



ALARM TRANSFER SYSTEM

Bridge Navigational Watch Alarm System - BNWAS (Box-Pc)

Description

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SAFETY NOTES:



- **Warning!**
Take care during maintenance and repair work: avoid touching live electrical connections. The applicable safety regulations such as VDE, VBG 4, OSHA 1919 and other appropriate safety standards must be followed.
- The installation and first putting into operation may only be performed by trained and qualified personnel.
- Maintenance and repair work may only be performed by trained and qualified personnel having knowledge of the national safety regulations for this type of equipment.
- The equipment can be damaged!
Parts may only be replaced when the supply voltage is switched off.

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Annex

1 General

A default Nautoconning System consists of:

- Navigation Data Manager (see separate Manual no. 3884)
- Conning Display see separate Manual no. 4094)

As an option a Alarm Transfer System can be added
(see annex, Block Diagram) :

- Navigation Data Manager
- Conning Display
- Alarm Transfer System (ATS)

The *Alarm Transfer System* is a management system for incoming alarm messages, system state signals and the Watch Alarm.

Independent from the default NAUTOCONNING System, the Alarm Transfer System is equipped with an own power supply.

So the Alarm Transfer System including Watch Alarm Control is operative even if the Conning Display or the Navigation Data Manager broke down.

1.1 Construction

The *Alarm Transfer System* consists of the following units:

- Alarm Manager
- Nautoconning Display
- Data Manager
- Conning Alarm Panel
- Ethernet Switch
- Status Converter or Signal Unit
- Watch Alarm Activator
- Watch Alarm (Timer) Reset

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1.2 Alarm Sources

Alarms can be caused by the following devices:

- ECDIS
- RADAR
- Nav. Sensor Inputs
- Autopilot NP20xx
- Gyro Compass STDxx
- Watch Alarm Activator
- Other essential system specific navigation equipment (NMEA format)
- Magnetic Compass TMC

The following warnings and errors are basically included in the Alarm Transfer System:

- Collision warnings (RADAR)
- X-track (ECDIS)
- Off-course (NP20xx)
- Compass course (STDxx)

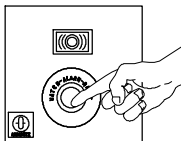
Detailed information about the full range of indicated warnings and errors can be referred to the corresponding device manuals.

1.2.1 Emergency Call-Function

This function allows (e.g. the guard officer) to send an Emergency Call from the bridge to the captains room by pressing the WATCH ALARM RESET BUTTON.

Situation:

One Man Bridge, the guard officer required urgently manoeuvre assistance.



Action:

Press the WATCH ALARM RESET BUTTON for 5s.

The Watch Alarm is immediately activated.

1.2.2 Mute Function

The Mute Function is used to acknowledge the acoustical alarm.

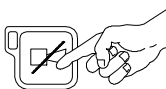
An acknowledgement of some active alarms are possible.

An acknowledgement of an important alarm is not possible. In this situation you have to check the situation directly at the e.g. ECDIS or Radar.

Situation:

The Alarm Transfer System detects a alarm signal from e.g. the ECDIS.

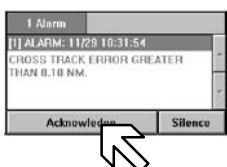
The Conning Alarm Panels and (if possible) the Signal Units sounds.



Action:

Press the Alarm key on a Conning Alarm Panel or on a Signal Unit.

The acoustical alarm switches off.



Check the Alarm Message in the ECDIS messages display area.

For acknowledging the Alarm Message press the softbutton Acknowledge per mouse key.

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1.3 Description

(see annex, Block Diagram)

1.3.1 Alarm Manager

The alarm manager (ALM) has the following tasks:

- To read the status of external devices and to place them on the Ethernet for display on the CONNING Display.
- To read alarms from external devices (e.g. compass, autopilot) from the Ethernet and DV bus, to generate appropriate alarm messages and send them to the desired Display.

The alarm manager consists of two pcb's for power supply and two pcb's for the alarm process managing.

The pcb's are located in a 19" rack (see Figure: 1-1). The back-plane is used as pcb holder and central distribution for the internal power supply and data transfer per CAN-BUS technology.

