

# QUICK GUIDE



## NANO MARINE

Commissioning,  
installation and testing



quick guide for a control and monitoring system  
meant for a Stat-X aerosol fire extinguishers



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## 2 ABBREVIATIONS

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NMS	NANO/MAR System
NCP	NANO Control Panel
NETB	NANO ETB/MAR/BOX (extinguishers terminal box)
PDS	Programming Dip Switch
CP	Connection Point
PSU	Power Supply
VFC	Volt free contact
EOL	End of line device
PCB	Printed circuit board

### 3 IMPORTANT NOTES – PLEASE READ CAREFULLY

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This quick guide manual is an addition to the existing DIOM of the NANO MAR SYSTEM dated January 1, 2023 version 1.2 from the K&G Groep BV. This quick guide should be read thoroughly and understood before installing of the NMS is undertaken. It is assumed that the person installs, testing and commissioning the system, is familiar with the terminology and the objective of the equipment. The NCP and the corresponding connections must be properly connected to the NETB and KG/KVB Stat-X extinguishing aerosol generators by an appropriately qualified and competent person. The equipment is only guaranteed in accordance with the DIOM of the NANO MAR SYSTEM dated January 1, 2023 version 1.2.

### 4 CERTIFICATION

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The NMS has successfully passed CE and FCC, EMC testing according to EN 50130, EN 61000, EN 55016, 47 CFR15-ICES-003, ANSI 63.4, IEC60945-pt11 and a DNV marine type approval according the DNV Class Guideline 0339-2021, certificate TAA000037H. For that the NMS has endured extensive environmental tests such as vibration, dry heat, damp heat and cold tests in accordance with the requirements of the DNV-CG 0339 standard.

### 5 PREFASE

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In our standard DIOM is all written for installing/commissioning and servicing the NMS, NCP control panel and extinguishers terminal box NETB. This quick guide is a shortened step-by-step plan who guides you to put the system into operation. The NMS is a multi-functional controller for fire detection and fire extinguishing release systems. This quick guide only covers the NMS intended for rooms on vessels. For other applications, please refer to the standard and comprehensive installation instructions.

### 6 PURPOSE

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The purpose of this document is to describe installation, service and troubleshooting of the NMS. Please note that only aspects regarding the NMS itself are covered by this manual. Physical placement of aerosol generators and cables etc. is not handled as these issues are typically to be specified specifically for each installation. The purpose of the NMS is to control and monitor a number of aerosol generators mounted on a ship as part of a fire extinguishing system.



## 7 SYSTEM OVERVIEW

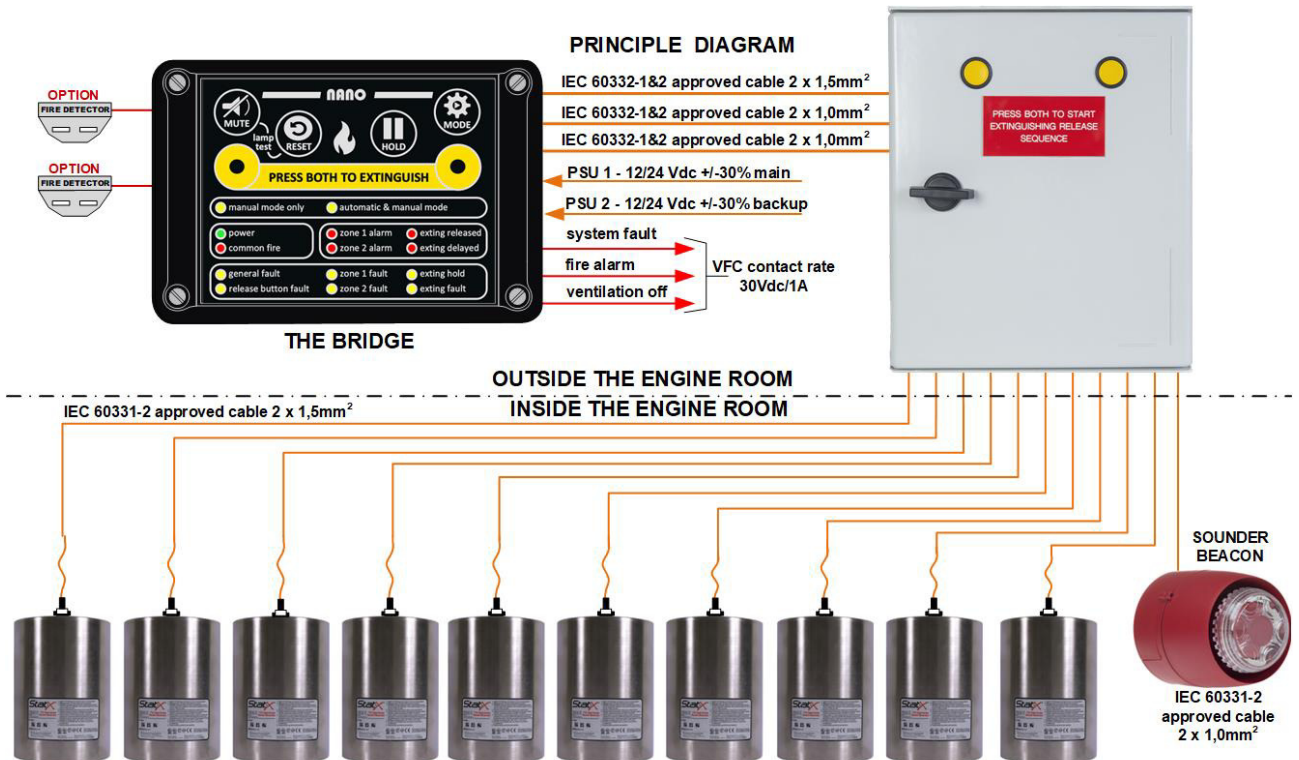
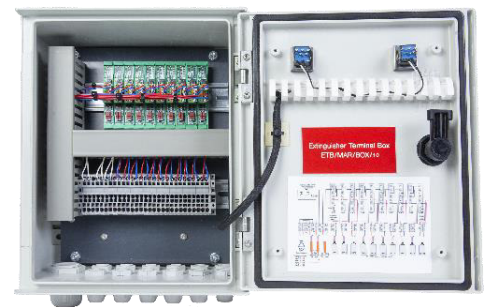
The purpose of the NMS is to control and monitor a number of aerosol generators mounted on a ship as part of a fire extinguishing system. The primary purpose of the NMS is to activate the aerosol generators in event of fire. The secondary purpose of the NMS is to monitor the system itself (e.g. power supplies, cables and individual system components) and give an alarm if a fault within the system is detected.



