# User Manual

## Marine Watch **S Series**

S-ONE Alarm Panel
S-ACE Annunciator Panel
I/O Cabinet



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# User Manual
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# 1 About this Manual

## 1.1 Intended Audience

This manual has been published primarily for professionals and qualified personnel. The user of this material is assumed to have basic knowledge of marine systems and must be able to carry out related electrical work.

⚠️ Work on the low-voltage circuit should only be carried out by qualified and experienced personnel.

Installation or work on the shore power equipment *must only* be carried out by electricians authorised to work with such installations.

## 1.2 Responsibilities

It is the **sole responsibility of the installer** to ensure that the installation work is carried out in a satisfactory manner, that it is operationally in good order, that the approved material and accessories are used and that the installation meets all applicable rules and regulations.

ⓘ Auto-Maskin continuously upgrades its products and reserves the right to make changes and improvements without prior notice.

All information in this manual is based upon information at the time of printing. For updated information, please contact your local distributor.

The crossed-out wheeled bin symbol indicates that the item should be disposed of separately. The item should be handed in for recycling in accordance with local environmental regulations for waste disposal.

By separating a marked item, you will help reduce the volume of waste sent to incinerators or landfills and minimise any potential negative impact on human health and the environment.

## 1.3 Revisions

This manual is valid for the latest software version of the Marine Watch S Series Alarm Panel.

### 1.3.1 Software revisions

- See [this document](#) for S-ONE Alarm Panel software revisions.
- See [this document](#) for S-ACE Annunciator Panel software revisions.

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### 1.3.2 User Manual Revision

User manual revision: December 5, 2023

# 2 System Overview

## 2.1 Introduction to Marine Watch

The Marine Watch S Series is a sophisticated and powerful alarm system, designed to be easy to set up and use.

The S-ONE Alarm Panel touchscreen displays binary events as rectangles, where each rectangle represents the status of a channel. Analog channels are represented with gauges.

In the event of a warning or an alarm, the corresponding rectangle indicates clearly with a flashing behaviour and the buzzer sounds. An operator can acknowledge the event by touching the rectangle.

Additional S-ONE Alarm Panels can be added to the network, and these are designated Subpanels. Finally, several S-ACE Annunciator Panels can be added to the network.

All I/O interfaces are built into a separate I/O Cabinet. The communication between the Alarm Panel and the I/O Cabinet is on standard Ethernet.
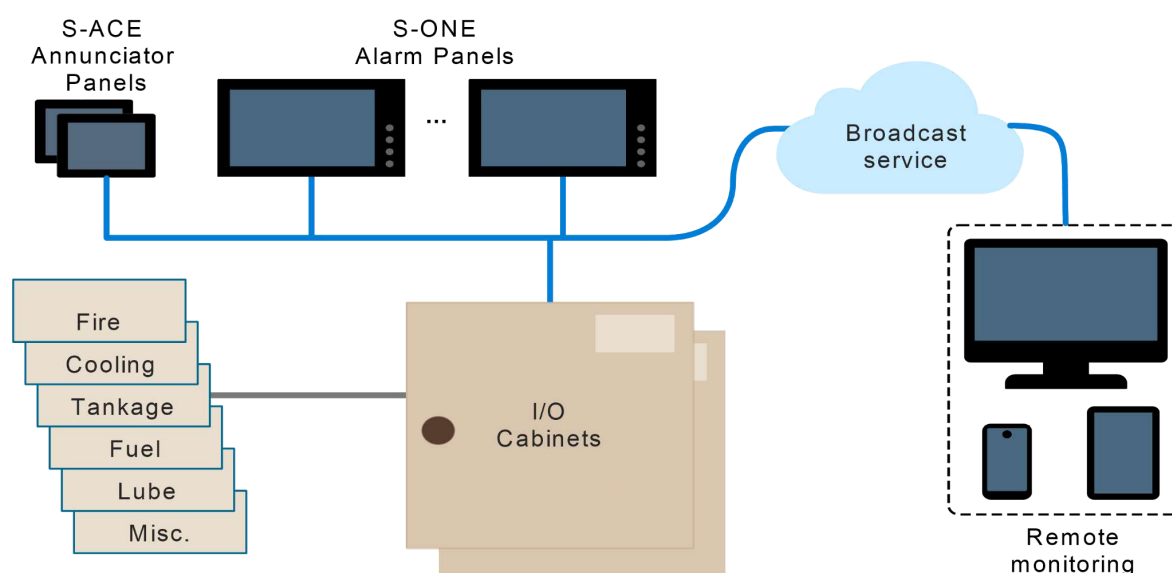


The optional Broadcast service provides remote monitoring of the system from shore.

## 2.2 Typical Installation

The typical Marine Watch installation consists of one or several I/O Cabinets, one or several S-ONE Alarm Panels, and a few S-ACE Annunciator Panels. All units are connected to a standard Ethernet network.

Additional S-ONE and S-ACE panels can be added at any time and require no change in the overall configuration. One must only make sure there is no IP address conflict.

The S-ONE Alarm Panel can be used as either the Main Panel or a Subpanel.

## 2.3 Components and Default IP Address

All Marine Watch S Series components have a factory-default IP address. If more than one of each type of component is in use, then make sure to change the IP address of the extra component.

No two components in the network shall have the same IP address.

### 2.3.1 Main Panel

One of the S-ONE alarm panels shall, in the configuration, be designated the Main Panel. This is the default setting.



The Main Panel shall be configured and it holds the entire system configuration. The configuration is done in the Administration submenu.

Configuration can be done manually using the panel menu interface or by loading a predefined configuration file.

**Note!** Ethernet 1 default IP address: 192.168.0.**151**

⚠ Configuration changes are automatically applied to all networked Subpanels and Annunciator panels.

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## 2.3.2 Subpanels

Additional S-ONE alarm panels can be added to the network, and these are called Subpanels. It must be configured as such, under Panel Type in the Administration menu.

Each Subpanel replicates the Main Panel and optionally has specific use cases.

A Subpanel is automatically always in sync with the Main Panel configuration.

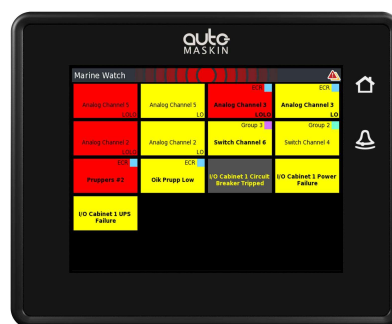**Note!** Ethernet 1 default IP address: 192.168.0.**151**[1]

## 2.3.1 Annunciator Panels

Several S-ACE annunciator panels can be added to the network.

An annunciator panel is automatically always in sync with the S-ONE Main Panel configuration.

**Note!** Default IP address: 192.168.0.**201**[2]

## 2.3.2 I/O Cabinet

The I/O Cabinet is the sensor hub. It collects all sensor data and makes it available to the Marine Watch Panels.

The I/O Cabinet is available in different sizes, I/O capacities, and I/O types.

There can be up to four I/O cabinets in the network.

**Note!** Default IP address: 192.168.0.**11**[3]

## 2.4 S-ONE Main Panel Emergency Switchover

In the unlikely event of a Main Panel failure, any Subpanel can act as a replacement panel, and quickly be reconfigured to be a Main Panel.

Make the system operative again:

---

[1] From the factory, the IP address on the Subpanel is the same as for the Main Panel. This must be changed so that all networked panels have a unique address.

[2] If several S-ACE Annunciator Panels are in use, then make sure all IP addresses are unique.

[3] If several I/O Cabinets are in use, then make sure all IP addresses are unique.

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1. Remove the Ethernet cable from the faulty Main Panel.
2. In the **Administration menu** of the desired replacement panel, select
   **This Panel** > **Panel Type**: Select **Main Panel**.
3. On the same administrative page, take note of the **replacement panel** IP address.

Reconnect any other Subpanels and Annunciator Panels.

4. If the Marine Watch S system consists of additional S-ONE Subpanels or S-ACE
   Annunciator Panels, they need to be reconfigured. In the **Administration menu**,
   select **I/O Cabinet > Network**: Enter the **replacement panel** IP address.
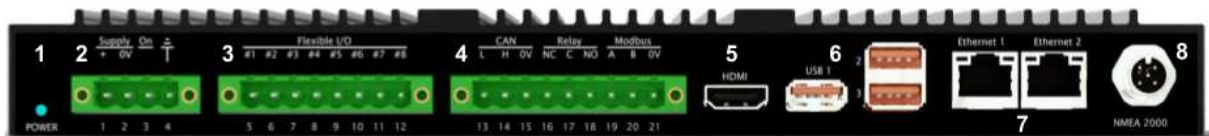
(!) Make sure there is only one panel configured as the **Main Panel** in the Marine
    Watch S system.

## 2.5 S-ONE Alarm Panel

### 2.5.1 Connectivity and Interfaces

The rear underside of the S-ONE Alarm Panel has all the interfaces.



| 1 | **Power LED** |
|---|---|
| 2 | **Power supply**<br>1. +12/24 V<br>2. 0 V<br>3. Power on[5]<br>4. Gnd |
| 3 | **Flexible I/O**<br>5. I/O #1<br>6. I/O #2<br>7. I/O #3<br>8. I/O #4<br>9. I/O #5<br>10. I/O #6<br>11. I/O #7<br>12. I/O #8 |
| 4[6] | **CAN bus, Relay, Modbus RTU**<br>13. CAN L<br>14. CAN H<br>15. CAN 0V<br>16. Relay NC<br>17. Relay C<br>18. Relay NO<br>19. Modbus A<br>20. Modbus B<br>21. Modbus 0V |

| 5[4] | **HDMI** |
|---|---|
| 6 | **USB-A (2.0 High-speed interface)**<br>● USB 1<br>● USB 2<br>● USB 3<br><br>Reserved for software update, event log extraction, and configuration file handling |
| 7 | **Ethernet**<br>● Ethernet 1, RJ45<br>● Ethernet 2, RJ45<br><br>Ethernet 1 is preferred for networking. |
| 8[7] | **NMEA 2000 – isolated** |

---

[4] Not in use
[5] Not in use, connect to 24V for future use
[6] Not in use
[7] Not in use

| Miscellaneous | |
|---|---|
| Buzzer | Activates for any new event. |
| Ambient Light Sensor | Automatic adjustment of screen brightness. |
| Proximity Sensor | Motion detection. |

## 2.5.2 Operator Interface

In addition to the touch interface on the screen, there are buttons on the right-hand side of the panel. These are used to control different parts of the panel as described below:
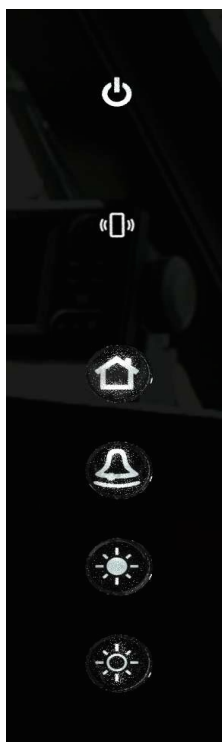
| Interface | |
|---|---|
| Power Indication | Lit when the panel is powered. |
| NFC Sensor | Not used in this software revision. |
| Home Button | The Home button displays the Home page.<br><br>When on the Home page, the home button displays the previous instrument page.<br><br>A long press displays the Menu page. |
| Alarm Button | Silences the buzzer and displays the alarm list.<br><br>When displaying the alarm list and pressing the Alarm button<br><br>● If the buzzer is sounding the buzzer will be silenced<br>● If no buzzer is sounding the previous page will be displayed |
| Brightness Increase Button | Increase screen brightness. |
| Brightness Decrease Button | Decrease screen brightness. |

## 2.5.3 Communication Interface

Other systems can interface with the S-ONE Alarm Panel using the built-in Modbus TCP interface on Ethernet.

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The communication I/O list can be found here: http://tiny.cc/zxxebz

## 2.6 S-ACE Annunciator Panel

### 2.6.1 Hardware Connections



| Connectivity | |
|---|---|
| **Description** | **Connector** |
| Power<br>Typical: 0.4 A @ 24 V | C1.11: +12/24 V<br>C1.12: 0 V |
| External Buzzer<br>Max: 0.2 A | C1.1<br>0 V at C1.12 or other 0 V. |
| Ethernet | RJ 45 |
| USB | USB-A |

For full information of the connectivity and interfaces, see the datasheet of the product.

In order to achieve full IP-56 ingression support, the unused connectors must be populated with sealing plugs[8].

### 2.6.2 Operator Interface

In addition to the touch interface on the screen, there are buttons on the right-hand side of the panel. These are used to control different parts of the panel as described below:

| Symbol | Button | Action |
|---|---|---|
|  | Home Button | Toggles between the Alarm list and Menu page. |
|  | Alarm Button | Silences the buzzer and displays the Alarm list. |

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[8] SKU: 1006946 (extend with Buzzer connectivity if needed)

## 2.7 I/O Cabinet
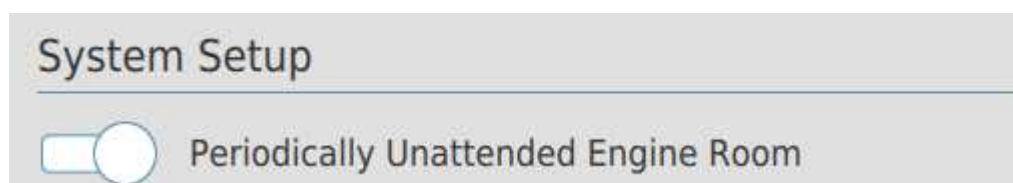
Marine Watch includes a standard set of signals in the I/O Cabinet. See the <u>I/O Cabinet chapter</u> for further details.

> The I/O Cabinet can be extended with additional switch channels, analog channels or output channels.

## 2.8 Periodically Unattended Engine Room

The Marine Watch S Series system supports periodically unattended engine room installations.



The minimum setup for a periodically unattended engine room installation is the following

- S-ONE Main Panel in the engine room / engine control room
- S-ACE or S-ONE Subpanel on the bridge
- S-ACE or S-ONE Subpanel in the engineers cabin

> When the engine room is unattended, any alarm condition in the main alarm system shall initiate an alarm in the duty engineers' cabin and in all public spaces the duty engineer may reside.

This can be accomplished by installing an S-ACE or S-ONE Subpanel in such locations.

### 2.8.1 Watch Responsibility and Watch Transfer

When the engine room is attended, the engineer in the engine room has the watch responsibility. The watch responsibility can be transferred to and from the bridge using the Marine Watch S Series panels.

