställ kabelöppningshöljet och säkra det med de 3 fästskruvarna.

   Varning: Se till att kabeln är placerad inom kabelskenan.

5. När detektorn är inriktad och ansluten:

   a. Placera höljet på detektorns huvuddel.
   b. Dra åt låsskruven.

Ansluta enheten

Tabell 1: Anslutning

Plint	Etikett	Beskrivning
1,2	− + 12 V DC	12 VDC-strömkälla
3, 4	A A	Larmrelä, normalt stängt
5, 6	T T	Sabotagerelä, normalt stängt

Figur 6 visar anslutningarna.

Multistråle - inriktning och maskering

Multifunktionslinsen som är monterad på Mini-detektorn producerar fem strålar med lång räckvidd och fem ridå-PIRstrålar med mellanlång till kort räckvidd. PIR-kretsen detektera värme- och rörelseändringar i strålmönstret; därför ska objekt såsom träd, buskar, dammar, värmerör och djur beaktas när detektorn placeras. Mikrovågsmodulen detekterar faktiska rörelser mot eller från detektorn och är programmerad att ignorera objekt som rör sig utanför räckvidden.

Detektormodulen är försedd med två skjutbara galler för att minska endast PIR-sensorns detekteringsvinkel. Ridåerna monteras på pan/tilt-modulen såsom visas i Figur 7. Varje sektion av detektorlinsen ger ett täckningsmönster på cirka 14 grader. När täckningen överskrider det önskade detekteringsområdet, justeras modulen i enlighet med vad som krävs och vissa strålar maskeras, vertikalt eller horisontellt, för att undvika oönskad detektering.

Använd delar av den självhäftande silvermasken för applicering på den bakre, släta sidan av linsen. För exempel på husdjursimmunitet se Figur 8. För att byta linsen, börja med att skjuta in en av sidorna i klipsen på pan/tilt-modulen. Efter att en sida är säkrad, gör samma sak på motsatt sida och säkerställ att linsen är korrekt placerad med den släta sidan vänd inåt och de två raderna med cirklarna riktad nedåt.

Byt alltid linsen på korrekt sätt för att säkerställa exakt mönstertäckning såsom visas i Figur 8.

Tabell 2 nedan visar vanliga maskerings konfigureringar.

Tabell 2: Strålar och maskeringskonfigurering

Konfiguration	Höjd (m)	Lutning (°)	Max. räckvidd (m)
Multibåge, optimal	3	5	15
Husdjurskydd [1]	1,5	−2	15

[1] Svart område ska maskeras för husdjursimmunitet upp till 15 meter.

Figur 9 visar mönstret för den maximala räckvidden för den optimala placeringen.

LED:er

Led:er visas i Figur 10.

Figur 10

Objekt	Färg	Beskrivning
1	Orange	Mikrovåg aktiv
2	Röd	PIR aktiverad
1+2	Röd + Orange	Detektionslarm

Valbara alternativ

Figur 11 visar inställningar för dip-switch (1).

Pulsräkning

Pulsräkningen är antalet gånger som detektorn måste detektera en närvaro innan den signalerar ett larm.

Brytare 2 AV = Pulsräkning 2

Brytare 2 PÅ = Pulsräkning 1 (mest känslig)

Detekterings-LED

Brytare 1 PÅ = Båda LED.er aktiverade

Brytare 1 AV = Båda LED.er inaktiverade

Gångtest & programmerbar tid

Ge elektroniken 3 minuter att ställa in sig när strömmen appliceras innan gångtestet utförs.

Slå brytare 1 till PÅ för att aktivera LED:erna för att utföra gångtestet. Detekterings-LED:erna kommer att tändas var för sig varje gång PIR- eller mikrovågssensorn aktiveras och båda kommer att tändas när både PIR- och mikrovågskretsarna är aktiva; därigenom bekräftas en larmdetektering.

Efter att gångtestet har slutförts, slå AV brytare 1 om LEDindikering inte krävs.

OBS: Se till att främre höljet är på plats när du utför gångtestet. Utför inte gångtestet med höljet borttaget.

Detektorns räckvidd ökar utan höljet.. Därför måste främre höljet vara monterat för att fastställa korrekt detektering. Panorera och luta modulen över synfältet för att erhålla korrekt täckningsområde.

Specifikationer

Täckning	14° till 70° detekteringsvinkel. 15 m x 13 m maximal täckning
Justering	90° pan., 45° lutn.
Fresnel-lins	20 sektioner för varje detektionselement, som kan maskeras med ridån
Anpassad optik	Dubbla silikontäckta quadelement eliminerar 50 000 lux vitt ljus
LED:er	Orange: Mikrovåg aktiverad Röd: PIR aktiverad Orange + Röd: Detektorlarm
Driftfrekvens	24 GHz
Radar frekvensband	8 500 MHz–10 600 MHz
Maximal effekt	27 dBm E.I.R.P.
Utgångar	Tyst, solid, skyddad mot magnetism
NC	Potentialfritt relä, signalkontakt 24 VAC/DC vid 50 mA med en integralresistor i 25-Ω -serien. Larmtid 5 sekunder
Ingångsspänning	9 V till 15 V likström
Ström	8 mA (12 V nominell)
Pulsräkning	1 eller 2
Temperatur-kompensering	Analog (termistor) och digital sensitivitetsjustering
Kontroll	Digital mikroprocessor med beständigt minne

Gångtest	Gångtest Utgånstestläge med LEDindikering Tillval att inaktivera LED:ar
Drifttemperatur	−30° till +65°C
Kapsling	Slagtålig ABS-plast med HDPE-hölje, UV-stabiliserad
Mått B x H x D	70 mm x 120 mm x 95 mm
Vikt	225 g netto, 325 g brutto
Monteringshöjd	Variabel upp till 6 m Optimal höjd 3 m för full räckvidd

Information om regler och föreskrifter

Tillverkare	SLÄPPT PÅ MARKNADEN AV: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA AUKTORISERAD EU-REPRESENTANT: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Netherlands/Holland
Produktvarningar och friskrivningar	DESSA PRODUKTER ÄR AVSEDDA FÖR FÖRSÄLJNING TILL OCH INSTALLATION AV BEHÖRIG PERSONAL. CARRIER FIRE & SECURITY KAN INTE GARANTERA ATT EN PERSON ELLER JURIDISK PERSON SOM KÖPER DESS PRODUKTER, INKLUSIVE ”KVALIFICERAD FÖRSÄLJARE" ELLER "ÅTERFÖRSÄLJARE”, ÄR ORDENTLIGT UTBILDAD ELLER HAR ERFARENHET AV ATT INSTALLERA BRAND- OCH SÄKERHETSRELATERADE PRODUKTER. För mer information om garantifriskrivningar och produktsäkerhet, se https://firesecurityproducts.com/policy/product-warning/ eller skanna QR-koden.
Certifiering	CE
EN	Denna produkt uppfyller kraven på EMC-testning till följande standarder: EN 50130-4:2011 EN 61000-6-3:2007 ETSI EN 300 440-1:2009 ETSI EN 301 489-1:2001 Denna produkt uppfyller miljökraven i EN 50130-5.
Elektrisk säkerhet	Denna produkt uppfyller kraven i lågspänningsdirektivet (LVD): 2006/95/EC Harmoniserade standarder: EN 60950-1:2006+A12:2011 EN 60950-22:2006+A11:2008
Miljöklass	IP65
EU-direktiv	Carrier Fire & Security deklarerar härmed att denna enhet överensstämmer med gällande krav och bestämmelser i alla tillämpliga regler och föreskrifter, inklusive men inte begränsat till direktivet 2014/53/EU. För mer information: firesecurityproducts.com
	2012/19/EU (WEEE): Produkter märkta med denna symbol får inte kastas i allmänna sophanteringssytem inom den europeiska unionen. För korrekt återvinning av utrustningen skall den returneras din lokala återförsäljare vid köp av liknande ny utrustning eller lämnas till en därför avsedd deponering. För mer information, se: www.recyclethis.info

Kontaktuppgifter

firesecurityproducts.com eller www.aritech.com

Tron AIS-SART

AIS Transmitter

User Manual



JOTRON
Performance for Life

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Abbreviatons	
AIS	Automatic Identification System
ECDIS	Electronic Chart Display and Information System
ECS	Electronic Chart System
EIRP	Effective Isotropic Radiated Power
GHz	Gigahertz
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
ITU	International Telecommunication Union
LED	Light Emitting Diode
MED	EU Marine Equipment Directive
MHz	Megahertz
SART	Search and Rescue Transponder
SOLAS	Safety of Life at Sea (An international maritime safety treaty)
VHF	Very High Frequency

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3 General

Jotron manufactures safety products designed for the search and rescue of human lives and property. For this product to be effective according to the design parameters, it is imperative that it is handled, maintained, serviced and stowed in accordance with this manual.

All information contained within this manual has been verified and is to Jotron's knowledge correct. Jotron reserves the right to make changes to any product(s) or module(s) described herein to improve design, function or reliability, without further notice.



Jotron is not liable and cannot be held responsible for any injury or damages caused directly or indirectly by an error or omission of information, incorrect or misuse, breach of procedures or failure of any specific component or part of this product.

Jotron documentation can be downloaded from jotron.com.

4 Standards

Jotron declares that this this product is compliant in accordance with IMO, SOLAS and GMDSS regulations.

A copy of the declaration of conformity can be downloaded from jotron.com.

The Tron AIS-SART has been verified, tested, and meets the following product standards:

MED 96/98/EC as amended, 2011/75/EU (Annex 1/4.55)	Equipment authorization of products for the maritime industry.
IEC 61097-14:2010	GMDSS - part 14: AIS-SART - Operational and performance requirements, methods og testing and required test results.
IEC 60945:2002	Maritime navigations and radiocommunication equipment and systems - General requirements - Methods of testing and required test results.
IEC 60945 Corr.1:2008	Corrigendum 1 - Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results.
IEC 61108-1 Ed.2.0, 2003	Maritime navigation and radiocommunication equipment and systems - Global navigation satellite systems (GNSS) - Part 1: Global positioning system (GPS) - Receiver equipment - Performance standards, methods of testing and required test results.
IMO Resolution MSC.246 (83)	Performance standards for survival craft AIS-SART for use in search and rescue operations.

IMO Resolution MSC.247(83)	Performance standards for survival craft radar transponders for use in search and rescue operations.
IMO Resolution MSC.256(84)	International convention for the safety of life at sea. Includes: construction (structure and electronics), construction (fire protections, detections, and extinction), Life-saving appliances and arrangements and radiocommunications.
ITU-R M.1371-4 (2010)	Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band.
SOLAS (74 amended) Chapter IV/7.1.3	Radiocommunications.
SOLAS (74 amended) Chapter III Regulation 6.2.2	Communications - Search and rescue locating devices
SOLAS (74 amended) Chapter III Regulation 26. Additional requirements	This regulation applies to ro-ro passenger ships.
SOLAS (74 amended) Chapter IV, Regulation 7.1.3	Required radio communication equipment on mobile offshore units.

5 Product description

Tron AIS-SART is a battery powered AIS emergency transmitter in a sealed waterproof enclosure, which is watertight to a minimum depth of 1 meter. It is water, oil and sunlight resistant.

An AIS search and rescue transmitter is a location device. The purpose of the Tron AIS-SART is to assist a seafarer in distress during a search and rescue operation.

The Tron AIS-SART is designed for easy operation, it is buoyant and can withstand a drop of 20 meters into water. The detection range of the Tron AIS-SART is 7-10nm to a vessel AIS Class-A and more than 40 nautical miles from an airborne AIS receiver.

The Tron AIS-SART includes a built-in GPS, which aids in pinpointing the exact location of a seafarer that has evacuated to a lifeboat/liferaft. The signal from the Tron AIS-SART consists of a GPS position which is transmitted on VHF and received by an AIS receiver located on a search and rescue ship or helicopter.

The Tron AIS-SART includes the following components:

- Tron AIS-SART unit
- Mounting rope for lifeboats/liferafts
- Wall bracket



Figure 1 Tron AIS-SART

6 Functional description

Tron AIS-SART consists of a housing sealed at the lower end with a bottom lid. It may be split into the following main parts:

- Transmitter module
- Battery module
- Bottom lid
- LED indicator

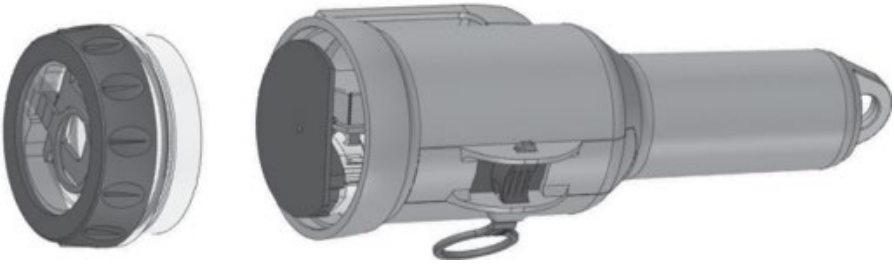


Figure 2 Illustration: Tron AIS-SART disassembled

6.1 Transmitter module

Tron AIS-SART transmitter module is inserted into the Tron AIS-SART housing. It consists of the main board, antenna and two screen boxes which is mounted in the housing. It can be divided into the following sections:

1. Transmitter module
2. Antenna
3. Screen boxes
4. Base of antenna

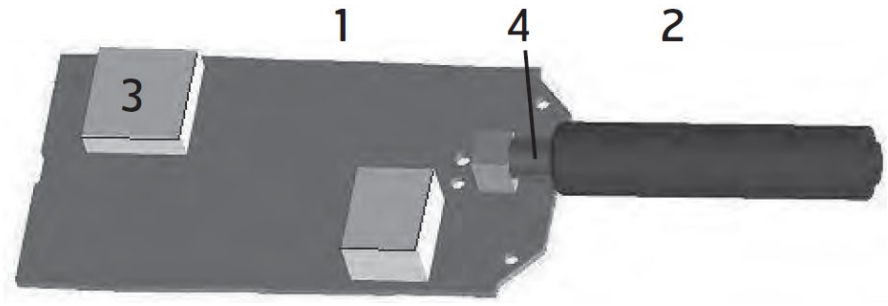


Figure 3 Illustration: Transmitter module

6.2 Battery module

The battery module consists of two C-size lithium batteries, a battery house and connector and cables. A battery expiry label on the Tron AIS-SART housing displays the expiry date. A new battery comes complete with cable and connector.

The battery module is inserted into the Tron AIS-SART housing. The battery label on the housing displays the battery expiry date.



Figure 4 Image: Tron AIS-SART battery label

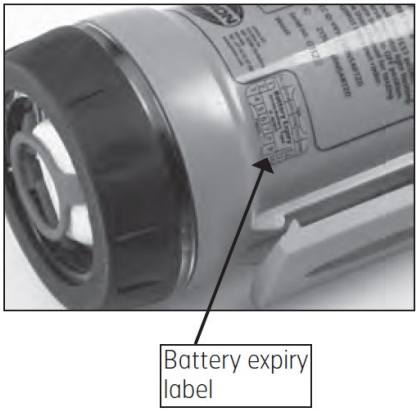


Figure 5 Illustration: Battery label on housing

IMPORTANT

The battery module is to be replaced every 5 years.

CAUTION

Only original Jotron batteries can be used with this product.

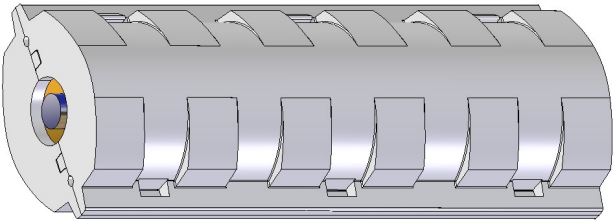


Figure 6 Illustration: Battery module (no cable or connector)

6.3 Bottom lid

The bottom lid includes four items:

1. Lanyard

2. Screen ring
3. Light tower
4. O-ring

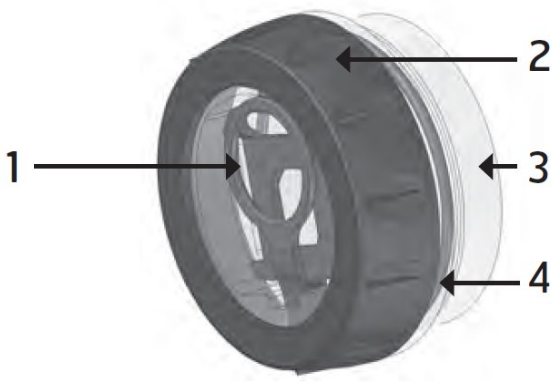


Figure 7 Illustration: Bottom lid

6.4 LED indicators

Tron AIS-SART is equipped with two coloured LED indicator lights, one green and one red. The LED indicators provide a visual status of the operation (active) and faults (errors). In addition, a built-in buzzer beeps regularly when in operation.

Description	Indicator	Buzzer
GPS position fix OK	Green LED ON (15 sec)	15 sec beep
Searching for GPS fix	Red and Green LED flashes	Regulary beep
No GPS fix, count number of flashes	Red LED ON (15 sec)	15 sec beep

Table 1 LED indicator functions

7 Installation

Tron AIS-SART can be mounted several ways near the emergency exit of the vessel. Normally, in the wheelhouse at the starboard or port exit (or both depending on the requirements) and inside a liferaft or lifeboat.

If the Tron AIS-SART is used in an emergency, it should be mounted vertically as high as possible to increase line of sight to the search and rescue units. Since the Tron AIS-SART has an integrated GPS receiver, it needs clear view to the sky to obtain GPS position.



Avoid having metal objects close to the unit, these will limit performance in the directions they are located.

7.1 Brackets

There are two different mounting brackets available.

- Wall bracket
- Lifeboat bracket (with or without a pipe clamp)

7.1.1 Mounting the wall bracket

A wall bracket is delivered with the Tron AIS-SART and should be used for storage of the unit.



The bracket should be mounted in a vertical position and placed where the Tron AIS-SART is easily available in the case of an emergency.

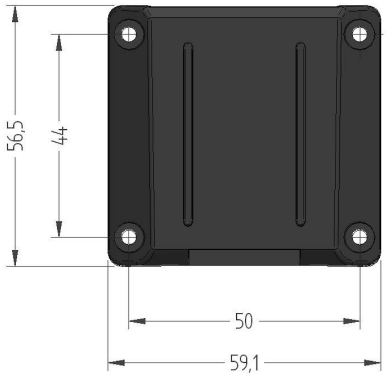


Figure 8 Illustration: Wall bracket dimensions

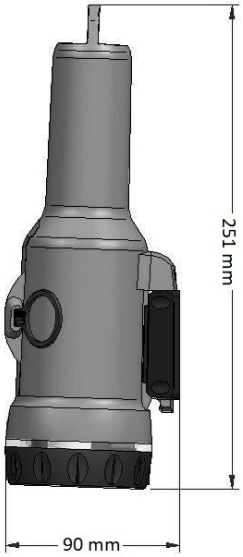


Figure 9 Illustration: Tron AIS-SART mounted in wall bracket

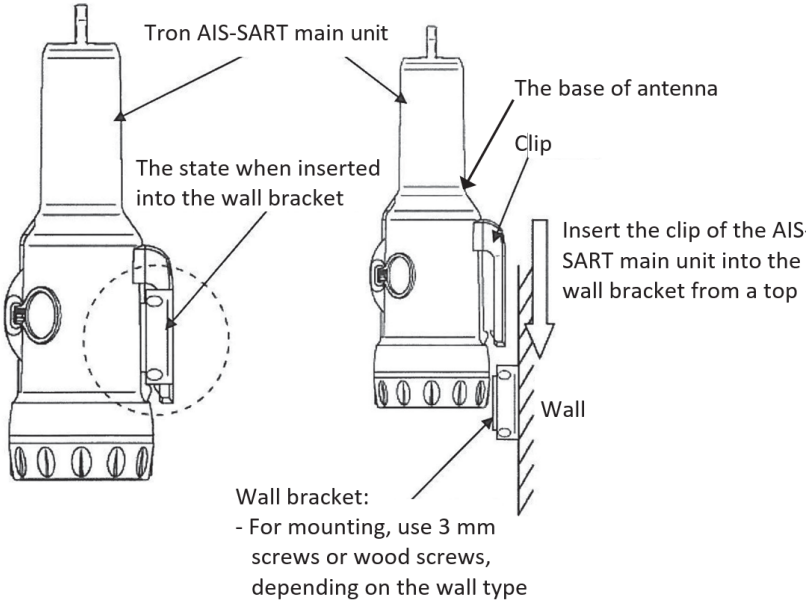


Figure 10 Illustration: Placement of AIS-SART in a wall mount

7.1.2 Mounting a lifeboat bracket

The lifeboat bracket should be mounted vertically and as high as possible on the roof of the lifeboat. This bracket can be mounted either on a wall or a pipe.

IMPORTANT	The Tron AIS-SART must not be permanently stored in this bracket if mounted outside a freefall lifeboat. Move the Tron AIS-SART to this bracket after the lifeboat is deployed in water.

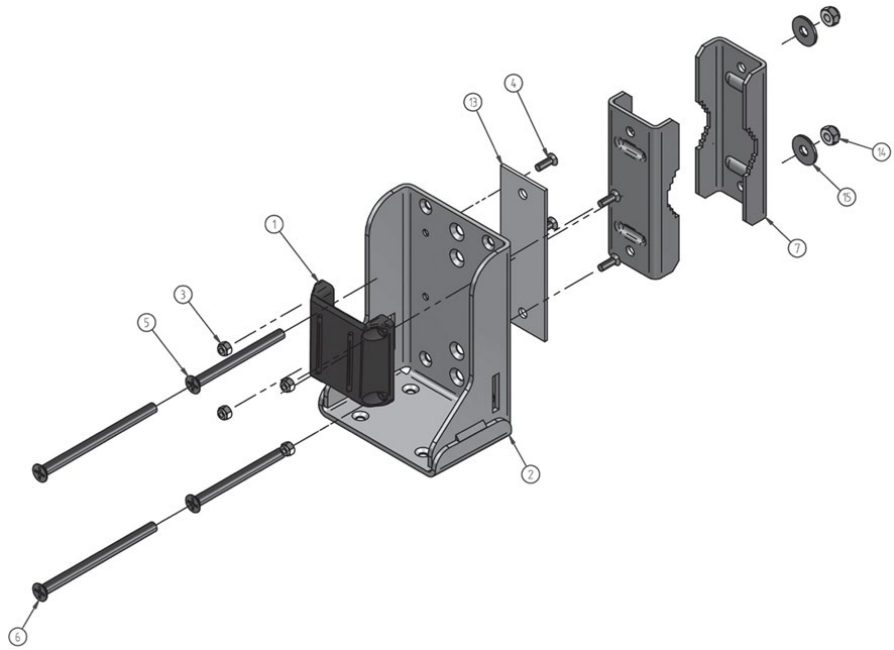


Figure 11 Illustration: Lifeboat bracket disassembled

Item no.	Document No.	Title
1	M-82746	Wall bracket
2	M-84163_VELDAMENT	M-84163_Bracket_Universal_Weldament D1
3	M-80312	Nut nylock M4 DIN 985
4	M-84676	Screw, DIN 965 – Pozidrive M4x12
5	M-84854	Screw, DIN 965 – Pozidrive M6x70
6	M-84855	Screw, DIN 965 – Pozidrive M6x90
7	M-84838	Pipe clamp
13	M-84875	Washer plate
14	M-91469	Nu nylock M6 DIN 985
15	M-82275	Washer, DIN 9021 – Ø6mm

Table 2 List of components - lifeboat bracket

Use the following dimensions when mounting the lifeboat bracket on a wall.

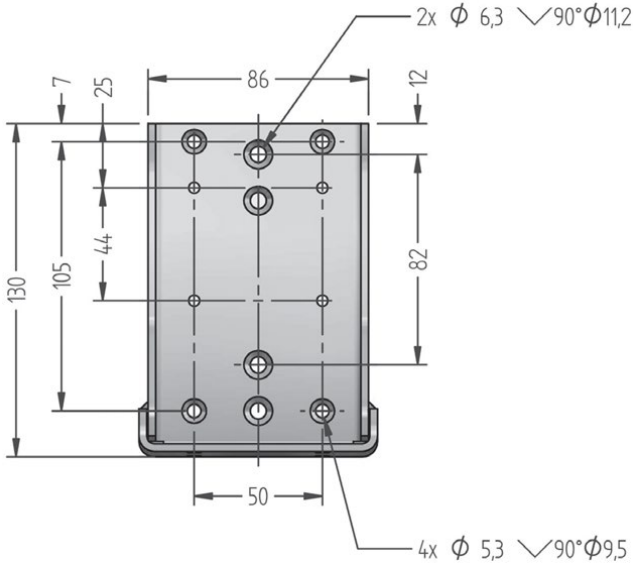


Figure 12 Illustration: Lifeboat bracket dimensions

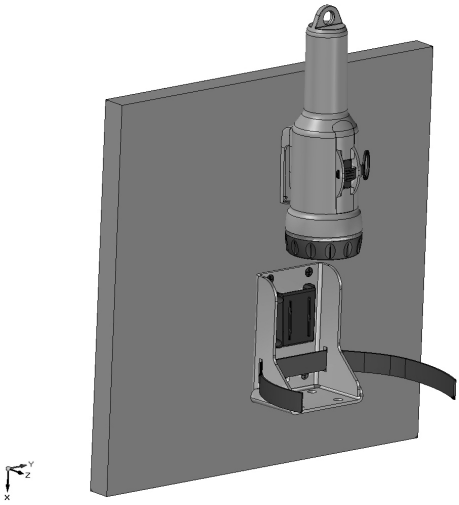


Figure 13 Illustration: Mounting - interior/exterior wall

The lifeboat bracket fits a pipe with a maximum diameter of 50mm.

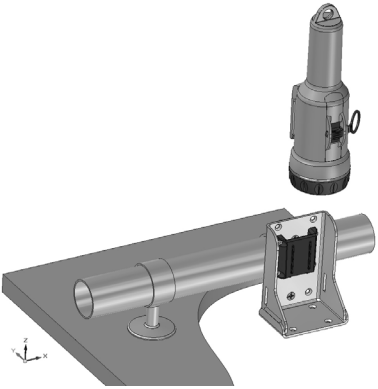


Figure 14 Illustration: Mounting on a pipe

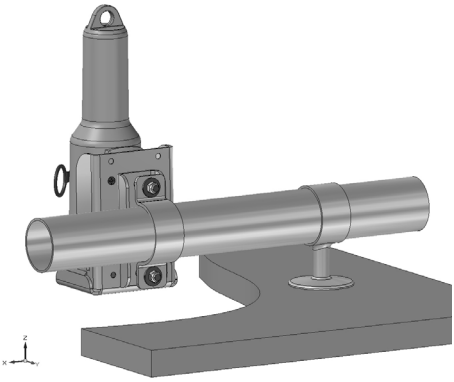


Figure 15 Illustration: Mounted ready on a pipe



Figure 16 Illustration: Placing the Tron AIS-SART into the lifeboat bracket

7.2 Non bracket mounting options

A Tron AIS-SART can be mounted on a lifeboat/liferaft without a bracket in several ways, choose one of the following:

- Lanyard
- Liferaft mounting strap
- Telescopic pole

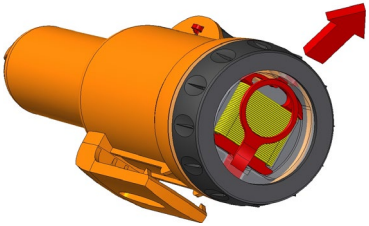
7.2.1 Mounting the lanyard

The lanyard can be used to hang the Tron AIS-SART inside a liferaft. Any objects that the lanyard can be attached to can be used. The lanyard is 10 meters in length.