Power supply

The Power Supply Unit can be connected to 230 VAC ship power or directly to 24 VDC ship power. The second DC Power Supply generates the supply voltage (± 5 and ± 15 DCV) for the Alarm Manager and the Alarm Slave.

Alarm process managing

The Alarm Manager is a Vx -Works PC that handles the Alarm List and communicates to the CAN-BUS. The Alarm Manager is connected to the Ship Ethernet Network.

The Alarm Slave Microprocessor handles the DV-BUS and all specific Alarm Units (e.g. Status Converter or Signal Unit).

Independent from the NAUTOCONNING system, the Alarm Manager is supported with an separate power supply.

In case of NAUTOCONNING break down, the Alarm Manager is full operative!

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The Alarm Manager consists of the following pcb's (see Figure: 1-1) :

- 1 Power Supply (+ 5 and \pm 15 VDC)
- 2 Alarm Manager
- 3 Alarm Slave
- 4 Power Supply Unit (24 VDC)

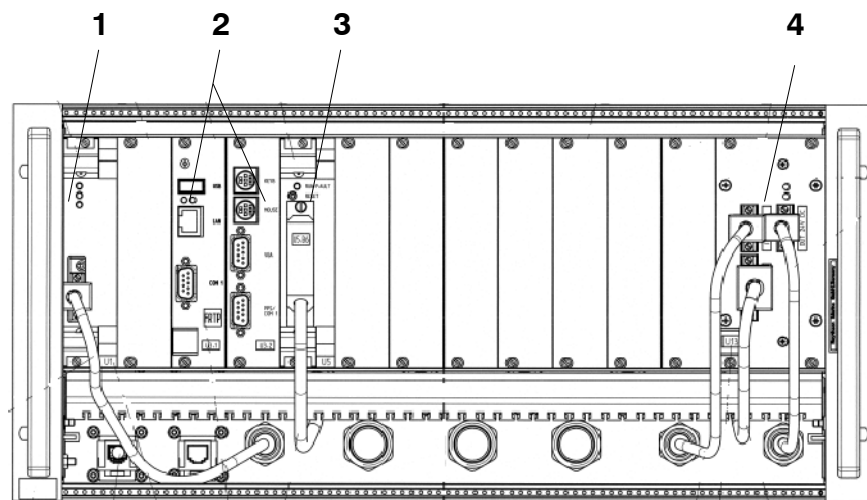


Figure: 1-1 Alarm Manager

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1.3.2 Functional description