When a successful watch transfer to the bridge has been executed, the bridge has the watch responsibility, and the engine room can be left unattended.
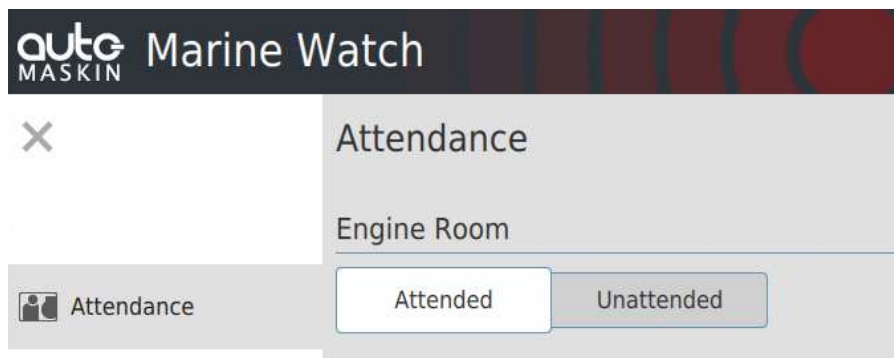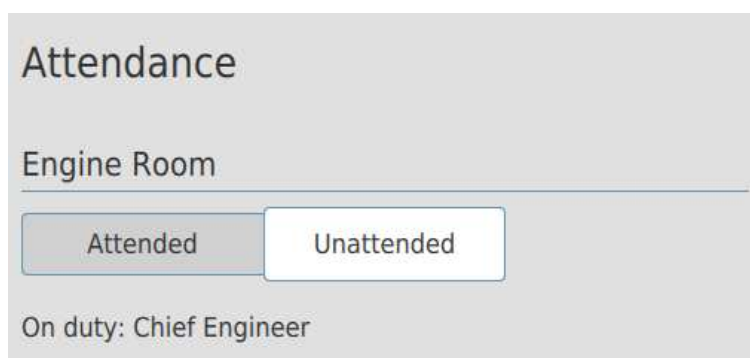
**Watch Responsibility Indication**

The following symbol is shown in the panel header when the panel has watch responsibility.
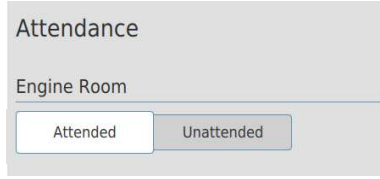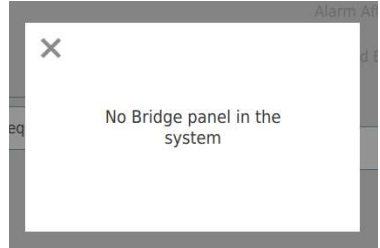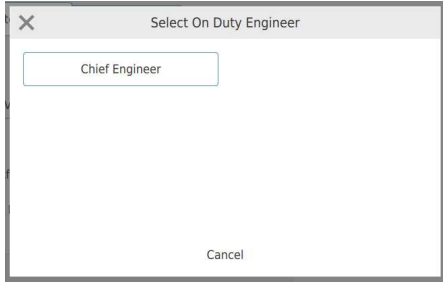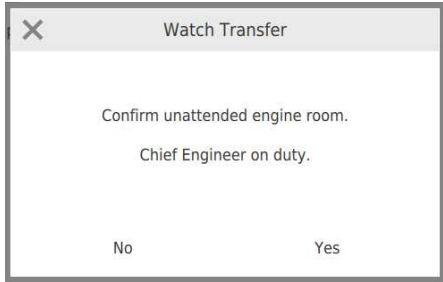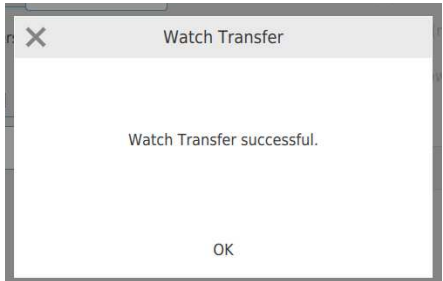


If the engine room has watch responsibility, this is equivalent to an attended engine room. Likewise, if the bridge has watch responsibility, the engine room can be unattended.

In addition, engine room status (attended / unattended), as well as an on-duty engineer (in case of unattended engine room), can be inspected using the panel menu.
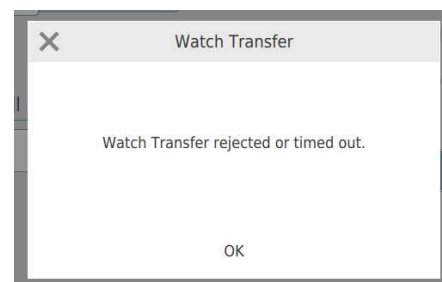


**Watch Transfer to Bridge**

When the engine room engineer is about to leave the engine room, the engineer must transfer watch responsibility to the bridge before leaving the engine room.

| | |
|---|---|
| Request unattended on the Engine Room panel or the Engine Control Room panel by pressing the **Unattended** button. | **Attendance**<br><br>Engine Room<br><br>Attended \| Unattended |
| If no Bridge panel exists in the system, this is indicated with a popup and the transfer request is aborted. | ✕<br><br>No Bridge panel in the system |
| Select which "Engineers Cabin" shall be "On duty".<br><br>If no Engineers Cabin panel exists in the system, this is indicated with a popup and the transfer request is aborted. | ✕  Select On Duty Engineer<br><br>Chief Engineer<br><br>Cancel |
| Audible sound and dialog on all Bridge panels. | ✕  Watch Transfer<br><br>Confirm unattended engine room.<br><br>Chief Engineer on duty.<br><br>No          Yes |
| If the bridge accepts the transfer, watch transfer is performed, and the bridge has the watch responsibility. | ✕  Watch Transfer<br><br>Watch Transfer successful.<br><br>OK |

| | |
|---|---|
| If the bridge denies the transfer (or times out), no watch transfer has been performed and the engine room still has watch responsibility. | **Watch Transfer**<br><br>Watch Transfer rejected or timed out.<br><br>OK |

**Watch Transfer to Engine Room**

When the engine room engineer enters the engine room, the engineer takes watch responsibility, and the bridge panel is informed.

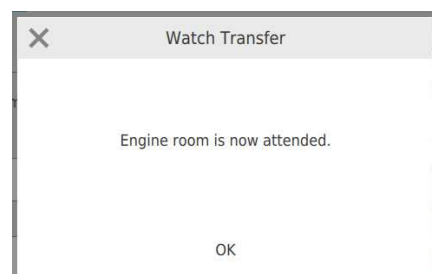| | |
|---|---|
| Request attended on the Engine Room panel or the Engine Control Room panel by pressing the **Attended** button. | **Attendance**<br><br>Engine Room<br><br>Attended   Unattended<br><br>On duty: Chief Engineer |
| Dialogue on all Bridge panels. | **Watch Transfer**<br><br>Engine room is now attended.<br><br>OK |

## 2.8.2 Buzzer and Acknowledge

Depending on the panel location, the buzzer activates according to the following table.

| Location | Attended Engine Room | Unattended Engine Room |
|---|---|---|
| Bridge | Per group configuration | Activate buzzer |
| Engineers cabin [on duty] | Silent | Activate buzzer |

| Location | Attended Engine Room | Unattended Engine Room |
|---|---|---|
| Engineers cabin [off duty] | Silent | Silent[9] |
| Other / Public spaces | Silent | Activate buzzer |
| Engine room | Activate buzzer | Activate buzzer |
| Engine control room | Activate buzzer | Activate buzzer |

The Marine Watch S Series panels installed on the bridge can be configured to which channel groups shall activate the buzzer in an attended engine room situation.

This can be used to minimise the potential disturbance on the bridge when the engine room is attended.
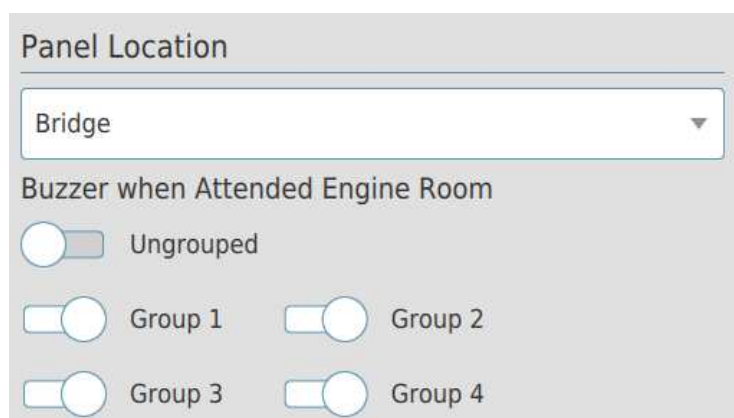


### Engine Room / Engine Control Room

The S-ONE Main Panel should be configured to acknowledge all events. If an S-ONE Subpanel is installed in the engine room, in addition to the S-ONE Main Panel, it can be configured to acknowledge events as well as perform a system-wide silence.

Silencing the buzzer on one of these panels will silence all buzzers in the Marine Watch S Series system.

### Other Locations

Panels in other locations shall not be able to acknowledge events. The S-ACE panels can not acknowledge any events, whereas the S-ONE Subpanels can be configured to not acknowledge events.

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[9] Engineers Alarm will activate the buzzer on the off duty engineers cabin as well.

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Silencing the buzzer on one of these panels only silences the local buzzer. The buzzer in all other locations is not affected by a local silence.

### 2.8.3 Engineers Alarm

The Engineers Alarm can be configured on the Main Panel.



If an event is not acknowledged within the configured time (1 - 10 minutes), the Engineers Alarm will activate. The Engineers Alarm will activate all panel buzzers (including any panel in the off-duty engineers cabin).

## 2.9 Cyber Security

In order to comply with the cyber security regulations by IACS, this chapter describes the configuration required and any input to a potential Cyber Security Management System.

### 2.9.1 Configuration
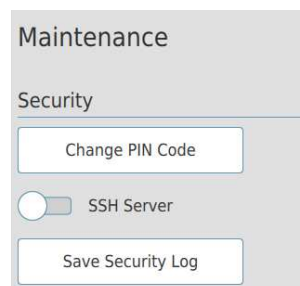
**Required Configuration**

- SSH shall be disabled, which is the default for factory-produced units.

**Recommended Configuration**

- Change the PIN code to something which is not the default.

**Inspect Configuration**

The configuration can be inspected in the Administrative part of the menu.

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## 2.9.2 Integration to Cyber Security Management System

**Backup and Recovery of System**

|  |  | S-ONE | S-ACE |
|---|---|---|---|
| Backup | | Take note of the software version | Take note of the software version |
| | | Extract configuration file to USB and store it | Take note of the following from the Administrative settings<br>- IP Address<br>- Panel Buzzer<br>- Alarm Groups<br>- Main Panel IP address<br>- Panel Location<br>- Buzzer when Attended Engine Room |
| Recovery | | Remove Ethernet cable(s) | Remove Ethernet cable |
| | | Perform a software update to the version in the backup | Perform a software update to the version in the backup |
| | | Perform factory reset | Perform factory reset |
| | | Change PIN code | Change PIN code |
| | | Restore the backed up configuration by loading configuration from USB | Restore configuration manually |
| | | Insert Ethernet cable(s) | Insert Ethernet cable |

**Periodical Functionality Audit**

For S-ONE and S-ACE, at a minimum, perform the following periodically to verify security functionality.

1. Attempt to log in to the Administrative menu with an incorrect PIN.
2. Login to the Administrative menu with the correct PIN.
3. Insert a USB memory stick, and extract the security log from the Maintenance section of the Administrative menu.
4. On a PC, verify the two latest records are "admin unsuccessful log in" and "admin log in" in the 'security_log.csv' file on USB.

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# 3 The S-ONE User Interface

## 3.1 Header Information



The header consists of the following information.

- The logotype, if any. This can be changed in the configuration.
- The default panel name is **Marine Watch**. The name can be changed in the configuration.
- A common warning/alarm banner; flashing for new unacknowledged events.
- When the buzzer is active, the buzzer symbol is indicated in the centre of the banner.
- The two most recent unacknowledged events, if any, are displayed next to the event indicator.
- Various status symbols.
- The Time can be displayed as an option.

## 3.1.1 Header Status Symbols

These symbols may appear in the header bar.

| | | |
|---|---|---|
| At least one channel indicates Alarm | At least one channel indicates Warning | At least one Alarm and at least one Warning |
| At least one alarm, one warning and one disabled channel | One or more channels are disabled by the operator | At least one new Alarm or Warning[10] |
| Watch responsible | The buzzer is sounding | |

---

[10] The red alarm banner takes precedence over the yellow warning banner

## 3.2 The Home Page

The Home Page indicates an overview of all the configured pages. Access to any page can be done by selecting that page.

Any active event on a page is indicated with the corresponding warning- or alarm triangle symbol, and a counter. Also, any disabled channels are indicated with a grey triangle.

The main menu can be accessed by selecting the ☰ symbol.
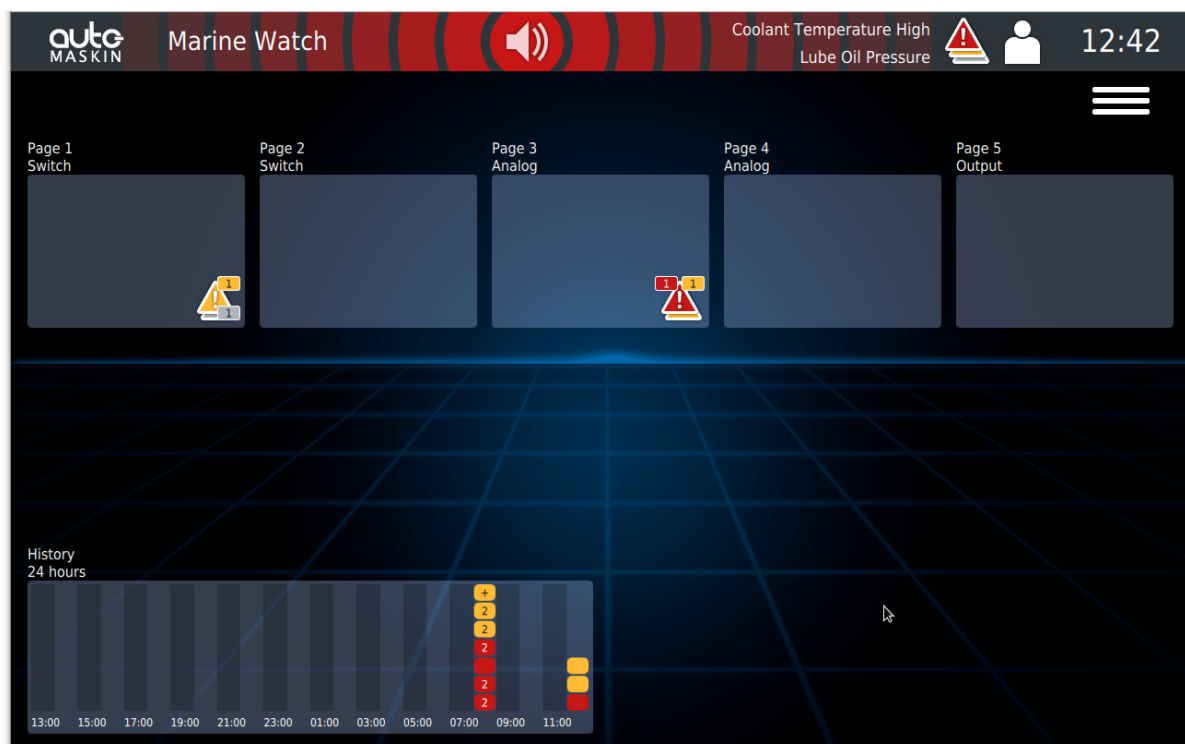


### 3.2.1 History Widget

The history widget displays the alarm status for the last 24 hours. Recurring alarms are indicated with a count. Select a time interval to see more detailed information.

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## 3.3 The Alarm List

The Alarm List displays all events in a grid or list view. If no events are present, the Alarm List displays a green all OK symbol. In case of the worst event is a warning, the background is coloured with warning colours.

Likewise, if the worst event is an alarm, the background is coloured with alarm colours.



| All OK | Most severe: Warnings | Most severe: Alarms |
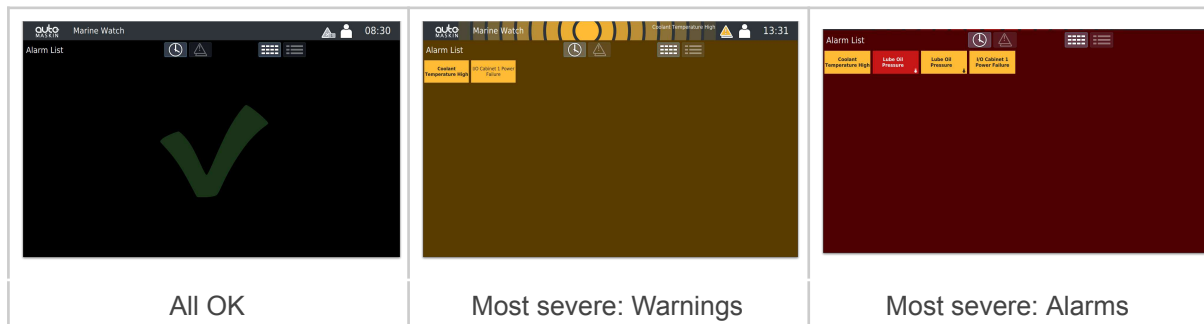
The events can be acknowledged from the panel if allowed in the configuration.