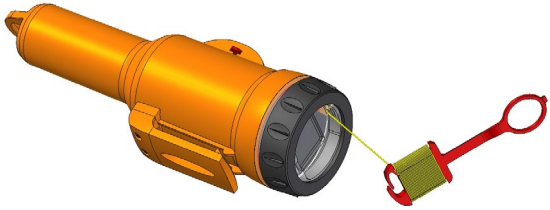
CAUTION	Keep the Tron AIS-SART away from any metal objects.

To use the lanyard, do the following:

1. Remove the lanyard.



2. Roll the lanyard out.



3. Thread the lanyard through the fastening ring on the top of the Tron AIS-SART.
4. Fasten the lanyard to the canopy.

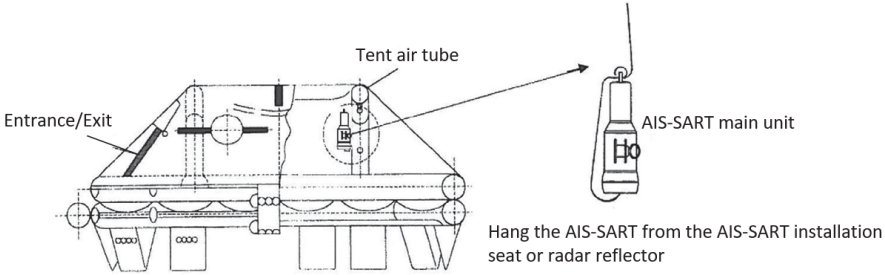


Figure 17 Illustration: using the lanyard on a lifeboat

7.2.2 Mounting the Liferaft mounting strap

The Liferaft mounting strap can also be used to attach the Tron AIS-SART to an inflatable canopy.

To use the Liferaft mounting strap, do the following:

1. Attach the strap to the fastening ring on the top of the Tron AIS-SART.
2. Fasten the other end of the strap to the canopy.



Figure 18 Image: Tron AIS-SART with Liferaft mounting strap attached

7.2.3 Mounting the telescopic pole

A telescopic pole can be used to extend the height of the Tron AIS-SART inside or outside the lifeboat/liferaft.

IMPORTANT

Ensure the rod is held as vertical as possible when activating the Tron AIS-SART.

To use the telescopic pole, do the following:

1. Attach the Tron AIS-SART to the pole.
2. Extend the pole to its full length and lock it in place.

NOTE

Make sure the pole is locked by pulling hard when it is fully extended. The pole can be fastened or held by a person.

3. Lift the Tron AIS-SART up through the tent air tube and secure it.

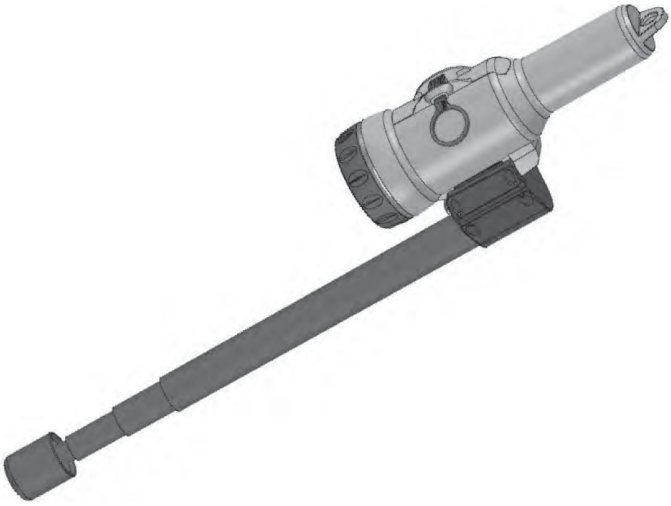


Figure 19 Illustration: Tron AIS-SART with telescopic pole attached

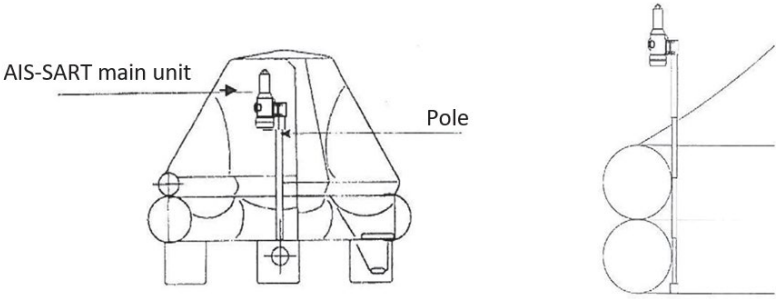


Figure 20 Illustration: using the telescopic pole on a lifeboat

7.3 Replacing the battery module

Below describes how to change the battery on the Tron AIS-SART.

7.3.1 Disassembly

To disassemble the battery module, do the following:

1. Twist the rubber grip anticlockwise to remove the lid. If difficult, remove the rubber holder over the lid and try again.

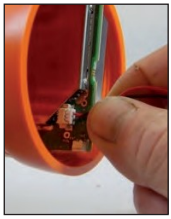




2. Once open set aside the rubber holder and lid (containing electronics), then look inside.




3. First, pull out the battery then pull out the cable from the connector.


4. Remove the two old 5gram silica gel bag.



7.3.2 Assembly

To assemble the battery module, do the following:

1. Install the new battery, verify the cable is within the guide.



2. Connect the cable to the electronics (black = left & red = right)



3. Add two new 5grams silica gel bags.



4. Mount the rubber holder.



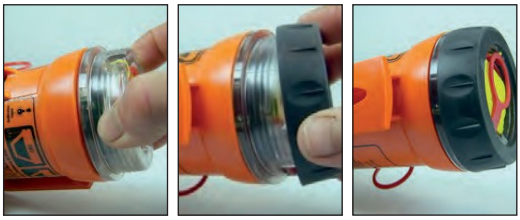
5. Remove old O-ring (using for example a plastic card). Use Vaseline (acid free) and fit a new O-ring in place.







6. Reinstall the lid (tighten by hand), then replace the rubber holder.



8 Operating instructions

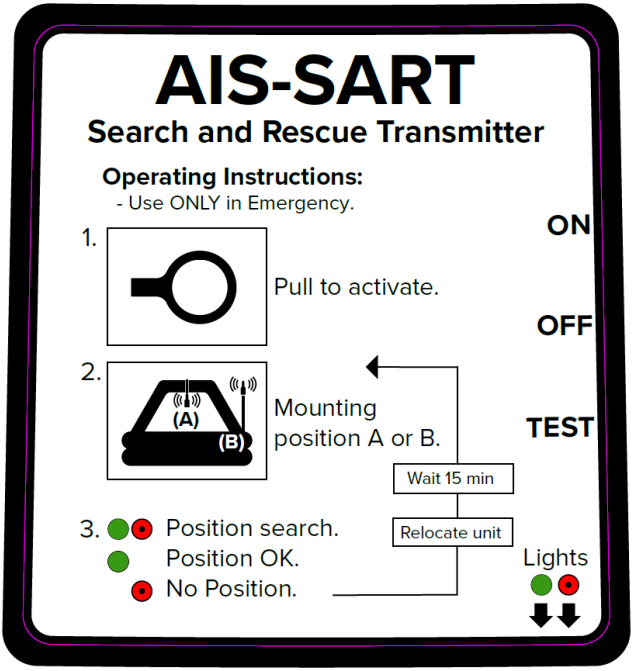


Figure 21 Image: Tron AIS-SART operating instructions label

The Tron AIS-SART should only be used in an emergency. The battery lasts for 96 hours from activation.

WARNING

Replace the battery if the unit is used for any purpose other than a test.

8.1 Activation

1. Pull the activation ring to activate.
2. Ensure the switch enters the ON position.

NOTE

The LED indicator starts to flash and the unit beep regularly.

3. Secure the Tron AIS-SART to the lifeboat/liferaft in a vertical position and as high as possible.
4. Both LEDs (green & red) will flash while the unit is searching to fix a GPS position (max. 15 mins).



Figure 22 Image: LEDs ON

5. You will hear a beep every time a transmission is made (every min).
6. When a successful GPS position has been fixed, the green LED flashes.



Figure 23 Image: Green LED

7. If no GPS position is fixed, it is indicated by a red LED flash. When this happens, reposition and restart the unit.



Figure 24 Image: Red LED

NOTE

When the green LED is flashing, the unit will update its GPS position every minute, transmitting the position to nearby ships and aircraft.

8.2 Deactivation

1. Move the switch to the OFF position.
2. Replace the activation ring.

8.3 Active reception on nearby vessels, AIS transponders and ECS/ECDIS or chat plotters

Some AIS transponders are not compliant with AIS-SART, but will still receive them as another ship, both with ID code, position, range, bearing and text message.

8.3.1 Reception - non AIS-SART compliant transponder

This type of AIS transponder will appear as a vessel without a name, but with MMSI (ID code), range, bearing and position. In addition, a text message stating SART ACTIVE will also be received.

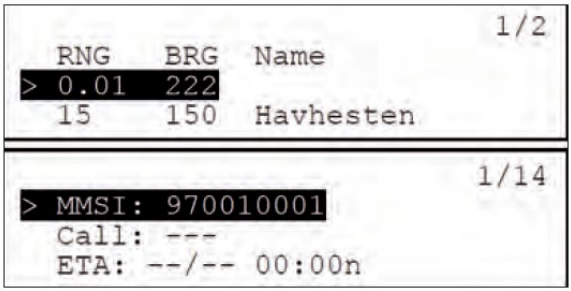


Figure 25 Image: Display - Non-compliant AIS transponder



Figure 26 Image: Text message display - Non-compliant AIS transponder

8.3.2 Reception - non AIS-SART compliant (ECS/ECDIS)

This will be shown as a ship. The same text message will be received stating: SART ACTIVE.

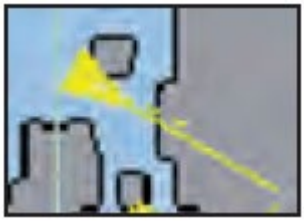


Figure 27 Image: Display - ECS/ECDIS

8.3.3 Reception - AIS-SART compliant transponder

By default, the target list is auto sorted in ascending order except the nearest active AIS SART or if supported, other target of interest shall be displayed at the top of the list.

The text SART ACTIVE appears as the vessel name showing range, bearing and position. In addition, a text message stating SART ACTIVE will also be received.

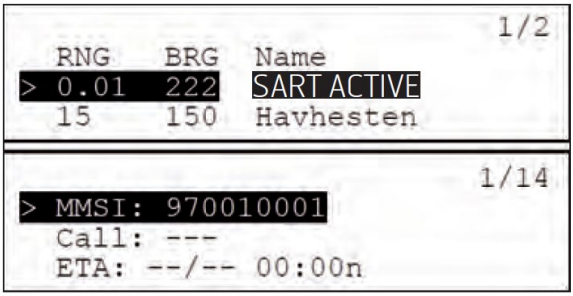


Figure 28 Image: Display - Compliant AIS transponder



Figure 29 Image: Text message display - Compliant AIS transponder

8.3.4 Reception - AIS-SART compliant (ECS/ECDIS)

Although the AIS transponder is not AIS-SART compliant, the electronic chart may show the correct symbol when receiving an AIS-SART in TEST or ACTIVE if it is updated to the latest revisions defined below:

A special symbol (RED) (ref. SN.1/Circ.243/add.1 and in the latest revision of IEC 62388)

An AIS search and rescue transponder is represented by a circle with an X. The diameter of the circle is 5mm. The symbol shall be drawn using a thick dashed line style (RED) The symbol will flash until acknowledged by the user. Once acknowledged, the symbol shall cease flashing.



Figure 30 Image: Display - Electronic chart - Red symbol and dashed line

A text message stating SART ACTIVE will also be received.

9 Maintenance

The Tron AIS-SART requires the following maintenance:

Timing	Requirements
Every month	Both the unit and the bracket should be inspected. The unit should be removed from the bracket and tested. Perform inspection and testing following the steps outlines in this manual.
Every 6 months	Both the unit and the bracket should be inspected. The unit should be removed from the bracket and tested. Perform inspection and testing following the steps outlines in this manual.
Every 5 years	Storage of a battery over a long period of time will reduce its capacity. To ensure long and reliable operation the battery unit must be replaced every 5 years. Battery replacement can be performed on board.

Table 3 Maintenance requirements

9.1 Testing

Although the Tron AIS-SART does not send an alarm via satellite, VHF or other radio communication, usage should be limited to short tests. This ensures the best battery capacity available for a potential emergency.

Do the following steps to test the Tron AIS-SART:

IMPORTANT

The test must be conducted outdoors with a clear view to the sky to maximize the GPS location.

1. Move the switch to the TEST position and hold.



NOTE

The Tron AIS-SART will now run through a self-test procedure. If a RED LED flashes, it indicates a critical fault. Refer to the error codes for more information.

2. Release the switch when both LEDs start flashing. The unit will now search for the GPS position. It will only search for 15 minutes max.



Figure 31 Image: LEDs ON

3. A successful test is indicated by a 15 sec BEEP and a GREEN LED.

NOTE

Refer to AIS transponder/Electronic chart for additional description information.



Figure 32 Image: Green LED

4. An unsuccessful test is indicated by a 15 sec BEEP and a RED LED. If this should happen, relocate the unit, and restart the test.



Figure 33 Image: Red LED

5. To cancel an ongoing test, hold the switch in the TEST position until the buzzer starts to beep.

9.2 Error codes (red flash during testing)

If the self-test detects a fault during testing, one or more of the following indications are shown:

Number of LED flashes	Error codes
2	Transmit power failure
3	Low battery
4	Transmit frequency error
5	User ID not programmmed
6	Undefined, contact Jotron
7	Internal communication error

Table 4 Tron AIS-SART error code descriptions – red flash during testing

NOTE

Test procedure instructions are also indicated on the product label.



Figure 34 Image: Tron AIS-SART - Test instruction label

9.3 Test reception on nearby vessels, AIS transponders and ECS/ECDIS or chat plotters

To conduct a complete test of a Tron AIS-SART, reception on the ships AIS transponder should also be checked. Some AIS transponders are not compliant with AIS-SART, but will still receive them as another ship, both with ID code, position, range, bearing and text message.

9.3.1 Reception on a non AIS-SART compliant AIS transponder

This type of AIS transponder will appear as a vessel without a name, but with MMSI (ID code), range, bearing and position. In addition, a text message will be received.

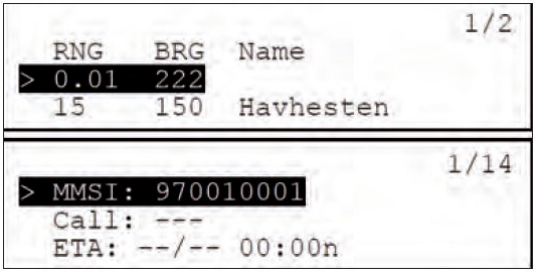


Figure 35 Image: Display - Non-compliant AIS transponder

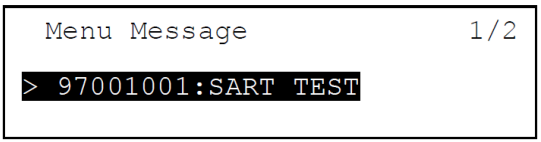


Figure 36 Image: Text message display - Non-compliant AIS transponder

9.3.2 Reception on a non AIS-SART compliant electronic chart (ECS/ECDIS)

This will be shown as a ship. The same text message will be received stating: SART ACTIVE.

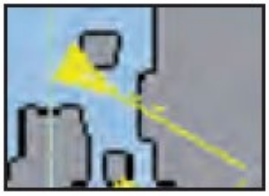


Figure 37 Image: Display - ECS/ECDIS

9.3.3 Reception on an AIS-SART compliant AIS transponder

The reception/visibility requirement on an AIS-SART compliant transponder is as follows:

There shall be a separate menu item in the AIS to activate reception of the AIS-SART in TEST.

Jotron TR-8000:


Advanced - VHF Link/Long range – Display SART in test mode
Furuno FA-150 implementation – USER SETTINGS – DISP SART TEST = ON

When this function is activated:

AIS-SART will be shown on top of the list with the vessel name SART TEST since this is an emergency product to show ships/people in distress (Normally, this list is sorted, but AIS-SART has higher priority than normal vessels).

AIS-SART will be show with ID code, range, bearing and position. In addition, a text message will be received.

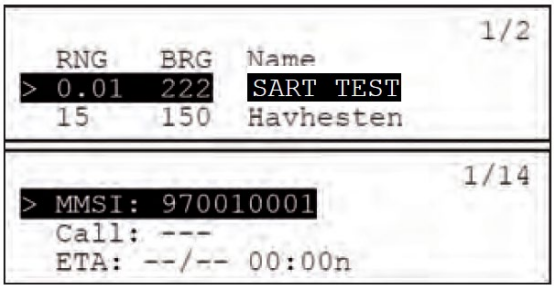


Figure 38 Image: Display - Compliant AIS transponder

9.3.4 Reception on an AIS-SART compliant electronic chart (ECS/ECDIS)

Although the AIS transponder is not AIS-SART compliant, the electronic chart may show the correct symbol when receiving an AIS-SART in TEST or ACTIVE if it is updated to the latest revisions defined below:

A special symbol (RED) (ref. SN.1/Circ.243/add.1 and in the latest revision of IEC 62388)
An AIS search and rescue transponder is represented by a circle with an X. The diameter of the circle is 5mm. The symbol shall be drawn using a thick dashed line style (RED) The symbol will flash until acknowledged by the user. Once acknowledged, the symbol shall cease flashing.



Figure 39 Image: Display - Electronic chart - Red symbol and dashed line

A text message stating SART TEST will also be received.

10 Test and maintenance records

Below is an overview of all test and control details.

Date	B/T*	Signature	Inspector name

*B=New battery, T=Test

11 Battery safety information

Manufacturer name:	Primary lithium metal
Volts:	3.6V/cell
Approximate weight:	51grams/cell
Chemical system:	Primary lithium-thionyl chloride
Designated for recharge:	No

For information regarding the physical and chemical properties, the potential health and safety measures and the environmental effects of the battery used with this product, refer to the manufacturer's safety information documentation.

The safety information is available for download at jotron.com - product. http://jotron.com/product/tron-ais-sart/.

11.1 Handling and storage

This product should be stored in a cool and well-ventilated area. Elevated temperatures can result in a reduction of battery life. Locations that handle large quantities of lithium batteries must ensure the batteries are isolated from combustibles. A short circuit for a few seconds will not seriously affect the battery. A prolonged short circuit will cause the battery to lose energy, generate significant heat and can cause the safety release vent to open. The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and/or explosion. Crushed or damaged batteries may result in a fire. A battery that is disassembled or exposed to water, fire or high temperatures can explode or leak causing burns.

11.1.1 Transportation

The product described in this manual is subject to follow special packing instructions and/or transportation regulations. Information regarding these regulations (in accordance with ICAO/IATA, IMDG code and/or ADR/RID) is included in the product safety information (PSI) and/or in the test summary report (TSR) (in accordance with UN test 38.3.5) and available for download at jotron.com - product. http://Jotron.com/product/tron-ais-sart/.

12 Technical specifications

12.1 Product specification

Battery type:	Primary lithium-thionyl chloride
Battery capacity:	7.2V/3.6Ah at -20°C
Battery service life:	5 years
Materials:	
Housing:	Glass reinforced polycarbonate
Light cover:	Polycarbonate
Impact ring:	Thermo plastic elastomer
Unit dimensions (H/W/D):	251mm x 89mm x 89mm
Weight:	450grams
Temperature operating:	-20°C to +55°C (-4°F to +131°F)
Temperature storage:	-30°C to +70°C (-22°F to +158°F)
Operating life:	96 hours continuous operation at -20°C.
Lanyard length:	10meters
Lanyard strength:	>25kg

12.2 Radio transmitter

Frequency:	161.975MHz and 162.025MHz
Radiated power (EIRP):	1W (30dBm ± 3dB)
Antenna pattern:	Vertical polarization

12.3 Brackets

12.3.1 Wall bracket

Materials:	ASA (acrylonitrile styrene acrylate)
Bracket (incl. unit) (H/W/D):	250mm x 89mm x 90mm
Weight:	20grams

12.3.2 Lifeboat bracket

Materials:	Anodized aluminum

Dimensions (H/W/D):	130mm x 86mm x 90mm
Weight:	560grams
Release mechanism:	Jotron HRU

13 Optional accessories

For an overview of the available optional accessories for this product, refer to jotron.com.

14 Spare parts

For an overview of the available spare parts for this product, refer to jotron.com.

14.1 Counterfeit spare parts

Ensure that all spare parts being fitted to this product are only original spare parts manufactured or approved by Jotron.

Any use counterfeit parts will invalidate the product type-approval certificate.

15 Recycling and disposal

This product should not be disposed as normal waste and must be handled in accordance with the applicable federal, state and local waste disposal regulations in the country where the equipment is used.

16 Warranty

All Jotron products are warranted against factory defects in materials and/or workmanship during the warranty period. Refer to the sales terms and conditions for specific warranty information regarding this product.

17 Service

All services such as testing, installation, programming, replacement, marking and battery exchange are provided by an authorized Jotron service agent.

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

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

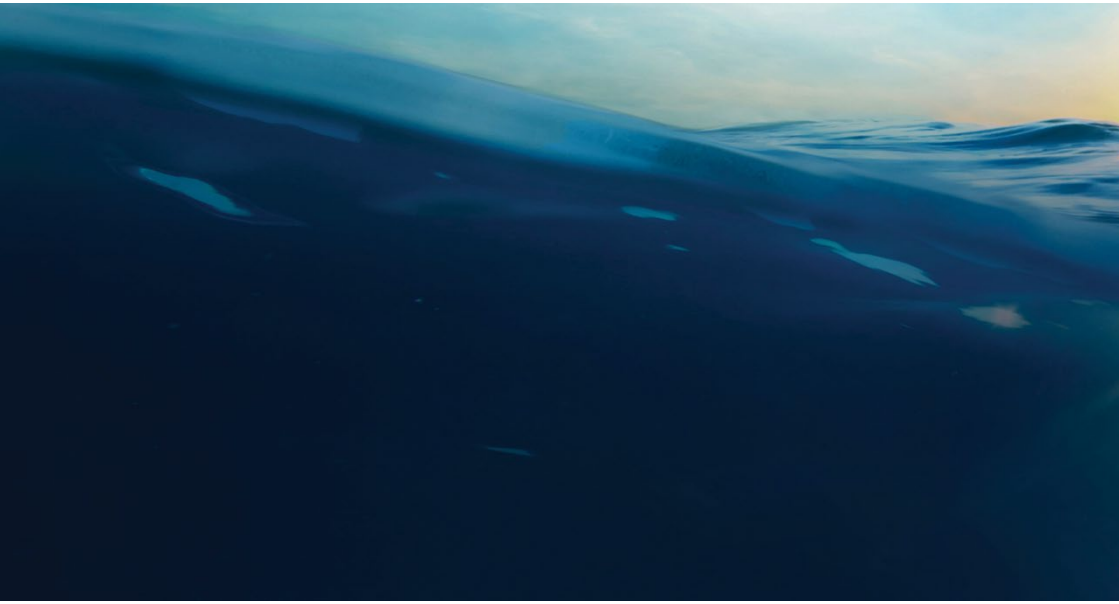
17.1 Service agents

Refer to jotron.com for an overview of Jotron partners and distributors.

https://jotron.com/partners-and-distributors/

18 Document revision log

Document revision log			
Rev	Date	Reason for Issue	Author
A	16.06.09	New product (28 pages)	ES
B	22.11.09	New information (page 2)	ES
C	08.12.09	Updated information (pages 22-27)	FIT
D	22.03.10	Updated information (30 pages)	FIT
E	21.04.10	Updated information (34 pages)	FIT
F	10.06.10	Updated information (page 28)	FIT
G	29.08.12	Updated information (36 pages)	FIT
H	21.12.21	Updated content, revised text structure and and new documentation design and layout in accordance with new company profile.	WB



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Tron 60AIS

EPIRB

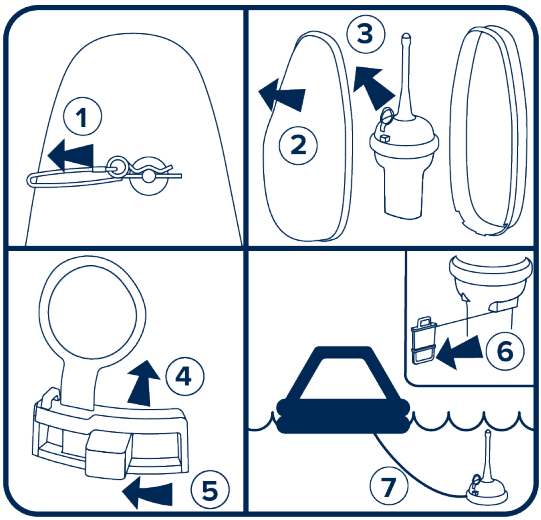
User manual



JOTRON
Performance for Life

1 Manual operation and activation

Use only in emergency!



It is not recommended to operate the EPIRB inside a life raft, or under a cover or canopy. Do NOT tie the lanyard to the ship in distress, as this will prevent the unit from functioning if the ship sinks.

1. Remove the locking pin from the front cover.
2. Remove the front cover.
3. Take the EPIRB out of the bracket.
4. Pull the red tab.
5. Push the switch to activate the EPIRB.
6. Unclip and release the lanyard.
7. Tie the lanyard to yourself or to the life raft.

The strobe light will start flashing indicating that the EPIRB is operating.

If possible, keep the EPIRB in an open area, away from any metal objects (ship construction etc.) that may limit the satellite coverage. Transmissions can be stopped by taking the EPIRB out of water and turning the switch to middle position.

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2 General

Jotron manufactures safety products designed for search and rescue of human lives and property. For this product to be effective according to the design parameters, it is imperative that it is handled, maintained, serviced and stowed in accordance with this manual.

All information contained within this manual has been verified and is to Jotron's knowledge correct. Jotron reserves the right to make changes to any product(s) or module(s) described herein to improve design, function or reliability without further notice.

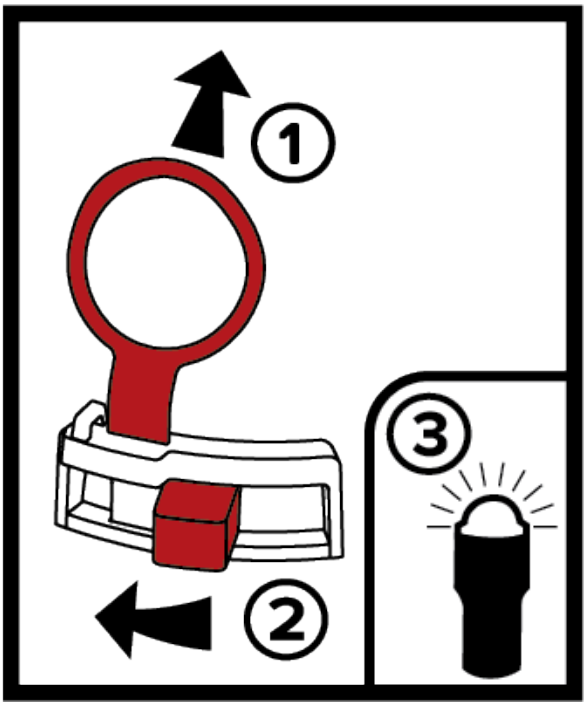


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Jotron documentation can be downloaded from jotron.com.