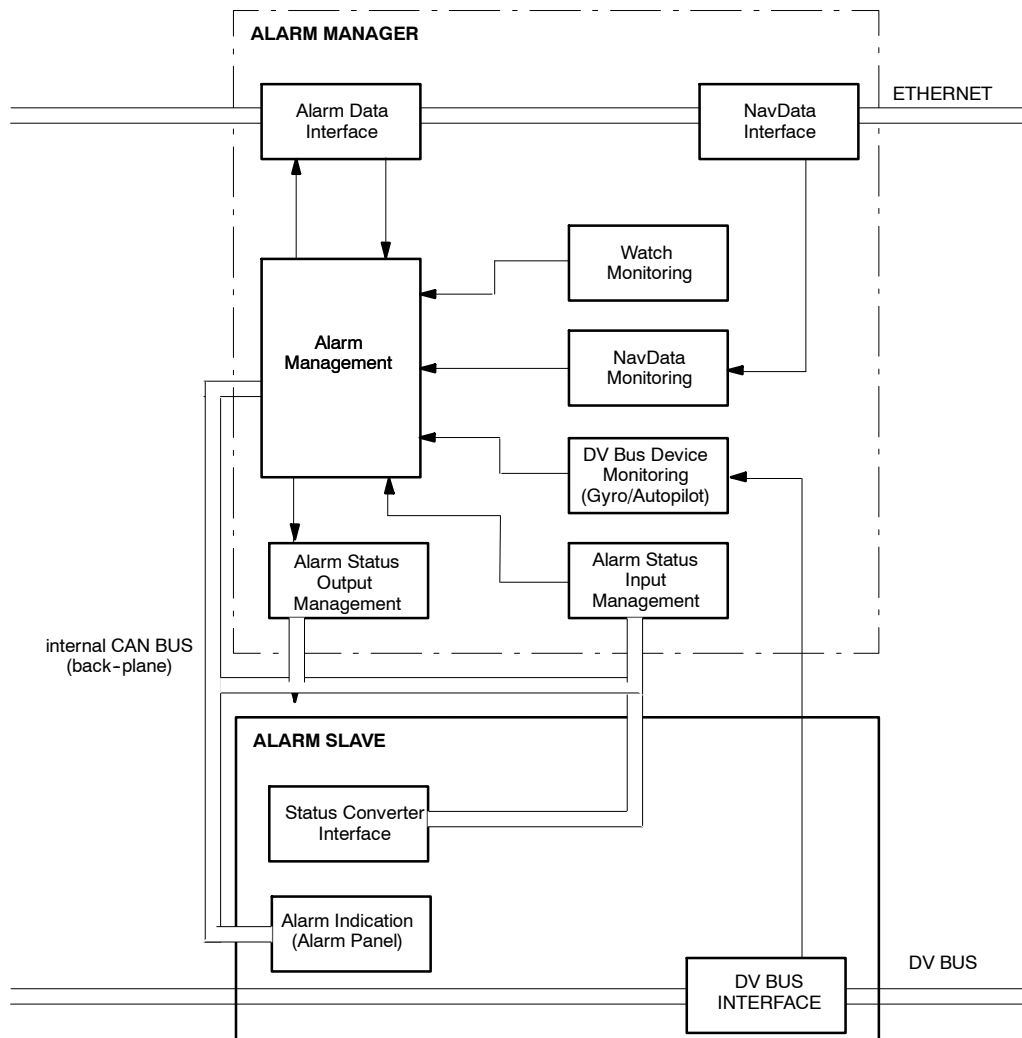


Figure: 1-2: Block Diagram ALARM MANAGER

After the equipment has been switched on, or after a RESET, the MASTER interrogates all the connected SLAVES and collects information regarding the transmitting and receiving interfaces, saving the coupling between source and target in an internal table.

Messages corresponding to all the possible alarms in the system are stored in another table.

Now if in operation the MASTER determines through cyclical interrogations of the Ethernet and DV bus that, for example, the position has failed, the appropriate alarm message is retrieved from the MASTER's internal table and sent to the

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output interface provided (e.g. for CONNING ALARM PANELS).

The same procedure occurs if an alarm is recognized that has already been placed on the Ethernet or the DV bus by an external device (Compass, Autopilot, Ecdis, Radar).

Alarm inputs are transferred to the Alarm Manager via the status converter.

In addition to that (as an option) status inputs can also be shown on the Signal Unit (NAUTOALARM).

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1.3.3 Conning Alarm Panel

The Conning Alarm Panel can be used as Central Alarm Panel or normal Conning Alarm Panel.

In this case the Central Alarm Panel can be configured as Alarm Panel or as Combi-Alarm Panel.

The Alarm Panel displays the actual Alarm and sets the acoustical Alarm.

The Alarm Panel used as Combi-Alarm Panel displays the actual Alarm, set the acoustical Alarm and displays the Pre-Warning Watch Alarm in combination with the Watch Alarm devices.

The normal Conning Alarm Panel can be configured as Alarm Panel, as Combi-Alarm Panel or as Watch Time Monitor.

The Watch Time Monitor displays the Watch Alarm Timer.

This diversity device configurations are ship-specific and have to be done by the service agent.

All Conning Alarm Panel can be manually set to alarm mode ON DUTY or STANDBY from the CONNING Display or from the Central Control Alarm Panel (Bridge).

Alarm Modes:

ON DUTY: Alarm monitoring enabled. The Alarm text strings can be listed on the display by the LIST button.
Active alarms are displayed (depending on Conning Alarm Panel configuration) and can be acknowledged.

STANDBY: No alarm monitoring.

MONITOR: Allows alarm listing and acknowledgement if the Control Alarm Panel is configured In STANDBY mode.

1.3.3.1 Configured as Central Alarm Panel

The Central Control Panel is always in ON DUTY mode. It is possible to configure each connected Conning Alarm Panel to ON DUTY or STANDBY by Monitor button (equal to Display ON DUTY on Conning Display) .

address00...indicates the Central Alarm Panel status.