To handle single-point power supply failures, the NCP provides 2 power supply inputs. The NMS consists of three components. The basis is formed by the NCP which is placed on the bridge or in its vicinity. There are two extinguisher terminal boxes (NETB). These NETB boxes must be placed outside, but in the immediate vicinity of the protected room. One is suitable for connecting up to 5 extinguishers and one for up to 10 extinguishers. From the NETB the cable leads to the KVB plug & play Stat-X extinguisher installed in the volume to be protected.



Just like on the front of the NCP on the front of the NETB, we have applied two dual-action buttons for releasing extinguishing. The fire extinguishers will be released, depending on the PDS (time) settings. In a marine application it is NOT common for a fire suppression system to be released by an automatic fire detector. But the NCP has two fire zones suitable for connecting Apollo Orbis Marine approved fire detectors. The NMS can be set up so that fire alarms from these Apollo fire detectors are detected, signaled, and reported on the NCP, but considered as informative/exploratory.



This schedule of working principles of the NANO fire extinguishing system is intended to be supportive of this leaflet and therefore not intended and suitable for technical realization. For more detailed information ask for the User Manual NANO-EN August 2022 V1.0 and contact the K&G Groep BV.

## 8 INSTALLATION

### 8.1 CONNECTION NCP & NETB

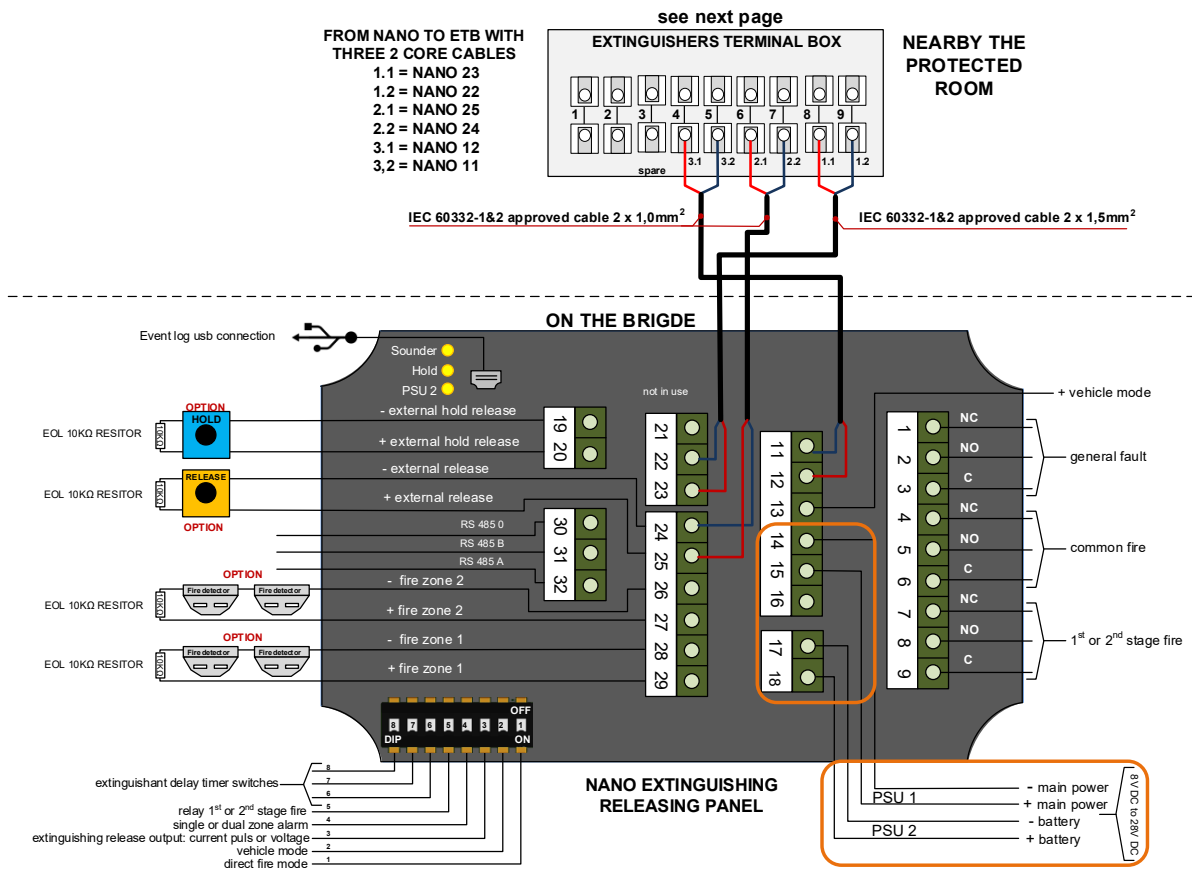
1. Make sure when installing the cables you chose for solution 1 or solution 2.  
See principle diagram page 3

### 8.2 CABLE SPECIFICATIONS

1. There is NO need for shielded cable, but we prefer pair twisted cable, this strength the protection against electrical or magnetic fields
2. Minimal solid copper core diameter, extinguishers cable <50 m length 1,0 mm<sup>2</sup> (AWG 18)
3. Minimal solid copper core diameter, extinguishers cable >50 m length 1,5 mm<sup>2</sup> (AWG 16)
4. Minimal solid copper core diameter, fire detection cables 0,5mm<sup>2</sup> (AWG 20)
5. Maximum solid copper core diameter other cables 1,0mm<sup>2</sup> (AWG 18)
6. Maximum conductor loop resistance, 1,5mm<sup>2</sup> cable is 24 Ω/km.
7. Maximum cable length of the fire zone cables is 50 meters
8. Maximum cable length of the cable from NCP to NETB is 30 meters
9. The total cable length of all extinguishers together is max 125 meters in total