3 Operating instructions

3.1 Manual activation



To activate the EPIRB follow these steps:

1. Remove pull tab
2. Push switch
3. Ensure that switch moves to “ON” position and that the strobe light starts flashing.

WARNING

Use only in emergency!

3.2 Indicator descriptions

The following tables describes the status of the different indicator lights when the EPIRB is operating normally.

Indicator light descriptions		
Off	The LED is off	
On	The LED is on	
Triple flash	The LED flashes fast in sequences of 3 consecutive flashes	
Steady flash	The LED flashes periodically with a long flash	
Multiple short off periods	The LED is turned off for short periods, creating a blink effect. (Negative blink, occulting blink)	
Multiple flashes	The LED flashes multiple times	

3.2.1 Strobe light

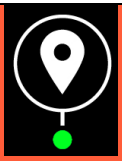
When the EPIRB is activated the strobe light will start flashing steadily with approximately 21 flashes per minute.

The first 406 MHz signal will be transmitted 60 seconds after activation. This is indicated with a triple flash.

After approximately 4.5 minutes the first AIS signal is transmitted. This is indicated with a double flash. At the same time the 121.5 MHz homing signal will start transmitting.

	 Strobe light
EPIRB active	Steady flashes
406 MHz signal transmitted	Triple flashes
AIS signal transmitted	Double flashes

3.2.2 Position indicator (GNSS)

	 Position indicator
Waiting for position	Triple flashes
Position achieved	Steady flashes

3.2.3 RLS indicator (if enabled)

Confirmation that the distress signal has been detected and received. See chapters 4.3 and 7.13 for more information.

	 RLS indicator
Waiting for RLS	Triple flashes
RLS acknowledged	Steady flashes
RLS disabled (EPIRB is not equipped with RLS protocol)	No light

3.2.4 Test indicator

The test indicator is not active during normal activation of the EPIRB.

3.3 Automatic activation

3.3.1 Float-free

If the ship is sinking, the EPIRB will be automatically released from the bracket when it has reached a depth of 2-4 meters (6-13 feet) and start transmitting when it has reached the surface.

The transmission will continue until the EPIRB is lifted out of the water and dried off.

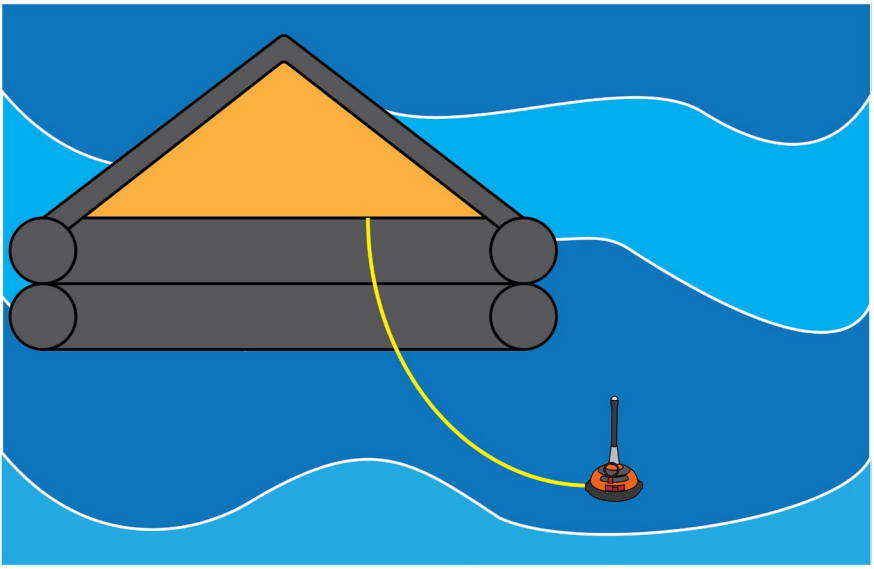
3.3.2 Water activation

The EPIRB is designed to automatically activate when deployed into water.

An internal safety function will prevent inadvertent activation caused by moisture, sea spray etc. when located in the bracket.

3.4 Operating scenarios

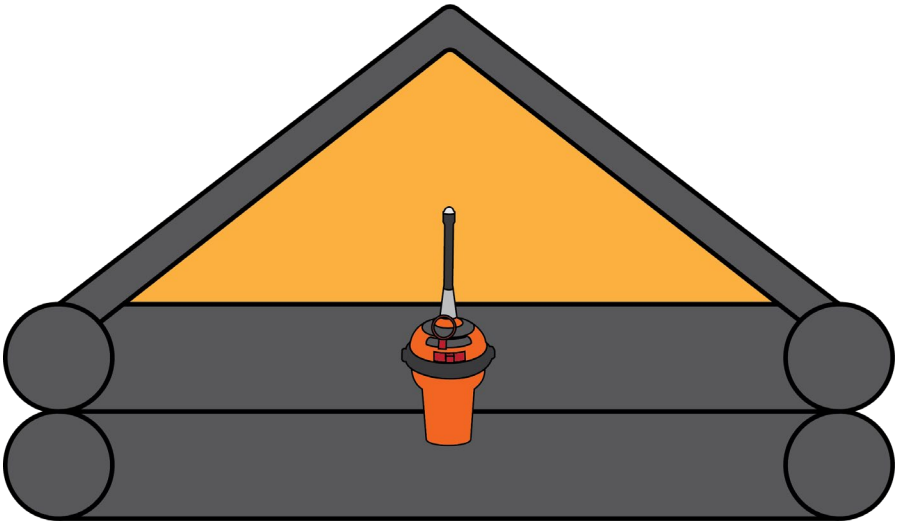
The EPIRB is designed to give the best distress signal performance when floating in the sea, but there may be situations where the EPIRB is activated elsewhere. To optimize the performance in these situations please follow the instructions in the next sections.



WARNING

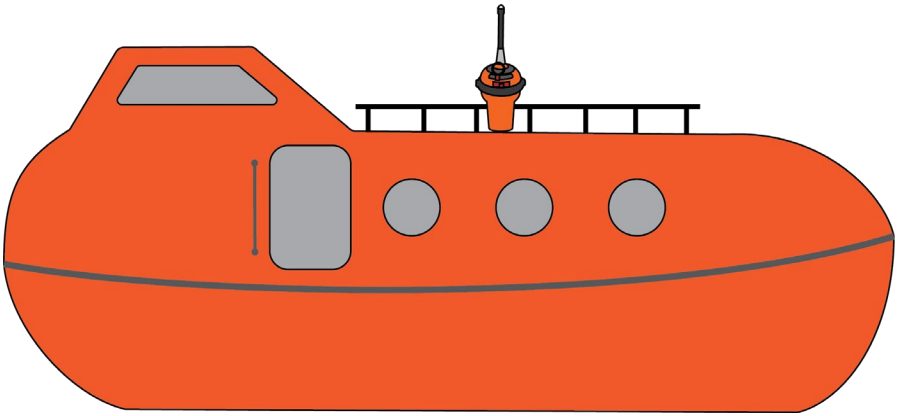
Do not obstruct the GNSS antennas view to the sky

3.4.1 In life raft



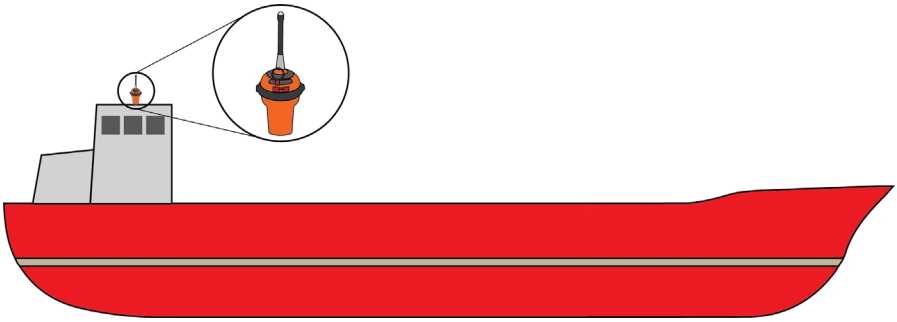
- Try to keep the EPIRBs view of the sky unobstructed.
- It is not recommended to operate the EPIRB under the life raft cover if it is made of materials that may obstruct the signals.
- Keep the antenna facing upwards.

3.4.2 In lifeboat



- Try to keep the EPIRBs view of the sky unobstructed.
- It is not recommended to operate the EPIRB under the lifeboat canopy if it is made of materials that may obstruct the signals.
- Keep the antenna facing upwards.

3.4.3 Onboard ship

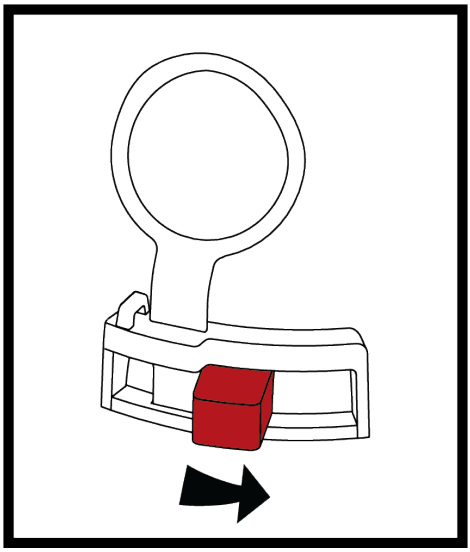


- Keep the EPIRB in an open space.
- Do not place the EPIRB inside, under a roof or other overhead obstructions.
- Do not tie the lanyard to the ship.
- Keep the antenna facing upwards.

3.5 Self-test

Self-tests shall be performed regularly to verify that the EPIRB is working correctly. A self-test will use battery power, so please follow the recommendations in Chapter 6 for self-test intervals.

3.5.1 Normal self-test



- To start the self-test, move the switch to test position and hold until the test indicator light is on.

During the normal self-test, the main functionality of the EPIRB is tested. A test signal is transmitted on all frequencies (121.5 MHz, AIS and 406 MHz). These test signals will not be recognized as distress signals. While transmitting the test signals the battery and the transmitted signals are tested.

The test indicator will give a short dark period every time a signal is transmitted.

If the RLS protocol is enabled the blue RLS indicator light will light up for approximately 1 second.

The top light will flash once if the self-test is successful.

If the self-test detects a fault in the EPIRB module, the test indicator LED will start flashing at the end of the test. For fault codes see the table in section 3.5.3.

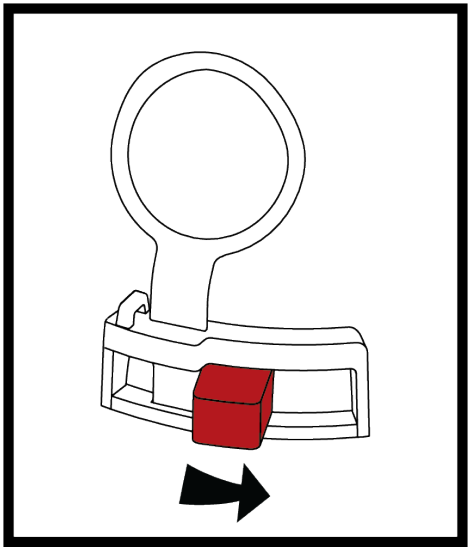
Test sequence	Position indicator	RLS indicator	Test indicator	Strobe light
Self-test started	-	-	○ On	-
Signals transmitted	-	-	●●●● Multiple short off periods	-
RLS enabled *	-	● On for 1 second	-	-
Extended self-test successful	-	-	-	○ One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			○○○ Multiple flashes**	

*For EPIRBs with RLS disabled the RLS indicator will remain off.

**See table in section 3.5.3 for on failure indications.

3.5.2 Extended self-test

The extended self-test includes a GNSS test in addition to the normal self-test.



To perform the extended self-test, do the following steps within a period of 3 seconds:

1. Move the switch to test position
2. Release to middle position
3. Move the switch to test position and release when the white test indicator lights up.

The white test indicator LED will light up and the green GNSS indicator LED will start flashing in sequences of 3 fast flashes. This indicates that the EPIRB is searching for a validated position.

When a valid position is found the green GNSS indicator LED will remain lit for approximately 1 second and a normal self-test will continue.

The top light will flash once at the end of the text if the extended self-test is successful.

If the self-test detects a fault in the EPIRB module, the test indicator LED will start flashing at the end of the test. For fault codes see the table in section 3.5.3.

Note that the extended self-test can only be performed 60 times. After that the self-test will indicate “Maximum number of extended self-tests exceeded”.

Test sequence	Position indicator	RLS indicator	Test indicator	Strobe light
Extended self-test started	-	-	On	-
Waiting for position	Triple flashes	-	-	-
Position achieved	On for 1 second	-	-	-
Self-test started	-	-	On	-
Signals transmitted	-	-	Multiple short off periods	-
RLS enabled *	-	On for 1 second	-	-
Extended self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			Multiple flashes**	

*For EPIRBs with RLS disabled the RLS indicator will remain off.
**See table in section 3.5.3 for on failure indications.

3.5.3 Test failure indications

If one of the sequences in the extended or normal self-test are unsuccessful the test indicator will flash a number of times according to the table below to indicate the occurred failure. Test failure descriptions and corrective actions

 Number of flashes	Failure indication
2	Battery failure
3	Transmitter failure
4	-
5	No position
6	-
7	Maximum number of extended self-tests exceeded
8	-
9	-
10	Wrong programming

3.5.4 Test failure descriptions and corrective actions

3.5.4.1 Battery failure

This indicates that the battery capacity is too low, or another critical battery error has been detected. Correct operation cannot be guaranteed anymore. Contact your service partner for battery replacement immediately.

3.5.4.2 Transmitter failure

This indicates that the RF-signal transmitted from the EPIRB is not good and is most probably because the antenna is too close to conductive material, like the bulkhead or railing, or you are holding your hand around the antenna. Place the EPIRB in an open space (minimum 30 cm) and try again. Contact your service partner if this does not help.

3.5.4.3 No position

The GNSS receiver in the EPIRB needs a free view of the sky to get a position within the time limit. Windows and canopies will also reduce the signals from the satellites. Place the EPIRB on a place with free space around (minimum 30 cm) and with a free view of the sky and try again. Contact your service partner if this does not help

3.5.4.4 Maximum number of extended self-tests exceeded

The extended self-test uses a lot of current and is therefore limited to a total of 60 tests. After this the EPIRB will continue to operate as normal in emergency mode and you can still perform normal self-test. However, verification of the GNSS receiver in the EPIRB is not possible until the battery is replaced. Contact your service partner for battery replacement.

3.5.4.5 Wrong programming

The programming of the EPIRB is not correct. Contact your service partner to solve this issue.

The EPIRB is delivered from the factory with a default programming that is not meant for costumer use. With the default factory programming the EPIRB will give this failure indication during self-test.

3.5.5 Testing of the AIS locating signal

During standard self-test mode, the EPIRB will transmit two text messages with the 15HEX ID in one message and the text EPIRB TEST in the other message. The figure below shows this text message as shown on the Jotron TR-8000 MkII AIS.



When doing GNSS self-test the position messages are also output together with the text messages.

Normally AIS stations will suppress AIS SART test messages but can be configured to display the test information. If an AIS installation is going to be used to verify AIS SART test messages, please consult the equipment manual of the AIS system for more information about this.

3.6 Deactivation of the EPIRB

If the EPIRB has been accidentally activated or to deactivate it after use, remove it from the water and move the switch back to its middle position. Note that it can take up to 15 seconds before the strobe light stops flashing.

3.7 False alerts



False alerts are a serious problem for the rescue service. Nearly 90% of EPIRB initiated distress alerts turn out to be false alarms.

Take the following precautions to prevent inadvertent activation:

- Make sure that the EPIRB is correctly mounted in the bracket.
- Keep the EPIRB dry when it is not mounted in the bracket.
- Keep the EPIRB away from strong magnetic fields.

If your EPIRB is activated in a non-distress situation, or a distress situation which has been resolved and you no longer require assistance, deactivate your EPIRB and contact the nearest SAR authorities to provide them with the following information:

- EPIRB ID number (15 characters UIN).
- Date, time, and position at time of activation. (Time zone)
- Date, time, and position at time of deactivation. (Time zone)
- EPIRB make and model.
- Vessel Name/ID.
- Circumstances/cause of activation (if known).

4 Product description

The main purpose of the Tron 60AIS EPIRB is to alarm the SAR authorities in a distress situation. When activated the EPIRB will transmit a signal, which includes the ID of the ship in distress and the position of the EPIRB. The strobe light will start flashing in both visible and infrared light. See chapter 0 for more details on the Cospas-Sarsat system.

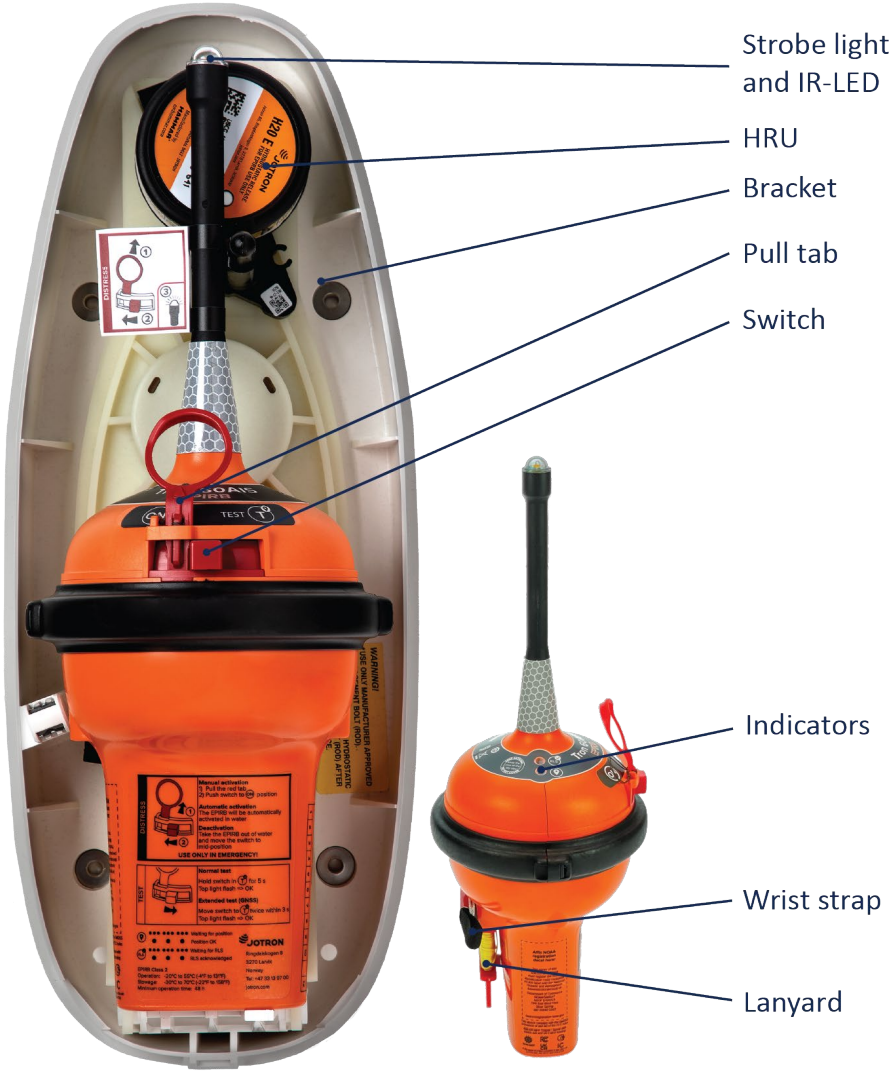
The main parts of the Tron 60AIS are:

- Tron 60AIS EPIRB
- FB-60 Float-free bracket or MB-60 Manual bracket

The EPIRB is buoyant and is equipped with a system that will activate distress transmissions if it is deployed into water. The EPIRB will not be activated if it is exposed to sea spray or rain when mounted in its bracket.

It has been developed to meet the regulations and rules for use on vessels and life rafts in the maritime service. See the Declaration of Conformity document at jotron.com for information on applicable standards.

4.1 Tron 60AIS EPIRB



4.1.1 Switch and pull tab



A pull tab is located next to the switch and must be removed in order to move the switch to “ON” position. The pull tab does not prevent the switch to move to “self-test” position and must not be removed when performing normal and GNSS self-tests.

The pull tab is removed by pulling firmly upwards. It can be re-fitted and used after it has been removed.

The switch has 3 positions. “ON” position to the left. “Auto / Ready” position in the middle, and “self-test” position to the right. The “ON” position is secured with a pull tab to prevent inadvertent activation.

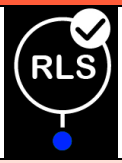
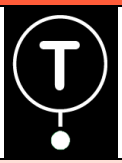
The switch is spring loaded and will move to “ON” position when pushed with the pull tab removed.

Switch position icons		
Icons	ON	T
Description	ON	Normal and GNSS self-test

4.1.2 Indicators



3 LED indicator lights with associated icons are positioned at the top of the EPIRB. See the tables below for descriptions.

Indicator panel icons			
Icons			
Description	Position (green LED)	RLS (blue LED)	Test (white LED)

NOTE

The blue RLS indicator will only be active if the EPIRB has enabled the RLS protocol.

4.1.3 Infrared (IR) light

To enhance visibility for SAR teams using night vision goggles and systems, the EPIRB is equipped with an infrared (IR) light in addition to the visible strobe light. The IR light is located at the top of the EPIRB, next to the strobe light, and will start flashing automatically when the EPIRB is activated. The strobe light and the IR light will flash synchronously.

4.1.4 Lanyard and wrist strap



The lanyard and the wrist strap are located on the back side of the EPIRB.

The purpose of the lanyard is to secure the EPIRB to yourself or the life raft. For optimal performance in an emergency, the EPIRB should be floating in the water.

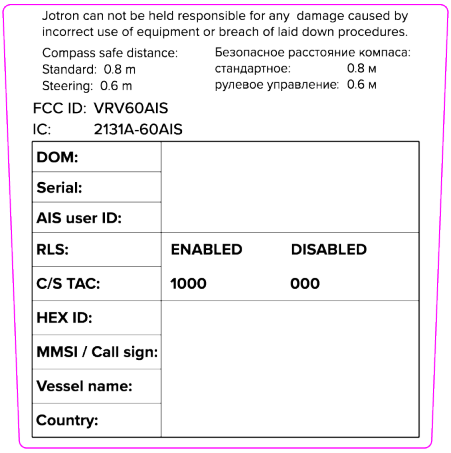
The end of the lanyard is secured to the EPIRB. To use the lanyard, unclip the lanyard coil from the equator belt and uncoil the line.



Do not secure the lanyard to the ship, as this will cause the EPIRB to follow the ship down if it is sinking.

The wrist strap can be used to carry the EPIRB in situations where it is necessary to have both hands free, e.g., when climbing a ladder. The wrist strap can be pulled out of its pocket, and your hand can be placed through it. Note that it is not possible to put the wrist strap back into its pocket after usage. If the wrist strap is used it should be replaced. Please contact your sales partner.

4.1.5 EPIRB ID information



Jotron can not be held responsible for any damage caused by incorrect use of equipment or breach of laid down procedures.

Compass safe distance:
Standard: 0.8 m
Steering: 0.6 m

Безопасное расстояние компаса:
стандартное: 0.8 м
рулевое управление: 0.6 м

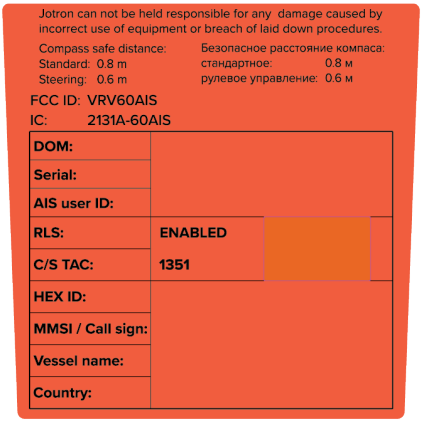
FCC ID: VRV60AIS
IC: 2131A-60AIS

DOM:		
Serial:		
AIS user ID:		
RLS:	**ENABLED**	**DISABLED**
C/S TAC:	**1000**	**000**
HEX ID:		
MMSI / Call sign:		
Vessel name:		
Country:		

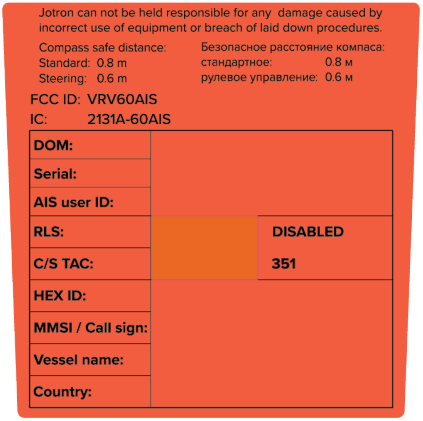
A table with all the ID information is located on the back side of the EPIRB. From the factory this table contains information about the date of manufacture (DOM), EPIRB serial number and AIS User ID.

The section showing the TAC number and RLS information is filled out by the dealer or supplier depending on the chosen protocol. The TAC number will have the prefix 1 if the EPIRB is programmed with an RLS protocol.

The dealer or supplier shall use the orange rectangular label included in the box to cover the information that is not applicable.



If the EPIRB has the RLS protocol enabled the label will appear as shown in this figure.[1]



If the EPIRB do not have the RLS protocol enabled the label will appear as shown in this figure.[1]

The remaining fields showing the ownership of the EPIRB shall be filled in and covered by the blank protection label included in the box.

[1] The TAC number on the EPIRB can deviate from the number shown in the figures.

4.2 FB-60 or MB-60 brackets

The Tron 60AIS is available with two different bracket options. The FB-60 which is a float-free bracket and the MB-60 which is a manual bracket.

4.2.1 FB-60 Float-free bracket



The FB-60 is a covered bracket with a HRU which will release the EPIRB if the bracket is submerged to a water depth below 2-4 meters or more. When the Tron 60AIS is mounted in the FB-60, it operates as an automatic float free unit.

4.2.2 MB-60 Manual bracket



The MB-60 manual bracket is for indoor installations and can be installed on ships that does not require a float free bracket or those that needs an additional manually activated EPIRB, for example in the wheelhouse or other protected areas. MB-60 is also used as a shipment bracket when sending replacement units. When the Tron 60AIS is mounted in the MB-60 bracket, it operates as a manual unit and will not be released automatically from the bracket.

IMPORTANT

The MB-60 is for indoor installations only.

4.3 Return Link Service (RLS)

This EPIRB has the capability to use the RLS feature, which is available in the Galileo navigation satellite system.

The RLS feature is an indication that confirms to the user that the distress signal has been received and is being sent to the responsible search-and-rescue (SAR) authorities. It does NOT mean that a rescue has yet been organized/launched, only that the distress alert has been received and routed to the appropriate government agencies. See 7.13 for a more detailed description.

5 Registration, Installation and mounting

5.1 Registration of the EPIRB

Your EPIRB must be registered before use. This allows the SAR authorities to retrieve information about you and your emergency contacts in an emergency. Which again enables them to contact you to determine if the distress signal from the EPIRB is a false alarm, and an expensive rescue operation can be avoided.

You should register your EPIRB with the national authority associated with the country code in the hexadecimal identification (15 Hex ID) of your EPIRB. If your country does not provide a registration facility, and has allowed direct registration, you can register your EPIRB online with the Cospas-Sarsat IBRD: www.406registration.com

For information about your country's registration requirements please consult the list of Beacon Registration Contacts on www.406registration.com

5.1.1 Registration in USA

For registration of the EPIRB in USA, use this link:

http://www.beaconregistration.noaa.gov

The preferred and easiest way to register, is to use the web page. However, if this is not possible, a filled in registration form can be emailed to:

beacon.registration@noaa.gov

The registration form is available at the US beacon registration website.