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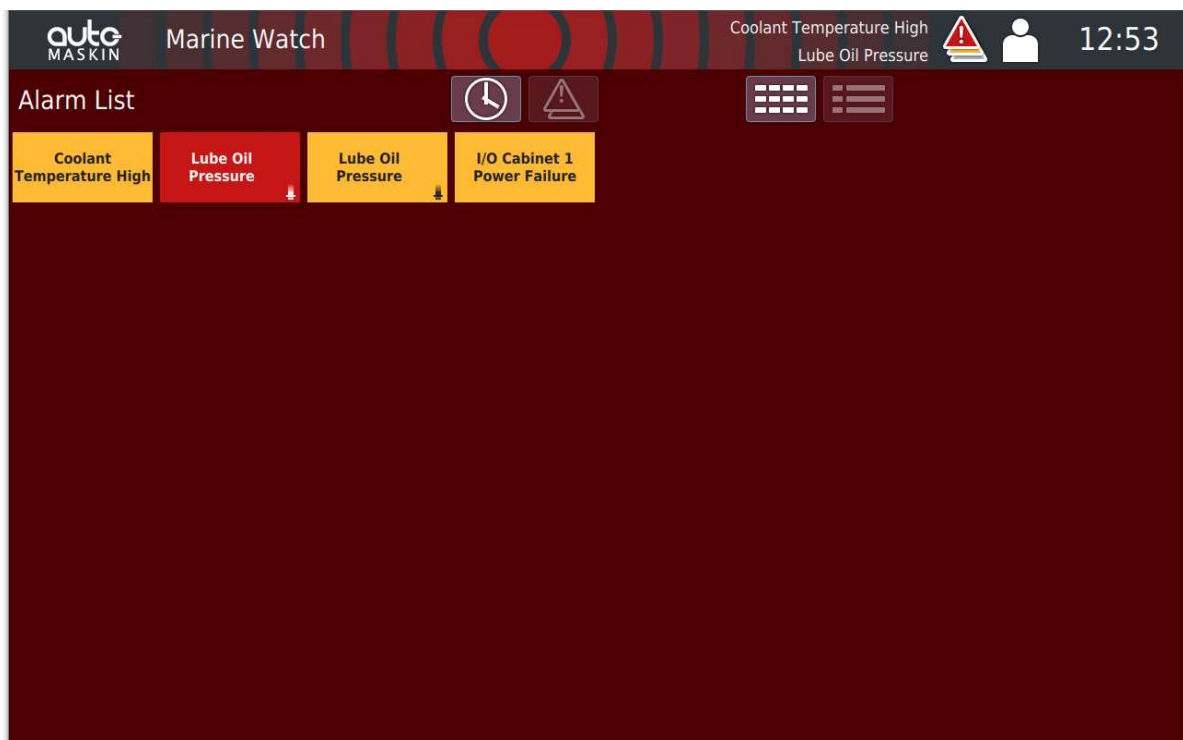
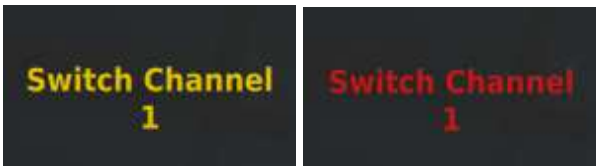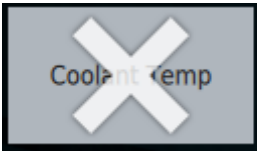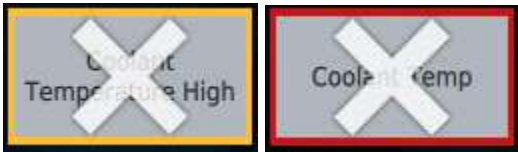## 3.3.1 Symbols in the Alarm List
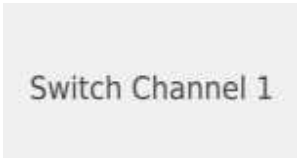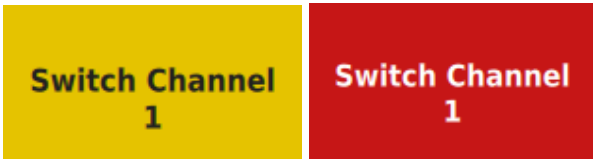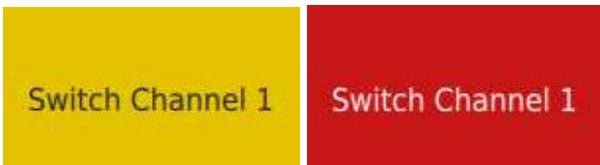
| Symbols in the Alarm List | |
|---|---|
|  | The events are sorted chronologically, with the most recent event first. |
|  | The events are sorted by severity, with the most severe event category first. |
|  | The events are displayed in a grid view. |
|  | The events are displayed in a list view. |

## 3.3.2 Alarm list colour coding

| Alarm List Colour Coding | | |
|---|---|---|
| **Warning text** | Bold black text on yellow background | Active, unacknowledged warning |
| Warning text | Normal black text on yellow background | Active, acknowledged warning |
| **Warning text** | Bold yellow text on grey background | Inactive, unacknowledged warning |
| **Alarm text** | Bold white text on red background | Active, unacknowledged alarm |
| Alarm text | Normal white text on red background | Active, acknowledged alarm |
| **Alarm text** | Bold red text on grey background | Inactive, unacknowledged alarm |

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## 3.4 The Switch Channel Page

There will be one or several pages with rectangles. This is dependent on the configuration, the number of connected I/O Cabinets, and the type of I/O in each Cabinet.

Each rectangle represents the status of one switch input channel, and each page can display status from up to 60 channels.



Channels can optionally be assigned to one of three different groups, and the group can be given a name and assigned a group colour.

Different alarm panels can be configured to indicate and allow acknowledgement for select groups of channels only.

(!) Note that channel OK can be indicated as a green or white rectangle, and this can be changed in the menu.

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### 3.4.1 Channel Status

Each rectangle represents the status of a binary channel as follows.

| Status | Description | Sample Graphic Representation |
|---|---|---|
| Normal | The channel is not alarming. | Switch Channel 1 |
| Active and not acknowledged | The channel is alarming, following its persistence timer.<br><br>Text in bold, flashing. | Switch Channel 1    Switch Channel 1 |
| Active and acknowledged | The channel is acknowledged by an operator and will clear when the alarm clears.<br><br>Regular text. | Switch Channel 1    Switch Channel 1 |
| Inactive and not acknowledged | The channel has been activated but is not active now.<br><br>It will clear when acknowledged.<br><br>Grey background, bold flashing text in yellow/red. | Switch Channel 1    Switch Channel 1 |
| Disabled | The channel has been disabled by an operator.<br><br>The rectangle is reduced in size and grey. | Coolant Temp |
| Disabled, but active event | The channel has been disabled by an operator.<br><br>Border in severity colour if the channel is active. | Coolant Temperature High    Coolant Temp |

## 3.5 The Analog Channel Page

The analog page can display up to eight channels in a 4 x 2 grid. Each channel is represented as a circular gauge or as a bar graph widget. An optional Sparkline can be displayed.

A maximum of two analog pages can be displayed, holding a maximum of 16 analog channels.
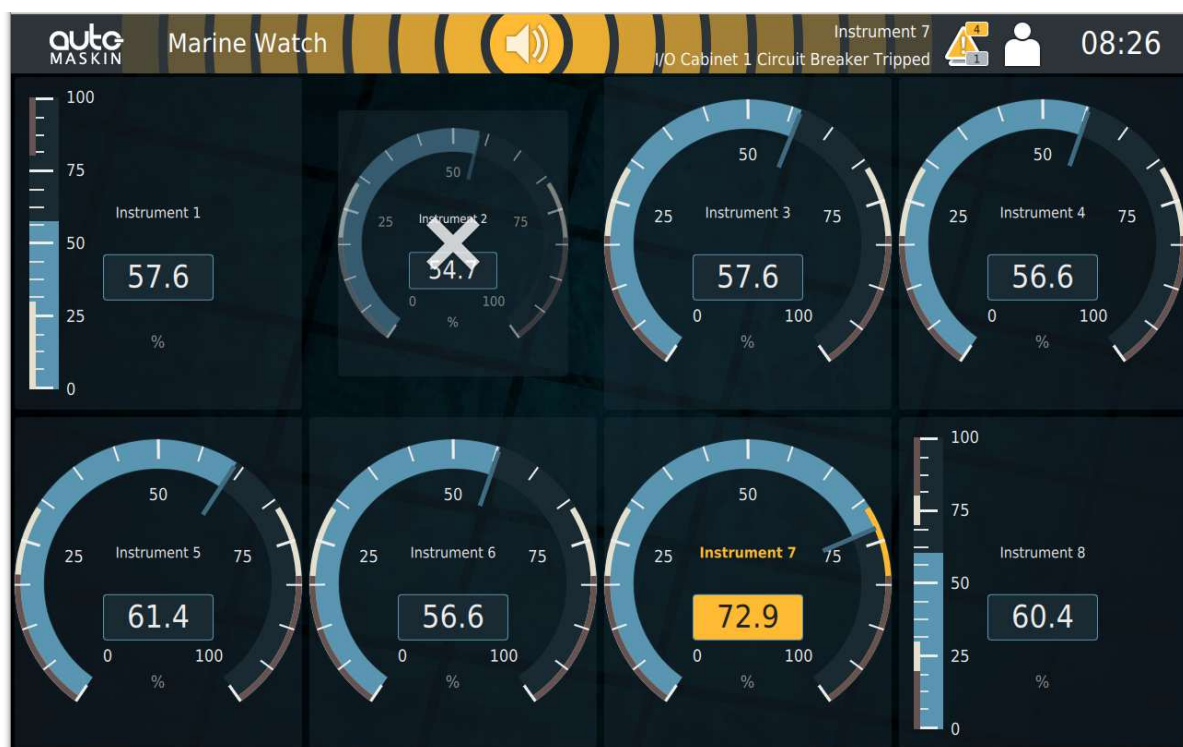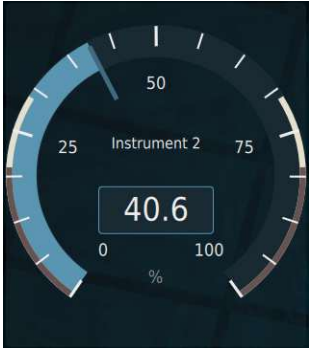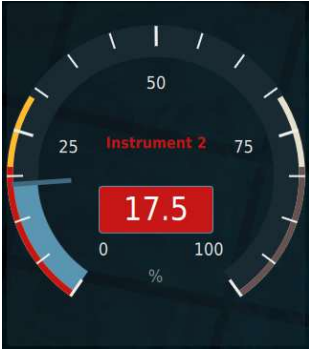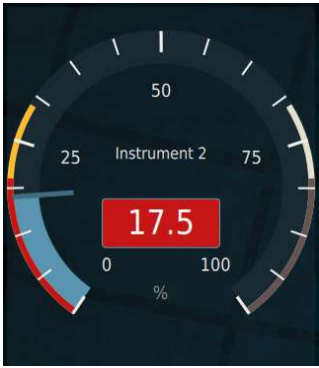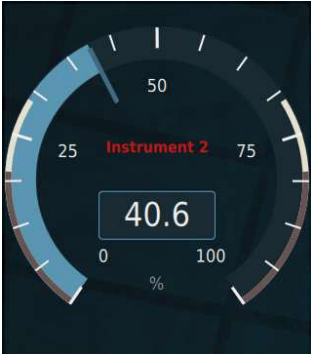


ⓘ  Analog channels are an option. If the I/O Cabinet does not include the analog option, then these pages are not displayed.

| Widget Properties | |
|---|---|
| Name | The analog signal description. |
| Value | Real-time value scaled between the sensor Min-Max value in the configuration. An out-of-limit value is indicated with "---". |
| Unit | The signal unit. |
| Min/Max Range | Instrument Min/Max values. |

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| Widget Properties | |
|---|---|
| Alarm Limits | LL • L • H • HH |
| Sparkline | Optional sparkline for up to 1 hour of operation. |

## 3.5.1 Channel Status

| Status | Description | Sample Graphic Representation |
|---|---|---|
| Normal | The channel is not alarming. |  |
| Active and not acknowledged | The channel is alarming, following its persistence timer.<br><br>Instrument text in bold, flashing. |  |
| Active and acknowledged | The channel is acknowledged by an operator and will clear when the alarm clears.<br><br>Regular instrument text. |  |

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| Status | Description | Sample Graphic Representation |
|---|---|---|
| Inactive and not acknowledged | The channel has been activated but is not active now. It will clear when acknowledged. |  |
| Disabled | The channel has been disabled by an operator. |  |
| Disabled, but active event | The channel has been disabled by an operator and is indicating an event. |  |

## 3.6 The Output Channel Page

The panel can be configured to display up to 16 operator switches on one page.

Note that the I/O Cabinet must have the optional expansion output modules. The output channels can be configured to either toggle or momentary. Only the Main Panel can control the outputs.
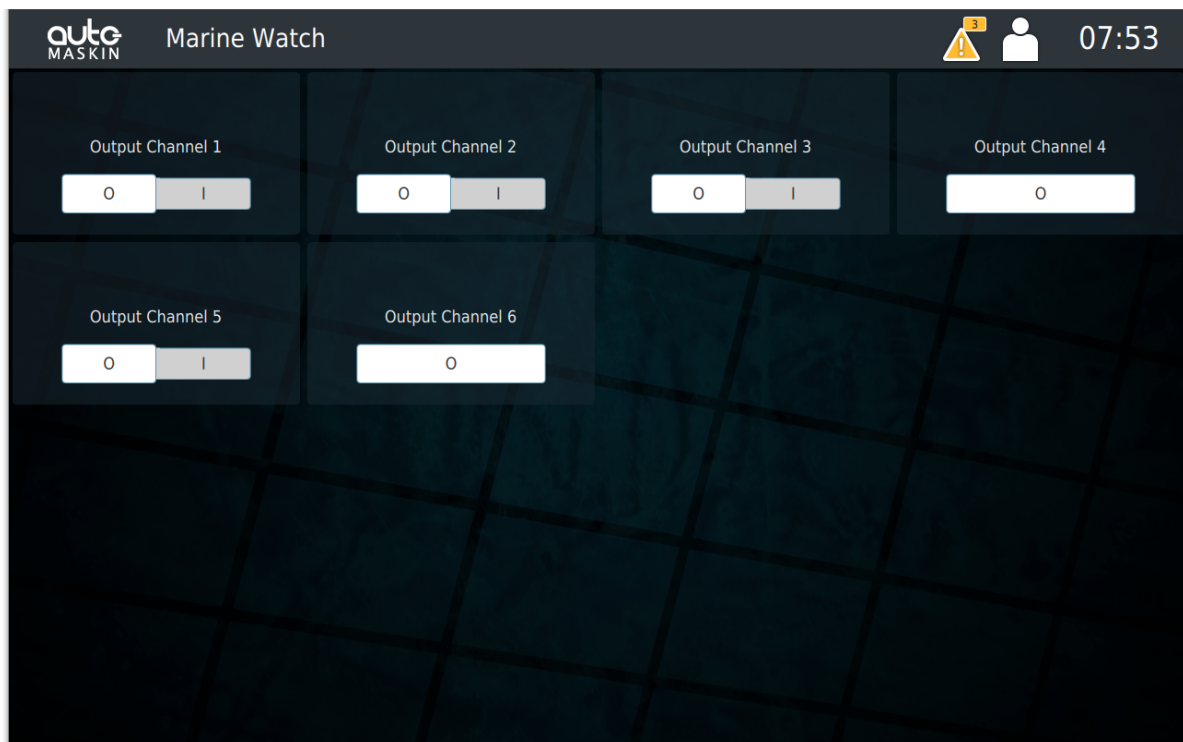


## 3.7 Screen Navigation

This is how to operate and navigate the panel.

| Action | Do this |
| --- | --- |
| Acknowledge an event | Tap the event in the Alarm List. <br><br> Tap the event widget. The event widget is <br><br> • the rectangle – for binary/switch channels <br> • the circular gauge or bar graph – for analog channels |
| Disable Channel | Push and hold the corresponding widget for one second. |
| Next Screen | Swipe left on the screen. |

| Action | Do this |
|--------|---------|
| Previous Screen | Swipe right on the screen. |

# 4 The S-ONE Main Menu

The Main Menu is always available to the operator. It is divided into several sections as follows.