### 8.3 POWER

1. the main power supply will need to be connected to PSU1 (CP 15 + / CP 14 -)
2. the backup power supply will have to be connected to PSU2 (CP 18 + / CP 17 -)  
(see wiring diagram)



## 9 VOLT FREE RELAY CONTACTS

Contact load relays 30VDC /1A

### 9.1 GENERAL FAULT

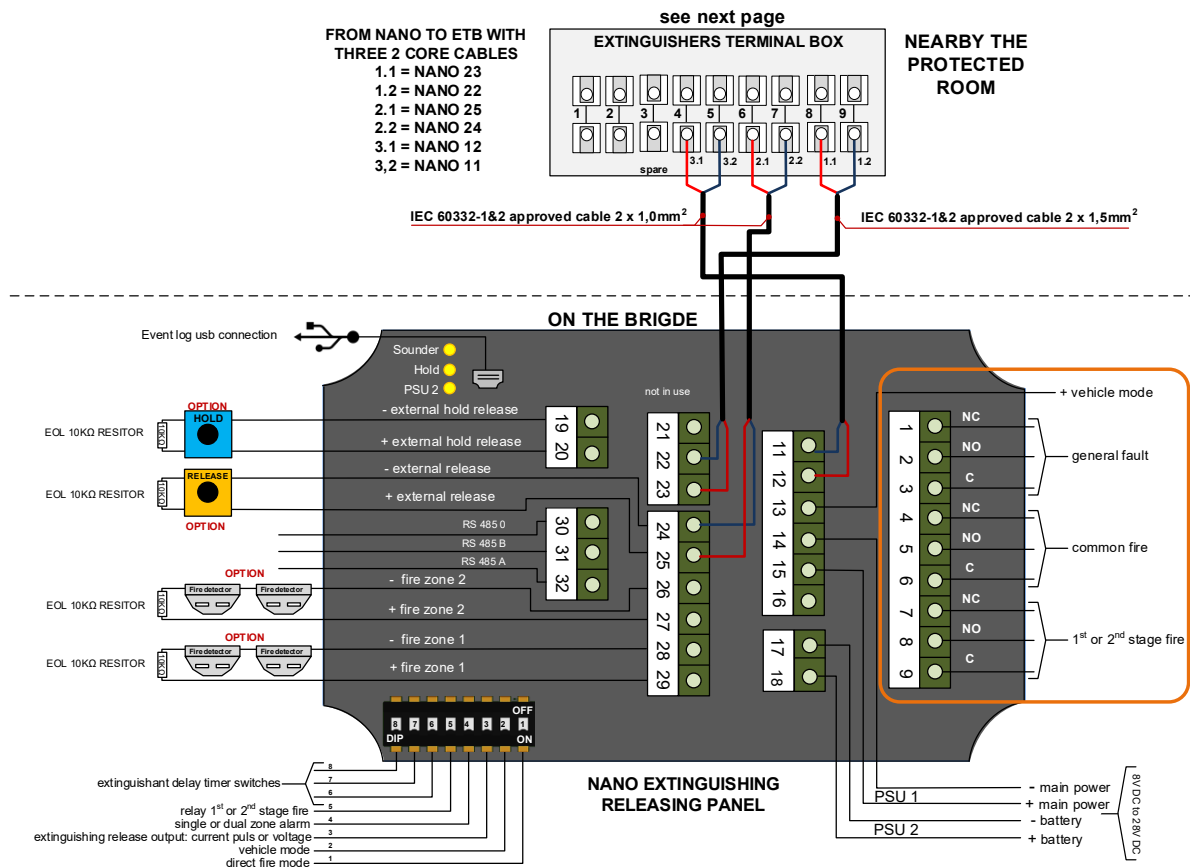
The general fault relay signals the presence of a fault in the NMS. In the event of a complete power failure, the general fault relay will be activated. (CP 1 – 2 – 3)

### 9.2 GENERAL FIRE

The general fire relay will energize upon activation of a fire condition on any of the fire zones or by pressing of the in or external extinguishing release buttons. (CP 4 – 5 – 6)