The Emergency contact information must be accurate, especially the telephone number, as this will be used to validate the distress signal.

The USCG will only launch an immediate rescue if the approximate location and EPIRB registration details can be confirmed. Otherwise, there will be a delay whilst further signals from the same source are received and verified.

5.2 Change of ownership

If the ownership of the EPIRB is transferred or a change of vessel occurs, the EPIRB must be recoded and re-registered on the new owner in accordance with local rules.

5.3 Installation

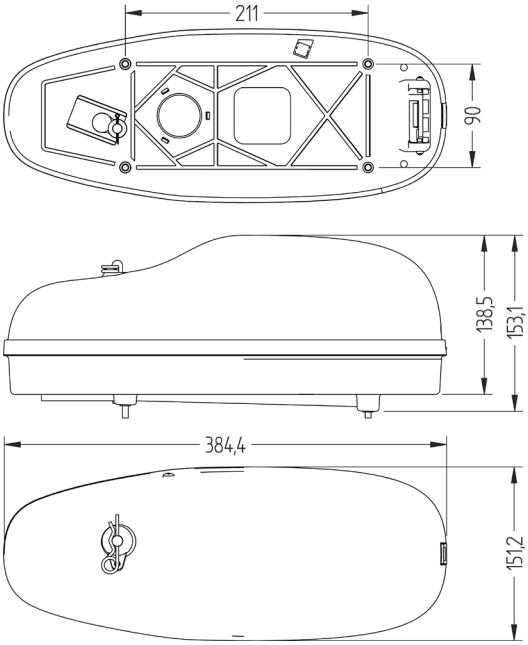
The EPIRB should be installed in a location that meets the following requirements:

- The EPIRB should, with greatest possible probability, float-free and avoid being caught in railings, superstructure, etc., if the ship sinks.
- Do not install the bracket near strong magnetic fields that could activate the EPIRB.
- The EPIRB should be located so that it may be easily released manually and brought to the survival craft by one person. It should therefore not be mounted in a radar mast or any other places which can only be reached by a vertical ladder.
- The bracket should, if possible, be installed in a position that will provide as clear a view of the sky as is practical, orientated to facilitate satellite reception.
- Do not install or operate the EPIRB in a location subject to high intensity RF fields. (e.g Radar or communications antennas).
- Be especially aware of interference from shipboard L band transceiver sources such as Inmarsat Fleet Broadband. The emitted signals from such sources are very strong and may influence the GNSS position reception.

The location should be well protected from environmental conditions such as direct sea-spray, chemicals, oil, exhaust and vibrations. - see more detailed information in chapter 4.10 of IMO COMSAR/Circ.32 regarding “Harmonization of GMDSS requirements for radio installations onboard SOLAS ships”.

5.4 FB-60 bracket installation and mounting

Mount the FB-60 bracket using four M5 bolts according to the mounting footprint shown in the following figures.

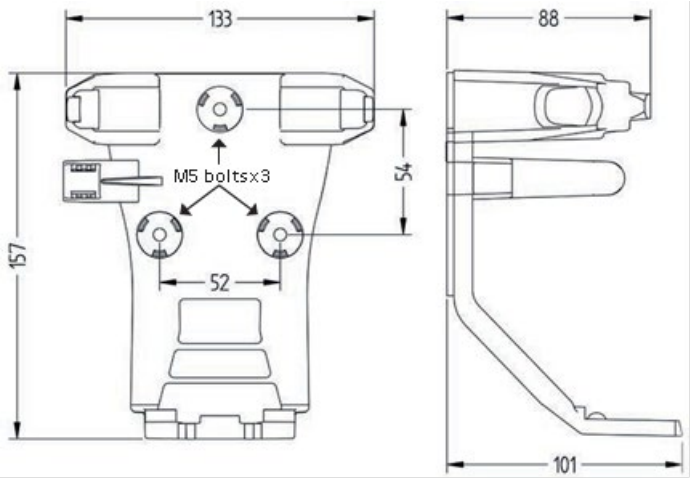


NOTE

Both the FB-60 and the MB-60 can be mounted horizontally or vertically. A vertical position is recommended, however, do what is best for maintenance and operation.

5.5 Mounting the MB-60

Mount the MB-60 bracket using three M5 bolts according to the mounting footprint shown in the following figures.



5.6 Mounting the EPIRB in the bracket

5.6.1 Tron 60AIS in FB-60



1



2



3

1. Make sure the bracket is not damaged.
2. Grab the EPIRB and match the bottom of the battery housing correct on the bracket base.
3. Place the cover by fitting it from the bottom first. Mount the locking pin to securely hold the cover in place.

5.6.2 Tron 60AIS in MB-60

1. Make sure the bracket is not damaged.
2. Grab the EPIRB and match the bottom of the battery housing correct on the bracket base. Push the EPIRB firmly into the two arms on the bracket.

6 Testing and maintenance

To ensure reliability and to minimize the risk of false distress alerting it is important that the EPIRB must undergo testing and maintenance as described in this chapter.

6.1 Every month

- Perform self-test (see chapter 3.5)
- Visual inspection:
  - Make sure that nothing prevents the release function of the EPIRB.
  - Check for defects on the EPIRB and its bracket
  - Make sure that the bracket is not covered by paint or any other chemicals.
  - Check that the lanyard is firmly attached to the EPIRB, and not tied to the vessel or any other objects.
  - Check the expiry date of the HRU. See chapter 6.7 for details.
  - Check the SBM date. See chapter 6.8 for details
  - Check the expiry date of the battery. See chapter 6.9 for details.

6.2 Every 3 months

- Perform an extended self-test instead of the monthly normal self-test. See chapter 3.5.2.

6.3 Every 12 months

The Tron 60AIS may be under the regulation of the IMO MSC.1/Circ 1040 rev.2, which requires annual testing performed by authorized radio-surveyor or authorized personnel trained and certified by Jotron.

6.4 Every 2nd year

- Replace the HRU including the plastic bolt. See chapter 6.7 for description
- Mark a new expiry date on the HRU label

6.5 Every 4 or 5 years

If the EPIRB has a mandatory requirement of shore-based maintenance, perform complete SBM service or replace the complete EPIRB. See chapter 6.8

The interval is 4- or 5-years dependent on the flag-state administration.

6.6 Every 10 years

Due to the harsh environment the EPIRB normally is situated in, Jotron strongly recommends replacing both the EPIRB and the bracket after 10 years.

6.7 Hydrostatic release unit (HRU) replacement

The hydrostatic release unit shall be replaced within the end of the year and month indicated on the side of the HRU. This is shown in the following figures.



Expiry month location



Expiry year location

Follow these steps to replace the HRU:



1



2



3

1. Release and remove FB-60 top cover by removing the locking pin. Note that the EPIRB can drop out of the FB-60 bracket when releasing the top cover. Remove the EPIRB from the bracket
2. Press down the spring-loaded bracket plate and remove the HRU by sliding it out of its locking slot. See the arrow for direction
3. Install a new HRU by pressing down the spring-loaded bracket plate and sliding the HRU into its locking slot
4. Refit the EPIRB and the bracket top cover. Be sure that the top cover is locked at the bottom end and replace the locking pin.

WARNING

Only Jotron HRU kit is acceptable for use. Any use of unoriginal spare parts will invalidate the product type approval certificates, and warranty will not apply. It may also compromise your safety.

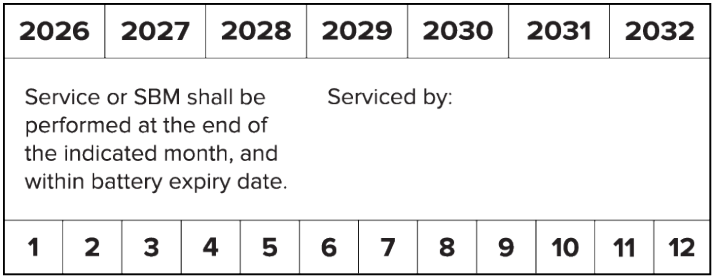
6.8 Shore based maintenance (SBM)

EPIRBs may have mandatory requirement of Shore Based Maintenance (SBM) either by IMO, SOLAS or national requirements at intervals specified by flag administration, not exceeding 5 years.

If the EPIRB is fitted on a vessel that is subject to SOLAS regulations, shore-based maintenance of EPIRBs should be carried out in accordance with IMO guidelines as set out in MSC/Circ.1039 rev.1 as amended.

SBM shall be performed latest by the date indicated on the SBM label on the EPIRB, by a Jotron approved SBM partner.

The SBM label is located at the side of the battery housing, and is shown in the figure below:



IMPORTANT

Only trained personnel certified and authorized by Jotron can perform battery replacement and SBM on the Tron 60AIS.

6.9 Battery expiry date

The battery expiry date can be found on a label located behind the lanyard on the back side of the Tron 60AIS.

The battery must be replaced within the end of the indicated month and year. However, Jotron strongly recommends replacing the complete EPIRB after 10 years.



7 Technical information

7.1 General

Tron 60AIS:	
EPIRB Class:	Class 2
- Operating temperature:	-20° C to 55° C (-4° F to 131° F)
- Stowage temperature:	-30° C to 70° C (-22° F to 158° F)
EPIRB Category with FB-60:	Category 1 - Float-free automatically activated EPIRB
EPIRB Category with MB-60:	Category 2 – Manually activated EPIRB
EPIRB Group:	Group 3 - Includes AIS transmitter and 121.5 homing transmitter
Housing material:	Glass reinforced polycarbonate
Height:	340 mm
Width:	130 mm
Weight:	700 g
Standard compass safe distance:	0.8 m
Steering compass safe distance:	0.6 m
Battery operating time:	More than 48 hours at -20° C
Lanyard length:	5 to 8 m
Lanyard tensile strength:	More than 25 kg

7.2 Strobe light

Infrared (IR) light	
Wavelength:	770-890 nm
Intensity:	More than 2.5 mW/sr
Flash rate:	21 flashes per minute

Visible light	
Color:	White
Intensity:	More than 0.75 cd
Flash rate:	21 flashes per minute

7.3 Cospas-Sarsat transmitter

Cospas-Sarsat transmitter	
Frequency:	406.031 MHz
Output power:	5W
Protocols:	Maritime, Serialized, Radio Call Sign
Modulation	Phase modulation
Data encoding	Bi Phase L
Short term stability	Less than $2x10^{-9}$
Medium term stability	Less than 10^{-9}
Residual noise:	Less than $3x10^{-9}$
Bit rate:	400 b/s
Antenna:	Omni directional

7.4 GNSS receiver

Navigation device	
Supported GNSS constellations:	GPS, GLONASS, Galileo
Antenna polarization:	PCB inverted-F antenna

7.5 Homing transmitter

Homing transmitter	
Frequency:	121.500 MHz
Output power:	Up to 100 mW
Modulation:	AM sweep tone (A9) Sweep range: 700 Hz Sweep rate: 2.5 Hz Emissions designator: 3K20A3X
Stability:	10 ppm over temperature range
Antenna:	Omni directional

7.6 AIS transmitter

AIS transmitter	
Frequency:	161.975 MHz (AIS 1) 162.025 MHz (AIS 2)
Output power:	1 W
Modulation:	GMSK
Stability:	±1 KHz
Antenna:	Omni directional

7.7 Brackets

7.7.1 FB-60 Float-free bracket

FB-60	
Material:	ASA
Dimensions:	151 x 384 x 153 mm
Weight:	1 kg
Release mechanism:	Jotron HRU kit
Storage and operation temperatures:	-30° C to +65°C (-22° F to +149° F)

7.7.2 MB-60 Manual bracket

MB-60	
Material:	Glass reinforced PA6
Dimensions:	133 x 157 x 101 mm
Weight (including thermostat):	0.15 kg
Release mechanism:	Manual
Storage and operation temperatures:	-30° C to +65°C (-22° F to +149° F)

7.8 Battery information

Capacity:	12 V / 2.9 Ah
Lithium metal content:	Below 1 gram per cell
Approximate weight:	14.5 g per cell
Chemical system:	Lithium metal
Battery life:	10 years *

*) Exact date is printed on the battery expiry label. See chapter 6.9

7.8.1 Battery safety

Due to risk of fire or explosion the batteries shall not be short-circuited, recharged, punctured, incinerated, crushed, immersed, forcibly discharged or exposed to temperatures above the declared operating temperature range of the product. The batteries in this EPIRB are sealed units which are not hazardous when used according to the recommendations of the

manufacturer. Under normal conditions of use, the batteries are hermetically sealed.

For information regarding the physical and chemical properties, the potential health and safety measures and the environmental effects of the battery used with this product, refer to the manufacturer's safety information documentation.

The safety information is available for download at jotron.com - product.

http://jotron.com/product/tron-60ais/

The product described in this manual is subject to follow special packing instructions and/or transportation regulations. See chapter 8.3.1 for details.

7.8.2 Handling and storage

Store in a cool, well-ventilated area.



If this EPIRB is kept above room temperature for prolonged periods of time then the battery capacity will be degraded and either the battery should be replaced earlier than the date stated on the EPIRB, or the quoted 48 hours operating life of the EPIRB may be reduced. The effect is more pronounced as the temperature increases

In locations that handle large quantities of lithium batteries, such as a warehouse, lithium batteries should be isolated from unnecessary combustibles.

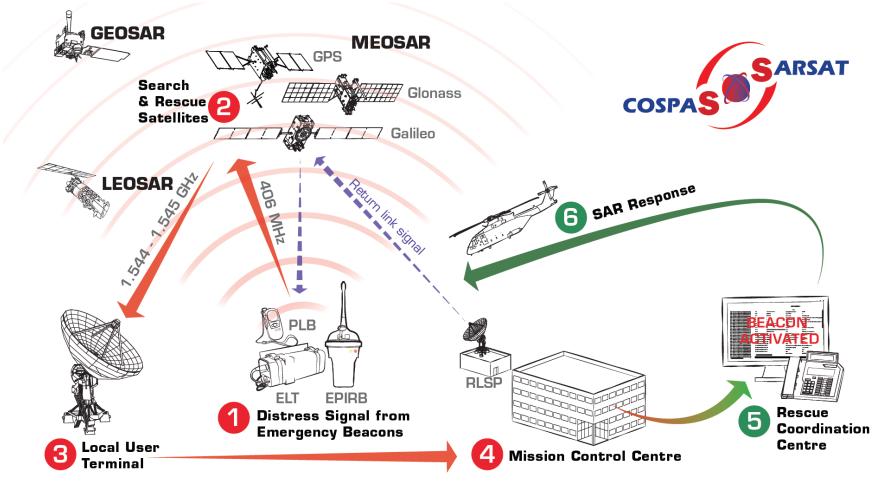


The battery can explode or leak and cause burns if it is disassembled, charged, installed with reversed polarity, or exposed to water, fire or high temperatures.

7.9 Cospas-Sarsat system

The Cospas-Sarsat system was created to detect and locate emergency beacons activated by aircrafts, ships, and people in remote areas.

The system was introduced in 1982 as a worldwide search and rescue system with the help of satellites covering the earth's surface. Since the introduction of the system tens of thousands persons have been rescued.



When the Tron 60AIS is activated (1), the next passing satellite (2) will detect the transmitted signal and relay it to an antenna at a LUT (3). The signal will be routed from the LUT to an MCC (4). The MCC will then relay the signal to the appropriate rescue coordination center (5) that will organize the rescue operation (6).

The system consists of:

- Satellites in low-altitude earth orbit (LEOSAR), geostationary orbit (GEOSAR) and medium latitude earth orbit (MEOSAR), that process and/or relay signals transmitted by beacons.
- Local user terminals (LUT) that receives and processes the signals from the satellites.
- Mission control centers (MCC) that distributes the signals to the appropriate search and rescue authorities.

Each EPIRB must be programmed with its own unique code in the system to identify the ship in distress. It is important that the EPIRB is registered in the database for the applicable country. See chapter 5.1 for more details.

The LEOSAR system has good coverage worldwide, including polar regions, and calculates the location of an activated EPIRB using Doppler processing techniques.

The GEOSAR system has good coverage worldwide, except for polar regions and can identify an activated EPIRB within a very short time. The system cannot calculate the location of the EPIRB but can use the EPIRBs GNSS receiver to provide a position.

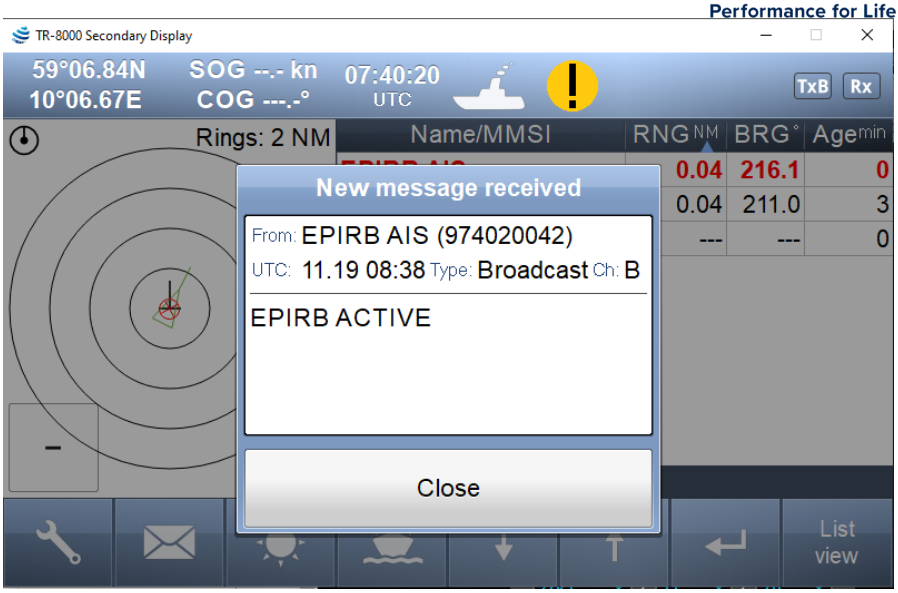
The MEOSAR system provides very good coverage worldwide. The position is calculated using the time delay between when the signal is sent from the EPIRB to it is received by the satellites, and the distance between them.

For more information see: https://www.cospas-sarsat.int/en/

7.10 AIS system

The EPIRB is capable of transmitting alert messages compatible with the Automatic Identification Systems (AIS) found onboard all SOLAS vessels and many other vessels. The transmission of these signals starts automatically after activation of the EPIRB. A burst consisting of eight messages are transmitted each minute with position velocity and course. These messages are received and plotted on AIS systems. They are distinguished from other vessels and are given special priority and alarm status.

Every 4 minutes a special text message containing the 15 HEX ID of the EPIRB and the text “EPIRB ACTIVE” is transmitted. These messages will be displayed immediately when received by an AIS installation.



The above figure shows this message as displayed on an Jotron TR-8000 MkII AIS.

7.11 121.5 MHz homing signal

The EPIRB transmits a sweep tone homing signal on 121.5 MHz that can be detected by overflying airplanes and the SAR vessels.

7.12 Position receiver (GNSS)

Jotron EPIRBs have a built in GNSS receiver capable of receiving position signals from GPS, GLONASS and Galileo satellite systems. The position is encoded by the message generator of the EPIRB and transmitted to the Cospas-Sarsat satellites. The GNSS position and the position calculated by the Cospas-Sarsat system itself will together give a precise indication of the actual position.

In addition, the position data from the GNSS receiver will be used in the AIS homing signal visible for all nearby AIS receivers.

The position fix is updated each 5 minutes for both Cospas-Sarsat messages and AIS messages and reflected in the next transmission.

7.13 RLS system

This EPIRB sends a Return Link Service status together with the distress signal on 406 MHz when it is activated. When this message is received by the ground station, an acknowledge signal is returned to the EPIRB through the Galileo position system. The EPIRB receives this acknowledge signal through its GNSS module. In this way the user can be informed that the distress signal has been received and localized.

To enable the RLS feature the EPIRB needs to be configured with a Cospas-Sarsat RLS protocol. You can check your 15 HEX code on this webpage http://www.cospas-sarsat.int/en/pro and look for the link “Beacon Message Decode Program” to check if you have an RLS protocol coded in your EPIRB.

The RLS feature is designed to send an acknowledgment to the user in less than 30 minutes from EPIRB activation. Alerting of the distress to SAR authorities is independent of (and may occur before) the RLS acknowledgment indication on the EPIRB. This specification is described in the Galileo SAR Service Definition Document:

https://www.gsc-europa.eu/sites/default/files/sites/all/files/Galileo-SAR-SDD.pdf

RLS is an optional function and may not be permitted in all countries or for all EPIRB types. You may visit the web page “Countries Allowing RLS Beacons” to learn the most recent information about national support for RLS:

https://cospas-sarsat.int/en/beacon-ownership/rls-enabled-beacon-purchase

8 Spare parts, warranty and disposal

8.1 Accessories and spare parts

For an overview of the available spare parts for this product, refer to the product information page on jotron.com or contact your sales partner.

8.2 Counterfeit spare parts

Jotron is aware of extended counterfeit spare parts being marketed and sold to fit GMDSS safety products. It is of extreme importance that any spare parts being fitted to this product are original spare parts, manufactured or approved by Jotron. Any use of counterfeit spare parts will invalidate the product type-approval certificates and warranty will not apply.

8.3 Warranty

All Jotron products are warranted against factory defects in materials and/or workmanship during the warranty period.

Refer to the sales terms and conditions for specific warranty information regarding this product.



Use of any counterfeit spare parts will invalidate your warranty and may compromise your safety.

For product support contact: support@jotron.com



Keep the original packing material as it is required if the EPIRB is shipped for service. Special hazardous goods requirements apply for packaging and labelling when shipping batteries.

8.3.1 Transportation

The product described in this manual is subject to follow special packing instructions and/or transportation regulations. Information regarding these regulations (in accordance with ICAO/IATA, IMDG code and/or ADR/RID) is included in the product safety information (PSI) and/or in the test summary

report (TSR) (in accordance with UN test 38.3.5) and available for download at jotron.com - product.

http://jotron.com/product/tron-60ais/

8.4 Service

All services such as testing, installation, programming, replacement, marking and battery exchange are provided by an authorized Jotron service agent.

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

Jotron does not accept any responsibility for the dismantling or reassembling of any Jotron product that occurs externally from a Jotron authorized facility and/or is handled by someone other than an authorized, training and certified person. This can void the user's authority to operate the equipment.

8.4.1 Service agents

Refer to jotron.com for an overview of Jotron partners and distributors.

https://jotron.com/partners-and-distributors/

8.5 Disposal

To prevent false alarms, it is important that the battery is removed from the EPIRB when it has reached the end of its life.

All parts of the EPIRB should be disposed of in a way that is not harmful for the environment. It should not be disposed as normal waste and must be handled in accordance with the applicable federal, state, and local waste disposal regulations in the country where the equipment is used.

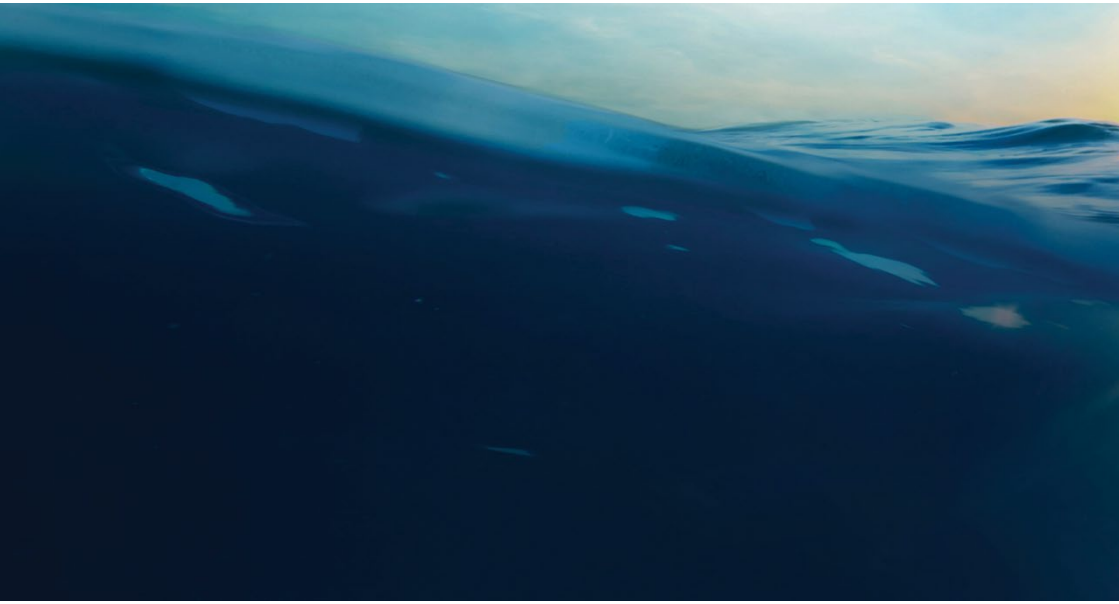
See jotron.com for updated instructions on disposal.

9 Abbrevations and definitions

AIS	Automatic Idendification System
COMSAR	Committee on Radiocommunications and Search and Rescue
COSPAS	COsmichskaya Sistyema Poiska Avariynich Sudov (Space System for the Search of Vessels in Distress)
EPIRB	Emergency Position Indicating Radio Beacon
GEOSAR	Geostationary Search and Rescue
GMDSS	Global Maritime Distress and Safety System
GNSS	Global Navigation Satellite Systems
IBRD	International Beacon Registration Database
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
LED	Light Emitting Diode
LEOSAR	Low Earth Orbiting Search and Rescue
LUT	Local User Terminal (Ground Station)
MCC	Mission Control Centre
MEOSAR	Medium Earth Orbiting Search and Rescue
MHz	Megahertz
NOAA	National Oceanic and Atmospheric Administration (USA)
RCC	Rescue Coordination Centre
RLS	Return Link Service
SAR	Search and Rescue
SARSAT	Search and Rescue Satellite Aided Tracking System
SBM	Shore Based Maintenance
SOLAS	Safety of Life at Sea (An international maritime safety treaty)

10 Ammendment records

Rev	Date	Reason for Issue	Author
A	10.06.21	First release	EJ
B	15.09.21	Updated chapter 3.1.6 and tables in 5.5.1 and 5.5.2	EJ
C	27.09.21	Corrected wrong reference	EJ
D	19.10.21	Updated descriptions on expiry dates in chapter 6 and 7.7	EJ
E	10.12.21	Released for produciton	EJ
F	10.02.22	Added info about IR-light. Updated photos	EJ
G	27.04.22	Changed description of failure indication 10. / Minor updates.	EJ



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COBHAM

SAILOR SP3540 Portable VHF ATEX GMDSS

User manual



Emergency procedure

- Turn the knob at the top of the radio clockwise. The display lights up showing the last used channel and the battery level.

- Select channel 16 (Distress or Safety), press the **16/C key**.

- Press the PTT and say:
  - "MAYDAY, MAYDAY, MAYDAY",
  - "This is"..... ships name repeated three times
  -
  - "MAYDAY"
  - "This is"..... ships name and call sign,
  - The ship's position in latitude and longitude or other reference to a known geographical location,
  - The nature of distress and assistance wanted,
  - Any other information which might facilitate the rescue.
  - "OVER"
- Release PTT and listen for answer.