## 4.1 Attendance

The Attendance menu is available only if any of the following has been configured.

- Periodically Unattended Engine Room (enables the Engine Room section)
- Location is engine room or engine control room (enables the Dead Man Alarm and the Engineers Call section)



### 4.1.1 Engine Room

Select **Attended** or **Unattended** to perform a watch transfer. See the chapter Periodically Unattended Engine Room for further information.

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## 4.1.2 Dead Man Alarm

This function can be enabled to sound the alarm if the engineer has not reset the timer in time. A notification dialog is indicated on the Engine Room panels and Engine Control Room panels before the alarm sounds. The alarm, however, is broadcasted to all panels.

A panel I/O output can be configured to indicate dead man reminder, and a panel I/O input can be configured to reset the dead man alarm timer.

## 4.1.3 Engineers Call

The engineer in the engine room or engine control room can request assistance from any other panel in the Marine Watch S system. The request can be either directed to a specific panel or broadcasted to all panels.

## 4.2 Controls

These settings are possibly used frequently.
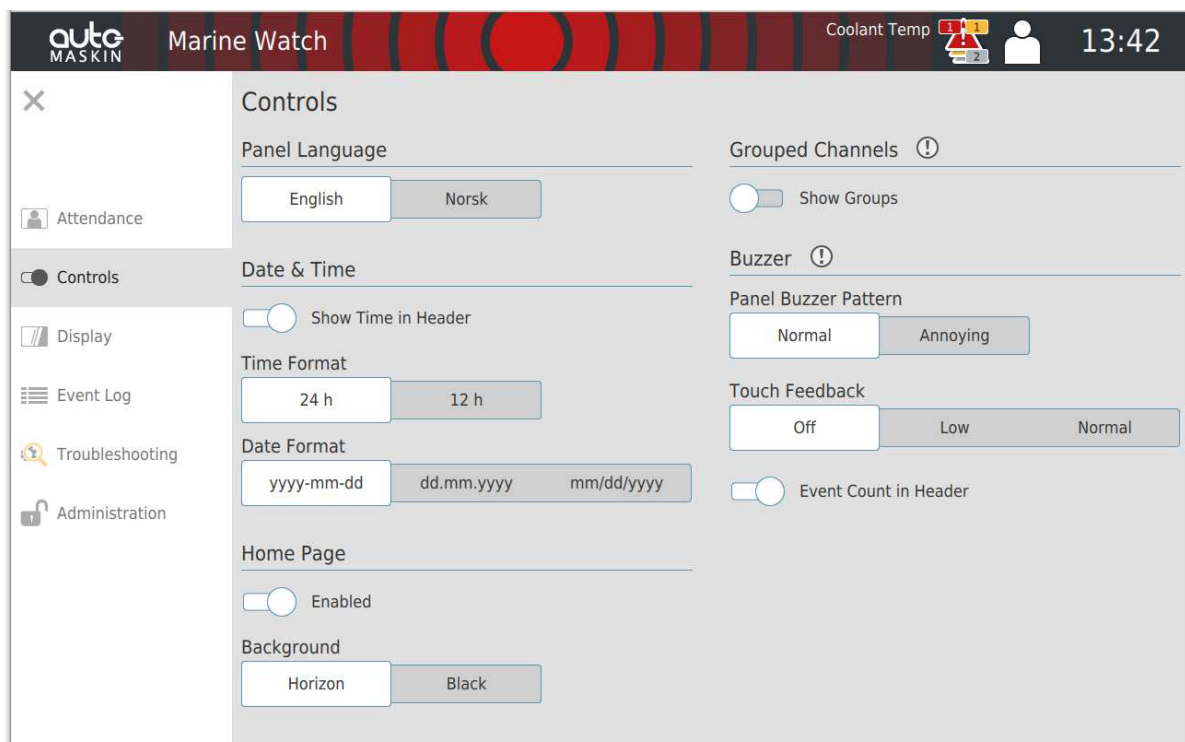


## 4.2.1 Panel Language

Select the preferred panel language.

## 4.2.2 Date & Time

Date and time formatting can be selected, together with the option of displaying the time in the header.

## 4.2.3 Home Page

The Home Page is a default but optional overview of all the pages and makes it easy to navigate to any page.

## 4.2.4 Grouped Channels

If a channel is assigned to a group, it can be indicated with a coloured rectangle and an optional group name. It is possible to assign each channel to one of three different groups.

Group 1

By default, a channel does not belong to any group.

## 4.2.5 Buzzer

The panel buzzer volume can be configured in the administrative part of the menu.

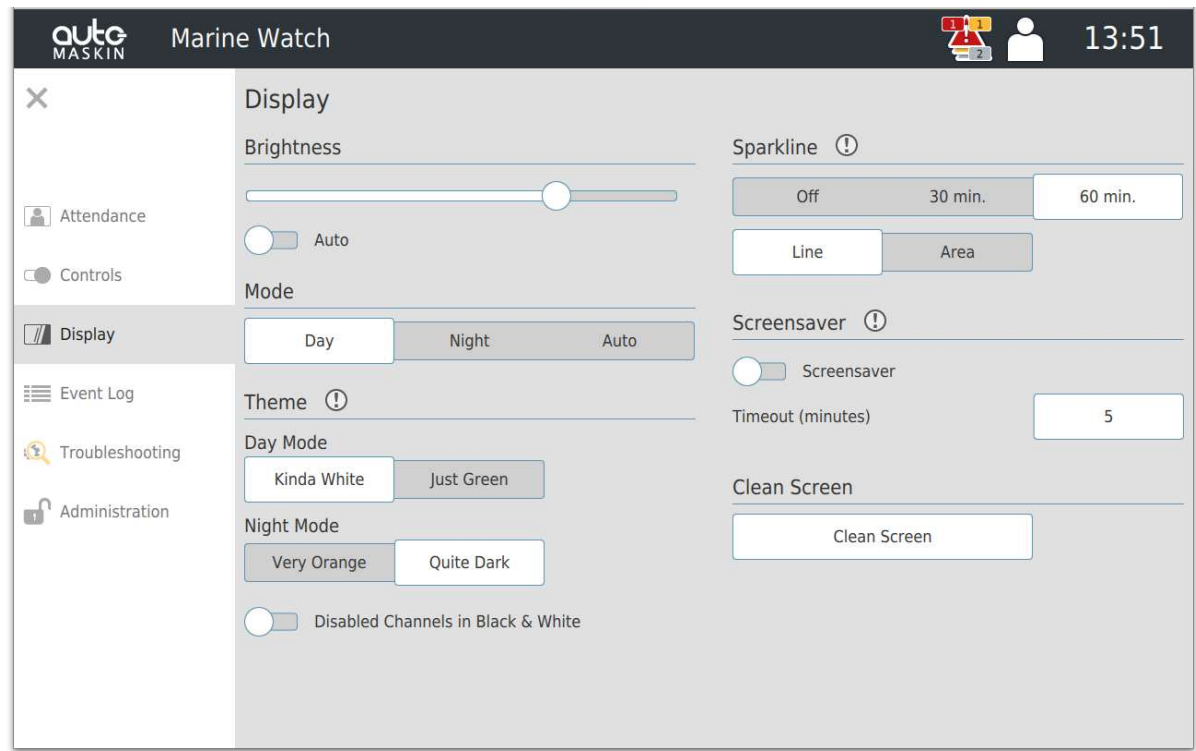| Panel Buzzer Pattern | |
|---|---|
| Standard | Standard on / off pattern. |
| Annoying | Four quick beeps. |
| **Touch Feedback** | |
| Off | Silenced. |
| Low | 50 % volume. |
| Normal | 100 % volume. |

**Event Count in Header**

The event count per severity can be configured to be displayed in the header. Also, any disabled channels are indicated.

## 4.3 Display

Various display settings are controlled from here.



## 4.3.1 Brightness

| Brightness | |
|---|---|
| Brightness slider | Manually adjust the backlight brightness (0-100%). |
| Auto | The backlight brightness is adjusted automatically.<br>**Note!** Using the physical buttons to change the brightness will set Auto to Off. |

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### 4.3.2 Mode

| Mode | |
|------|--|
| Day | Colours optimised for daylight. |
| Night | Colours are optimised for use in dark environments. |
| Auto | Switch automatically between Day and Night modes. |

### 4.3.3 Theme

| Theme | |
|-------|--|
| Day Mode | Choose a colour representation for use in Day mode |
| Night Mode | Choose a colour representation for use in Night mode |

Disabled channels can be configured to be displayed in black & white.

### 4.3.4 Sparkline

A Sparkline is a miniature chart contained within the circular gauge and bar graph. Choose between 30 or 60 minutes of history and a line or area representation.

## 4.3.5 Screensaver

| Screensaver | |
| --- | --- |
| Screensaver | Enables the screensaver. The screensaver will activate when there are no events. |
| Timeout (minutes) | Set the inactivity time in the number of minutes until the screensaver activates. Any active or new event will deactivate the screensaver. |

## 4.3.6 Clean Screen

| Clean Screen | |
| --- | --- |
| Clean Screen | Displays the screen in all black so fingerprints are clearly visible and can be wiped off with a clean soft cloth. Press the button on the screen to exit. |

## 4.4 Event Log

The event log is displayed in chronological order.

The Event Log holds the last 1000 events and can be exported as a CSV file to a USB storage device.

It is possible to filter the Event Log further by pressing and holding the event Type, or the event symbol, eg. the warning triangle.

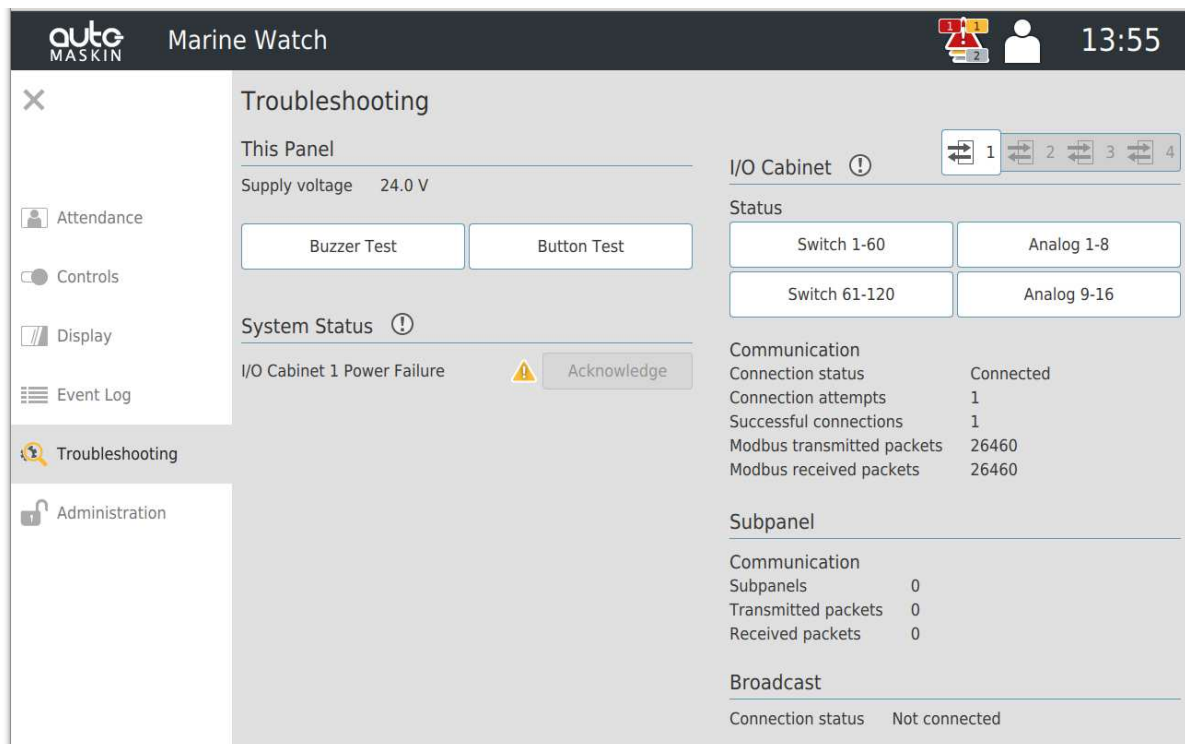(!) | If the Event Log is filtered, a "Show All" button will appear at the top, making it possible to reset the filtering.

| Legend | | |
|---|---|---|
| Indication | ⚠ | An Alarm event. |
| | ⚠ | A Warning event. |
| | ⚙ | Configuration change. |
| | ⓘ | Information. |

## 4.5 Troubleshooting

The Troubleshooting menu can be used to help to diagnose faults.



## 4.5.1 This Panel

Troubleshooting this panel.

| Indication | |
|---|---|
| Supply Voltage | The panel supply voltage is displayed. |
| **Buttons** | |
| Buzzer Test | Press and hold the button to activate the buzzer. |
| Button Test | The button brings up a dialogue for testing of the panel's physical buttons. |

## 4.5.2 System Status

The active internal events, if any, are listed here.

Unacknowledged events are listed in bold. Press the corresponding Acknowledge button to acknowledge the event.

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The following internal events are defined.

| System Status | |
|---|---|
| I/O Cabinet Communication Failure | Communication with the I/O Cabinet is lost. |
| Main Panel Communication Failure | Communication to the Main Panel is lost. |
| Lost Contact to <location name> Panel | Communication lost to any Subpanel or Annunciator Panel configured to be in the Marine Watch system. |
| Main Panel Low Voltage | Main Panel voltage below 21 V for 30 seconds. |
| Dead Man Alarm | The dead man alarm timer has expired. |
| Engineers Alarm[11] | An event has not been acknowledged within the configured time. |
| Diagnostic Failure | I/O data bus failure. |
| UPS Failure | UPS battery failure. |
| Power Failure | Power is below the limit for the 12V (9.6V) or 24V (19.2V) supply. |
| Circuit Breaker Tripped | I/O Cabinet circuit breaker tripped. |

---

[11] Only for Periodically Unattended Engine Room configurations.

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### 4.5.3 I/O Cabinet

Troubleshooting of the selected I/O Cabinet.

| Status | |
|---|---|
| Switch 1-60[12] | See the status of the binary channel at the I/O Cabinet. |
| Analog 1-8[13] | See the status of the analog channel at the I/O Cabinet. |
| **Communication** | |
| Connection state | Connectivity status between the Main Panel and the I/O Cabinet. |
| Connection attempts | Connection attempts since the last restart of this panel. |
| Successful connections | Number of successful connections since the last restart. |
| Transmitted packets | Data packets transmitted. |
| Received packets | Data packets received. |

### 4.5.4 Subpanel

Troubleshooting of any connected Subpanel.

| Communication | |
|---|---|
| Subpanels | Number of connected Subpanels |
| Transmitted packets | Data packets transmitted |
| Received packets | Data packets received |

### 4.5.5 Broadcast

If the Marine Watch Broadcast functionality is enabled, connection status to the cloud server is indicated here.

---

[12] Additional buttons may be displayed depending on the I/O Cabinet capacity.

[13] Displayed only if supported by the I/O Cabinet.