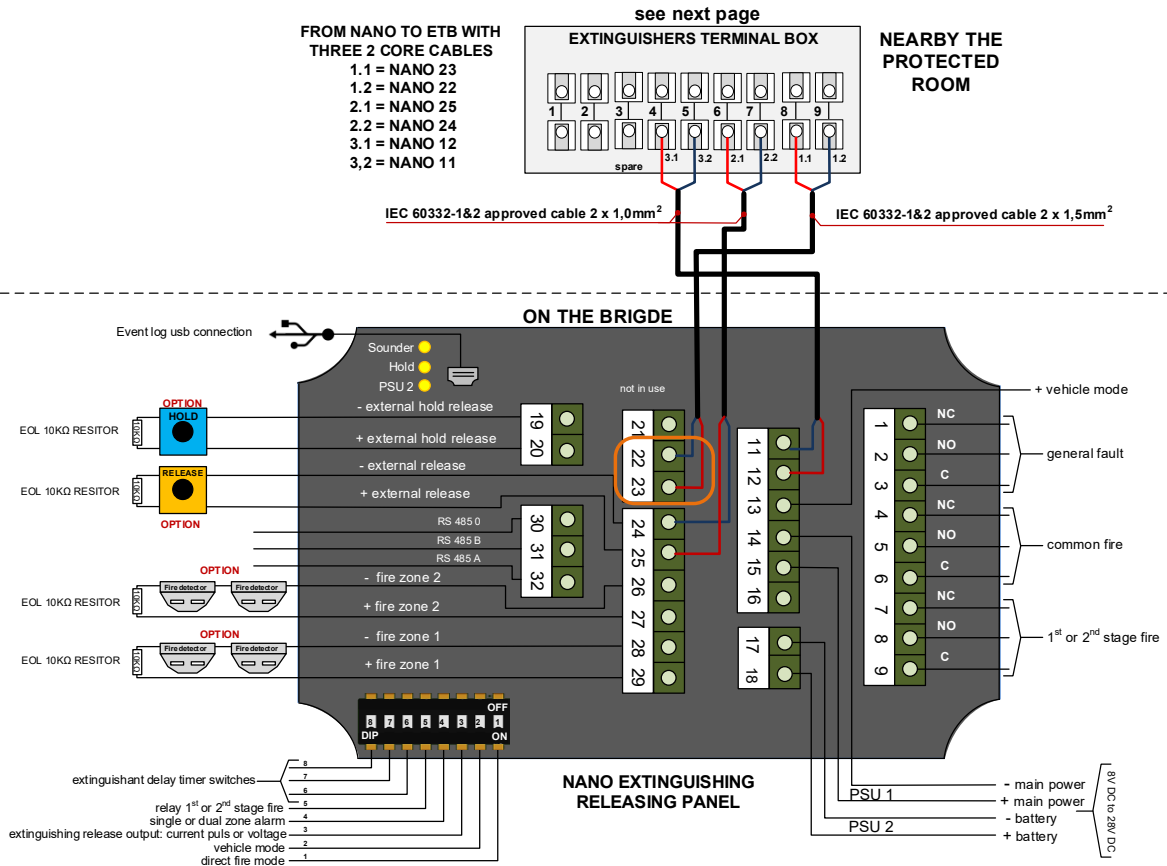
### 9.3 VENTILATION

Use relay output at 1st or 2nd fire alarm for ventilation. This VFC relay output is programmable for 1<sup>st</sup> or 2<sup>nd</sup> fire alarm and intended, among other things, for switching off ventilation and/or air conditioning of the area to protected. (CP 7 – 8 – 9) **Marine settings see page 12 subject 15.7**



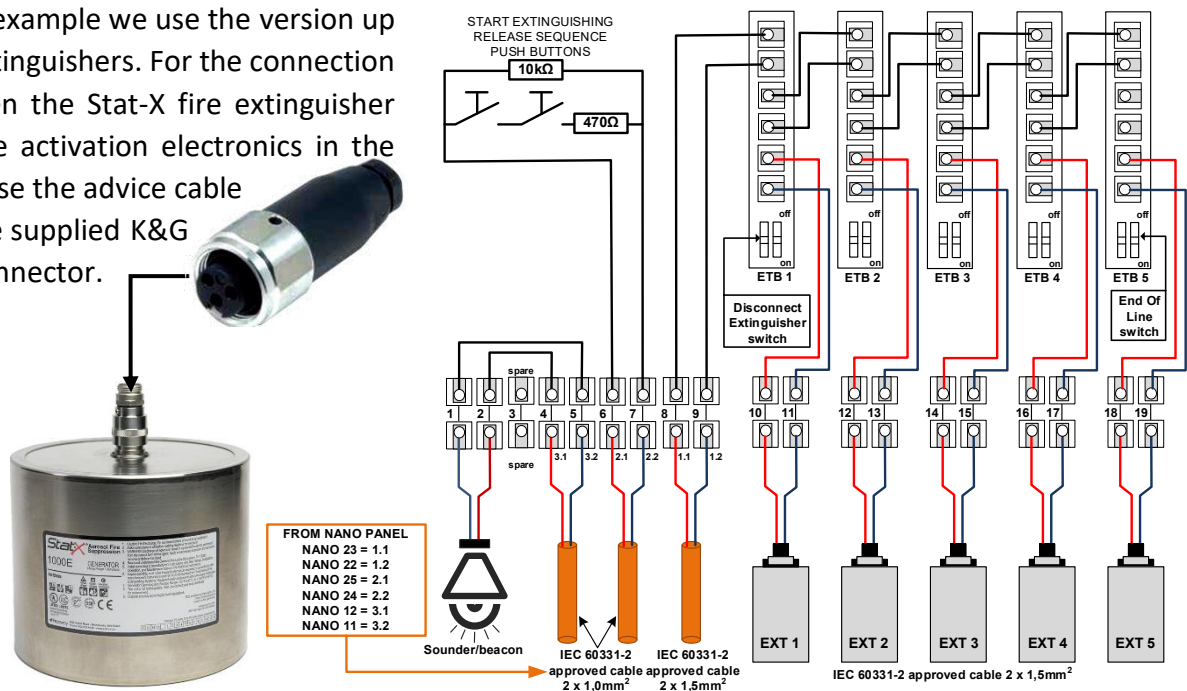
## 10 EXTINGUISHER OUTPUT

The NCP, equipped with a fire extinguisher output ( CP 22 - CP 23 + ) is monitored for short circuit and wire breakage. Only in combination with the NETB the NCP extinguishing output is protected against reverse polarity and equipped with surge protection.



## 11 CONNECTING EXTINGUISHERS TO NETB

In this example we use the version up to 5 extinguishers. For the connection between the Stat-X fire extinguisher and the activation electronics in the NETB use the advice cable and the supplied K&G KVB connector.



## 12 CONNECTING CABLE TO EXTINGUISHERS CONNECTOR

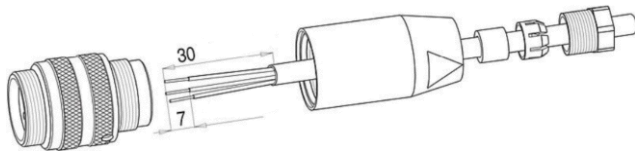
The Stat-X KVB extinguisher comes complete with a male socket sub connector in the top of the extinguisher.

1. Strip cable jacket at the end of the cable, meant to connected the fire extinguisher.

2. Finish the two wires with insulated crimp bootlace ferrules.



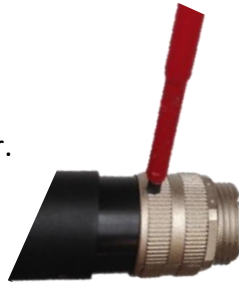
3. Follow strictly the wiring specifications of the connector supplied.