IMPORTANT INFORMATION

Safe use of ATEX equipment:

- Do not change the battery in wet or humid environments.
- Always keep battery connectors dry and clean.
- Use only with Sailor ATEX approved accessories. Alternatively ATEX approved accessories in compliance with the accessory connector ATEX specification may be used.
- Do not change accessories in wet or humid enviroments.
- Do not charge the battery in hazardous area.
- For charge of battery use
  Part no: 403505A - ATEX CH3505 Compact Charger,
  Part no: 403507B - ATEX CH3507 Single Position Charger or
  Part no: 403508B - ATEX CH3508 Dual Position Charger
- Use only battery type Sailor B3503 or B3504.
- Do not use a mechanically damaged radio.
- Unpacking of the radio and accessories and the removal of the protective film in front of the display window must not take place in the ATEX protected area.

SP3540 ATEX VHF GMDSS

Document number: 98-124307-L

Release date: 8 April 2021

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Trademark Acknowledgements

- **SAILOR** is a registered trademark of Thrane & Thrane A/S.
- **Other product and company names** mentioned in this manual may be trademarks or trade names of their respective owners.

Warranty limitation

IMPORTANT - The radio and batteries are sealed waterproof units. To create and maintain the waterproof integrity they were assembled in a controlled environment using special equipment. The radio and batteries are not user maintainable units, and under no circumstances should the units be opened except by authorized personnel. Unauthorized opening of the units will invalidate the warranty.

Disclaimer

Any responsibility or liability for loss or damage in connection with the use of this product and the accompanying documentation is disclaimed by Thrane & Thrane A/S. The information in this manual is provided for information purposes only, is subject to change without notice and may contain errors or inaccuracies. Manuals issued by Thrane & Thrane A/S are periodically revised and updated. Anyone relying on this information should acquire the most current version e.g. from www.cobhamsatcom.com, Cobham SYNC Partner Portal, or from the distributor. Thrane & Thrane A/S is not responsible for the content or accuracy of any translations or reproductions, in whole or in part, of this manual from any other source. In the event of any discrepancies, the English version shall be the governing text.

Thrane & Thrane A/S is trading as Cobham SATCOM.

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Precautions

Avoid water and salt in the I/O connector and keep it clean frequently.

Only use original Thrane & Thrane battery packs. Make sure they are clean and dry before attaching the transceiver. Be careful not to damage any gaskets.

Only use the original Thrane & Thrane charger for the rechargeable battery.

Be very careful when handling the Lithium batteries. With correct use they are safe but any misuse might cause dangerous situations.

Never short circuit the battery terminals, never expose the transceiver and the batteries to extreme temperature or fire and never use any kind of violence.

Avoid close contact between the antenna and parts of the human body. The top of the antenna must never be closer than 5 cm to the body when transmitting.

Do not submerge the transceiver more than 1 m for 30 minutes.

Keep the transceiver at least 0.3 m away from the magnetic compass.

Training information

SAILOR SP3540 ATEX VHF GMDSS is designed for "occupational use only". It must be operated by licensed personnel only.

The SP3540 complies with the FCC RF exposure limits for "Occupational Use Only".

- FCC OET Bulletin 65 Supplement C, evaluating compliance with FCC guidelines for human exposure to radio frequency electromagnetic fields.
- American National Standards Institute (C95.1) IEEE standard for safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz.
- American National Standards Institute (C95.3) IEEE recommended practice for the measurement of potentially hazardous electromagnetic fields - RF and microwaves.



Warning! Your Thrane & Thrane VHF radio generates electromagnetic RF (radio frequency) energy when transmitting. To ensure that you are not exposed to excessive amounts of energy and thus to avoid health hazards from excessive exposure to RF energy, all persons must be at least 5 cm away from the antenna when the radio is transmitting.

Correct use

For best performance, hold the radio vertically and 10 cm away from the head when talking into the microphone.

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Introduction

Your ATEX VHF GMDSS



SP3540, your new SAILOR portable VHF transceiver, is approved to fulfil the GMDSS requirements for portable VHF radios for Safety at Sea and is waterproof to the IP67 standard.

As part of the required safety equipment, the SAILOR SP3540 is to be used in an emergency situation. However the best way to guarantee functionality in an emergency situation, is to use the radio in daily communication on board.

The SP3540 is designed for daily use and it connects easily to external equipment like headsets and fist mikes, making the SP3540 suitable for any noisy environment.

The unique battery concept makes the radio suited for both daily use and emergency situations. The primary emergency battery is to be stored for emergency situations and a secondary rechargeable battery can be used for daily communication in your new portable VHF transceiver.

The radio is designed with a unique man machine interface, an excellent grip even with gloves, and large tactile buttons.

The display has red adjustable backlight which makes the display visible even at night, without violating the night vision.

The radio is equipped with a lanyard and a belt clip. A huge accessory program comes with the SAILOR SP3500 series.

Please find the nearest SAILOR distributor on www.cobham.com.

Performance

For best performance of the transceiver keep the following in mind:

- Keep clear of metal environment.
- Hold the transceiver vertically and 10 cm from lips and push the PTT when transmitting.
- In receive mode carry the transceiver vertically with belt clips.
- To preserve battery power, adjust squelch to close the loudspeaker when there is no signal.
- If you are in a lifeboat keep the antenna as high as possible.

Channels

This radio operates with the following channels according to the Radio Regulations Appendix 18.

Note Channel designators xxA corresponds to 10xx defined in the Radio Regulations Appendix 18.

6	12	17	67	73	78A
8	13	19A	68	74	79A
9	14	20A	69	75 ***L)***	87
10	15	27A	71	76 ***L)***	88
11	16	28A	72	77	

L) Tx power is limited to 1 W.

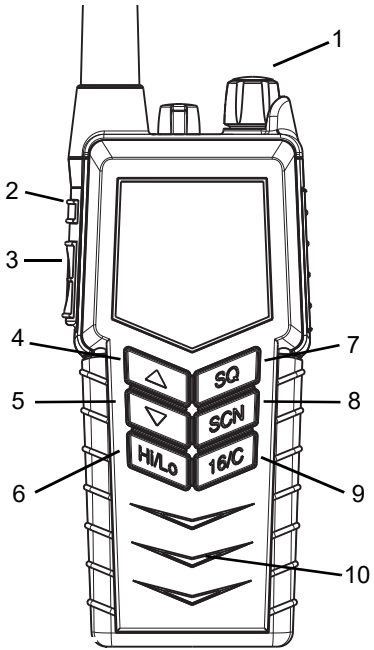
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Operation

Controls

Keys and buttons

1. On/off/volume
2. Light/Lock
3. Push To Talk (PTT)
4. Up key
5. Down key
6. Hi/Lo output power
7. Squelch
8. Scan
9. Priority channel (16)/ Call channel
10. Loudspeaker/microphone



Key presses

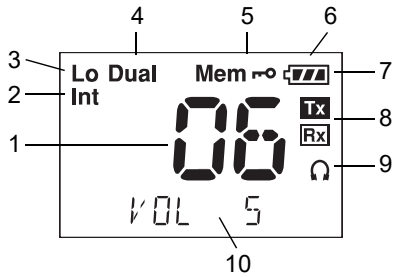
Pressing and holding certain keys gives access to additional functions, shown in the table below.

Key	Short press (1 beep)	Long press (2 beeps)	Extra long press (3 beeps)
	Show next available item in the list (up or down). Default: Channel selection	Run through available items, **or** select tagged channels A (▼) or B (▲).	Run through available items if an A or B channel is tagged
	Activate Squelch control (Adjust with up/down arrows).	Monitor function. Open Squelch completely.	
	1 press: Activate/ terminate Dual/Triple watch. 2 presses: Activate memory scan.	Add/Delete channel from memory scan.	
	Toggle between high and low transmitter power.		
	Select channel 16.	Select programmed Call channel.	Program Call channel.

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The display

The display holds various fields of information, explained below.



1. Current working channel.
2. Current channel mode.
3. "Lo": Reduced transmitter power.
   Full transmitter power is not shown in display.
4. Dual watch activated.
5. Current working channel is marked for scanning.
6. Keypad is locked.
7. Battery level indicator.
8. Transmitting (Tx) /Receiving (Rx).
9. Accessory is connected.
10. Service line for various purposes. In this example the volume level.

Using the ATEX VHF GMDSS

Basic functions

Note Before using the radio, mount the antenna at the top of the radio. The antenna is delivered with the radio.

Switching the radio on and off



- **To switch the radio on**, turn the knob at the top of the radio **clockwise**.
  The display lights up showing the last used channel and the battery level.
- **To switch the radio off**, Turn the knob back **counter-clockwise** until it clicks.

Selecting the working channel

- To select **channel 16** (Distress or Safety), press the **16/C** key.
- To select the **Call channel**, use a long press on **16/C**.
- To select among **all available channels**, press ▲ or ▼ on the keypad. For fast selection, press and hold ▲ or ▼.

The display shows the currently selected channel.

Note Long press on ▲ or ▼ can also be used to select preferred channels. For information on how to program preferred channels, see *Configuring the ATEX VHF GMDSS* on page 11.

Activating a call



To **activate a call** to the selected channel, press and hold the **PTT** button on the side of the radio.

The radio transmits as long as the PTT button is pressed. A small **Tx** sign next to the channel number indicates when the radio is in transmit mode.

Adjusting the volume

- **To increase** the volume, turn the on/off knob at the top of the radio **clockwise**.
- **To decrease** the volume, turn the knob **counter-clockwise**.

The display shows the level of the volume, e.g. "VOL 5", while it is adjusted.

Using Squelch control

- **To activate** Squelch control, press the **SQ** key.
- **To set** the Squelch level, press ▲ (closing) or ▼ (opening). The display shows the Squelch level while it is adjusted, e.g. "SQ 5".

Adjusting the display backlight



- **To turn on** the backlight, press the **Light/Lock** button on the side of the radio.
- **To adjust** the backlight level, press ▲ or ▼ within 3 seconds after turning on the light. The display shows the level while it is adjusted, e.g. "DIM MED".

Using Dual watch

To activate Dual watch, press the **SCN** key.
The display shows "Dual" at the top and "16" at the bottom right. The radio toggles between the selected channel and channel 16.

- **To terminate** Dual watch, press **SCN** again.

Scanning channels

- **To activate** scanning memory, press 2 times **SCN** within 2 seconds. During scanning, the display shows "SC" in the channel field. The radio toggles between channel 16 and each of the channels marked for scanning.
- **To terminate** scanning, press **SCN** once.

Changing the transmitter power

To change the transmitter power, press the **Hi/Lo** key. The display shows "Lo" when power is set to low. Otherwise maximum power is used.

Locking the keypad

- **To lock** the keypad, press and hold the **Light/Lock** button. The display shows a key symbol when the keypad is locked.
- **To unlock** the keypad, press and hold the **Light/Lock** button again.

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Other functions

Programming the Call channel

To program the Call channel, do as follows:

1. Press and hold **16/C** until the current Call channel number is flashing.
2. Select the channel with ▲ or ▼.
3. Press **16/C** to confirm.

Programming the scanning memory

To add a channel to the scanning memory, select the channel and then press and hold the **SCN** key until the display shows MEM at the top.

To remove a channel from the scanning memory, select the channel and then press and hold the **SCN** key until the MEM sign disappears from the display.

Alive beep

To enable "ALIVE" function do as follows:

1. Select the channel where ALIVE function is desired to be transmitted.
2. Press and hold the **Hi/Lo** until you see "ALIVE ON" on the radio display. It takes approx. a second.
3. Now "ALIVE" is transmitted by a "beep" on the working channel, with approx. 4-second intervals.

To deactivate "ALIVE" function do as follows:

- Press and hold the **Hi/Lo** pressed until "ALIVE ON" no longer appears on the radio display. It takes approx. a second.

"ALIVE" function is also deactivated when

- The channel is changed.
- The radio is turned OFF and ON again.
- Watch or scanning is enabled.
- Squelch is open.

Refer to *ALIVE* on page 13

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Configuring the ATEX VHF GMDSS

Entering and using configuration mode

Note The radio is not operational in configuration mode.

- **To enter** configuration mode, press and hold the **Light/Lock** button while turning on the radio.
  The bottom line of the display shows the current menu item/setting.
- **To exit** configuration mode, turn off the radio or press any key except ▲, ▼ and the Light/Lock button.
  Using the PTT button or leaving the radio inactive for 10 seconds also causes the radio to exit configuration mode.
- **To change** a setting, press ▲ or ▼.
- **To confirm the current setting** and go to the next menu item, press the **Light/Lock** button.

Configuration settings

Configuration mode is used to program preferred channels and volume of key beep and battery alarm.

The following settings are available in configuration mode.

BEEP	MAX	Status click/beep sound on key press, long press (settings/programming saved) and battery alarm. Maximum level.
	MIN	Status click/beep sound on key press, long press (settings/programming saved) and battery alarm. Minimum level.
	OFF	All beeps off.
PREFA	OFF	Remove tag “A” for current working channel.
	ON	Tag current working channel with “A”. If another channel was previously tagged “A”, this is overruled. • The working channel can now be selected with a long press on ▼.
PREFB	OFF	Remove tag “B” for current working channel.
	ON	Tag current working channel with “B”. If another channel was previously tagged “B”, this is overruled. • The working channel can now be selected with a long press on ▲.
VER	X.XX.XX	Software version. Read-only.

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ALIVE	OFF	Factory default state.
	ON	Press ▲ to set “ALIVE” on.
ADD NAME	A-Z, 0-9	Makes it possible to name the channels. The name must contain a maximum of 9 characters, use only capital letters, digits and spaces. Press **Light/Lock** to confirm programming. Note: The name appears in the service line on the display.

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Batteries

Battery types

- The orange primary battery pack contains a non-rechargeable Lithium battery. This battery pack is only to be used in case of emergency.
- The blue secondary battery pack contains a rechargeable battery. This battery pack is for daily use.

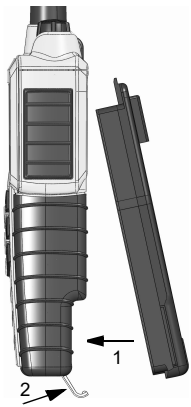
The primary battery

Important The orange primary battery pack is only for emergency use, and is **not** rechargeable.

Before using the primary battery, remove the seal on the battery pack.

Then do as follows:

1. Attach the battery pack to the radio as shown.
2. Lock the battery with the safety lock at the bottom.



The primary battery is capable of providing sufficient power for 8 hours of operation defined as 10% Tx, 10% Rx and 80% standby.

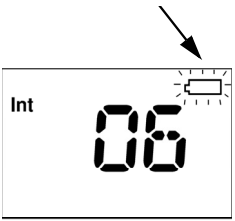
When the primary pack is not in use it must always be placed in the dedicated rear position in the charger cradle, see *The battery charger* on page 17.

The secondary battery

Battery level indication

The blue secondary battery pack is for daily use of the radio. When the battery level is low, you should recharge the battery.

The radio display shows the battery status. When the battery symbol is empty and flashing, the battery should be recharged as soon as possible.



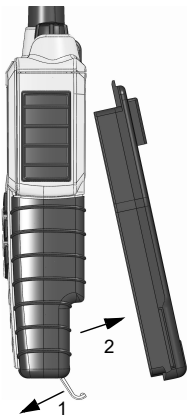
Removing and inserting the battery pack

To remove the battery pack, do as follows:

1. Open the safety lock as shown.
2. Remove the battery.

To insert the battery pack, attach the battery and close the safety lock as shown on the previous page.

If the radio is not used for several weeks it is recommended to store the radio and battery separated to reduce self discharge of the battery.



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The battery charger

The chargers has two compartments.

CH3505

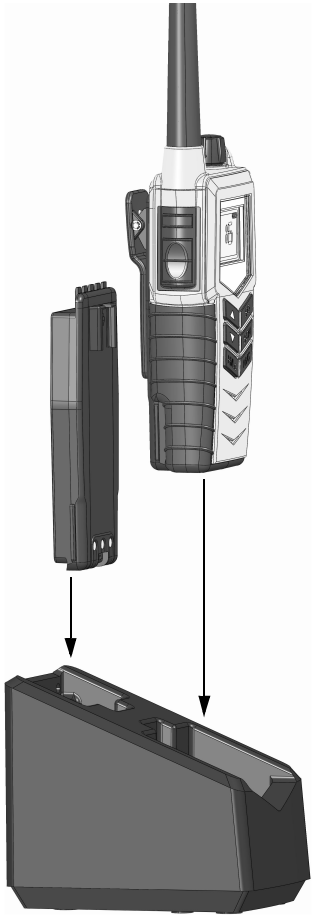
- A compartment for recharging the battery alone or while attached to the radio.

CH3507

- A rear compartment only for storing a spare battery. It does not have a charger function.
- A front compartment for recharging the battery alone or while attached to the radio.

CH3508

- It is possible to charge a battery in rear compartment simultaneously with the radio/battery in front.



Installing the charger

Mounting the charger

There are several options for mounting one or more chargers on a table or a wall.

For information on dimensions and screw positions, refer to Dimensional drawing, charger on page 27.

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When mounting the charger, make sure it is placed in a dry place and away from direct sunlight. The charger is not waterproof.

Connecting to power

The charger can be supplied with DC or AC.

DC: Connect the 12-24VDC Connection Cable between the DC supply and the connector on the underside of the charger.

AC: Connect the AC/DC adapter to the connector on the underside of the charger. Then connect the AC/DC adapter to the AC outlet.

Recharging the secondary battery

Important | Do not attempt to recharge the orange primary battery!

To recharge the secondary battery, place the radio with battery or the battery alone in the front position of the charger cradle.

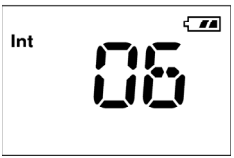
If the radio cannot turn on due to complete discharged battery, then **turn of** the radio and place it in the charger or charge the battery alone.

The light indicators on the charger cradle show the status as follows:

- Green light: Power is connected to the charger.
- Steady red light: Charging completed. Trickle charge mode.

Charging time with empty battery: VHF off approx. 4 hours, VHF on: approx. 5 hours.

The battery indicator on the radio display indicates if the radio is placed in the charger while radio and charger are both powered.



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Equipment and accessories

External equipment

List of equipment

The following equipment can be connected to the radio:

Equipment	Order number
SAVOX C-C440AV Push-To Talk unit	403900-942
SAVOX C-C500 Remote Speaker Microphone	403500-944
SAVOX NC/400 Noise-com	403500-003
SAVOX HC-E Helmet-com	403500-004
SAVOX HC-1 Helmet	403500-005
Peltor MT7H79F-50 Headset	403500-006
Peltor MT7H79P3E-50 Headset - Helmet Mount	403500-007
Peltor MT1H7F2-07-51 Tactical ATEX - Headband	403500-008
Peltor MT1H7P3E2-07-51 Tactical ATEX - Helmet	403500-009

We recommend to remove all accessories during emergency use.
All accessories listed might be used when body worn.

Connecting external equipment

Connect the dedicated interface cable between the external equipment and the top connector on the radio.

Interface cable	Order number
SAVOX C-C440AV - for SAVOX PTT unit	403900-942
SAVOX C-C500 - for SAVOX Headset	403500-944
SAVOX C-C500/C-C440 - for PELTOR headset when using SAVOX PTT	403900-953
Peltor FL5261 - for Peltor Headset	403500-952



When external equipment is connected to the radio, the right side of the display will show a headset.



Impact on radio operation

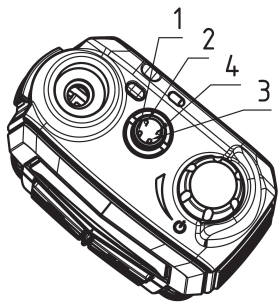
The external equipment can have a built-in PTT button, speaker and microphone. Thus a connection has per default the following impact on the radio operation:

- If a speaker or earpiece is built into the detected external equipment, the sound device of the external equipment is used, and the internal radio speaker is disabled.

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- The external accessory microphone is selected as audio input device, when the external PTT button is pressed. The transceiver microphone is used as audio input device when the transceiver PTT button is pressed.
- This behaviour can be changed in the service tool.

Accessorie connector



Pin 1. Loudspeaker,
minimum 8 ohm impedance.

Pin 2. Accessory power,
3.5V maximum 13mA.

Pin 3. Microphone input,
Ri = 2.2kohm, 3V phantom power.

Pin 4. GND.

Accessories

List of accessories

The following accessories are delivered with your radio:

Accessory	Part number
ATEX Primary battery (orange, non-rechargeable), B3503	403503A
ATEX Secondary battery (blue rechargeable), B3504	403504A
ATEX Charger, CH3507	403507B
AC/DC converter, length 150cm (100-240V~ /12VDC out)	88-125538
12-24VDC Connection cable, length 150cm	37-124381
Belt clip	62-124320
Antenna	88-124370
Lanyard	41-124375
User Manual (this manual)	98-124307

Batteries, charger, AC/DC Converter and **12VDC Connection** are described in Batteries on page 13.

To mount the **antenna**, simply screw it into the threaded bush at the top of the radio.

Use of **lanyard** is only for hand held operation. Put it around the wrist to prevent dropping the radio.

Accessories you may buy

Accessory	Part number
ATEX Compact Charger CH3505	403505A
ATEX Dual Position Charger CH3508	403508B
ATEX Leather Case with shoulder strop	403500-207

Leather Case



Warning!

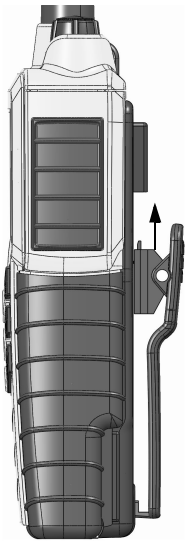
The display must always be kept away from the body to reduce the RF explosure when body worn.

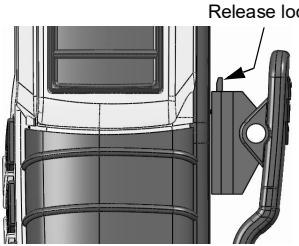
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Attaching and removing the belt clip

To attach the belt clip, slide the belt clip upwards into the rails at the back of the radio until it locks.

To remove the belt clip, press the projection at the top of the belt clip to release the lock and slide the belt clip downwards out of the rails.

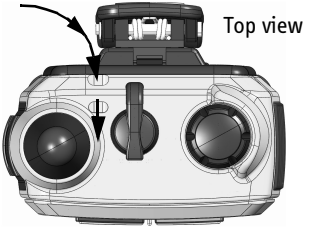




Attaching the lanyard

Do as follows:

1. Take the lanyard through the eye at the top of the radio.
2. Put one end of the lanyard through the loop at the other end of the lanyard and pull to tighten.



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Troubleshooting

Displaying errors

Some errors result in an error message in the display. These error messages are listed below.

Display text	Problem	Type	Actions
Err EMPTY BAT	The battery voltage is below a critical level, where further operation would damage the battery.	Severe. Radio is non-functional.	Change/recharge the battery.
Err HW ERR	Hardware error.	Severe. Radio is non-functional.	Service required.
ILLEGAL	Context fails operation. This text will appear on the following occasions: • Multiple watch is selected on channel 16, or in channel regions where it is not allowed. • High power is selected on a channel where it is prohibited. • Transmission on blocked channels	Fail operation	Consider operation in a different context.

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Technical specifications

Technical data SP3540

General

Item	Specification
RX frequency range	155.000 - 163.425 MHz
TX frequency range	155.000 - 161.450 MHz
Modulation	16K0G3E
Power supply	7.4 VDC Li battery
Current drain at 2 W TX	1.2 A
Current drain at 1 W TX	0.8 A
Current drain RX max audio	0.25 A
Antenna port	50 ohm
Primary Battery	Lithium Iron Disulfide, 3000 mAh
Secondary Battery	Lithium-Ion, 1650 mAh rechargeable
Operating temperature	-20°C to +55° C
Water ingress protection	IP67
Frequency stability	Better than ±0.7 kHz
Weight with emergency battery	390g

Transmitter

Item	Specification
RF output power	2 W /1 W
RF output power, Canada	1.7 W ±0.7 dB / 0.8 W ±1 dB
Max deviation	±5 kHz
Spurious emission	< 0.25 uW
Adjacent channel power	> 70 dB

Receiver

Item	Specification
Sensitivity (20 dB SINAD)	-117 dBm typical
Intermodulation	Better than 70 dB
Spurious response	> 70 dB
Adjacent channel selectivity	> 70 dB
Audio output, internal	0.25 W at 10% dist.
Audio output, external	0.25 W/8 ohm

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Battery life guidelines

Primary battery (non-rechargeable)

The primary non-rechargeable battery pack is capable of providing sufficient power for the specified 8 hours according to regulations.

The expiry date printed on the battery label is valid when the battery is stored at temperatures below +40°C.

The expiry date will typically be more than 5 years from the purchase date.

Replace the battery at or before this date.

To ensure a long lifetime keep the battery in the store position in the charger and avoid high temperature and direct sunlight.

Secondary battery (rechargeable)

Note New batteries should be placed in the charger for minimum 12 hours first time.

During daily use, always keep the battery fully charged and away from hot areas.

Keep the battery terminals dry and clean.

Never discharge beyond the specifications of the battery.

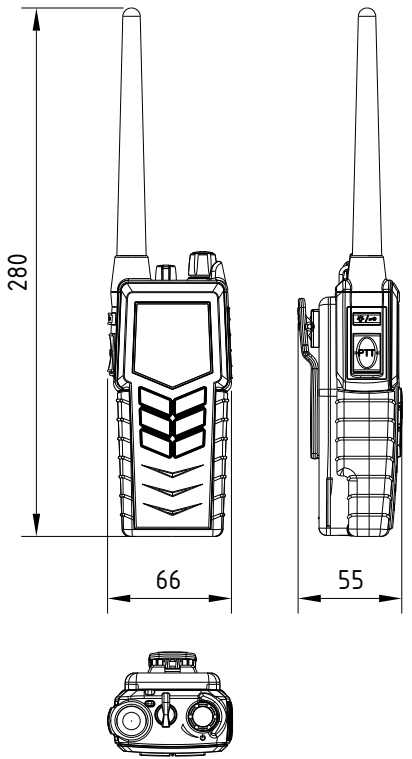
Operation/Standby time depends on usage. Generally, the more the radio is transmitting, the faster it will drain the battery. Also, the “Hi” power setting will drain the battery faster than the “Lo” setting.

Approximate figures are:

- A battery can be stored for 4 to 6 month at 25°C if charged to 40%.
- The battery will normally last for 5 to 9 hours of use on a fully charged battery.

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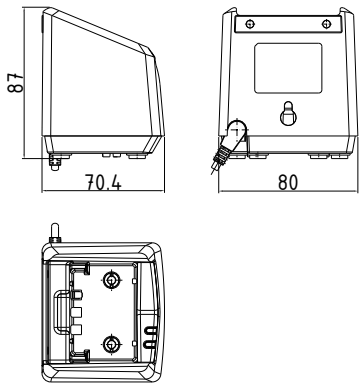
Dimensional drawing, transceiver



1724000452-QC-DB-00462-01556

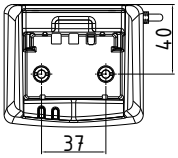
Dimensional drawing, chargers

CH3505

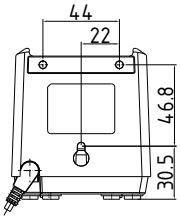


Mounting Possibillities

Desktop mounting, top view

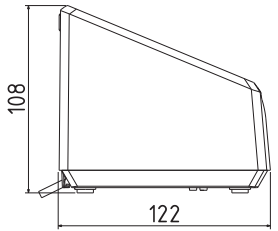


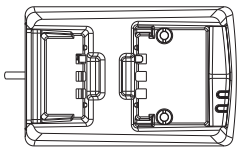
Wall mounting, rear view



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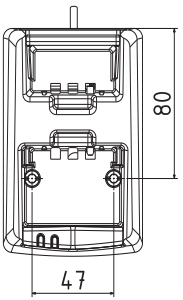
CH3507 and CH3508



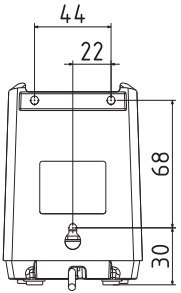


Mounting Possibillities

Desktop mounting, top view



Wall mounting, rear view



Declarations of Conformity

COBHAM

Thrane & Thrane A/S

Declaration of Conformity with ATEX Directive 2014/34/EU

The object of the declaration described below is in conformity with the relevant Union harmonization legislation: Directive 2014/34/EU.