## 4.6 Administration

This is the login page for the Administration menu. It also displays some data as follows.
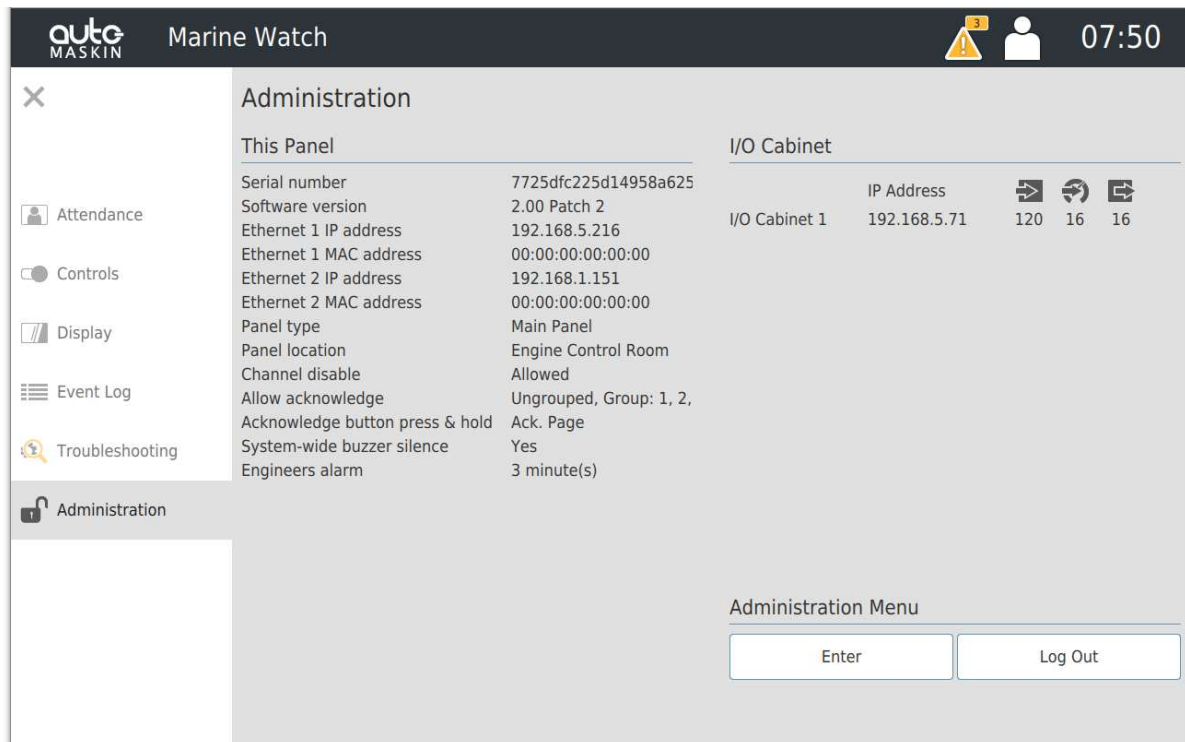


## 4.6.1 This Panel

This section lists the panel settings.

## 4.6.2 I/O Cabinet

This section lists the I/O Cabinets in use. Each I/O Cabinet lists the IP address and the I/O Cabinet capacity.

## 4.6.3 Administration Menu

This login button is the entrance to the Administration Menu.

To log in, press the **Log In** button, then add the following info into the dialogue.

- User: **admin**
- PIN code: **1234**

Administration Log In

admin

PIN code

Cancel          Log In

⊙ Three failed PIN code attempts will result in a PIN code lockout for 5 minutes, and also an encrypted PIN code.



PIN Code Lockout

Encrypted PIN: 70844

OK

If the PIN Code is lost, then your distributor can source the PIN code using the encrypted PIN code.

The following buttons can appear.

| Buttons | |
|---|---|
| Log In | Press the **Log In** button to access the login dialogue. |
| Enter | Already logged in. Press the **Enter** button to access the Administration menu. |
| Log Out | **Log Out** the active user to remove access to the Administration menu. |

# 5 The S-ONE Administration Menu

All the configuration is performed in the varying sub-sections of the Administration Menu. Any configuration change is saved in the Alarm Panel as soon as it is entered.

## 5.1 This Panel

This section holds the top-level configuration of this panel.

ⓘ The page is scrollable. Scroll down to see all configurations of This Panel.



## 5.1.1 Panel Name

The Panel Name is displayed in the header bar, just after the logo displayed top-left.

## 5.1.2 Panel Type

Choose between **Main Panel** and **Subpanel**.

If this is the only Alarm Panel in the network, then it shall be a Main Panel. Other panels in the network shall be of type Subpanel.

⊙ There shall be only one Main Panel in a network. Having multiple Main Panels connected to the same I/O Cabinet can cause unpredictable behaviour.

## 5.1.3 Panel Location

Select a location for this panel. The panel location is used for the following functions

- Watch Transfer (see chapter Periodically Unattended Engine Room for more information)
- Dead Man Alarm and Engineers Call (functions are enabled for the engine room and engine control room)

The panel location can be selected to any of the following.

| Panel Location | |
|---|---|
| Engine room | The panel is located in the engine room. |
| Engine control room | The panel is located in the engine control room. |
| Bridge | The panel is located on the bridge. |
| Engineers cabin | The panel is located in an engineers cabin. |
| Other / Public spaces | The panel is located in any other location. |

**Buzzer when Attended Engine Room**

If the **Bridge** panel location is selected, and **Periodically Unattended Engine Room** is enabled, the panel can be configured for which groups the buzzer shall be enabled for new events.

## 5.1.4 Panel Buzzer

Select the panel buzzer volume for new events.

| Panel Buzzer | |
|---|---|
| Off | Silenced. |
| Low | 50 % volume. |

| Panel Buzzer | |
|---|---|
| Normal | 100 % volume. |

(!)  It is possible to connect an external buzzer to the I/O Cabinet or to the panel I/O itself.

This is required to fulfil sound requirements in a type-approved installation.

## 5.1.5 Network

Set the IP address of this Alarm Panel. The default IP address of Ethernet 1 is 192.168.0.**151**. Ethernet 1 is the preferred port for network communication.

(!)  The IP addresses of the S-ONE Alarm Panel can not be configured to the same subnet. For instance, Ethernet 1 set to 192.168.**0**.151 and Ethernet 2 set to 192.168.**0**.161 is not allowed.

Make sure that all IP addresses in use on the network are unique.

The Gateway setting is required if using the Broadcast functionality. The Gateway shall then be set to the default gateway of the network.

(!)  Contact the network administrator if unsure about the gateway setting.

## 5.1.6 Disable & Acknowledge

**Channel Disable**

Select if this panel shall have the possibility to disable and enable channels.

**Allow Acknowledge**

Select which channel group(s) this panel shall have the authority to acknowledge.

**Press and Hold of the Acknowledge Button**

Configures the behaviour of a long-press on the acknowledge button.

| Acknowledge Button | |
|---|---|
| Nothing | No action. |

| Acknowledge Button | |
|---|---|
| Ack. Page | Acknowledge all events visible on this page. |
| Ack. All | Acknowledge all events. |

**System-wide Buzzer Silence**

Configures the behaviour of the buzzer in the entire system.

ⓘ This setting is only present for Subpanels.

| System-wide Buzzer Silence | |
|---|---|
| Enabled | Silences the buzzer on all panels in the system. |
| Disabled | Silences the buzzer locally on this panel only. |

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## 5.1.7 Panel I/O

First select Input or Output for the desired panel I/O. Then select the function to be used.



| Input Functions[14] | |
|---|---|
| Silence Buzzer | Silences the panel buzzer. |
| Reset Dead Man Alarm | Resets the Dead Man Alarm timer. |

| Output Functions | |
|---|---|
| Buzzer Active | Active when the panel buzzer is active. Note that the panel buzzer can be disabled, but this does not affect this function. |
| Unacknowledged Events | Active for any unacknowledged events. |
| Active or Unacknowledged Events | Active for any active or unacknowledged events. |

---

[14] All input functions are edge triggered, meaning they activate on a 0V to 24 V transition.

| Output Functions | |
|---|---|
| Watch Responsible | Active when the panel is watch responsible. |
| Dead Man Alarm Reminder | Active when the dead man alarm timer is below the configured reminder time. |

## 5.2 System

System settings for the Marine Watch S system.
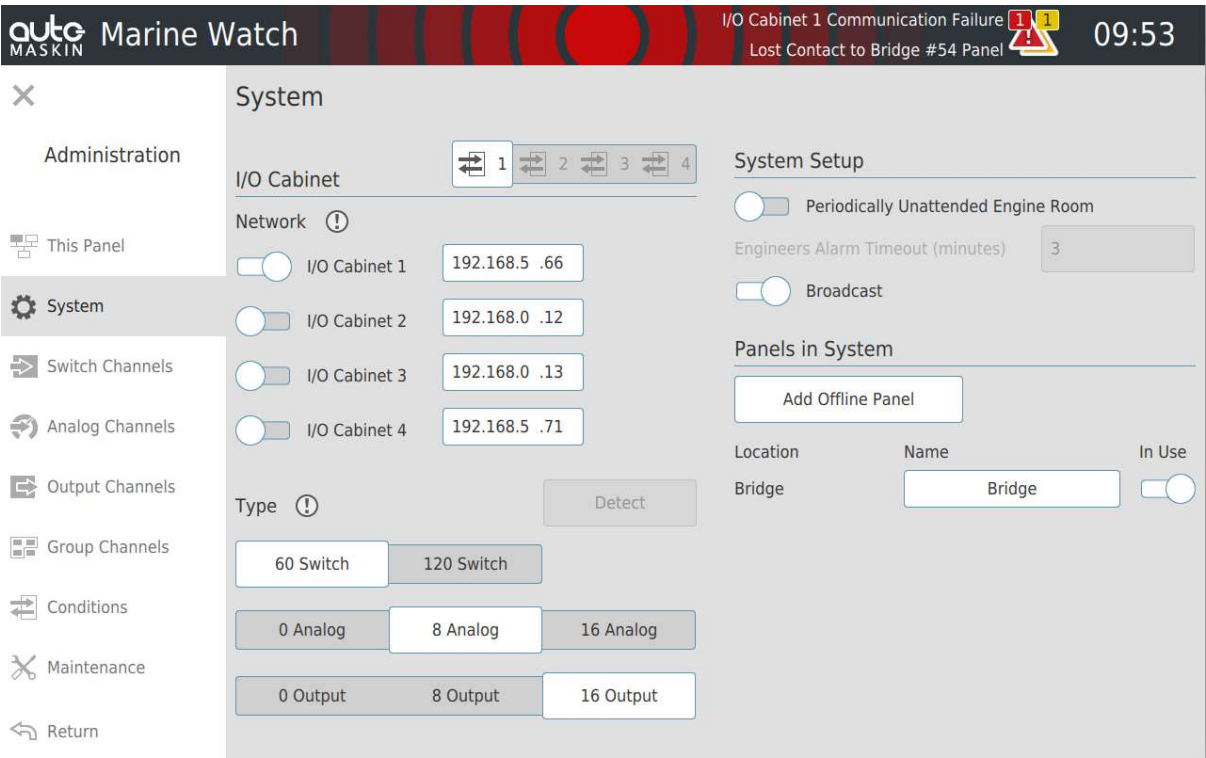


If the panel is configured as a Subpanel, the Main Panel IP address shall be configured, and not the I/O Cabinet IP address.

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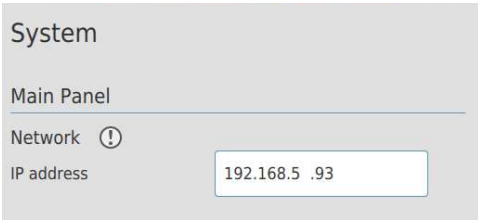
## 5.2.1 I/O Cabinet

**Network**

Set the IP address of the I/O Cabinet in the network. The default IP address for an I/O cabinet is 192.168.0.11.

The Marine Watch system currently supports connection with up to four I/O Cabinets. In each I/O Cabinet, locate the bus coupler and set the rotary switches S1 and S2 as follows:

| I/O Cabinet | S1 | S2 | IP address |
|---|---|---|---|
| I/O Cabinet 1 (default) | 1 | 1 | 192.168.0.11 |
| I/O Cabinet 2 | 1 | 2 | 192.168.0.12 |
| I/O Cabinet 3 | 1 | 3 | 192.168.0.13 |
| I/O Cabinet 4 | 1 | 4 | 192.168.0.14 |

| ⓘ | Make sure to reboot the I/O Cabinet after any changes to the S1 or S2 rotary switches. |

**Type**

Select the correct I/O Cabinet type from the range of supported I/O Cabinets. This menu option is available only if the panel is configured to be the Main Panel.

| ⓘ | Make sure the selected I/O Cabinet type is matching the actual I/O in the I/O Cabinet. Otherwise, unpredictable behaviour can occur. |

It is possible to auto-detect the I/O Cabinet type by pressing the Detect button. If the detection is successful, a confirmation dialogue will appear before committing the I/O Cabinet type.

## 5.2.2 System Setup

**Periodically Unattended Engine Room**

If the Marine Watch S system shall support periodically unattended engine room installations, this needs to be enabled. By enabling this setting, the following functions are enabled

- Watch Responsible Indication

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- Watch Transfer
- Engineers Alarm

See the chapter [Periodically Unattended Engine Room](#) for more information.

**Engineers Alarm Timeout**

Select the time before the Engineers Alarm will activate. The Engineers Alarm will activate if an event has not been acknowledged within the configured time in an unattended engine room situation.

**Broadcast**

By enabling this setting, the S-ONE will transmit alarm information to a cloud server, making it available from shore.

> ⓘ The S-ONE needs to have Internet access, and the Gateway setting under This Panel must be correctly configured.

For more information on the Broadcast, please see the Marine Watch Broadcast User Manual.

## 5.2.3 Panels in the System

Select the panels to be monitored in the Marine Watch S system. Selected panels can be named, and the system will issue warnings if the communication to the panel is lost.

If all panels are installed and configured correctly, the list will automatically populate, and the configurator only needs to select which panels to be included, typically all. In addition, there is a possibility to add off-line panels by IP address.

## 5.3 Switch Channels

All switch channels are configured here. To edit, the panel must be a Main Panel.



The configuration for each switch channel is as follows.

| Type | |
|---|---|
| # | Press the channel number to enable or disable that channel. |
| Channel Description | The text displayed in the rectangle.<br>Maximum 45 characters and four lines of text; word wrapping is performed automatically. |
| Condition | Any condition which must be fulfilled in order for this channel to issue an event. |
| Type | Choose Warning or Alarm, depending on the required event type. |
| Switch Type | A Normally Open (NO) channel activates when the switch is closed.<br>A Normally Closed (NC) channel activates when the switch opens.<br>The latter is preferred. |

| Type | |
|---|---|
| Delay | Select a suitable persistence delay time in seconds before the event is triggered. |

## 5.4 Analog Channels

All analog channels are configured here. To edit, the panel must be a Main Panel.