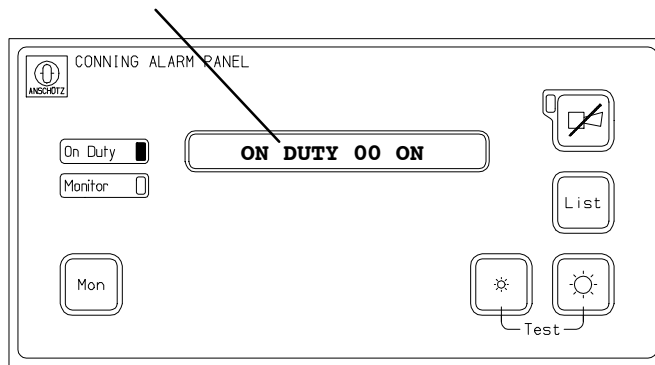


Figure: 1-3 Central Alarm Panel: ON DUTY configuration

If the Watch Alarm Activator is switched off, the watch time can be set.

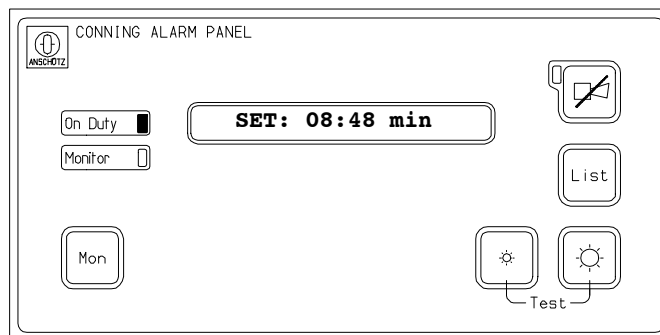

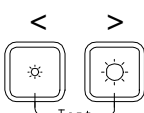
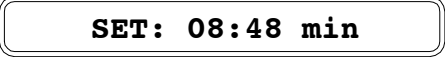



Figure: 1-4: Central Alarm Panel: SET TIME

	Indications	Comment/Notes
Setting the Watch Alarm Timer		
		 used as ENTER key

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1.3.3.2 Configured as Watch Time Monitor

If the Conning Alarm Panel is configured as a Watch Time Monitor, the alarm monitoring is not active. Only the actual watch time is displayed.

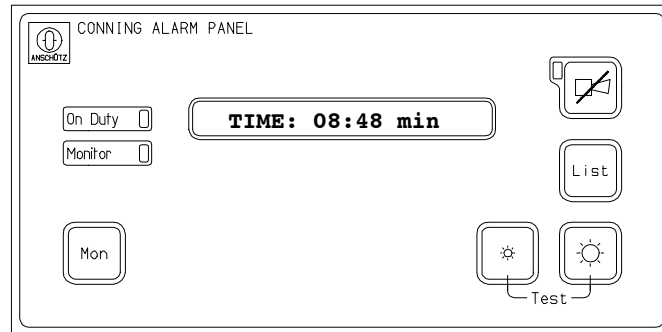


Figure: 1-5 Conning Alarm Panel used as Watch Time Monitor

1.3.3.3 Signal Unit - NAUTOALARM (Option)

Subsystems and devices are monitored with the NAUTOALARM signal unit. The unit can display up to 15 operating conditions (gyro, pumps etc.) or errors. Operating conditions are signaled by means of a dimmable continuous light, and errors by flashing light and an acoustic signal.

Since the signalized operating conditions can be caused by grouped alarms, more detailed information is only available via the alarm listings on the Conning Display or the Conning Alarm Panel.

An acknowledgement of an active alarm is not possible.

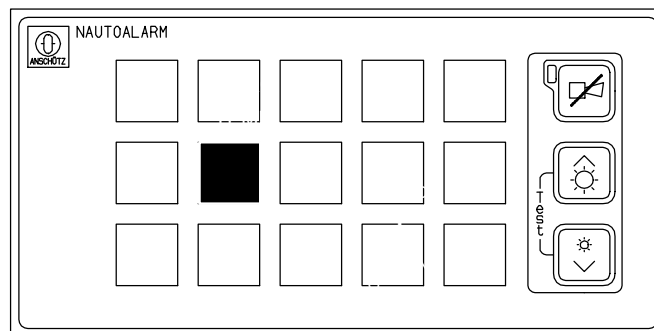


Figure: 1-6: NAUTOALARM Signal Unit

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1.3.4 Conning Display

1.3.4.1 Conning Display - ALARM -

The Display 'ALARM' has to be selected.