Equipment

SAILOR SP3540	ATEX Portable maritime VHF GMDSS radiotelephone	PN = 623540A
SAILOR B3503	ATEX Primary Battery	PN = 403503A
SAILOR B3504	ATEX Rechargeable Li-Ion Battery	PN = 403504A

Associated equipment for use in non-ATEX area

SAILOR CH3505	Battery Compact Charger for ATEX	PN = 403505A
SAILOR CH3507	Battery Charger for ATEX	PN = 403507B
SAILOR CH3508	Dual Battery Charger for ATEX	PN = 403508B
	AC/DC Adapter	PN = 88-125538

Equipment Applicability

SAILOR SP3540 is a simplex/semi duplex VHF radiotelephone, designed for maritime communication within the Global Maritime Distress and Safety System, GMDSS.
SAILOR SP3540 is able to operate on all international VHF channels.

Declaration

The requirement with respect to the ATEX Directive 2014/34/EU is met by conforming to the harmonized EU standards EN 60079-0:2018 and EN 60079-11:2012.
SP3540 meets the ATEX requirement for gas environments of class II 2 G Ex ib IIC T4
SP3540 also meets the requirement for Ingress Protection to the level of IP67.

Manufacturer

Thrane & Thrane A/S Lundtoftegårdsvej 93D, 2800 Kgs. Lyngby, Denmark
Industrivej 30, 9490 Pandrup, Denmark

Certificate

TÜV 08 ATEX 353822 X

Place and Date

Pandrup, 18 January, 2021

Program Director R&D
Peter Haslev

2261

MANAGEMENT SYSTEM CERTIFICATION DNV·GL ISO 9001 = ISO 14001

Document number: 99-129012-G

Thrane & Thrane A/S trading as Cobham SATCOM
Lundtoftegårdsvej 93D, 2800 Kgs. Lyngby, Denmark
T +45 39 55 88 00 · F +45 39 55 88 88 · Comp. reg: 65 72 46 18 · SATCOM.info@cobham.com · cobham.com

Translation

(1) EC-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 94/9/EC**

(3)	**Certificate Number**	**TÜV 08 ATEX 353822 X**
(4)	for the equipment:	Radio Transceivers Type: SAILOR SP3540 VHF GMDSS
(5)	of the manufacturer:	**Thrane & Thrane A/S**
(6)	Address:	Porsvej 2 DK-9200 Aalborg SV, Denmark
	Order number:	8000353822
	Date of issue:	2008-12-29

(7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, notified body No. 0044 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 08 203 353822.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2006 **EN 60 079-11:2007**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

Ex **II 2G Ex ib IIC T4**

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body

Schwedt

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(13) **SCHEDULE**

(14) **EC-Type Examination Certificate No. TÜV 08 ATEX 353822 X**

(15) Description of equipment

The ATEX VHF radio transceiver type SP3540 VHF GMDSS are designed as intrinsically safe for use onboard ships and on land in classified areas Zone 1 and Zone 2.
The SP3540 is a special GMDSS approved radio for use in emergency situations onboard ships. SP3540 are orange and are supplied either from the ATEX Primary battery type B3503 or alternatively the Secondary battery type B3504. The ATEX Primary battery B3503 is orange and can not be charged. The ATEX Secondary battery B3504 is blue and is rechargeable. Charging takes place in the belonging non ATEX charger. Charging takes place outside protected ATEX area.
Both the primary and the secondary batteries are constructed with intrinsically safe connection facilities and they can be changed inside the hazardous area and fulfils Ex ib IIC T4 specifications.
The cabinet of the radio is designed to fulfil antistatic ATEX requirements even without the accessory leather case.

Technical data

The accessory interface connector on top of radio is intrinsically safe with the following entity parameters:

Uo: 8.4 V
Io: 0.45 A
Lo: 10 µH
Co: 150 nF

Only ATEX certified accessories matching the above mentioned entity parameters must be connected.

Approved accessories:

Charger CH3505	403505A
Charger CH3507	403507B
Charger CH3508	403508B
VHF Antenna	88-124370-A
VHF Antenna	62-124370
Lanyard	41-124375-A
Belt clips	62-124320
Leather case	403500-207
Service cable	403500-958

Ingress protection: IP 67

Permitted range of the ambient temperature - 20 °C to +55 °C

(16) Test documents are listed in the test report No. 08 203 353822.

page 2/3

Schedule EC-Type Examination Certificate No. TÜV 08 ATEX 353822 X

(17) Special conditions for safe use the following 2 conditions should be added:

- Do not change the battery in wet or humid environments.
- Always keep battery connectors dry and clean.
- Use only with Sailor ATEX approved accessories.
  Alternatively ATEX approved accessories in compliance
  with the accessory connector ATEX specification may be used.
- Do not change accessories in wet or humid environments.
- Do not charge the battery in hazardous area.
- For charge of battery use
  Part no: 403505A - ATEX CH3505 Compact Charger,
  Part no: 403507B - ATEX CH3507 Single Position Charger or
  Part no: 403508B - ATEX CH3508 Dual Position Charger
- Use only battery type Sailor B3503 or B3504.
- Do not use a mechanically damaged radio.
- Unpacking of the radio and accessories and the removal of the protective film in front of the display window must not take place in the ATEX protected area.

(18) Essential Health and Safety Requirements

no additional ones

page 3/3

Attention

Gore-Tex Membrane

To keep the VHF watertight, is it very important that the Gore-Tex membrane under no circumstances must be damaged/covered or removed.

That is, do not remove the Gore-Tex membrane or place any labels in the area.



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Science.
Applied to Life.™

3M™ PELTOR™ TWIN CUP Headset IECEx/ATEX

Technical Data Sheet

Description

The 3M™ PELTOR™ TWIN CUP Headset IECEx/ATEX has high-attenuating shells with optimised acoustic design and excellent space for the ears, as well as a noise compensated microphone for clear and reliable communication.

Key Features

- IECEx/ATEX approved for use in areas where intrinsic safety is required
- Dynamic noise-cancelling microphone
- TWIN CUP technique for increased attenuation

Applications

The PELTOR™ TWIN CUP IECEx/ATEX approved headset, is designed to be used in industrial areas where intrinsic safety is required.

Standards

These TWIN CUP headsets have been tested by an accredited laboratory in accordance with the requirements specified in the Australian/New Zealand Standard AS/NZS1270:2002.

Declaration(s) of Conformity are available at www.3M.com/Hearing/certs.

Approvals

The product has been approved for use in potentially explosive environment according to ATEX directive and IEC Ex. Product marking: II 2 G Ex ib IIC T4 Gb, Ta : -20°C to +50°C IEC Ex certificate number: IECEx NEM 09ATEX1119X



MT7H72H540P3E-50



MT7H72H540A

Quick Reference

	3M™ PELTOR™ TWIN CUP Headsets IECEx/ATEX	
	Headband (Available Q4 2023) MT7H72H540A	Helmet Attach MT7H72H540P3E-50
Attenuation Data		
SLC80	31dB	30dB
Class	5	5
Tested to	AS/NZS1270:2002	AS/NZS1270:2002
Physical Properties		
Clamp Force	11.4 N	10.9 N
Weight (Batteries Included)	387g	400g
Material Listing		
Cup	ABS Plastic	
Headband	PVC, PA, Stainless Steel Wire	N/A
Helmet Attachment Arm / Neckband	N/A	Stainless Steel Wire
Cable	PE,TPE	
Two-Point Fastener	POM	
Cushion	PVC covered PUR foam	
Insert (Liner)	PUR foam	
Speech Microphone	ABS,PA	
Connection Cord	Insulated with flexible polyurethane and with a moulded connector.	
Specifications		
Wired connectivity	Nexus TP-120 connector	
Microphone/ Type	Noise cancelling dynamic microphone Sensitivity: -60dB+-3dB (0dB=1V/Pa @ 1 kHz) Impedance: 230 Ω +20% -10%	
Speakers	230 Ohm +/-10%	
Operating temperature	–20 °C (–4 °F) to 50 °C (122 °F)	
Storage temperature	–20 °C (–4 °F) to 40 °C (104 °F), <90% humidity	
Product lifetime	Up to 5 years (excl. batteries)	
Level Dependent Microphone for Ambient Listening	N/A	
Other		
Colour	Blue	
Hygiene Kit	HY13	
Compatible with 3M™ E-A-Rfit™ Validation System	No	Yes
Helmet Attachment Backplate	N/A	On Product P3E (30mm)

Use limitation: Never modify or alter this product.

Fitting Instructions

Inspect the hearing protector before each use. If damaged, select an undamaged hearing protector or avoid the noisy environment.

When additional personal protective equipment is necessary (e.g. safety glasses, respirators, etc.), select flexible, low profile temples or straps to minimize interference with the earmuff cushion. Remove all other unnecessary articles (e.g. hair, hats, jewelry, headphones, hygiene covers, etc.) that could interfere with the seal of the earmuff cushion and reduce the protection of the earmuff.

Headband Headset

To fit the hearing protector:

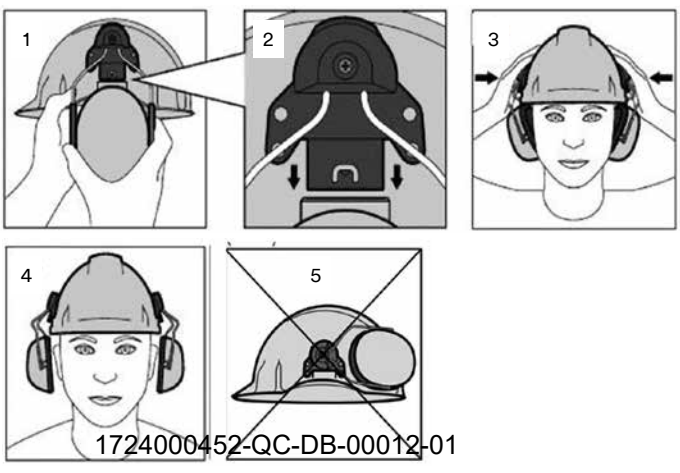
1. Slide out the cups and tilt the top of the cup out, as the cable must be on the outside of the headband (Fig 1).
2. Pull the cups apart and place the ear muffs over the ears so that the cushions form a snug seal around the ears.
3. Adjust the height of the cups by sliding them up or down while holding the headband in place (Fig 2).
4. The headband should be positioned across the top of your head (Fig 3).



Helmet Attach Headset

To fit the hearing protector:

- **Fit the cup:** Push the attachment blade firmly into the slot on the side of the helmet until it clicks into place (Fig 1 & 2)
- **Working position:** With the cups over the ears press the arms inwards until you hear a click on both sides indicating a firm seal (Fig 3).
- **Stand-by position:** Lift the cups to the fixed stand-by position. In a noisy environment the ear muffs must be worn in the working position at all times (Fig 4).
- **Parking position:** First lift the cups to the stand-by position (Fig 4), then rotate them up to the next fixed position.
- **Ventilation mode:** Avoid placing the cups against the helmet as this prevents ventilation (Fig 5).
- **Storage Position:** When the helmet is not in use, lower the earmuffs and press them inward. Keep the cups clean and dry and store at normal room temperature.



Fit Check

When hearing protectors are correctly worn, your voice should sound hollow and sounds around you should not sound as loud as before.

Hearing Protector Fit Testing the 3M™ E-A-Rfit™ Dual-Ear Validation System

The success of your hearing conservation program requires more than offering earplugs or earmuffs. Each worker needs to wear the most effective hearing protector for the environment and the correct fit for their unique anatomy.

With 3M™ E-A-Rfit™ Dual-Ear Validation System, you can quickly identify how much protection each worker receives from their 3M hearing protectors.

The Technology Behind 3M™ E-A-Rfit™

The 3M™ E-A-Rfit™ Dual-Ear Validation System is based on Field Microphone-In-Real Ear (F-MIRE) technology that measures the effectiveness of hearing protectors from inside a worker's ears, providing accurate, quantitative results.

The tester wears a pair of modified 3M™ probed hearing protectors connected to a dual-element microphone. A loudspeaker is placed in front of the tester. When it emits a broadband noise, the dual-element microphone measures the signal in the ear canal and outside the ear plug. In less than five seconds, the difference between the two measurements is calculated and a Personal Attenuation Rating (PAR) is displayed.

It Starts with PAR

The 3M™ E-A-Rfit™ Validation System puts the worker in the context of their noise environment and helps you understand their level of attenuation.

The results you get from the 3M™ E-A-Rfit™ is displayed as a PAR. The PAR is a numerical value that shows the reduction in sound level within the ear when a hearing protector is worn. The resulting PAR, combined with the worker's exposure to noise, is used to determine if a worker is receiving appropriate protection from the noise hazard.

Knowing the PAR lets you identify workers who are inadequately protected, so you can provide real-time intervention and training.

Key Benefits of the 3M™ E-A-Rfit™ Dual-Ear Validation System include:

- Tests both ears simultaneously in less than 5 seconds
- Science-based, quantitative testing
- Fast, clear, and accurate results
- Tests 7 frequencies 125Hz to 8000Hz
- 3M™ Earplug, earmuff and headset (comms) testing capability

Contact your 3M Personal Safety Specialist to find out more about our 3M™ E-A-Rfit™ Dual-Ear Validation System or for assistance in solving your complex or day-to-day hearing conservation challenges

Attenuation Data

3M™ PELTOR™ TWIN CUP Headset, Headband MT72H540A-50 **AS/NZS 1270:2002**

Test Frequency (HZ)	125	250	500	1000	2000	4000	8000	SLC_{80}	Class	Clamp Force	Mass
Mean Attenuation (dB)	19.1	23.4	33.2	35	33.1	37.1	34.1	31dB	5	11.3 N	387g
Standard Deviation (SD) (dB)	4.9	3.7	3	3.1	2.8	3.1	4.4				
Means minus SD (dB)	14.2	19.7	30.2	31.9	30.3	34	29.7				

Hearing protector Class 5 tested to AS/NZS1270. When selected, maintained as specified in AS/NZS1269, this protector may be used in noise up to 110dB(A) assuming an 85dB(A) criterion. A lower criterion may require a higher protection class.

3M™ PELTOR™ TWIN CUP Headset, Helmet Attach* MT7H72H540P3E-50 **AS/NZS 1270:2002**

Test Frequency (HZ)	125	250	500	1000	2000	4000	8000	SLC_{80}	Class	Clamp Force
Mean Attenuation (dB)	23.1	24.9	34.5	34.5	31.3	39.6	37.0	30dB	5	10.9 N
Standard Deviation (SD) (dB)	3.5	5.9	5.2	4.3	3.0	3.9	3.7			
Means minus SD (dB)	19.6	19.0	29.3	30.2	28.3	35.7	33.3			

Hearing protector Class 5 tested to AS/NZS1270. When selected, maintained as specified in AS/NZS1269, this protector may be used in noise up to 110dB(A) assuming an 85dB(A) criterion. A lower criterion may require a higher protection class.

* These earmuffs were tested in combination with the HC600 industrial safety helmet using the P3G adapter and may give different levels of protection if fitted to different helmets.

Mean = Mean attenuation value derived from testing in accordance with AS/NZS 1270:2002.
SD = Standard Deviation derived from testing in accordance with AS/NZS 1270:2002.
Mean-SD = Mean attenuation value minus Standard Deviation
SLC_{80} = Single number rating commonly used in Australia and New Zealand to compare acoustic performance of hearing protectors. The subscript '80' indicates that in well managed hearing protector programs, the protection provided is expected to equal or exceed the SLC80 in 80% of protector-wearer noise spectrum combinations.
Class = A simplified process for selecting hearing protectors based on the wearers 8-hour equivalent continuous A-weighted sound pressure level.

3M strongly recommends personal fit testing of hearing protectors. Research suggests that users may receive less noise reduction than indicated by the attenuation label value(s) on the packaging due to variation in fit, fitting skill, and motivation of the user. Refer to applicable regulations and guidance on how to adjust attenuation label value(s). In the absence of applicable regulations, it is recommended that the attenuation label value(s) be reduced to better estimate typical protection.

The effectiveness of a hearing protector reduces dramatically when the hearing protector does not fit properly, is incorrectly inserted or is not worn 100% of the time during ALL hazardous noise events. Removal of the hearing protector, even for brief moments, substantially reduces protection and greatly increases the risk of hearing damage.

Cleaning and Maintenance

Follow recommended care and cleaning instructions in order to maintain best noise reduction and function.

Cleaning

- Use a cloth wetted with soap and warm water to clean the outer shells, headband and ear cushions.

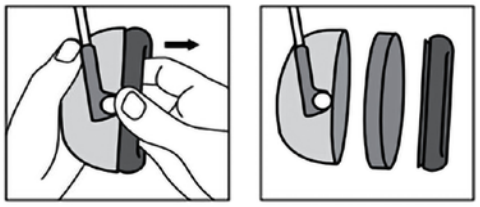
NOTE: Do NOT immerse the hearing protector in water.

If the hearing protector gets wet from rain or sweat, turn the earmuffs outwards, remove the ear cushions and foam liners, and allow to dry before reassembly. The ear cushions and foam liners may deteriorate with use and should be examined at regular intervals for cracking or other damage. When used regularly, 3M recommends replacing the foam liners and ear cushions at least twice a year to maintain consistent attenuation, hygiene, and comfort. In hot and humid environments more frequent changes may be required to maintain acceptable hygiene. If an ear cushion is damaged, it should be replaced.

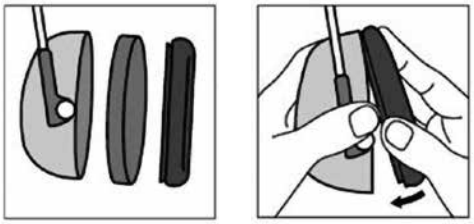
Maintenance - Changing the Hygiene Kit

Cushions and inserts can be replaced by using the approved Hygiene Kits for your 3M™ PELTOR™ Product. See 'Ordering Information' section.

1. Remove the cushions and inserts as shown.



2. Replace the worn or damaged cushions and insert with the new pair from the approved hygiene kit.



- 3M™ PELTOR™ HY100A Clean Hygiene Pads can be applied onto the earmuff cushions to help absorb sweat and moisture for improved comfort and hygiene.

Storage

- Store the product in a clean and dry area before and after use.
- Always store the product in the original packaging and away from any sources of direct heat or sunlight, dust and damaging chemicals.
- Storage temperature range:–20°C (–4°F) to 40°C (104°F).
- Relative humidity: <90%.
- For headband versions: make sure that no force is applied to the headband and that the cushions are not compressed.
- Helmet attachment version: ensure the earmuffs are in the storage position and that the cushions are not compressed.

Disposal

If the product is to be disposed*, it should be disassembled and disposed of as solid waste. Please see local authority regulations for disposal advice and locations.

*Discard the product within 5 years from date of manufacture or immediately if damaged or cannot be cleaned.

Australia: Customers must refer to their Local Council Muncipal area for disposal of electronics at their end of life.

New Zealand: Customers must dispose of electronics at their end of life in their local e-waste disposal bins.

Ordering Information

3M Code	Model #	Description
Headsets		
UU011743018	MT72H540A-50	3M™ PELTOR™ WS™ TWIN CUP IECEx/ATEX Headset, Headband
XH001674254	MT72H540P3E-50	3M™ PELTOR™ WS™ TWIN CUP IECEx/ATEX Headset, Helmet attach
Accessories - Helmet Adaptors/Backplates		
UU010853503	Z3GS/2 (25mm)	Helmet Adapter for 3M™ Scott Safety Helmets and 3M™ Scott Safety Visor Range
XL001642468	Z3E/2 (30mm)	Helmet Adapter for Common Helmets
XL001642484	Z3G/2 (25mm)	Helmet Adapter for 3M™ Visor Range
Accessories - Hygiene		
XH001659297	HY13	3M™ PELTOR™ HY13 Hygiene Kit
XH001651351	HY100A	3M™ PELTOR™ HY100A Clean Hygiene Pad
Accessories - Microphone		
UU008159483	M171/2	3M™ PELTOR™ M171/2 Wind shield/Wind protector, 2 pcs for speech microphone
AT010580697	HYM1000	3M™ PELTOR™ HYM1000 Microphone protection
3M™ E-A-Rfit™ Dual-Ear Validation System - Probe		
70071691110	393-3001-2	3M™ PELTOR™ Earmuff Probed Test Cushion B

In the box

- 1 × 3M™ PELTOR™ TWIN CUP Headset IECEx/ATEX
- 1 x User Instruction

Warning

These hearing protectors help reduce exposure to hazardous noise and other loud sounds. Misuse or failure to wear hearing protectors at all times that you are exposed to noise may result in hearing loss or injury. For proper use, see supervisor, User Instructions, or call 3M TechAssist Helpline 1800 024 464.

Always ensure the hearing protection device (HPD) is:

- Suitable for the application;
- Fitted correctly;
- Worn during all periods of exposure;
- Replaced when necessary.

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SECTION 2
-
TEST RECORD

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2.1

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FAT REPORT

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Base Load Power Hub (BLPH)

FAT REPORT – TELECOM EQUIPMENT

Document Number: 1724000452-QC-RE-00009

Document Class: 2

Luigi Pignatelli
ON BEHALF OF CROSSWIND
DATE 13/9/24 WR

FORES ENGINEERING Srl
Luca Pizzigati
Project Quality Control Manager
☒ Witness ☐ Review
13/09/2024

01	11/09/2024	Accepted for Construction (AFC)	L.Pizzigati	G.Rossini	M.Manenti
00	09/08/2024	Issue for Information (IFI)	L.Pizzigati	L.Cavallini	M.Manenti
Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Accepted for Costruction (AFC)

HOLDS LIST

No.	Description
1	
2	
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4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.



Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

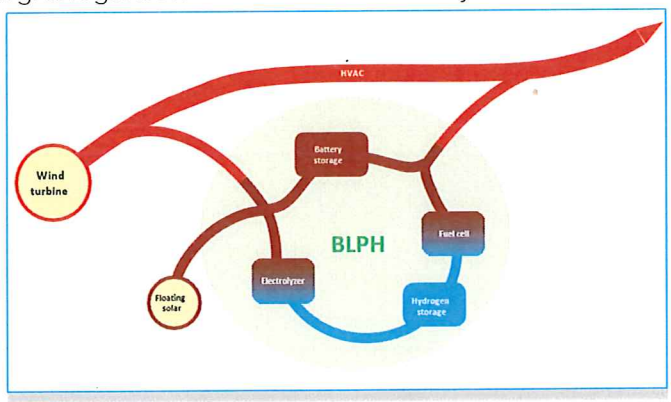


Figure 3 - BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting

wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document lists the checks and the tests to be carried out to verify conformity to supply specification of project equipment.