The configuration for each analog channel is as follows.

| Type | |
|---|---|
| # | Press the channel number to enable or disable that channel. |
| Description | The text that is displayed in the circular gauge or bar graph.<br>Maximum 45 characters and four lines of text; word wrapping is performed automatically. |
| Condition | Any condition which must be fulfilled in order for this channel to issue an event. |

| Type | |
|---|---|
| Value Band | The Value Band toggles the visibility of the gauge value band. |
| Circ. / Bar | Select a circular gauge or a bar graph. |
| Sensor Type | Select the sensor type connected to the I/O Cabinet. |
| Sensor Min | Analog sensor low range. |
| Sensor Max | Analog sensor high range. |
| Unit | Sensor unit, eg. Bar, PSI, %, etc. |
| Instrument Min | Displayed low range. |
| Instrument Max | Displayed high range. |
| LoLo / Lo / Hi / HiHi | Warning/Alarm limits.<br>**Note!** Leaving the field empty indicates no event. |
| Delay | Select a suitable persistence delay time in seconds before the event is triggered. |

(!) Make sure the connected analog sensors match the input channels in the I/O Cabinet. The input channels accept 4-20mA and 0-10V signals. The Sensor Min and Sensor Max configuration shall match the actual sensor min and max
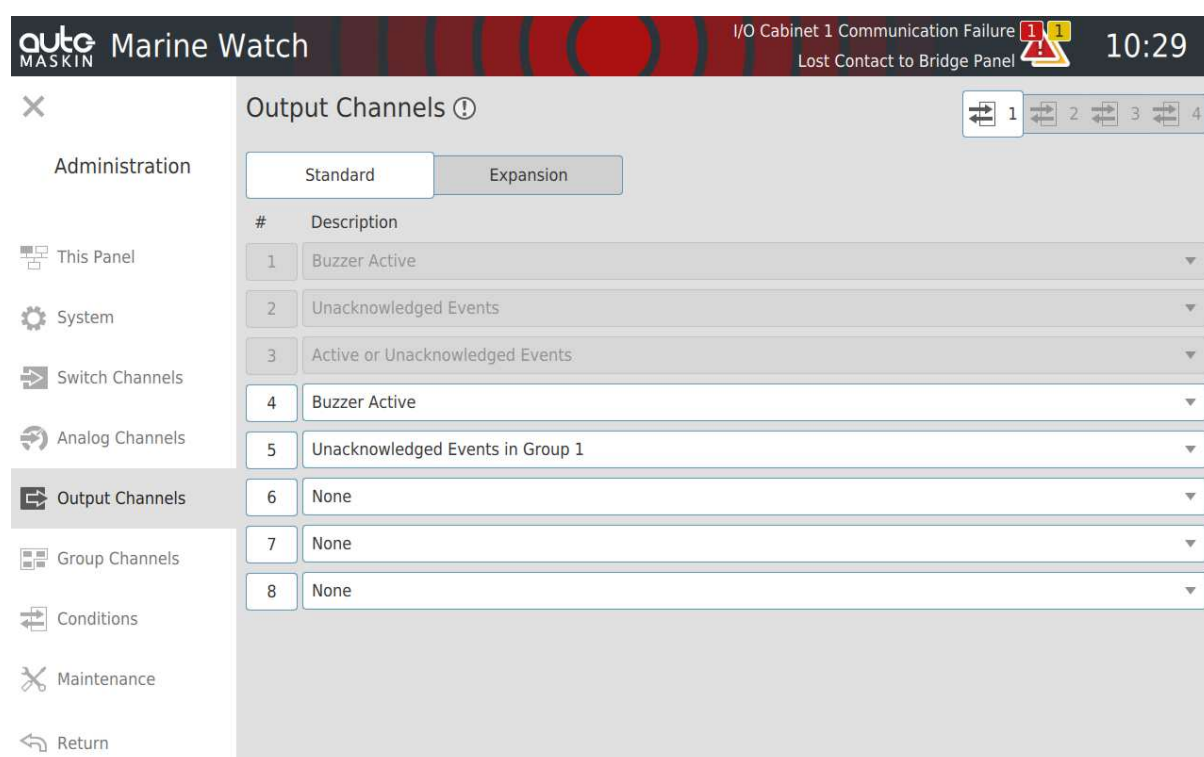
## 5.5 Output Channels

The Standard Output Channels are always included in the Marine Watch I/O Cabinet.

The Expansion Output Channels are optional modules.

### 5.5.1 Standard Output Channels

Select the required function on the standard output module. The function for the first three standard output channels is locked.



| Available Functions | |
|---|---|
| Buzzer Active | Activates on any new events. Deactivates on – acknowledge of event, OR – press the Alarm button |
| Unacknowledged Events | Active if at least one unacknowledged event is present. |

| Available Functions | |
|---|---|
| Active or Unacknowledged Events | Active if at least one active OR at least one unacknowledged event is present. |
| Active or Unacknowledged Events in Group 1 | Active if at least one active OR at least one unacknowledged event in group 1. |
| Active or Unacknowledged Events in Group 2 | Active if at least one active OR at least one unacknowledged event in group 2. |
| Active or Unacknowledged Events in Group 3 | Active if at least one active OR at least one unacknowledged event in group 3. |
| Active or Unacknowledged Events in Group 4 | Active if at least one active OR at least one unacknowledged event in group 4. |
| Unacknowledged Events in Group 1 | Active if at least one unacknowledged event in group 1. |
| Unacknowledged Events in Group 2 | Active if at least one unacknowledged event in group 2. |
| Unacknowledged Events in Group 3 | Active if at least one unacknowledged event in group 3. |
| Unacknowledged Events in Group 4 | Active if at least one unacknowledged event in group 4. |

## 5.5.2 Expansion Output Channels

Expansion output channels are reserved for operator commands that are displayed on a separate page.



| Type | |
|------|--|
| # | Press the channel number to enable or disable that channel. |
| Description | The text that is displayed in the circular gauge or bar graph.<br><br>Maximum 45 characters and four lines of text; word wrapping is performed automatically. Choose a consistent style for all the channel descriptions. |
| Type | A Toggle type output channel remains in its last selected state, while a Momentary type will reset automatically. |

## 5.6 Group Channels

Channels are by default not assigned to any group but can be assigned to any of the four available groups.

To edit this, the panel must be a Main Panel.
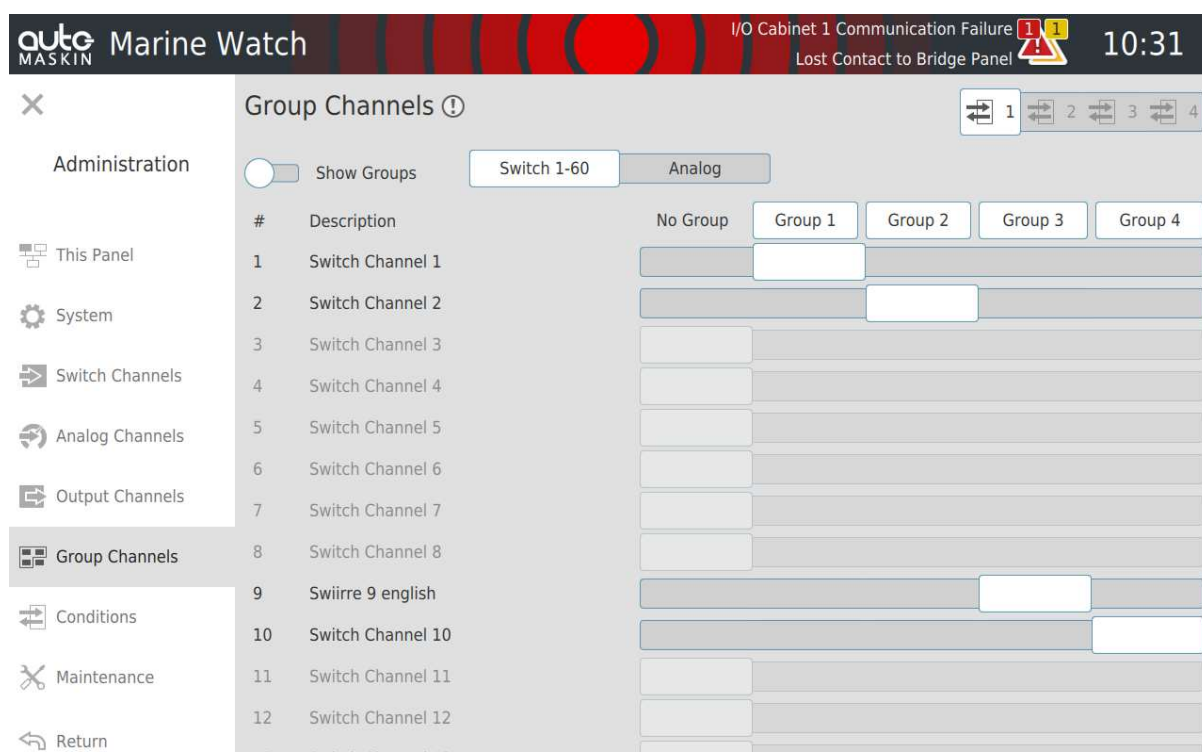


A panel can have the authority to acknowledge all channels or a select group of channels only. This is selected in the Administration menu under This Panel.

Channels that are assigned to a group can only be acknowledged on panels that have selected this group. They are in a way "protected" from acknowledging, which can be done from select panels only.

Furthermore, if a channel is assigned to a group, then the group belonging can be visualised in the grid/gauge view. The operator can switch this visualisation on/off.

| Status | |
|---|---|
| Groups | Select which group the channel shall be assigned to. By default, all channels are unassigned.<br>**Note!** Press the group name to change the name of that group. |

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## 5.7 Conditions

Configure up to 10 conditions which can be used in the channel configuration. If used in a channel configuration, the condition must be fulfilled for the channel to issue an event.

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## 5.8 Maintenance
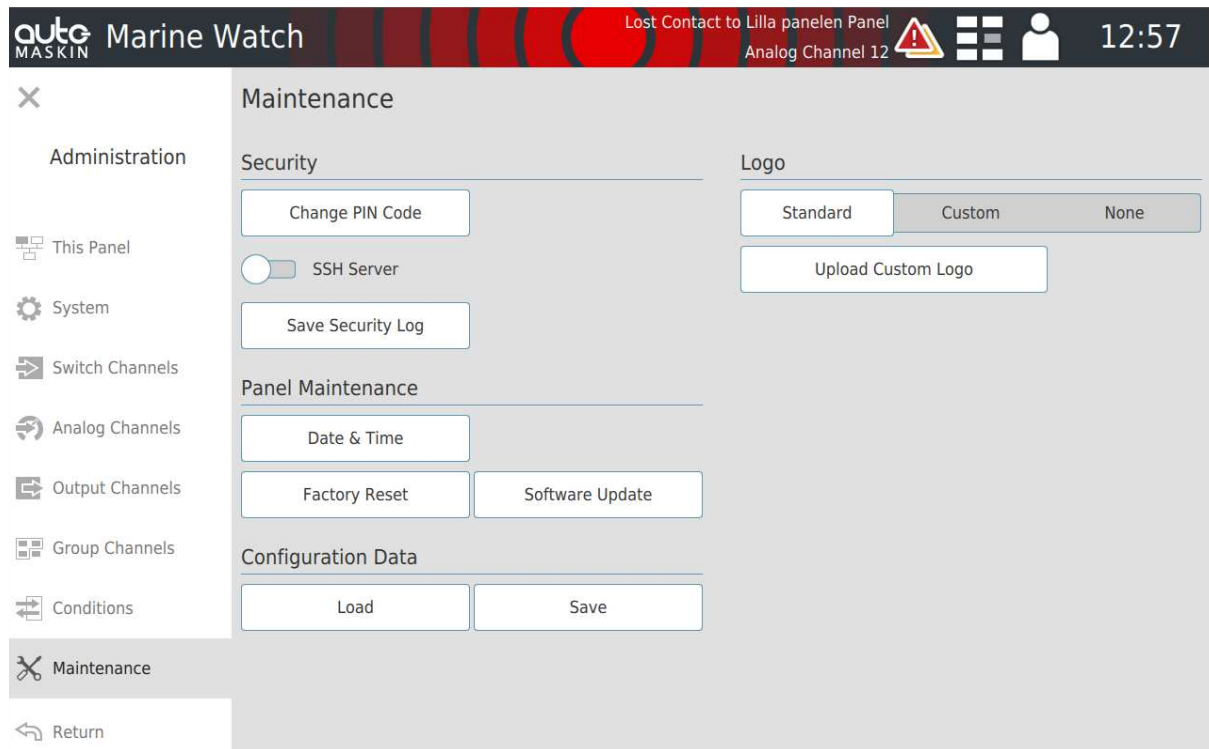


## 5.8.1 Security

**Change PIN Code**

Dialogue for changing the active PIN code for logging in to the Administration menu.

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**SSH Server**

Enables a debug SSH server for this panel. A power cycle will disable the SSH server again.

**Security Log**

The security log contains events related to cyber security. In order to extract the security log, a USB stick needs to be inserted into the unit.

## 5.8.2 Panel Maintenance

**Date & Time**

Sets the date and time of the panel.



**Factory Reset**

A Factory Reset will remove and reset the following

- Configuration
- Event log
- User PIN code
- Security log

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**Software Update**

Updates the software of the Alarm Panel.

Using any of the three available USB-A ports, insert a USB storage device with a software update file, `<filename>.mender`, and press the **Software Update** button to select the desired update file.

> The software update process takes several minutes. Do not unplug the power supply during the update.

## 5.8.3 Configuration Data

Load a configuration file named `config.ini` into the panel from a USB storage device, or save the current configuration to a USB storage device.

Make sure the USB storage device is inserted first.

A saved configuration file will be named `config.ini` and overwrite any current file on the USB storage device.

## 5.8.4 Logo

Select which logo, if any, should be presented in the header.

| Logo | |
|---|---|
| Standard | The default logo. |
| Custom | The custom logo; can be changed. |
| None | No logo in the header. |

**Upload Custom Logo**

Insert a USB storage device with one or several logos, in the **png** file format. Select the Upload Custom Logo to select the desired logo to be used.

The **png** file should preferably be 64px height and less than 240px width. Any larger logo will be shrunk to fit.

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# 6 The S-ACE Annunciator Panel

The S-ACE Annunciator Panel displays the events from the S-ONE Main Panel in an Alarm View. No configuration is required, other than the network configuration.
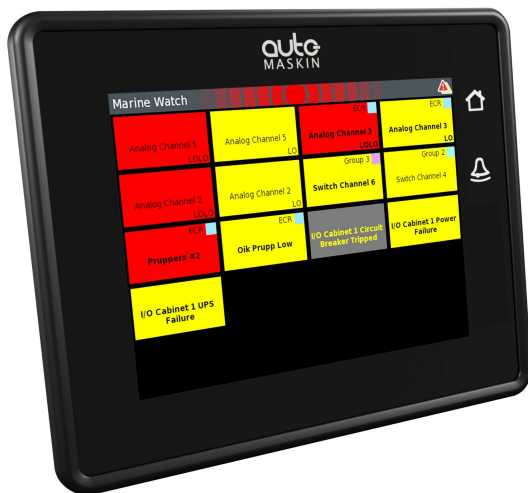


The S-ACE can be configured to show all events, or a subset of the events available in the S-ONE Main Panel, based on group settings.

In addition, the S-ACE indicates the channel groups as defined in the S-ONE Main Panel.

This is indicated with a coloured square in the top-right of the warning/alarm rectangles.

## 6.1 Buttons

In addition to the touch-screen interface there are two buttons on the right-hand side of the panel. These are used to command the panel as described below:

| Symbol | Button | Action |
|---|---|---|
|  | Home Button | Toggle between the Alarm and Menu page. |
|  | Alarm Button | Silence the buzzer locally on this panel only, and display the Alarm View. |

## 6.2 Header Information



The header consists of the following information.

- The Panel is named **Marine Watch**.
- A common warning/alarm banner. The entire centre of the header is flashing for new unacknowledged events.

- Event status symbols.
- Time, optionally displayed. The displayed time is inherited from the S-ONE Main Panel.

## 6.3 Header Status Symbols

These symbols may appear in the header bar.

| | | | |
|---|---|---|---|
| At least one channel indicates Alarm | At least one channel indicates Warning | At least one Alarm and at least one Warning | At least one new Alarm or Warning[15] |
| The buzzer is sounding | Watch responsible | | |

## 6.4 Alarm View

The Alarm View is the main view of the S-ACE Annunciator Panel. All events are shown here in a grid format.

> The Annunciator Panel can be configured to show individual groups only. This is selected in the administrative part of the Panel menu.
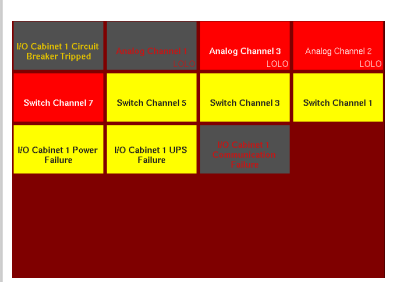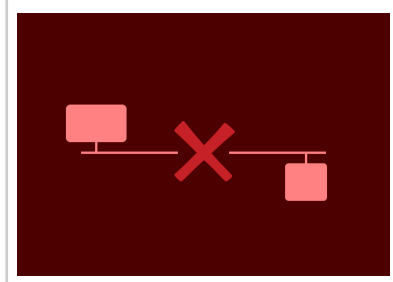
The events are listed in chronological order, with the newest event in the top left position. If the number of events exceeds one page, a scrollbar will automatically show.