The Conning Display is designed as a redundancy alarm display to the Master Conning Alarm Panel. On all data displays an ALARMS section is visible (see Figure: 1-7), which includes *the same* functionality as the Conning Alarm Panel.

The ALARM LIST indicates all active and acknowledged Alarms in a list.

A still active alarm (not yet acknowledged) is indicated in red.

A still standing in line alarm (but already acknowledged) is indicated in white and remains so long in the alarm list until the trouble source is fixed.

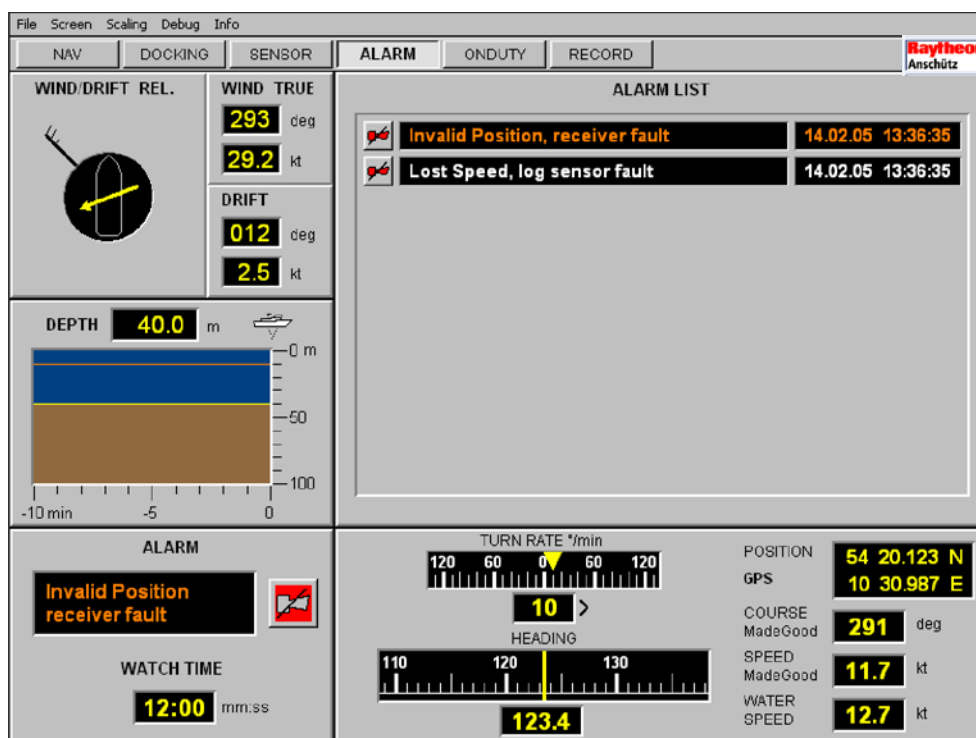


Figure: 1-7: Alarm Display

In the lower left part of the ALARM Display, which is signed „ALARMS“ the last active Alarm is shown as a text string and can be acknowledged.

The actual Watch Time is indicated in the textbox WATCH TIME and can be modified as shown in chap. 1.3.9.

1.3.4.2 Conning Display - ON DUTY -

The Display ON DUTY has to be selected.

Via the Menu function it is possible to set specified Conning Alarm Panel to ON DUTY or to STANDBY.

Alarm Units which are labeled with ON DUTY FIX can not be changed to STANDBY.

The actual status is listed in the list field CONFIG ALARM ON DUTY.