2.1 REFERENCES

Doc. No.	Description
1724000452-QC-ITP-00004	INSPECTION AND TEST PLAN – TELECOM EQUIPMENT
1724000452-TL-DS-00005	EQUIPMENT DATASHEETS – TELECOM EQUIPMENT
1724000452-TL-LIS-00006	EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT
1724000452-COM-LIS-00014	SPARE PARTS LIST – TELECOM EQUIPMENT

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 FACTORY ACCEPTANCE TEST REPORT

3.1 VISUAL AND DIMENSIONAL CHECK REPORT

3.1.1 IDCS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of IDCS material	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.1.1, 2.1.2, 2.1.3, 2.1.4 and 2.1.5	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 1 to 27 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	✓		
2	Mechanical damage check	No mechanical damage	✓		
3	Equipment quality check	Equipment in compliance with related Data sheet	✓		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	✓		
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents	✓		
6	Certificated check	Compliance with Reference Documents	✓		

Remarks

FORES ENGINEERING FORLI' - ITALY

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PITIGLIANI	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNATELLI	

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept. 13/09/24

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3.1.2 NAVIGATION AIDS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of navigation aids material	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10 and 2.2.11	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 28 to 39 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	✓		
2	Mechanical damage check	No mechanical damage	✓		
3	Equipment quality check	Equipment in compliance with related Data sheet	✓		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	✓		
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents	✓		
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard	✓		
7	Certificated check	Compliance with Reference Documents	✓		

Remarks

FORES ENGINEERING FORLI' - ITALY

Test attendant			Name and surname	Signature
	Completed by	FORES	LUCA PITIGLIO	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNATELLI	

ROSETTI MARINO SpA
Stefano Binari
Quality Control Dept. 13/09/24

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3.1.3 RADIO SYSTEM MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of UHF portable radio	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.3.1, 2.3.2, 2.3.3, 2.3.4 and 2.3.5	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 40 to 45 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	✓		
2	Mechanical damage check	No mechanical damage	✓		
3	Equipment quality check	Equipment in compliance with related Data sheet	✓		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	✓		
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents	✓		
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard	✓		
7	Certificated check	Compliance with Reference Documents	✓		

Remarks

FORES ENGINEERING FORLI' - ITALY

			Name and surname	Signature
Test attendant		FORES	LUCA PITIGAZY	
		ROSETTI MARINO	LAURA LANDI	Laura Landi
		CROSSWIND	LUIGI PIGNATELLI	

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3.1.4 SPARE PARTS

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of spare parts	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.4.1 and 2.4.2	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-COM-LIS-00014 SPARE PARTS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items listed in the Spare Part List	
Requirements	/	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	✓		
2	Mechanical damage check	No mechanical damage	✓		
3	Equipment quality check	Equipment in compliance with related Data sheet	✓		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	✓		
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard	✓		

Remarks

FORES ENGINEERING FORLI' - ITALY

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PITIGATI	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNATELLI	

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3.2 POWER UP REPORT

3.2.1 VHF MARINE RADIO

Test Name / Test N°	RADIO POWER UP	
Test Scope	Verify the correct power up of the VHF Handheld Marine Radios.	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.2.12	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing the used channel and the battery level	✓		

Remarks

FORES ENGINEERING FORLI' - ITALY

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PIAIOLI	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNATELLI	

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13/09/24

3.2.2 DMR UHF RADIO

Test Name / Test N°	RADIO POWER UP	
Test Scope	Verify the correct power up of the DMR UHF Radios.	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.3.6	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 40 and 41 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing the used channel and the battery level	✓		

Remarks

FORES ENGINEERING FORLI' - ITALY

Test attendant			Name and surname	Signature
	Completed by	FORES	LUCA PITTALIS	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNATELLI	

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3.3 COMMUNICATION TEST REPORT

3.3.1 VHF MARINE RADIO

Test Name / Test N°	RADIO COMMUNICATION TEST	
Test Scope	Verify the correct power up of the equipment and measure the most important radio-electric technical data of the VHF Handheld Marine Radios.	
ITP Reference	1724000452-QC-ITP-00004 - Step 2.2.13	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS - TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST - TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	Both radios will be operating on the same simplex Marine channel.	✓		
2	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.	✓		
3	Connect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.	✓		
4	1) Pressing the external Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the external Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.	✓		

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5	Disconnect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is disconnected to the radio, the right side of the display will not show a headset.			Not Applicable
6	Connect only the Twin cup headset to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.			Not Applicable
7	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.			Not Applicable

Remarks

FORES ENGINEERING FORLI' - ITALY

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PITIGATI	
	Witness by	ROSETTI MARINO	LAURA LANDI	Laura Landi
		CROSSWIND	LUIGI PIGNATELLI	

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3.3.2 VHF MARINE RADIO RF CHARATERISTIC TEST

Test Name / Test N°	VHF MARINE FIXED RADIO TRANSMITTER RF CHARACTERISTIC TEST	
Test Scope	The scope of this test is to verify the TX RF Power Output in normal and emergency condition, and Tx Frequency	
ITP Reference	1724000452-QC-ITP-00004 – Step 2.2.13	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	Digital Radio Test Set	
Prerequisites	The Transmitter antenna port of VHF MARINE RADIO must be connected to Radio Test Tool at T/R Port VHF Radios are supposed to be already switched off	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	The VHF Radio displays the current working channel (e.g. channel 11).	✓		
2	Set the VHF marine Radio to transmit at high power (2 Watt)	The VHF marine radio does not show "Lo" on the display	✓		
3	Press PPT to transmit	The TX Power on the digital radio test shall be 32 dBM +/- 1 db. 32dbm = 33dbm (2Watt) – 1 db (loss value of the cable used for the measurement) TX Frequency reading shall be Frequency selected +/- 500Hz	31,5dBM (tag 001) 31,7dBM (tag 002) ✓		
4	Set the VHF marine Radio to transmit at low power (1 Watt)	the VHF marine radio shows "Lo" on the display	✓		
5	Press PPT to transmit	The TX Power on the digital radio test shall be 29 dBM +/- 1 db. 29 dbm = 30dbm (1Watt) – 1 db (loss value of the cable used for the measurement) TX Frequency reading shall be Frequency selected +/- 500Hz	28dBM (tag 001) 28dBM (tag 002) ✓		

Remarks

FORES ENGINEERING FORLI' - ITALY

Test attendant			Name and surname	Signature
	Completed by	FORES	LUCA PITIGOTTI	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNATARO	

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3.3.3 VHF MARINE RADIO ADDITIONAL FEATURES TEST

Test Name / Test N°	VHF MARINE RADIO ADDITIONAL FEATURES TEST
Test Scope	The scope of this test is to verify some additional features of the VHF RADIO
ITP Reference	1724000452-QC-ITP-00004 – Step 2.2.13
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT
Equipment Involved	Item 32 and 33 in the Equipment List
Requirements	
Prerequisites	
Notes	/

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Power up the VHF RADIO and verify that radio operates with channels according to the radio Regulations Channels : 6 12 17 67 8 13 19A 68 9 14 20A 69 10 15 27A 71 11 16 28A 72	Check that the channels are displayed on the screen	✓		
2	Locking the keypad: To lock the keypad, press and hold the Light/Lock button. To unlock the keypad, press and hold the Light/Lock button again.	The display shows a key symbol when the keypad is locked.	✓		
3	Using Squelch control To activate Squelch control, press the SQ key. To set the Squelch level, press ↑ (closing) or ↓(opening).	The display shows the Squelch level while it is adjusted, e.g. "SQ 5".	✓		

Remarks

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Test attendant			Name and surname	Signature
	Completed by	FORES	LUCA PITTIGLIO	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNATELLI	

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3.3.4 SART TEST MODE

Test Name / Test N°	SART TEST MODE	
Test Scope	This test ensures the best battery capacity available for a potential emergency. Although the Tron AIS-SART does not send an alarm via satellite, VHF or other radio communication, usage should be limited to short tests.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 28 and 29 in the Equipment List	
Requirements	The test must be conducted outdoors with a clear view to the sky to maximize the GPS location.	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Move the switch to the TEST position and hold. 	Tron AIS-SART will now run through a self-test procedure. If a RED LED flashes, it indicates a critical fault. Refer to the error codes for more information	✓		
2	Release the switch when both LEDs start flashing. The unit will now search for the GPS position. It will only search for 15 minutes max. 	A successful test is indicated by a 15 sec BEEP and a GREEN LED. 	✓		

Remarks

Tested tag Y-89-24-TSA-001

the tag 002 tested internally (see IAT Report)

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Test attendant			Name and surname	Signature
	Completed by	FORES	LUCA PITTIGNI	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI SIGNORA	

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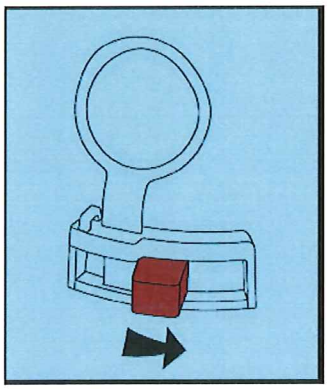
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3.3.5 EPIRB TEST MODE

Test Name / Test N°	EPIRB TEST MODE	
Test Scope	During the normal self-test, the main functionality of the EPIRB is tested. A test signal is transmitted on all frequencies (121.5 MHz, AIS and 406 MHz). These test signals will not be recognized as distress signals. While transmitting the test signals the battery and the transmitted signals are tested.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 30 and 31 in the Equipment List	
Requirements		
Prerequisites	/	
Notes	/	

Procedure

Description | **Acceptance Criteria**

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	To perform the extended self-test, do the following steps within a period of 3 seconds: 1. Move the switch to test position 2. Release to middle position 3. Move the switch to test position and release when the white test indicator lights up. 	The white test indicator LED will light up and the green GNSS indicator LED will start flashing in sequences of 3 fast flashes. This indicates that the EPIRB is searching for a validated position. When a valid position is found the green GNSS indicator LED will remain lit for approximately 1 second and a normal self-test will continue. The top light will flash once at the end of the text if the extended self-test is successful.			*

Test sequence	Position indicator	RLS indicator	Test indicator	Strobe light
Extended self-test started	-	-	On	-
Waiting for position	Triple flashes	-	-	-
Position achieved	On for 1 second	-	-	-
Self-test started	-	-	On	-
Signals transmitted	-	-	Multiple short off periods	-
RLS enabled *	-	On for 1 second	-	-
Extended self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			Multiple flashes**	

*For EPIRBs with RLS disabled the RLS indicator will remain off.
**See table in section 3.5.3 for on failure indications.

Remarks
IS NECESSERY TO SET INSTRUMENT WITH VALUE OF HHSA CODE. CW WILL GIVE CODE TO RM FOR TEST DURING COMMISSIONING.

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PITIGARI	
	Witness by	ROSETTI MARINO	LAURA LANDI	
		CROSSWIND	LUIGI PIGNAGELLI	

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FORES ENGINEERING FORLI' - ITALY

2.2
-
SAT REPORT

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Base Load Power Hub (BLPH)

SAT REPORT – TELECOM EQUIPMENT

Document Number: 1724000452-QC-RE-00010

Document Class: 3

ROSETTI MARINO

1 X	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
Marco Mastroforti	14/05/2025

02	09/04/2025	Issue for Information (IFi)	L.Pizzigati	G.Rossini	S.Montanari
01	11/10/2024	Issue for Information (IFi)	L.Pizzigati	G.Rossini	M.Manenti
00	09/08/2024	Issue for Information (IFi)	L.Pizzigati	L.Cavallini	M.Manenti
Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFi)
02	Issue for Information (IFi)

HOLDS LIST

No.	Description
1	
2	
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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

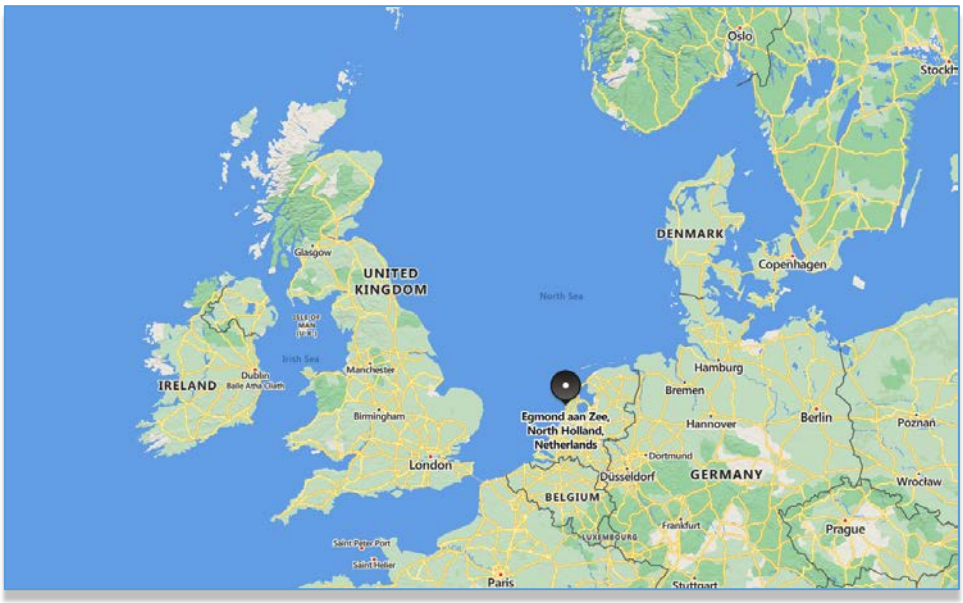


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

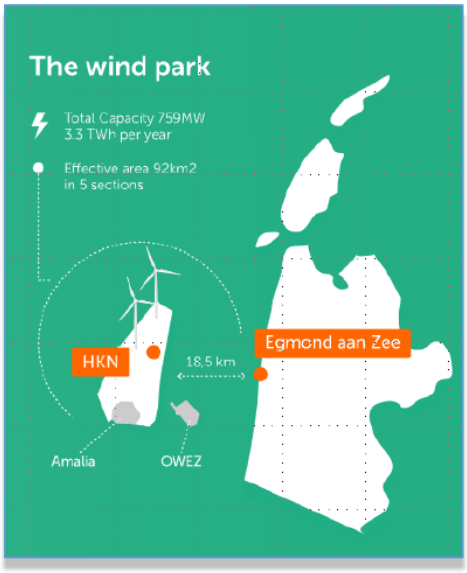


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

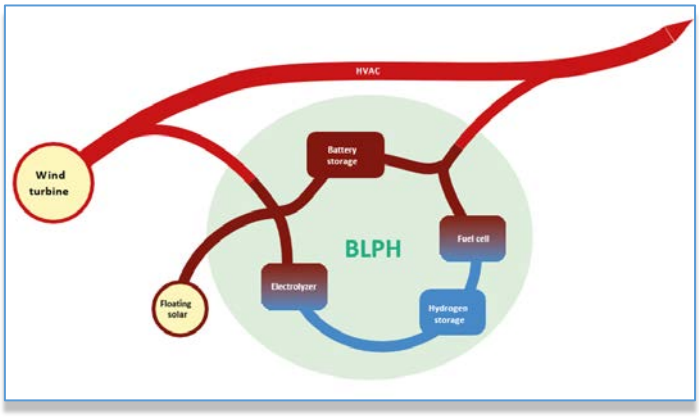


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power

output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document lists the checks and the tests to be carried out to verify conformity to supply specification of project equipment.

2.1 REFERENCES

Doc. No.	Description
1724000452-TL-DS-00005	EQUIPMENT DATASHEETS – TELECOM EQUIPMENT
1724000452-TL-LIS-00006	EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT
1724000452-COM-LIS-00014	SPARE PARTS LIST – TELECOM EQUIPMENT

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	CROSSWIND
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 SAT REPORT

3.1 VISUAL AND DIMENSIONAL CHECK REPORT

3.1.1 IDCS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of IDCS material	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 1 to 27 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet			
2	Mechanical damage check	No mechanical damage			
3	Equipment quality check	Equipment in compliance with related Data sheet			
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List			

Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

3.1.2 NAVIGATION AIDS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of navigation aids material	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 28 to 39 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet			
2	Mechanical damage check	No mechanical damage			
3	Equipment quality check	Equipment in compliance with related Data sheet			
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List			

Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

3.1.3 RADIO SYSTEM MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of UHF portable radio	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 40 to 45 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet			
2	Mechanical damage check	No mechanical damage			
3	Equipment quality check	Equipment in compliance with related Data sheet			
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List			

Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

3.1.4 SPARE PARTS

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of spare parts	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-COM-LIS-00014 SPARE PARTS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items listed in the Spare Part List	
Requirements	/	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet			
2	Mechanical damage check	No mechanical damage			
3	Equipment quality check	Equipment in compliance with related Data sheet			
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List			

Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

3.2 FUNCTIONAL TEST

3.2.1 DMR UHF RADIO POWER UP AND VERIFY CONFIGURATION UPLOADED

Test Name / Test N°	RADIO POWER UP AND VERIFY CONFIGURATION UPLOADED	
Test Scope	Verify the correct power up and the Configuration Uploaded of the DMR UHF Radios.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 40 and 41 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing “out of range” and the battery level			
2	From the menu, select Utilities→Radio Info To check on the site information, select **Site Info**.	Site Alias and site ID are shown on the screen. Site Alias : **OFFSHORE** Site ID : **1**			
3	From the menu, select Utilities→Radio Info To check on your radio ID and alias, select **My ID**.	Name and Number are shown on the screen. For UHF Radio mobile Y-89-06-THU-001: Name : **CW HKN – 5002** Number : **00005002** For UHF Radio mobile Y-89-06-THU-002: Name : **CW HKN – 5003** Number : **00005003**			
4	From the menu, select Utilities→Radio Info To check on the firmware and Codeplug versions, select **Versions**	Firmware Version and CP version are shown on the screen Firmware Ver.: **R02.22.03.1001** CP Version **: 22.23.06**			
5	To check on the latest software update information, select **SW Update**.	Updated Date and Updated Time are shown on the screen Updated Date: **2024-07-19** Updated Time: **08.53.07**			

Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

3.2.2 VHF MARINE POWER UP AND COMMUNICATION TEST

Test Name / Test N°	RADIO POWER UP AND COMMUNICATION TEST	
Test Scope	Verify the correct power up and communication of the VHF Handheld Marine Radios.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	VHF Radios are supposed to be already switched off	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	Both radios will be operating on the same simplex Marine channel.			
2	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.			
3	Connect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.			
4	1) Pressing the external Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the external Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.			
5	Disconnect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is disconnected to the radio, the right side of the display will not show a headset.			

Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

3.2.3 VHF MARINE RADIO ADDITIONAL FEATURES TEST

Test Name / Test N°	VHF MARINE RADIO ADDITIONAL FEATURES TEST	
Test Scope	The scope of this test is to verify some additional features of the VHF RADIO	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements		
Prerequisites		
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Power up the VHF RADIO and verify that radio operates with channels according to the radio Regulations Channels : 6 12 17 67 73 78A 8 13 19A 68 74 79A 9 14 20A 69 75 (L) 87 10 15 27A 71 76 (L) 88 11 16 28A 72 77	Check that the channels are displayed on the screen			
2	Locking the keypad: To lock the keypad, press and hold the Light/Lock button. To unlock the keypad, press and hold the Light/Lock button again.	The display shows a key symbol when the keypad is locked.			
3	Using Squelch control To activate Squelch control, press the SQ key. To set the Squelch level, press ↑ (closing) or ↓(opening).	The display shows the Squelch level while it is adjusted, e.g. “SQ 5”.			

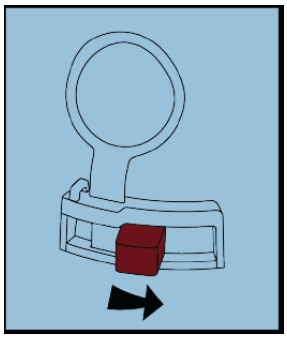
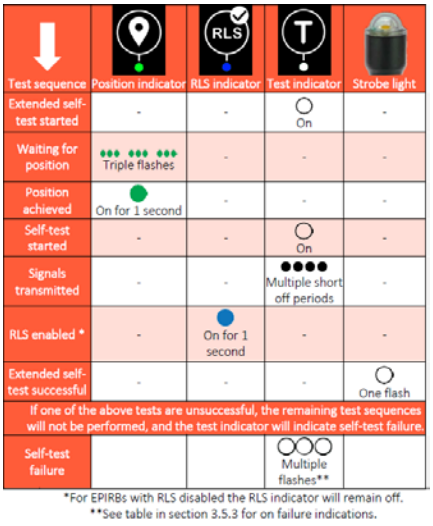
Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

3.2.4 EPIRB TEST MODE

Test Name / Test N°	EPIRB TEST MODE	
Test Scope	During the normal self-test, the main functionality of the EPIRB is tested. A test signal is transmitted on all frequencies (121.5 MHz, AIS and 406 MHz). These test signals will not be recognized as distress signals. While transmitting the test signals the battery and the transmitted signals are tested.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 30 and 31 in the Equipment List	
Requirements	This Test can be only done and passed if the EPIRB is programmed before Testing.	
Prerequisites	EPIRB must be configured before test and registered before use. This allows the SAR authorities to retrieve information about you and your emergency contacts in an emergency.	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	To perform the extended self-test, do the following steps within a period of 3 seconds: 1. Move the switch to test position 2. Release to middle position 3. Move the switch to test position and release when the white test indicator lights up. 	The white test indicator LED will light up and the green GNSS indicator LED will start flashing in sequences of 3 fast flashes. This indicates that the EPIRB is searching for a validated position. When a valid position is found the green GNSS indicator LED will remain lit for approximately 1 second and a normal self-test will continue. The top light will flash once at the end of the text if the extended self-test is successful. 			

Test sequence	Position indicator	RLS indicator	Test indicator	Strobe light
Extended self-test started	-	-	On	-
Waiting for position	Triple flashes	-	-	-
Position achieved	On for 1 second	-	-	-
Self-test started	-	-	On	-
Signals transmitted	-	-	Multiple short off periods	-
RLS enabled *	-	On for 1 second	-	-
Extended self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			Multiple flashes**	

*For EPIRBs with RLS disabled the RLS indicator will remain off.
**See table in section 3.5.3 for on failure indications.

Remarks

			Name and surname	Signature
Test attendant	**Completed by**	**FORES**		
	Witness by	**ROSETTI MARINO**		
		CROSSWIND		
		DATA		

Markup Details	Annotations	Comments
Consolidated May 14 12:10 PM Marco Mastroforti 14/05/25 12:10:59 (GMT +02:00)	Stamp 14 May, 2025 12:10:58 Page: 1	Stamp Template: Vendor Review Stamp Marco Mastroforti 14 May, 2025 12:10:58
	Line 14 May, 2025 12:10:58 Page: 1	
	Line 14 May, 2025 12:10:58 Page: 1	
	Text 14 May, 2025 12:10:58 Page: 1	Marco Mastroforti Marco Mastroforti 14 May, 2025 12:10:58
	Text 14 May, 2025 12:10:58 Page: 1	14/05/2025 Marco Mastroforti 14 May, 2025 12:10:58
Markup May 14 12:08 PM Marco Mastroforti 14/05/25 12:10:45 (GMT +02:00)	Stamp 14 May, 2025 12:08:54 Page: 1	Stamp Template: Vendor Review Stamp Marco Mastroforti 14 May, 2025 12:08:54
	Line 14 May, 2025 12:09:18 Page: 1	
	Line 14 May, 2025 12:09:39 Page: 1	
	Text 14 May, 2025 12:10:11 Page: 1	Marco Mastroforti Marco Mastroforti 14 May, 2025 12:10:11
	Text 14 May, 2025 12:10:28 Page: 1	14/05/2025 Marco Mastroforti 14 May, 2025 12:10:28

2.3
-
IAT REPORT

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Base Load Power Hub (BLPH)

IAT REPORT – TELECOM EQUIPMENT

Document Number: 1724000452-QC-RE-00009

Document Class: 2

FORES ENGINEERING Srl
Luca Pizzigati
Project Quality Control Manager
☒ Witness ☐ Review
11/09/2024

00	11/09/2024	Internal Document	L.Pizzigati	G.Rossini	M.Manenti
Rev.	Date	Description	Prepared	Reviewed	Approved
FORES ENGINEERING					

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Revision / Change Log

Rev.	Description
00	Internal Document

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 DOCUMENT SCOPE

This document lists the checks and the tests to be carried out to verify conformity to supply specification of project equipment.

1.1 REFERENCES

Doc. No.	Description
1724000452-QC-ITP-00004	INSPECTION AND TEST PLAN – TELECOM EQUIPMENT
1724000452-TL-DS-00005	EQUIPMENT DATASHEETS – TELECOM EQUIPMENT
1724000452-TL-LIS-00006	EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT
1724000452-COM-LIS-00014	SPARE PARTS LIST – TELECOM EQUIPMENT

Table 1 - Reference Documents

1.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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2 INTERNAL ACCEPTANCE TEST REPORT

2.1 VISUAL AND DIMENSIONAL CHECK REPORT

2.1.1 IDCS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of IDCS material	
ITP Reference	1724000452-QC-ITP-00004 - Step 1.1.1, 1.1.2, 1.1.3, 1.1.4 and 1.1.5	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 1 to 27 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	✓		
2	Mechanical damage check	No mechanical damage	✓		
3	Equipment quality check	Equipment in compliance with related Data sheet	✓		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	✓		
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents	✓		
6	Certificated check	Compliance with Reference Documents	✓		

Remarks

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PIZZIGATI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

FORES ENGINEERING FORLI' ITALY

2.1.2 NAVIGATION AIDS MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of navigation aids material	
ITP Reference	1724000452-QC-ITP-00004 - Step 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.2.6, 1.2.7, 1.2.8, 1.2.9, 1.2.10 and 1.2.11	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 28 to 39 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	X		
2	Mechanical damage check	No mechanical damage	X		
3	Equipment quality check	Equipment in compliance with related Data sheet	X		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	X		
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents	X		
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard	X		
7	Certificated check	Compliance with Reference Documents	X		

Remarks

TRON AIS-START S/N : 370028689 TAG Y-89-24-TSA 002
TRON AIS-MRT S/N : 370028236 TAG Y-89-24-TSA-001
TRON GOAIS S/N 26800 TAG Y-89-24-TEP-001
TRON GOAIS S/N 26796 TAG Y-89-24-TEP-002
SF3540 S/N 580092004 TAG Y-89-25-THC-001
SF3540 S/N 390654303 TAG Y-89-25-THC-002
403536A AIS TEST REPORT ATTACHMENT 1 e 2

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PIZZIGATTI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

FORES ENGINEERING FORLI' - ITALY

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2.1.3 RADIO SYSTEM MATERIAL

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of UHF portable radio	
ITP Reference	1724000452-QC-ITP-00004 - Step 1.3.1, 1.3.2, 1.3.3, 1.3.4 and 1.3.5	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items from 40 to 45 in the Equipment List	
Requirements	Measuring tape	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	V		
2	Mechanical damage check	No mechanical damage	V		
3	Equipment quality check	Equipment in compliance with related Data sheet	V		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	V		
5	Equipment tag labels check	Tag Label material and fixing as Reference Documents	V		
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard	V		
7	Certificated check	Compliance with Reference Documents	V		

Remarks

TAG: Y-89-06-THV-001 SIN: 627TE8058L
Y-89-06-THV-002 SIN: 627TE00512
Y-89-06-THS-001 SIN: 1065 77738
Y-89-06-THS-002 SIN: 1067 92880

			Name and surname	Signature
Test attendant		FORES	LUCA PITTIGLIO	
		ROSETTI MARINO		
		CROSSWIND		

FORES ENGINEERING FORLI' ITALY

2.1.4 SPARE PARTS

Test Name / Test N°	MATERIAL VISUAL AND DIMENSIONAL CHECK	
Test Scope	Perform visual and mechanical check of spare parts	
ITP Reference	1724000452-QC-ITP-00004 - Step 1.4.1 and 1.4.2	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-COM-LIS-00014 SPARE PARTS LIST – TELECOM EQUIPMENT	
Equipment Involved	Items listed in the Spare Part List	
Requirements	/	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Visual dimensional check	Equipment in compliance with related Data sheet	√		
2	Mechanical damage check	No mechanical damage	√		
3	Equipment quality check	Equipment in compliance with related Data sheet	√		
4	Equipment quantity check	Quantity of supplied devices in compliance with Equipment List	√		
6	Equipment Ex marking check	Ex label installed and compliant to Ex standard	√		

Remarks

ATTACHMENT 3

			Name and surname	Signature
Test attendant	Completed by	FORES	LUCA PIZZUTI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

FORES ENGINEERING ITALY

2.2 POWER UP REPORT

2.2.1 VHF MARINE RADIO

Test Name / Test N°	RADIO POWER UP	
Test Scope	Verify the correct power up of the VHF Handheld Marine Radios.	
ITP Reference	1724000452-QC-ITP-00004 - Step 1.2.12	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing the used channel and the battery level	√		

Remarks

TAG 4-89-25-THC-001 = OK

4-89-25-THC-002 = OK

			Name and surname	Signature
Test attendant	Completed by	FORES	GIANMARIA ROSSINI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

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2.2.2 DMR UHF RADIO

Test Name / Test N°	RADIO POWER UP	
Test Scope	Verify the correct power up of the DMR UHF Radios.	
ITP Reference	1724000452-QC-ITP-00004 - Step 1.3.6	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 40 and 41 in the Equipment List	
Requirements	/	
Prerequisites	Handheld radio battery shall be charged	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Switch the radio on turning clockwise the main knob at the top of the radio itself	The radio display will light up showing the used channel and the battery level	✓		

Remarks

Y - 89 - 06 - THU - 002 → SWITCH ON
Y - 89 - 06 - THU - 001 → SWITCH ON

NOTE ; OUT OF RANGE WITHOUT REPEATER

Test attendant			Name and surname	Signature
	Completed by	FORES	GIANMARIA ROSSINI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

2.3 COMMUNICATION TEST REPORT

2.3.1 VHF MARINE RADIO

Test Name / Test N°	RADIO COMMUNICATION TEST	
Test Scope	Verify the correct power up of the equipment and measure the most important radio-electric technical data of the VHF Handheld Marine Radios.	
ITP Reference	1724000452-QC-ITP-00004 – Step 1.2.12	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	/	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	Both radios will be operating on the same simplex Marine channel.	✓		
2	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.	✓		
3	Connect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.	✓		
4	1) Pressing the external Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the external Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.	✓		

5	Disconnect the Twin cup headset and the PTT Control Unit (SAVOX C-C440 Ex) to the VHF Handheld marine Radio	When external equipment is disconnected to the radio, the right side of the display will not show a headset.	V		
6	Connect only the Twin cup headset to the VHF Handheld marine Radio	When external equipment is connected to the radio, the right side of the display will show a headset.			N.A
7	1) Pressing the Push To Talk switch (PTT) on the first portable radio unit and speaking in close proximity of the handset microphone a voice message will be received by the second radio. 2) Pressing the Push To Talk switch (PTT) on the second portable radio and speaking in close proximity of its integrated microphone, a voice message will be received by the first radio.	1) Second radio receives voice messages from first radio. 2) First radio receives voice messages from second radio Half duplex bidirectional communications can be instated between the radios.			N.A

Remarks

			Name and surname	Signature
Test attendant	Completed by	FORES	GIAN MARIA MOSSINI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