4. Connect the two wires to point 2 and 3 of the supplied female connector.



5. Finish the supplied female connector.



6. Connect the connector to the Stat-X fire extinguisher

7. Check the connection and measure the resistance from the other end of the cable (NETB side).

8. It should be between 1.4 and 2.4 Ohms.

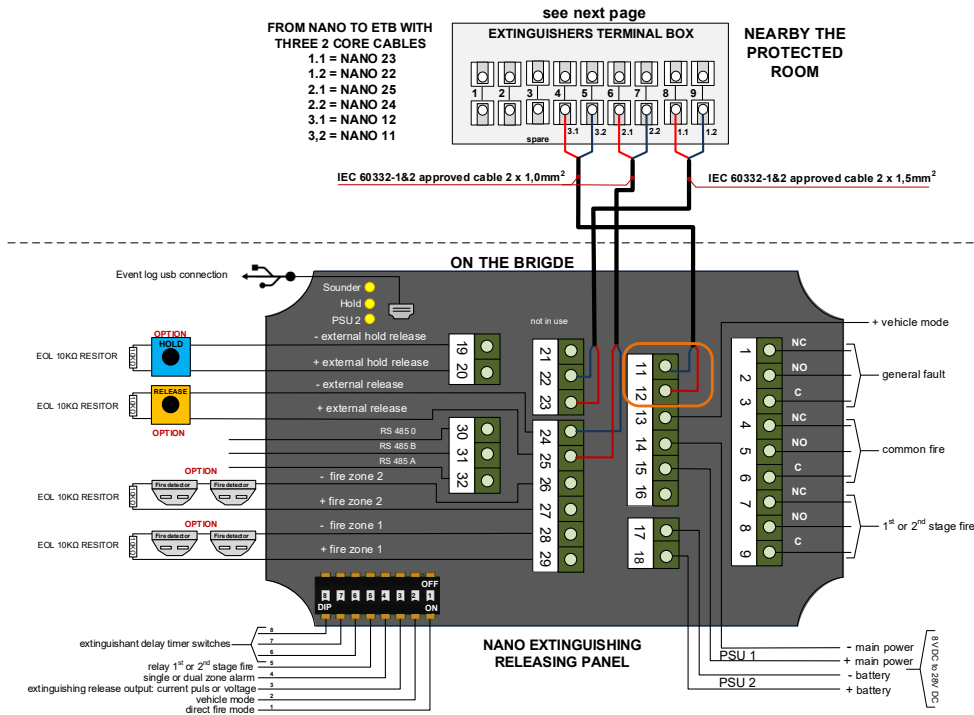
9. After conducting the point 6 check, connect the cable to the control electronics NETB CP 10 & CP11 and successively to CP18 & CP 19.





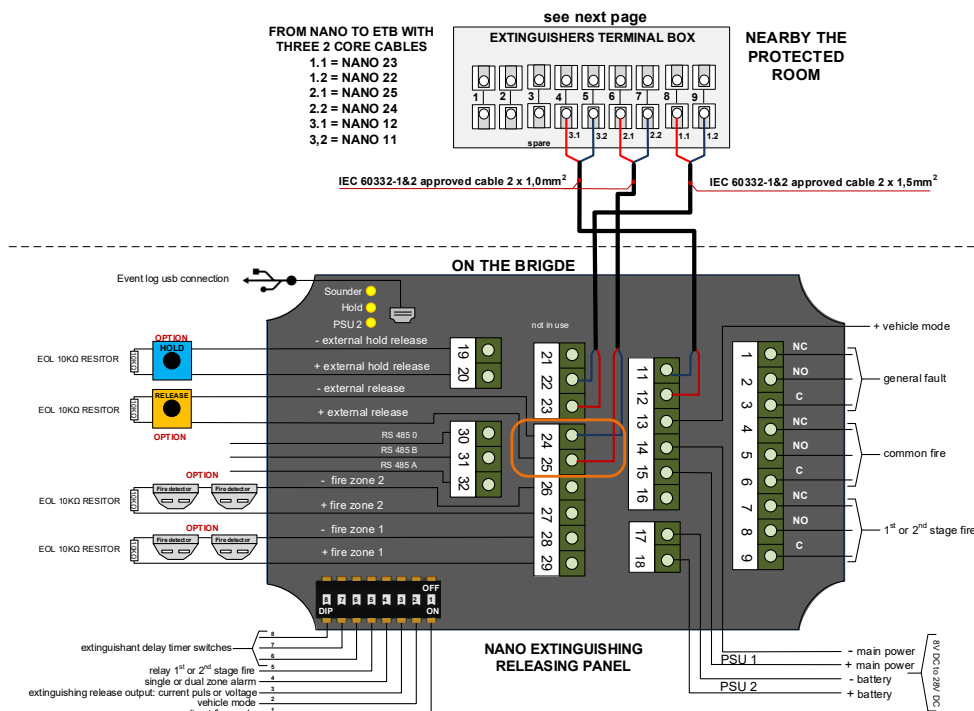
## 13 SOUNDER OUTPUT

The sounder output is meant for an optical & acoustical alarm device. It is monitored for short circuit and wire break by placing a 10 KΩ end-of-line monitoring resistor on the + and – connection (4 and 6) of the alarm device VTB-32EM. ( CP 11 + CP 12 -)



## 14 EXTERNAL EXTINGUISHING RELEASE

The NCP has a separate input ( CP 24 + CP 25 - ) for an external dual action controlled extinguishing release button. This external dual action extinguishing release button has the same function as the dual release extinguishing buttons (fire buttons) on the front of the NCP. By pressing the external release extinguishing buttons simultaneous, the fire extinguisher(s) will be released.



## 15 ROADMAP FOR FINAL COMMISSIONING

### 15.1 POWER OFF STEP ONE

Make sure that both power supplies on the NCP are turned off.

### 15.2 STEP TWO NETB

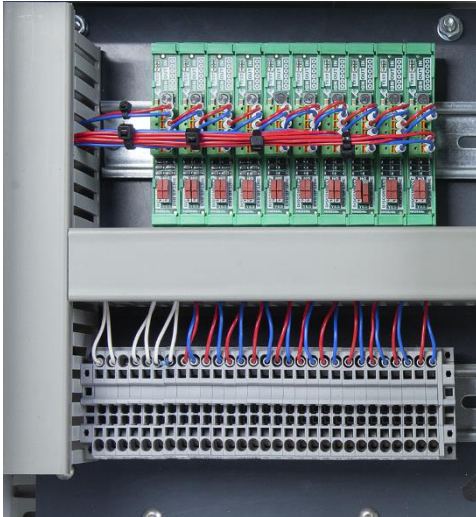
- 1 Open the NETB connected to the NCP
- 2 Make sure the aerosol generators are disconnected

#### DISCONNECT EXTINGUISHER

Move the disconnect switch in the YES position and the aerosol extinguisher is disabled and can not be activated. All ETB's connected thereafter will remain in operation. A disablement will be signaled as fault on the NCP.