The S-ACE Annunciator Panel indicates channel groups as defined in the S-ONE Main Panel. This is indicated with a coloured square in the top-right of the warning/alarm rectangles.

> There is no option to change the group setting on the Annunciator Panel. It inherits the setting made in the S-ONE Main Panel.
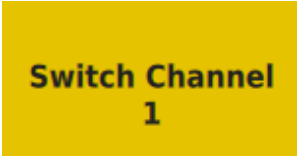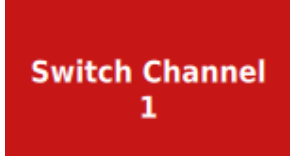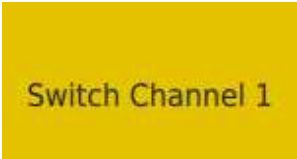
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[15] The red alarm banner takes precedence over the yellow warning banner

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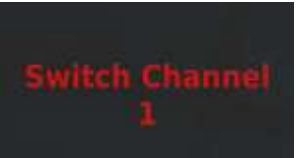
If the Annunciator Panel is not operated for one minute, the Annunciator Panel will automatically default to show the Alarm View.

| | | |
|---|---|---|
|  |  |  |
| Events | All OK | Communication Failure |

**Channel Status**

Each rectangle represents the status of a channel as follows.

| Status | Description | Sample Graphic Representation | |
|---|---|---|---|
| Active and not acknowledged | The channel is alarming, following its persistence timer.<br><br>Text in bold, flashing. | Switch Channel 1 | Switch Channel 1 |
| Active and acknowledged | The channel is acknowledged by an operator and will clear when the alarm clears.<br><br>Regular text. | Switch Channel 1 | Switch Channel 1 |
| Inactive and not acknowledged | The channel has been activated but is not active now.<br><br>It will clear when acknowledged.<br><br>Grey background, bold flashing text. | Switch Channel 1 | Switch Channel 1 |

## 6.5 Menu

The menu system of the S-ACE Annunciator Panel is divided into a user menu area and an administrative menu area.

The user menu is open for the operator, and the administrative menu is locked by a selectable PIN code.

## 6.5.1 Main Menu

**Controls**

Whenever the Main Menu is accessed, it always displays the Controls section.
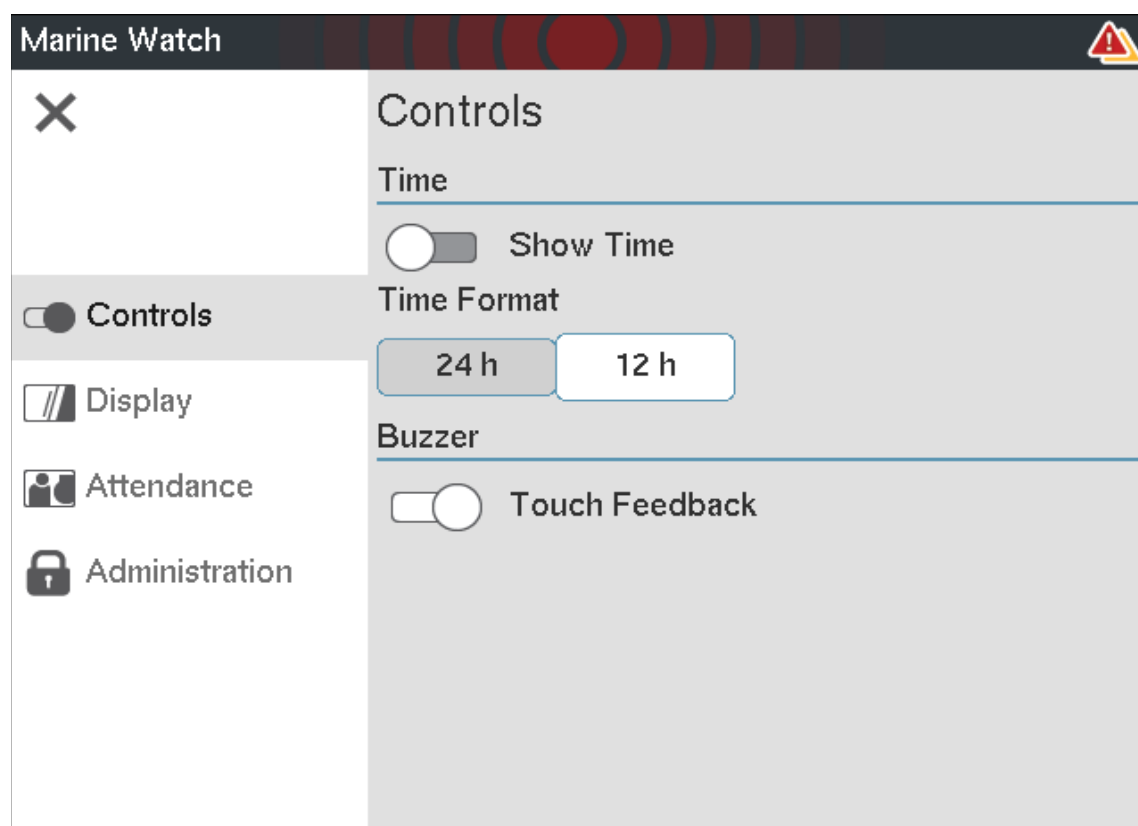


| Time | |
|------|---|
| Show Time | Select whether the time shall be shown in the header. |
| **Time Format** | |
| 24 h | Select the 24 h presentation of time, for instance, 18.42 |
| 12 h | Select the 12 h presentation of time, for instance, 6.42 PM. |
| **Buzzer** | |
| Touch Feedback | Select whether audible feedback is given upon touch and key button presses. |

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**Display**
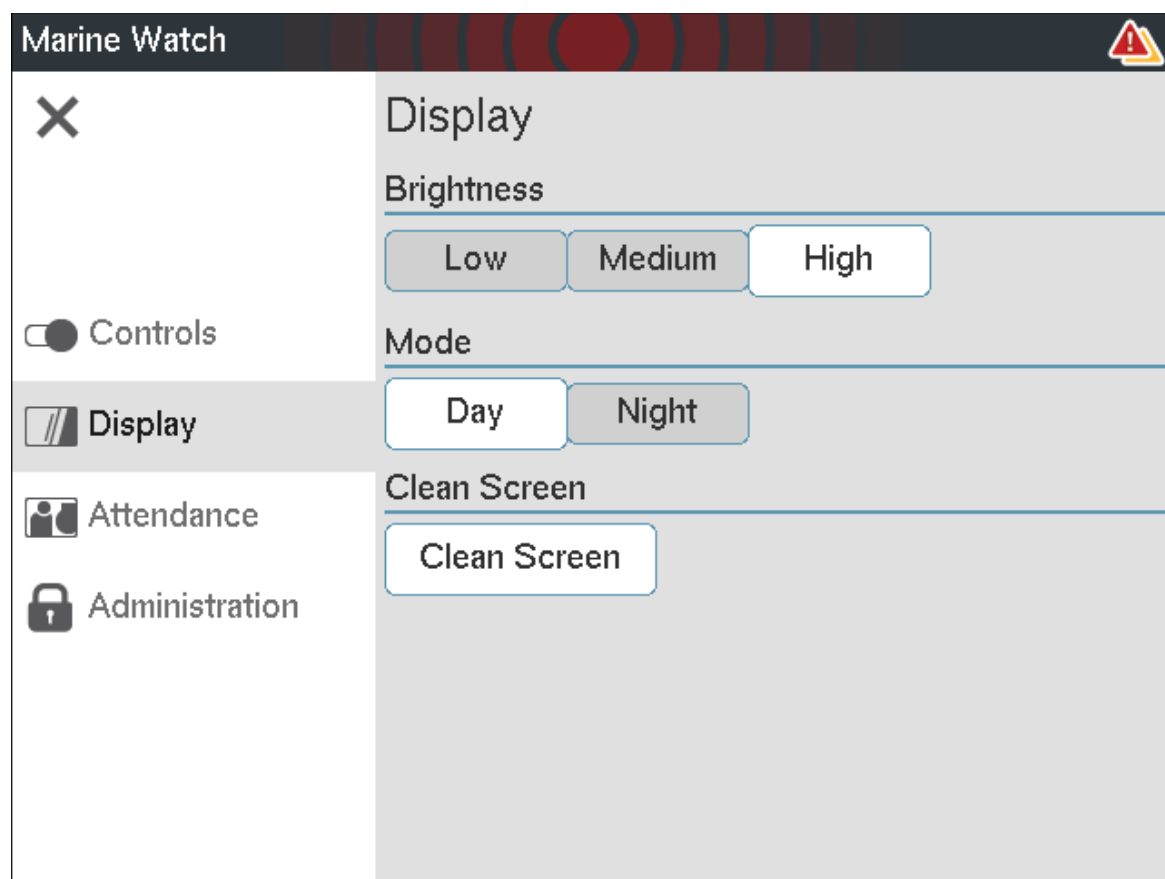


| Brightness | |
|---|---|
| Low, Medium, High | Select the screen brightness |
| **Mode** | |
| Day | Colours optimised for daylight. |
| Night | Colours are optimised for use in dark environments. |
| **Clean Screen** | |
| Clean Screen | Displays the screen in all black so fingerprints are clearly visible and can be wiped off with a soft cloth.<br>Press the button on the screen to exit. |

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**Attendance**

This menu page is only visible if the Main Panel is configured for periodically unattended engine room.
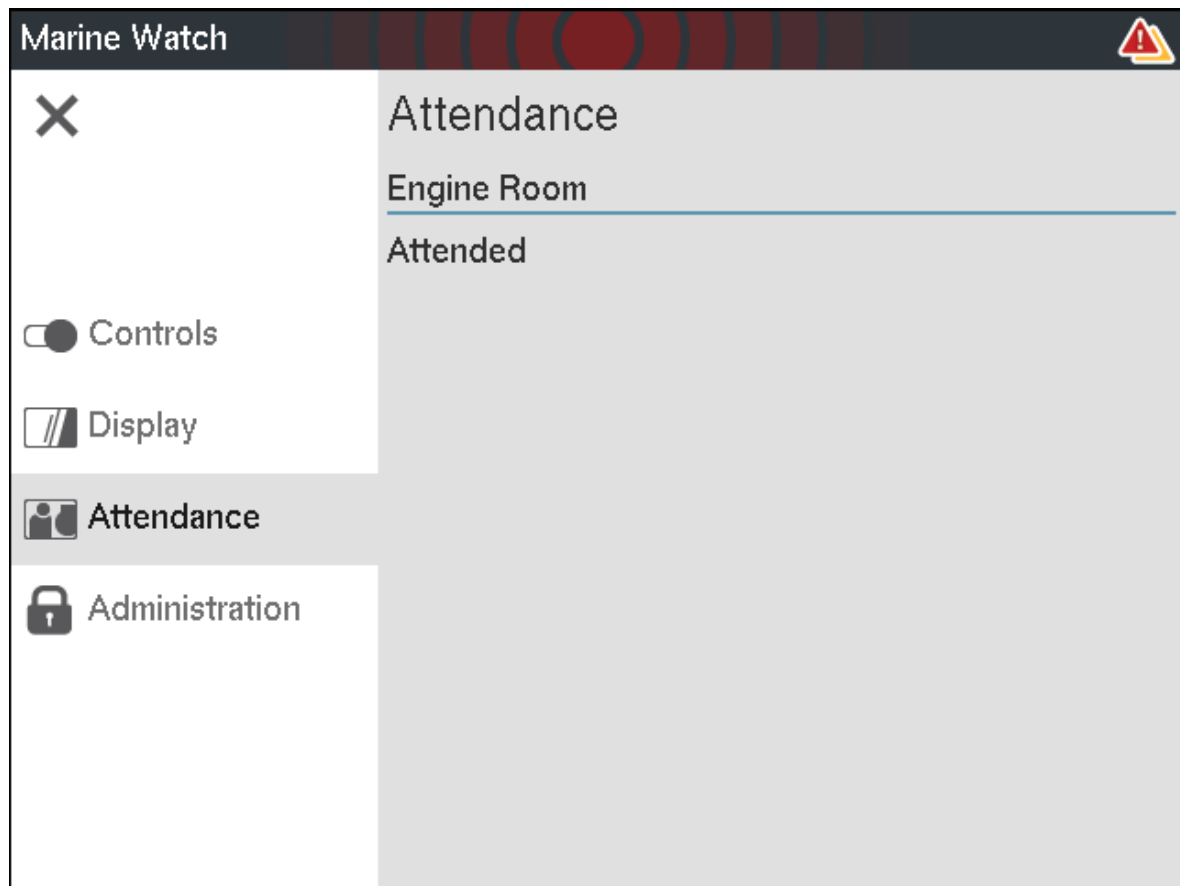


This menu page displays engine room attendance status as well as on duty engineer.

**Administration**

This is the login page for the Administration menu. It also displays some data as follows.
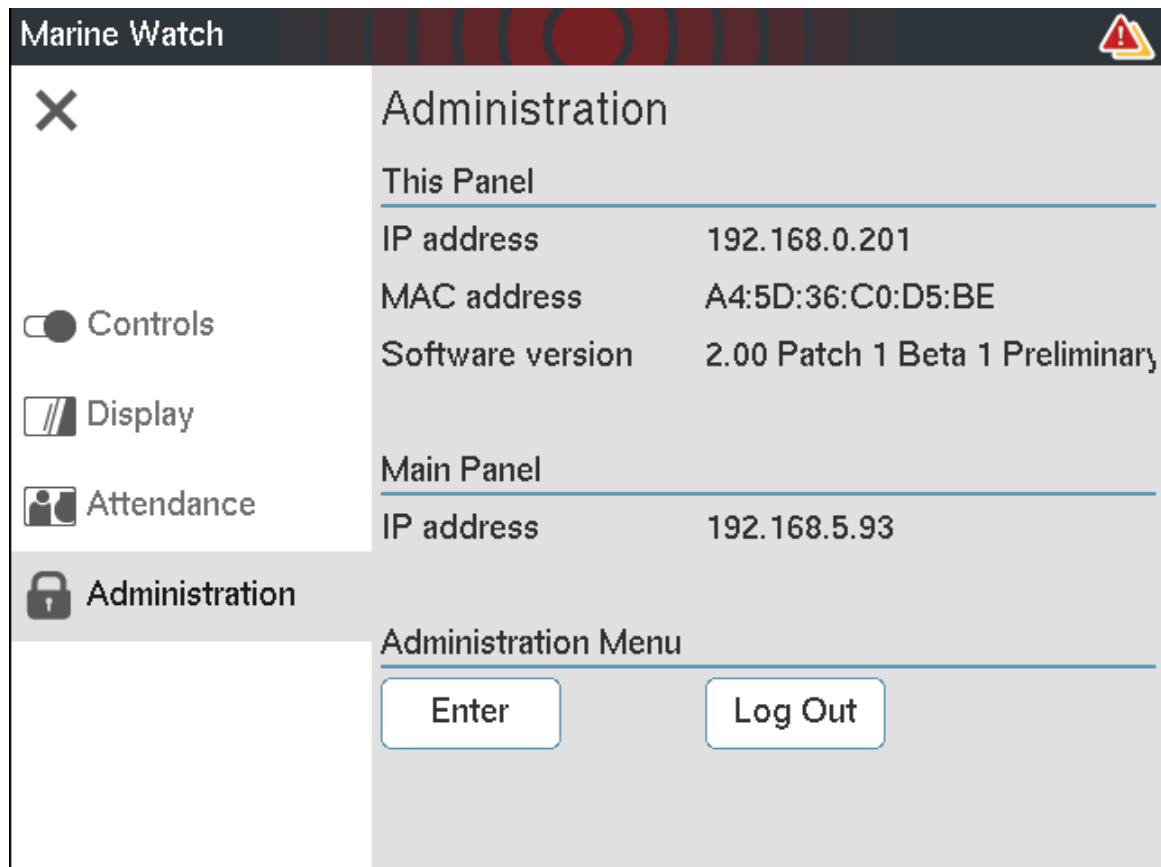


This button is the entrance to the Administration Menu.