2.3.2 VHF MARINE RADIO RF CHARATERISTIC TEST

Test Name / Test N°	VHF MARINE FIXED RADIO TRANSMITTER RF CHARACTERISTIC TEST	
Test Scope	The scope of this test is to verify the TX RF Power Output in normal and emergency condition, and Tx Frequency	
ITP Reference	1724000452-QC-ITP-00004 - Step 1.2.12	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS - TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST - TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements	Digital Radio Test Set	
Prerequisites	The Transmitter antenna port of VHF MARINE RADIO must be connected to Radio Test Tool at T/R Port VHF Radios are supposed to be already switched off	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Tune the VHF radios on the same simplex channel within the International Marine channel list (e.g. Channel 11 corresponding to frequency 156.550MHz).	The VHF Radio displays the current working channel (e.g. channel 11).	√		
2	Set the VHF marine Radio to transmit at high power (2 Watt)	The VHF marine radio does not show "Lo" on the display	√		
3	Press PPT to transmit	The TX Power on the digital radio test shall be 32 dBM +/- 1 db. 32dbm = 33dbm (2Watt) - 1 db (loss value of the cable used for the measurement) TX Frequency reading shall be Frequency selected +/- 500Hz	√		
4	Set the VHF marine Radio to transmit at low power (1 Watt)	the VHF marine radio shows "Lo" on the display	√		
5	Press PPT to transmit	The TX Power on the digital radio test shall be 29 dBM +/- 1 db. 29 dbm = 30dbm (1Watt) - 1 db (loss value of the cable used for the measurement) TX Frequency reading shall be Frequency selected +/- 500Hz	√		

Remarks

			Name and surname	Signature
Test attendant	Completed by	FORES	GIAN MARIA ROSSI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

2.3.3 VHF MARINE RADIO ADDITIONAL FEATURES TEST

Test Name / Test N°	VHF MARINE RADIO ADDITIONAL FEATURES TEST	
Test Scope	The scope of this test is to verify some additional features of the VHF RADIO	
ITP Reference	1724000452-QC-ITP-00004 – Step 1.2.12	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 32 and 33 in the Equipment List	
Requirements		
Prerequisites		
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Power up the VHF RADIO and verify that radio operates with channels according to the radio Regulations Channels : 6 √ 12 √ 17 √ 67 √ 8 √ 13 √ 19A √ 68 √ 9 √ 14 √ 20A √ 69 √ 10 √ 15 √ 27A √ 71 √ 11 √ 16 √ 28A √ 72 √	Check that the channels are displayed on the screen	√		
2	Locking the keypad: To lock the keypad, press and hold the Light/Lock button. To unlock the keypad, press and hold the Light/Lock button again.	The display shows a key symbol when the keypad is locked.	√		
3	Using Squelch control To activate Squelch control, press the SQ key. To set the Squelch level, press ↑ (closing) or ↓(opening).	The display shows the Squelch level while it is adjusted, e.g. "SQ 5".	√		

Remarks

			Name and surname	Signature
Test attendant	Completed by	FORES	GIAN MARIA RUSSINI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

2.3.4 SART TEST MODE

Test Name / Test N°	SART TEST MODE	
Test Scope	This test ensures the best battery capacity available for a potential emergency. Although the Tron AIS-SART does not send an alarm via satellite, VHF or other radio communication, usage should be limited to short tests.	
ITP Reference		
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT	
Equipment Involved	Item 28 and 29 in the Equipment List	
Requirements	The test must be conducted outdoors with a clear view to the sky to maximize the GPS location.	
Prerequisites	/	
Notes	/	

Procedure

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	Move the switch to the TEST position and hold. 	Tron AIS-SART will now run through a self-test procedure. If a RED LED flashes, it indicates a critical fault. Refer to the error codes for more information	X		
2	Release the switch when both LEDs start flashing. The unit will now search for the GPS position. It will only search for 15 minutes max. 	A successful test is indicated by a 15 sec BEEP and a GREEN LED. 	X		

Remarks

- WE HAVE ONLY TESTED THE TAG 4-89-2C-TSA-002

OTHER EQUIPMENT WILL TESTED DURIN FAT

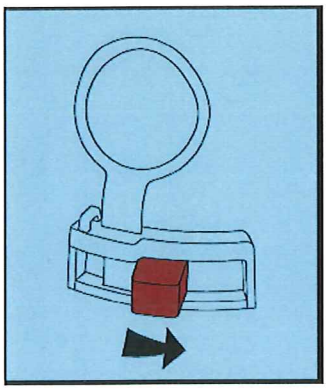
			Name and surname	Signature
Test attendant	Completed by	FORES	GIAN MARIA RUSSIN	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

2.3.5 EPIRB TEST MODE

Test Name / Test N°	EPIRB TEST MODE
Test Scope	During the normal self-test, the main functionality of the EPIRB is tested. A test signal is transmitted on all frequencies (121.5 MHz, AIS and 406 MHz). These test signals will not be recognized as distress signals. While transmitting the test signals the battery and the transmitted signals are tested.
ITP Reference	
Reference Documents	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS – TELECOM EQUIPMENT 1724000452-TL-LIS-00006 EQUIPMENT AND SPECIAL TOOLS LIST – TELECOM EQUIPMENT
Equipment Involved	Item 30 and 31 in the Equipment List
Requirements	
Prerequisites	/
Notes	/

Procedure

Description	**Acceptance Criteria**

Step	Description	Acceptance Criteria	Pass	Fail	N.A.
1	To perform the extended self-test, do the following steps within a period of 3 seconds: 1. Move the switch to test position 2. Release to middle position 3. Move the switch to test position and release when the white test indicator lights up. 	The white test indicator LED will light up and the green GNSS indicator LED will start flashing in sequences of 3 fast flashes. This indicates that the EPIRB is searching for a validated position. When a valid position is found the green GNSS indicator LED will remain lit for approximately 1 second and a normal self-test will continue. The top light will flash once at the end of the text if the extended self-test is successful.			X

Test sequence	Position indicator	RLS indicator	Test indicator	Strobe light
Extended self-test started	-	-	On	-
Waiting for position	Triple flashes	-	-	-
Position achieved	On for 1 second	-	-	-
Self-test started	-	-	On	-
Signals transmitted	-	-	Multiple short off periods	-
RLS enabled *	-	On for 1 second	-	-
Extended self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			Multiple flashes**	

*For EPIRBs with RLS disabled the RLS indicator will remain off.
**See table in section 3.5.3 for on failure indications.

Remarks

			Name and surname	Signature
Test attendant	Completed by	FORES	GIAN MARIA ROSSINI	
	Witness by	ROSETTI MARINO		
		CROSSWIND		

ATTACHMENT 1

TRON AIS-SART

Test Report

JOTRON

Product Type: 87251 'Tron AIS-SART w/Bulkhead Bracket'
Product SW Version: 1.1.0
Serial Number: 970028926
Test System Version: 4-4-5
Date: 2024-07-03
Operator: AKV

Digital Signatures

Approved	Signee	Date
Tested by:	Danguole Mezanskiene	2024-07-08
Test at +55°C	Danguole Mezanskiene	2024-07-08
Test at -20°C	Danguole Mezanskiene	2024-07-08

Transmitter Characteristics

Measurement	Limits
Ch AIS 1 Deviation	*2400Hz +/-240Hz*
	2457.8
Ch AIS 1 Conducted Power	*>= 36dBm*
	37.1
Ch AIS 1 Frequency Offset	*< 500Hz*
	-160.3
Ch AIS 2 Deviation	*2400Hz +/-240Hz*
	2411.7
Ch AIS 2 Conducted Power	*>= 36dBm*
	37.1
Ch AIS 2 Frequency Offset	*< 500Hz*
	237.6
Transmitting Current	*<= 1500 mA*
	1181.9
GPS Current	*<= 50 mA*
	20.9
Standby Current	*<= 12 mA*
	6.9

Message Characteristics

Measurement	Limits
GPS Syncronisation	*PASS/FAIL*
	PASS
GPS Position	*PASS/FAIL*
	PASS

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TRON AIS - SART

Test Report

JOTRON

Product Type: 87251 'Tron AIS-SART w/Bulkhead Bracket'
Product SW Version: 1.1.0
Serial Number: 970028689
Test System Version: 4-4-5
Date: 2024-06-18
Operator: AKV

Digital Signatures

Test Name	Signee	Date
Tested by:	Erika Sadauskaite	2024-07-04
Test at +55°C	Danguole Mezanskiene	2024-07-04
Test at -20°C	Danguole Mezanskiene	2024-07-04

Transmitter Characteristics

Measurement	Limits
Ch AIS 1 Deviation	*2400Hz +/-240Hz*
	2387.9
Ch AIS 1 Conducted Power	*>= 36dBm*
	37.0
Ch AIS 1 Frequency Offset	*< 500Hz*
	-114.1
Ch AIS 2 Deviation	*2400Hz +/-240Hz*
	2366.1
Ch AIS 2 Conducted Power	*>= 36dBm*
	37.0
Ch AIS 2 Frequency Offset	*< 500Hz*
	345.3
Transmitting Current	*<= 1500 mA*
	1179.5
GPS Current	*<= 50 mA*
	19.6
Standby Current	*<= 12 mA*
	6.8

Message Characteristics

Measurement	Limits
GPS Syncronisation	*PASS/FAIL*
	PASS
GPS Position	*PASS/FAIL*
	PASS

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Tron AIS-60

Test Report

JOTRON

Product Type: 103161 'Tron 60AIS' **Serial Number:** 26800 **Date:** 2024-06-13 **Operator:** 236

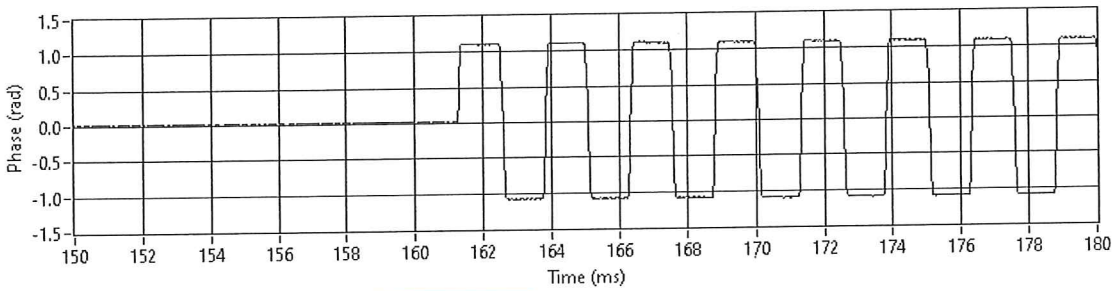
Digital Signatures

Test Name	Signee	Date
Test at +20°C	Reda Matulevičienė	2024-06-17
Test at +55°C	Romualdas Kerza	2024-06-18
Test at -20°C	Romualdas Kerza	2024-06-19
IR LED light test	Romualdas Kerza	2024-06-19
Watertightness test	Romualdas Kerza	2024-06-19

406MHz Frequency stability

Description	Unit	Limit min	Limit max	Measurement
STF Allan Variance/100ms	[nHz]	>= 0.0	<= 2.0	0.1
Medium Term Frequency Stability Slope/min	[nHz]	>= -1.0	<= 1.0	-0.3
Medium Term Frequency Stability Sigma/min	[nHz]	>= 0.0	<= 3.0	0.9

406 Measurements



Description	Unit	Limit min	Limit max	Measurement
Bit Rate	[b/s]	>= 399.6	<= 400.4	400.0
Positive Deviation	[rad]	>= 1.00	<= 1.20	1.10
Negative Deviation	[rad]	>= -1.20	<= -1.00	-1.09
Phase Fall Time	[us]	>= 50	<= 250	130
Phase Rise Time	[us]	>= 50	<= 250	133

Default production numeric hex message

406 hex	406 hex
Hex	FFFE2F902D577A2C0DC1859389384FC376A4

406 RF Measurements

Description	Unit	Limit min	Limit max	Measurement
Power @ 50 ohm	[dBm]	>= 35.0	<= 39.0	36.0
Carrier Frequency	[Hz]	>= 406030000	<= 406032000	406030924

AIS RF Channel A

Description	Unit	Limit min	Limit max	Measurement
Power @ 50ohm	[dBm]	>= 31.0	<= 34.0	33.0
Deviation	[Hz]	>= 1500	<= 3000	2179
Frequency	[Hz]	>= 161974500	<= 161975500	161975021

AIS Decoded Channel A

AIS	AIS User ID
AIS Message	974016800

AIS RF Channel B

Description	Unit	Limit min	Limit max	Measurement
Power @ 50ohm	[dBm]	>= 31.0	<= 34.0	33.0
Deviation	[Hz]	>= 1500	<= 3000	2182
Frequency	[Hz]	>= 162024500	<= 162025500	162025021

AIS Decoded Channel B

AIS	AIS User ID
AIS Message	974016800

AIS PERP

Description	Unit	Limit min	Limit max	RF Power + Antenna gain
Calculated PERP	[dBm]	>= 27.0	<= 36.0	32.0

121.5 MHz

Description	Unit	Limit min	Limit max	Measurement
Low Sweep Frequency	[Hz]	>= 300	<= 900	381
High Sweep Freq	[Hz]	>= 900	<= 1600	1214
Sweep Range	[Hz]	>= 700	<= 1300	833
Modulation Duty Cycle	[%]	>= 33	<= 55	35
Repetition Rate	[Hz]	>= 2.0	<= 4.0	2.7
Modulation	[%]	>= 90.0	<= 100.0	100.0
Power @ 50ohm	[dBm]	>= 18.0	<= 21.0	19.8
Frequency	[Hz]	>= 121499000	<= 121501000	121499985

121.5 MHz PERP

Description	Unit	Limit min	Limit max	RF Power + Antenna gain
Calculated PERP	[dBm]	>= 14.0	<= 20.0	16.8

Current @ 12V

Description	Unit	Limit min	Limit max	Measurement
Quiescent	[A]	>= 0.003	<= 0.010	0.006
GNSS Current	[A]	>= 0.010	<= 0.025	0.016
121.5 MHz current	[A]	>= 0.010	<= 0.025	0.017
406 MHz current	[A]	>= 0.50	<= 0.90	0.75
AIS current	[A]	>= 0.30	<= 0.60	0.42

GNSS

GNSS	Pass/Fail
GNSS Test	Pass

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ATTACHMENT 2

TRON AIS -60

Test Report

JOTRON

Product Type: 103161 'Tron 60AIS'

Serial Number: 26796

Date: 2024-06-13
Operator: 236

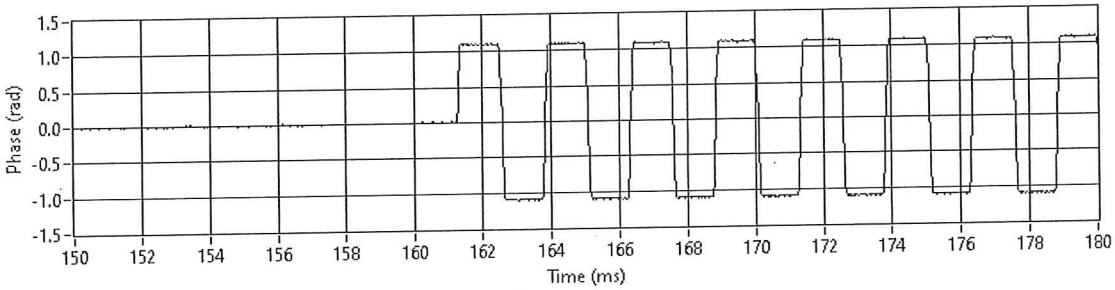
Digital Signatures

Test Name	Signee	Date
Test at +20°C	Reda Matulevičienė	2024-06-17
Test at +55°C	Romualdas Kerza	2024-06-18
Test at -20°C	Romualdas Kerza	2024-06-19
IR LED light test	Romualdas Kerza	2024-06-19
Watertightness test	Romualdas Kerza	2024-06-19

406MHz Frequency stability

Description	Unit	Limit min	Limit max	Measurement
STF Allan Variance/100ms	[nHz]	>= 0.0	<= 2.0	0.1
Medium Term Frequency Stability Slope/min	[nHz]	>= -1.0	<= 1.0	-0.2
Medium Term Frequency Stability Sigma/min	[nHz]	>= 0.0	<= 3.0	0.5

406 Measurements



Description	Unit	Limit min	Limit max	Measurement
Bit Rate	[b/s]	>= 399.6	<= 400.4	400.0
Positive Deviation	[rad]	>= 1.00	<= 1.20	1.10
Negative Deviation	[rad]	>= -1.20	<= -1.00	-1.10
Phase Fall Time	[us]	>= 50	<= 250	130
Phase Rise Time	[us]	>= 50	<= 250	130

Default production numeric hex message

406 hex	406 hex
Hex	FFFE2F902D577A2B0DC182D609F84FC376A4

406 RF Measurements

Description	Unit	Limit min	Limit max	Measurement
Power @ 50 ohm	[dBm]	>= 35.0	<= 39.0	35.9
Carrier Frequency	[Hz]	>= 406030000	<= 406032000	406030913

AIS RF Channel A

Description	Unit	Limit min	Limit max	Measurement
Power @ 50ohm	[dBm]	>= 31.0	<= 34.0	33.0
Deviation	[Hz]	>= 1500	<= 3000	2280
Frequency	[Hz]	>= 161974500	<= 161975500	161975025

AIS Decoded Channel A

AIS	AIS User ID
AIS Message	974016796

AIS RF Channel B

Description	Unit	Limit min	Limit max	Measurement
Power @ 50ohm	[dBm]	>= 31.0	<= 34.0	33.0
Deviation	[Hz]	>= 1500	<= 3000	2288
Frequency	[Hz]	>= 162024500	<= 162025500	162025025

AIS Decoded Channel B

AIS	AIS User ID
AIS Message	974016796

AIS PERP

Description	Unit	Limit min	Limit max	RF Power + Antenna gain
Calculated PERP	[dBm]	>= 27.0	<= 36.0	32.0

121.5 MHz

Description	Unit	Limit min	Limit max	Measurement
Low Sweep Frequency	[Hz]	>= 300	<= 900	381
High Sweep Freq	[Hz]	>= 900	<= 1600	1208
Sweep Range	[Hz]	>= 700	<= 1300	827
Modulation Duty Cycle	[%]	>= 33	<= 55	35
Repetition Rate	[Hz]	>= 2.0	<= 4.0	2.7
Modulation	[%]	>= 90.0	<= 100.0	100.0
Power @ 50ohm	[dBm]	>= 18.0	<= 21.0	19.8
Frequency	[Hz]	>= 121499000	<= 121501000	121499976

121.5 MHz PERP

Description	Unit	Limit min	Limit max	RF Power + Antenna gain
Calculated PERP	[dBm]	>= 14.0	<= 20.0	16.8

Current @ 12V

Description	Unit	Limit min	Limit max	Measurement
Quiescent	[A]	>= 0.003	<= 0.010	0.006
GNSS Current	[A]	>= 0.010	<= 0.025	0.017
121.5 MHz current	[A]	>= 0.010	<= 0.025	0.016
406 MHz current	[A]	>= 0.50	<= 0.90	0.71
AIS current	[A]	>= 0.30	<= 0.60	0.39

GNSS

GNSS	Pass/Fail
GNSS Test	Pass

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ATTACHMENT 3

ROSETTI MARINO

SPARE PARTS LIST

CROSSWIND

Document Title	Spare Parts List					
The document relates to	HOLLANDSE KUST NOORD WIND PARK Project - Base Load Power Hub (BLPH)					Contract: CW-I-WP4-2023-05
Project ID	123A90	Doc. n°	1724000452-COM-LIS-00014	Rev.: 02	Rev. Date: 08-Aug-24	Status: AFC / Class: 2

The equipment consists of the following units/components

1	Tag no.	Y-89-25-TBC-001+004	Y-89-06-THU-001+002	Y-89-73-TIR-001+009	Y-89-73-TDC-001+018	
2	Tag description	Single unit charger for VHF Marine Radio	UHF DMR Portable Radio	Microvawe Motion Detector	Door Contact	
3	Manufacturer model/type no.	403536A	DP4801Ex	6931P	DC108	
4	Manufacturer serial no.					
5	No. of units	4	2	9	18	

Supplier: FORES Engineering S.r.l.
Address: Via Secondo Casadei, 12, 47122 Forli (FC), ITALY

PO Number: 1724000452
PO description: BLPH - Telecom System
Supplier telephone no: +39 0543 813537
E-mail: spare.parts@fores.it

Contact name: Mrs Paola Bacchini
Contact mobile no:
WEBSITE http://www.fores.it/

General Information:

6 Quantity of parts FITTED / INSTALLED per unit/component

Item Number	Total number of identical spares installed	Description of recommended spare parts	Parts/drawing ref. Project Datasheet no.	Project Detail dwg. no.	Item ref.	Material	Certificate Type (if applicable)	Certificate Reference (if applicable)	Shelf life (years)	Weight (net)	Weight (gross)	Volume	HS Code	ECCN Code	% US Content	Country of origin	Supplier part no.	Manufacturer part no.	Manufacturername	Commissioning spares: Quantity ordered	2 Years spares: Quantity ordered	Remarks
7	8		9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	4	ATEX single battery charger kit for SP3540	1724000452-TL-DS-00005															403536A	Sailor		1	
2	2	Hard Leather Carry Case																PMLN8299A	Motorola		2	
3	2	ATEX Remote Speaker Microphone for DP4801Ex	1724000452-TL-DS-00005															PMMN4094	Motorola		1	
4	2	2075mAh Li-ion Battery for DP4801Ex	1724000452-TL-DS-00005															NNTN8359	Motorola		2	
5	9	Motion Sensor	1724000452-TL-DS-00005															6931P	Carrier	1		
6	18	Door magnetic contact	1724000452-TL-DS-00005															DC108	Carrier	1	2	
7																						
8																						
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SECTION 3
-
QUALITY DOCUMENTS

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3.1

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INSPECTION AND TEST PLAN

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Base Load Power Hub (BLPH)

INSPECTION AND TEST PLAN - TELECOM EQUIPMENT

Document Number: 1724000452-QC-ITP-00004

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
ROSETTI MARINO S.p.A. Stefano Lloyd Delegated Quality Control Dept.	26/08/2024

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
01	25/07/2024	Accepted for Construction (AFC)	L.Pizzigati	L. Cavallini	M.Manenti
00	10/04/2024	Issue for Review (IFR)	L.Pizzigati	L. Cavallini	M.Manenti

FORES ENGINEERING

File: 1724000452-QC-ITP-00004 Rev.01.xlsx

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SH.	DESCRIPTION	REVISIONS							
		00	01						
1	Cover	X	X						
2	Table of Contents	X	X						
3	Revision / Change Log	X	X						
4	IAT PHASE	X	X						
5	IAT PHASE	X	X						
6	FAT PHASE	X	X						
7	FAT PHASE - FINAL ACTIVITY	X	X						

File: 1724000452-QC-ITP-00004 Rev.01.xlsx

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Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ACCEPTED FOR CONSTRUCTION (AFC)

CODE OF INTERVENTION

H BINDING PRESENCE. The cycle continuationis bound to the presence

W NOT BINDING PRESENCE. In case of unwitnessed test the Supplier is authorized to continues the production cycle

R CHECK OF THE CERTIFICATES AND/OR DOCUMENTS.

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STEP	STEP DESCRIPTION	APPLICABILE DOCUMENTS, STANDARDS and ACCEPTANCE CRITERIA	REQ. OF CERTIF.	REQ. STANDARD	FORES	ROSETTI MARINO	CROSSWIND	REMARKS
1.0	IAT PHASE							
1.1	IDCS SYSTEM							
1.1.1	Microwave Motion Detector visual dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.1.2	Microwave Motion Detector quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.1.3	Door Contact visual dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.1.4	Door Contact quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2	Navigation Aids SYSTEM							
1.2.1	SART visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.2	SART quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.3	EPIRB visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.4	EPIRB quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.5	GMDSS VHF Marine Portable Radio visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.6	GMDSS VHF Marine Portable Radio quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.7	PTT Contol Unit visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.8	PTT Contol Unit quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.9	Headset visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.10	Headset quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.11	Radio Power UP	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.2.12	Radio Communication Test	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	

STEP	STEP DESCRIPTION	APPLICABILE DOCUMENTS, STANDARDS and ACCEPTANCE CRITERIA	REQ. OF CERTIF.	REQ. STANDARD	FORES ENGINEERING	ROSETTI MARINO	CROSSWIND	REMARKS
1.0	IAT PHASE							
1.3	Radio SYSTEM							
1.3.1	DMR UHF RADIO visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.3.2	DMR UHF RADIO quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.3.3	Remote Speaker visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.3.4	Remote Speaker quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.3.5	Radio Power UP	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.4	Spare Parts							
1.4.1	Spare Parts visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	IAT REPORT		H	R	R	
1.4.2	Spare Parts quantity check	1724000452-COM-LIS-00014 SPARE PARTS LIST	IAT REPORT		H	R	R	

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STEP	STEP DESCRIPTION	APPLICABILE DOCUMENTS, STANDARDS and ACCEPTANCE CRITERIA	REQ. OF CERTIF.	REQ. STANDARD	FORES ENGINEERING	ROSETTI MARINO	CROSSWIND	REMARKS
2.0	FAT PHASE							
2.1	IDCS SYSTEM							
2.1.1	Microwave Motion Detector visual dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.1.2	Microwave Motion Detector quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.1.3	Door Contact visual dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.1.4	Door Contact quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.1.5	Door Contact quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.1.6	Certificate check (if applicable)	224E20-DDL-QUA-CER-00001 EQUIPMENT HAZARDOUS AREA REGISTER and CERTIFICATE	-	ATEX AND EU/CE DECLARATION	H	R	R	
2.2	Navigation Aids SYSTEM							
2.2.1	SART visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.2	SART quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.3	EPIRB visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.4	EPIRB quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.5	GMDSS VHF Marine Portable Radio visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.6	GMDSS VHF Marine Portable Radio quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.7	PTT Contol Unit visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.8	PTT Contol Unit quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.9	Headset visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.10	Headset quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.11	Certificate check (if applicable)	224E20-DDL-QUA-CER-00001 EQUIPMENT HAZARDOUS AREA REGISTER and CERTIFICATE	-	ATEX AND EU/CE DECLARATION	H	R	R	
2.2.12	Radio Power UP	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.2.13	Radio Communication Test	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	

STEP	STEP DESCRIPTION	APPLICABILE DOCUMENTS, STANDARDS and ACCEPTANCE CRITERIA	REQ. OF CERTIF.	REQ. STANDARD	FORES ENGINEERING	ROSETTI MARINO	CROSSWIND	REMARKS
2.0	FAT PHASE							
2.3	Radio SYSTEM							
2.3.1	DMR UHF RADIO visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.3.2	DMR UHF RADIO quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.3.3	Remote Speaker visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.3.4	Remote Speaker quantity check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.3.5	Certificate check (if applicable)	224E20-DDL-QUA-CER-00001 EQUIPMENT HAZARDOUS AREA REGISTER and CERTIFICATE	-	ATEX AND EU/CE DECLARATION	H	R	R	
2.3.6	Radio Power UP	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.4	Spare Parts							
2.4.1	Spare Parts visual and dimensional check	1724000452-TL-DS-00005 EQUIPMENT DATASHEETS	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
2.4.2	Spare Parts quantity check	1724000452-COM-LIS-00014 SPARE PARTS LIST	224E20-DDL-QUA-RE-00001 FAT REPORT		H	W	W	
3.0	FINAL ACTIVITY							
3.0.1	Release note	-	-		H	H	-	
3.0.2	Final documentation review	224E20-DDL-QUA-DB-00001 EQUIPMENT MANUFACTURER MANUALS COLLECTION	DOCUMENT RELEASE		H	R	-	