- 3 Check if the wiring is all connected correctly



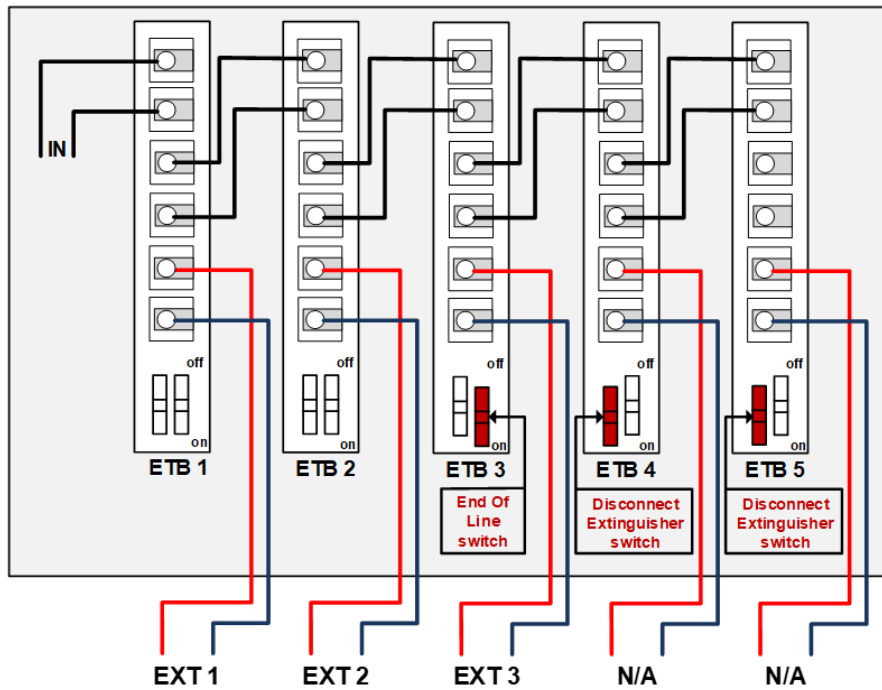
- 4 Check the last ETB for the end off line diode switch

#### ENABLE END OF LINE DIODE

To monitor for short circuit or wire break, only the end of line switch on the last ETB must be set into the YES position. A failure to do so will be signaled as a fault on the NCP.

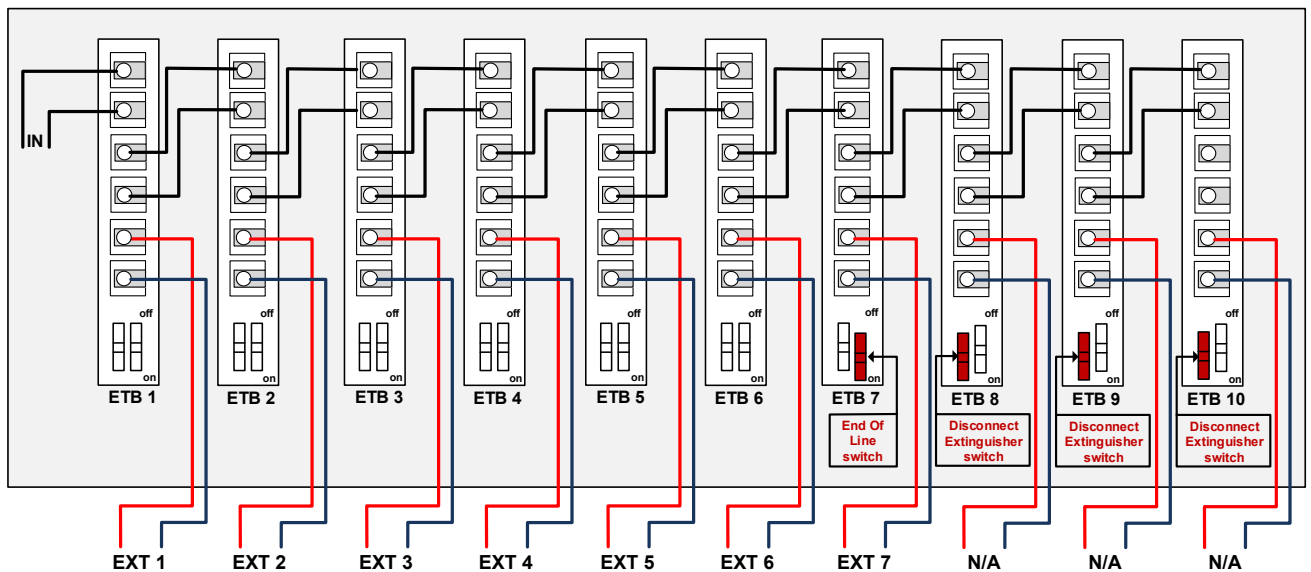


### 15.3 EXAMPLE SWITCH POSITION NETB 5 WITH 3 EXTINGUISHERS



The ETB dip switch positions on a NETB 5 in use with 3 Stat-X extinguishers

### 15.4 EXAMPLE SWITCH POSITION NETB 10 WITH 7 EXTINGUISHERS



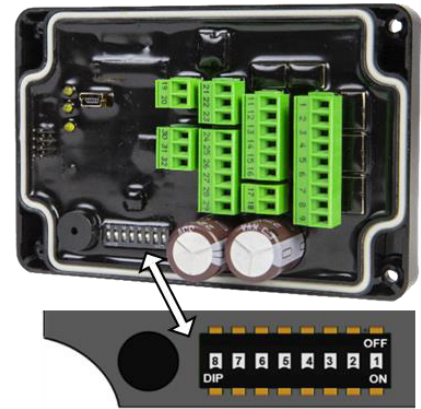
The ETB dip switch positions on a NETB 10 in use with 7 Stat-X extinguishers

### 15.5 POWER STEP TWO

- 1 turn both the power supplies to the NCP back on
- 2 the system will now power up.