To log in, press the **Log In** button, then add the following info into the dialogue.

■   PIN code: **1234** (factory default)

If the PIN Code is lost, then your distributor can source the PIN code using the encrypted PIN code.

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## 6.5.2 Administration Menu

**This Panel**



| Network |
| --- |
| Set the IP address of this S-ACE panel. Make sure all IP addresses in the network are unique. |
| **Panel Buzzer** |
| Enable / disable the panel buzzer for any new event. |
| It is possible to connect an external buzzer to the panel using connector C1.1. This is required to fulfil sound requirements in a type-approved installation. |
| **Alarm Groups** |
| Select which groups of events this S-ACE Annunciator Panel shall monitor. |
| ⓘ    Channels that are not assigned to any group will not be displayed if the Ungrouped switch is not selected. |

---

> If a group is not selected, this S-ACE Annunciator Panel will not issue events for channels assigned to that group.

**Main Panel**



| Network |
| --- |
| Set the IP address of the S-ONE Main Panel. |

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**System**
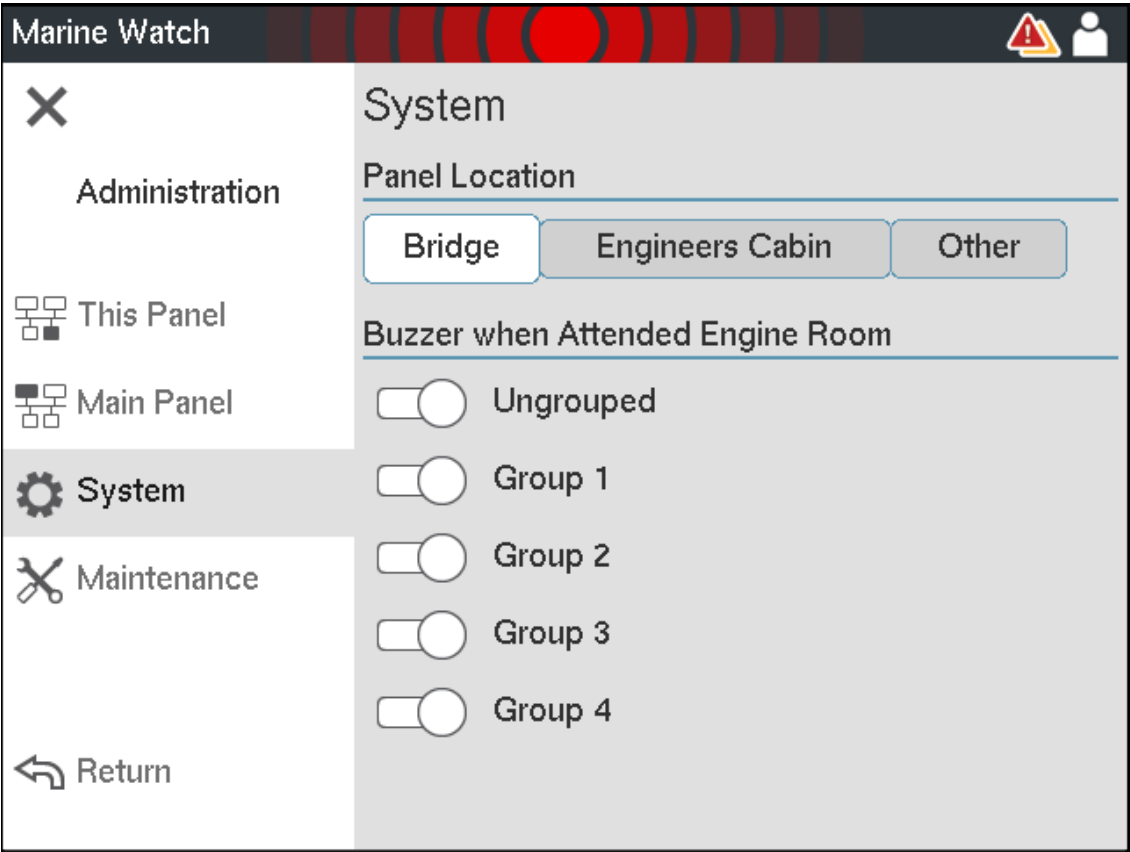


| Panel Location |
| --- |
| Select the panel location. |
| **Buzzer when Attended Engine Room** |
| If the **Bridge** panel location is selected, and **Periodically Unattended Engine Room** is enabled for the Marine Watch S system, the panel can be configured for which groups the buzzer shall be enabled for new events. |

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**Maintenance**
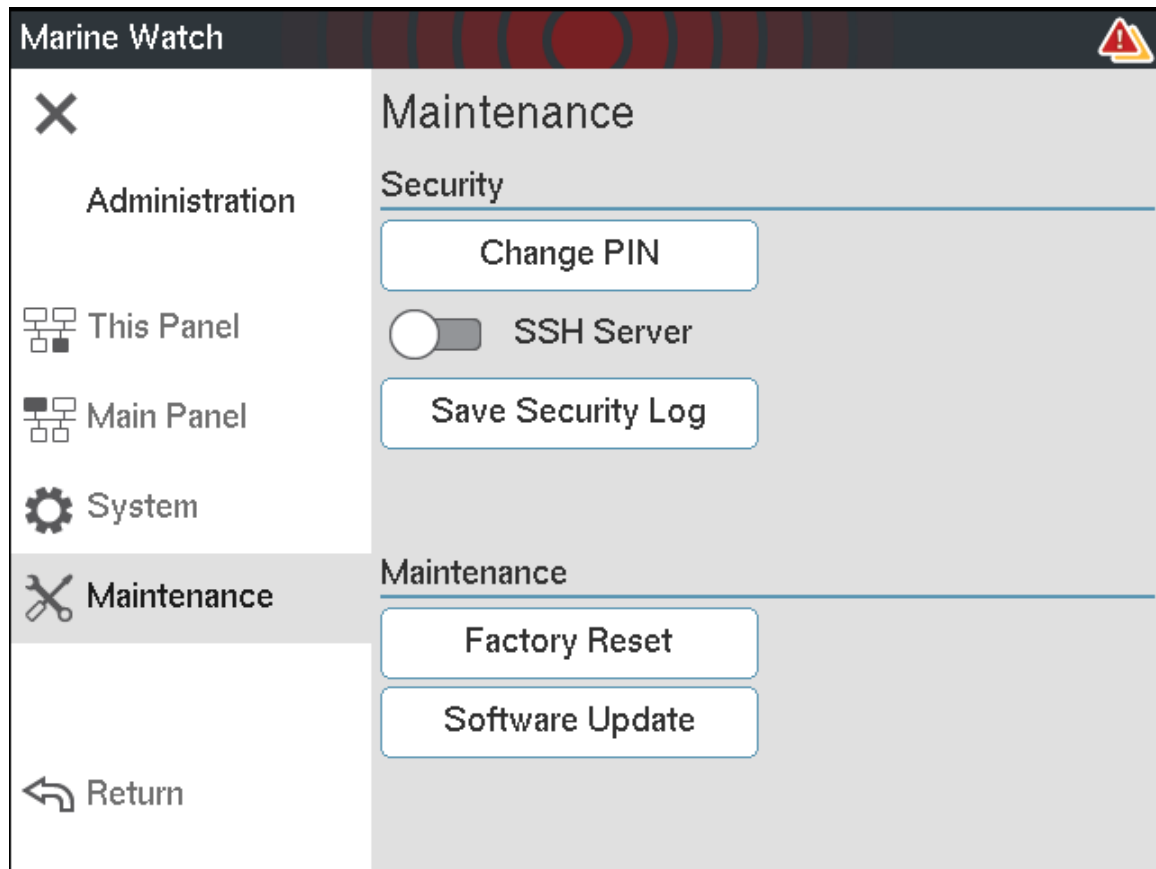


| Change PIN |
| --- |
| Dialogue for changing the active PIN code for logging in to the Administration menu. |
| **SSH Server** |
| Enable or disable the SSH server. This is a volatile setting and will be disabled upon the next power cycle for released software. |
| **Save Security Log** |
| Extracts the security log to USB. The log will be named "security_log.csv". A USB memory stick needs to be inserted. |
| **Factory Reset** |
| A Factory Reset will remove and reset the following
  ▪ Configuration |

| ■ User PIN code |
| --- |
| **Software Update** |
| Updates the software of the Annunciator Panel.<br><br>Insert a USB storage device with a software update file, `marinewatch_sace.tar.gz`, and press the **Software Update** button to start the update.<br><br>ⓘ  The software update process takes several minutes. Do not unplug the power supply. |

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# 7 I/O Cabinet Connections

All references below are made to the I/O Cabinet wiring diagram.

⊙ Always refer to the supplied wiring diagram for details. In case of conflicting information in the wiring diagram and this manual, then follow the wiring diagram.

## 7.1 Power Supply

The I/O Cabinet supports dual power supplies. If only one supply is being used, then connect the two supply inputs together in parallel. Use a minimum of 14 AWG / 2.5 mm$^2$ wire.

| Supply | Circuit breaker | 12/24V | 0V |
|---|---|---|---|
| Main source | 4Q2 | Terminal 2 | Terminal 4 |
| Backup source | 4Q4 | Terminal 2 | Terminal 4 |

### 7.1.1 Ground Connection

Connect the I/O Cabinet to the ground using a cable connected to the ground bar.

## 7.2 Ethernet Communication

Connect a CAT5 Ethernet cable between any of the available ports on the Ethernet Switch and an alarm panel. Multiple alarm panels can be connected.

## 7.3 Switch Channels

All switch input channels shall be connected directly to the I/O module. From the wiring diagram, locate the correct I/O module and connect as follows.

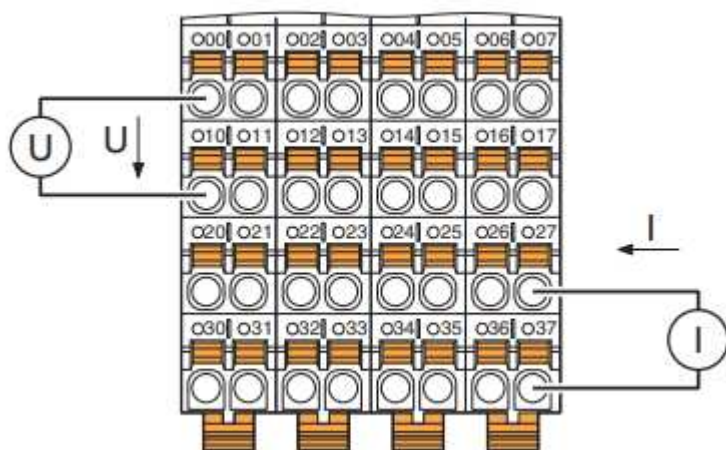| Switch input channel | Connections |
|---|---|
| 1 | 00 – 10 |
| 2 | 01 – 11 |
| 3 | 02 – 12 |
| etc. | ... |

Do prefer normally closed (NC) contacts, as then a broken wire also indicates an event.
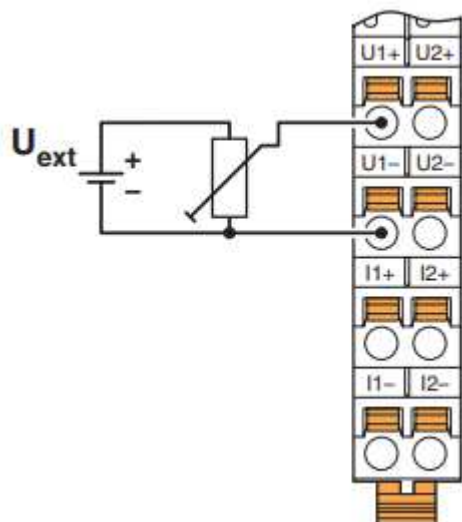
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## 7.4 Analog Channels

All analog input channels shall be connected directly to the I/O module. Connect either a 4-20 mA signal or a 0-10 V signal per channel.

From the wiring diagram, locate the correct I/O module and connect as follows.

| Analog channel | 0-10 V connections | 4-20 mA connections |
|---|---|---|
| 1 | 00 – 10 | 20 – 30 |
| 2 | 01 – 11 | 21 – 31 |
| 3 | 02 – 12 | 22 – 32 |
| ... | ... | ... |
| 8 | 07 – 17 | 27 – 37 |

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## 7.4.1 Analog Channel, 0 - 10 V



## 7.4.2 Analog Channel, 4-20 mA
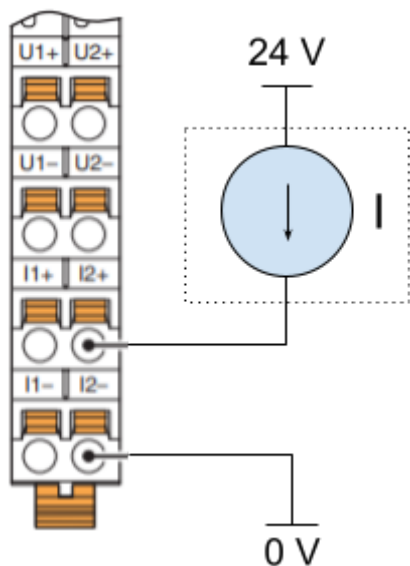


2-wire sensor



4-wire sensor

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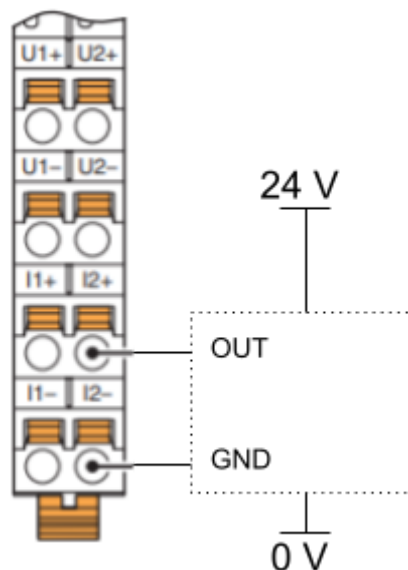
## 7.5 Output Channels

The I/O Cabinet comes with a set of standard output channels. In addition, optional output channels may be installed.

### 7.5.1 Standard Output Channels

The following output channels are always available in the I/O Cabinet.

| # | Function | Connections | Description |
|---|----------|-------------|-------------|
| 1 | Buzzer Active | 00 – 10 | Activates on new events.<br><br>Deactivates on<br>– acknowledge of event, OR<br>– press the Alarm button |
| 2 | Common Unacknowledged Events | 01 – 11 | Active if at least one unacknowledged event is present. |
| 3 | Common Active OR Unacknowledged Events | 02 – 12 | Active if at least one active OR at least one unacknowledged event is present. |
| 4 | Configurable | 03 – 13 | |
| 5 | Configurable | 04 – 14 | |
| 6 | Configurable | 05 – 15 | |
| 7 | Configurable | 06 – 16 | |
| 8 | Configurable | 07 – 17 | |

See the Output Channels chapter for available configurable functions.

### 7.5.2 Expansion Output Channels

All switch output channels shall be connected directly to the I/O module. From the wiring diagram, locate the correct I/O module and connect as follows.

| Switch output channel | Connections |
|-----------------------|-------------|
| 1 | 00 – 10 |
| 2 | 01 – 11 |
| 3 | 02 – 12 |
| etc. | ... |

One channel can source a maximum of 2 A. However, there is a maximum of 2 A in total for the I/O module including the standard output channels.

The optional two output I/O modules can source a maximum of 2 A in total.

## 7.6 Alarm Panel Supply

The I/O Cabinet has the circuit breaker 4Q35 reserved for 24 V / 2 A power to one external alarm panel.

Additional alarm panels need a separate power arrangement.