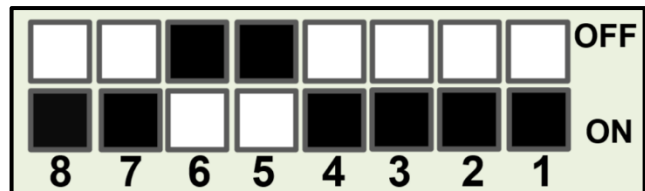
## 15.6 PROGRAMMING STEPS

1. Open the NCP
2. At the back of the NCP you will see the programming dipswitches PDS
3. These are numbered 1 to 8



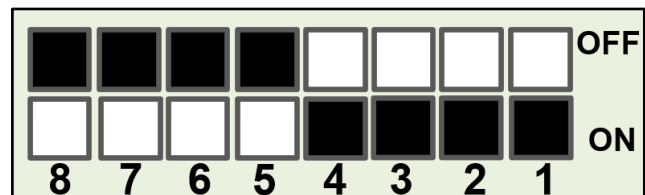
## 15.7 RECOMMENDED SETTING FOR MARINE APPLICATION WITH MANUAL RELEASE ONLY

1. Front NCP manual release ONLY, fire detectors are not in use (PDS 1 OFF)
2. The vehicle mode is disabled is not in use (PDS 2 OFF)
3. Activation of electrical igniters for aerosol fire extinguishers (PDS 3 OFF)
4. Dual zone alarm is not in use (PDS 4 OFF)
5. VFC relay meant for ventilation off, activate at 1st (PDS 5 ON)
6. Extinguishant release 20 seconds (PDS 6 ON - PDS 7 OFF - PDS 8 OFF)



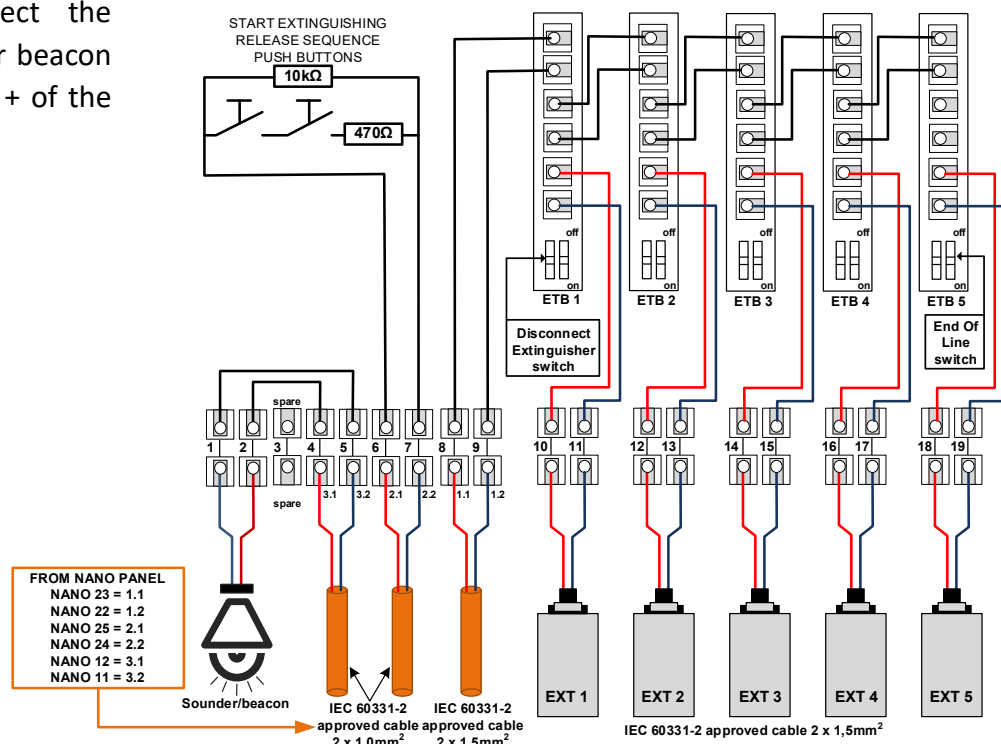
## 15.8 CHANGE THE DELAY TIME FROM 20 TO 30 SECONDS

1. Change PDS 7 and 8 to ON position



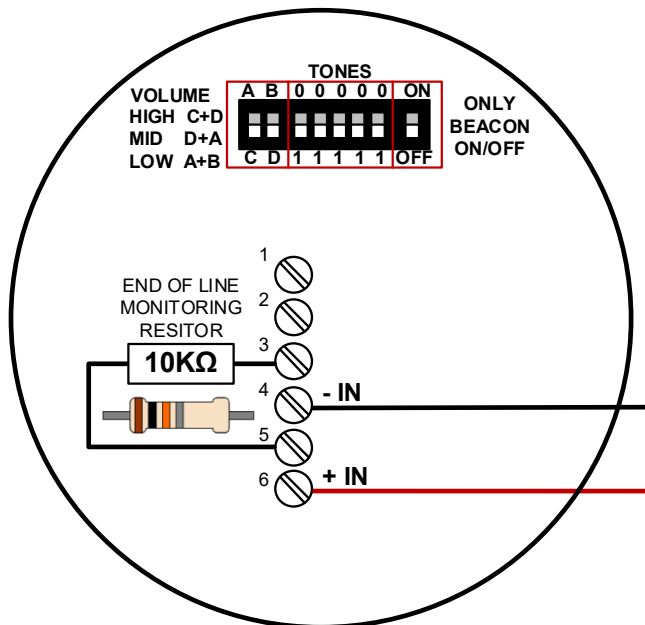
## 16 SOUNDER BEACON

Install and connect the VTB-32EM sounder beacon on CP1 – and CP2 + of the NETB.

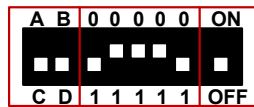


## 16.1 SINGLE SOUNDER BEACON

By a single sounder beacon follow the connection diagram below. The recommended setting gives the best and deviating alarm signal compared to the usual evacuation alarm signal on vessels.

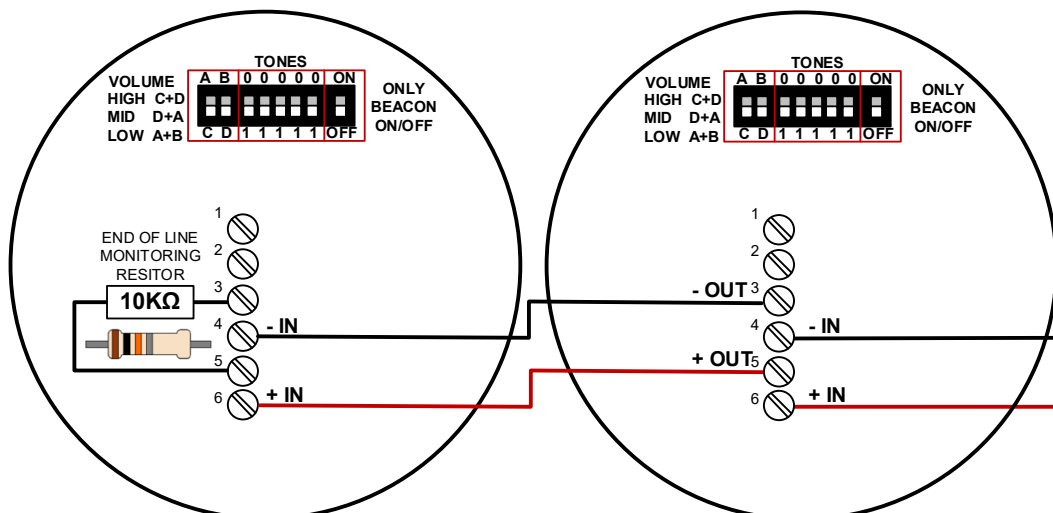


Recommended setting  
 sounder/beacon  
 C/D – 10001 - OFF

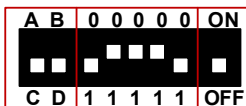


## 16.2 OPTION EXTENDED SOUNDER & BEACONS

In some cases, or in larger rooms, the installation of a second audible and visual notification device is necessary. Usually this is caused by the lack of visibility and observability of the of the optical alarm signal in the protected area. In a noisy environment, the optical alarm signal is the main warning element.



Recommended setting  
 sounder/beacon  
 C/D – 10001 - OFF



## 17 NANO MAR SYSTEM TEST OPTION 1

**Step 1 OPEN** the ETB MAR BOX

**Step 2 DISCONNECT** each extinguisher by using the disconnect switch on each ETB.



**Disconnect extinguisher**

**MOVE** the disconnect switch of all in the YES position and the aerosol extinguisher is disabled and can not be activated. A disablement will be signaled as fault on the NANO control panel.



**Step 3 ACTIVATE** the extinguishing by pressing simultaneous both yellow extinguishing release buttons on the ETB MAR BOX door.

**Step 4 CONFIRMATION**



**Confirmation of extinguisher activation**

As confirmation of a successful extinguishment activation, the red LEDs on the extinguishers terminal board will flash and the red extinguishing released LED on the NANO control panel front lite up.



**Step 5 RESET** the system by pressing the reset button on the NANO front.



**Step 6 REPEAT** activate the extinguishing release by pressing simultaneous the extinguishing release buttons on the front of the NANO control panel .



**Step 7 CONFIRMATION**

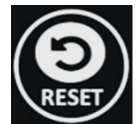


**Confirmation of extinguisher activation**

As confirmation of a successful extinguishment activation, the red LEDs on the extinguishers terminal board will flash and the red extinguishing released LED on the NANO control panel front lite up.

**Step 8 RESET** the system by pressing the reset button on the NANO control panel.

**Step 9 RESTORE** the system and re-connected the extinguishers.



**CONNECT extinguishers**

**Move** the disconnect switch in the NO position and the aerosol extinguisher is connected to the system and can be activated.

The fault LED on the front of the NANO control panel goes out. Only the green Power LED and the Manual Only LED light up to indicate that the system is ready for use.

## 18 NANO MAR SYSTEM TEST OPTION 2.

A test plug, specially developed for that purpose, is available for testing the NANO system up to the extinguishing generator.

Put this test plug in place of each extinguishing generator.

An acknowledgment of receipt of the activation pulse is indicated by the red LEDs in the test plug.

These start to pulse after receiving the activation current pulse.

**Step 1 DISCONNECT** the extinguishing generator by removing the connector. See image



**Step 2 CONNECT** the test plug on the cable of the extinguisher. See image



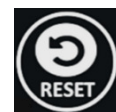
**Step 3 ACTIVATE** the extinguishing by pressing simultaneous both yellow extinguishing release buttons on the ETB MAR BOX.



**Step 4 AS CONFIRMATION** of a successful extinguishment activation, the red LEDs on the test plug, see image, will flash and the red extinguishing released LED on the NANO control panel front lite up.



**Step 5 RESET** the system by pressing the reset button on the NANO front.



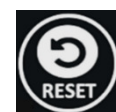
**Step 6 REPEAT** activate the extinguishing release by pressing simultaneous the extinguishing release buttons on the front of the NANO control panel.



**Step 7 AS CONFIRMATION** of a successful extinguishment activation, the red LEDs on the test plug will flash. See image



**Step 8 RESET** the system by pressing the reset button on the NANO front.



**Step 9 END** the test session, restore the system, and re-connected the extinguishers.



The diagrams of operating principles of the NMS fire-/extinguisher system, included in this manual, are intended to support this manual and are therefore not intended and suitable for technical implementation or realization. No part of this manual may be reproduced, stored in an automated database, or made public in any form or by any means either electronically, mechanically or by photocopying, recording, or in any other way, without prior written permission from K&G GROEP B.V. The policy of the K&G GROEP B.V. is one of continuous improvement and as such we reserve the right to amend product specifications at any time and without prior notice. Errors and omissions excepted.

Outdated or replaced computers and electronics are valuable sources for secondary raw materials, if recycled. Dealers of the NMS must comply with local regulations for waste separation applicable in the country where the supplier is located. Questions concerning the information presented in this manual may be addressed to your dealer. For technical questions or support contact your dealer or further assistance.