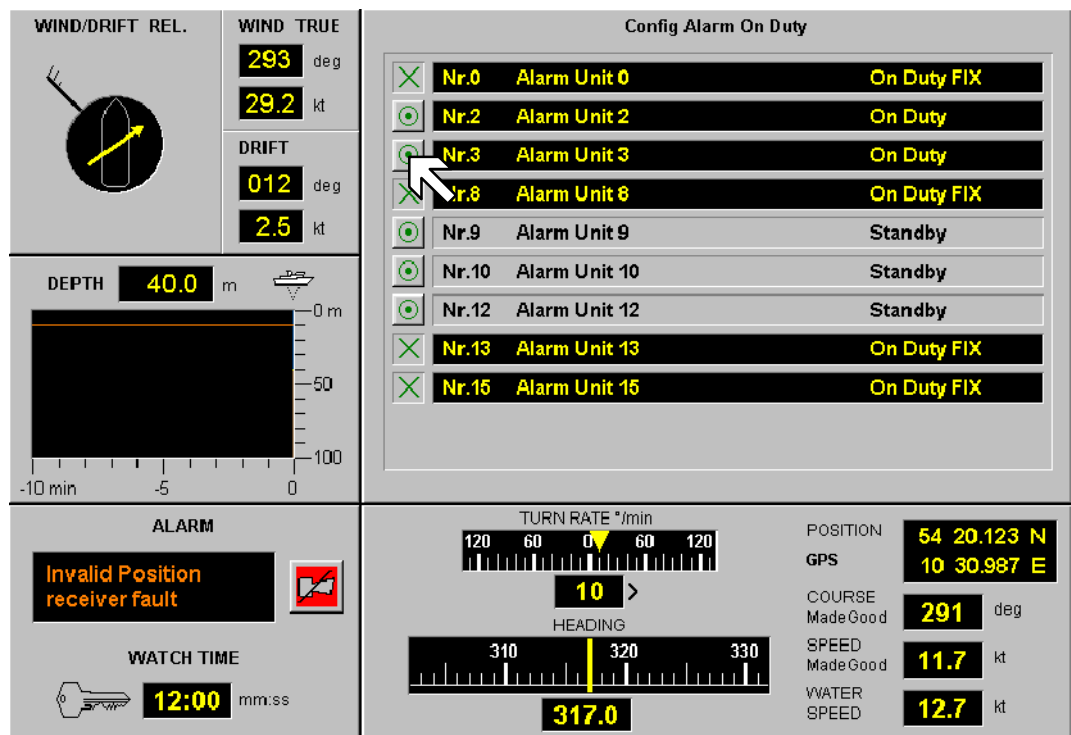


Figure: 1-8: Display ON DUTY

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1.3.5 Status Converter

The status converter converts external status signals (collision alarm, door contacts etc.) into a serial signal (RS422) and transfers it to the alarm manager slave pcb.

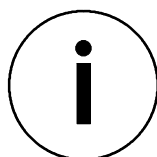
The signal management and assignment of the output signals is carried out by the alarm manager (see status converter description).

1.3.6 Watch Alarm Activator

If the key is switched to „**OFF**“ no W1 Alarms are transferred within the system.

If the key is switched to „**ON**“ the Watch Alarm is in permanent operation.

If the key is switched to „**AUTO**“ and the AUTOPILOT is switched to TRACK or HEADING Control, the Watch Alarm is working automatically.



Acc. MSC 128 the Watch Alarm will be automatically brought into operation whenever the ship's heading or track control system is activated and inhibited when this system is not activated (Watch Alarm Activator in position "AUTO").

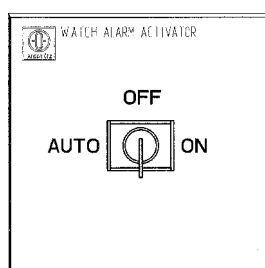


Figure: 1-9 Watch Alarm Activator

1.3.7 Watch Alarm (Timer) Reset

By pressing the reset button the Watch Alarm timer will be reset.
(see also chap. 1.2.1).

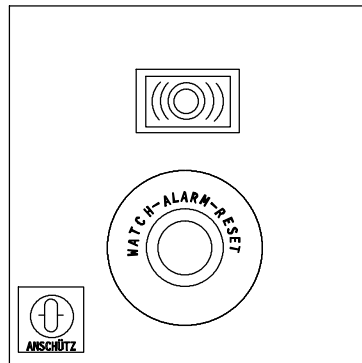


Figure: 1-10 Watch Alarm (Timer) Reset

1.3.8 Resetting the Watch Alarm Timer

A Watch Alarm Timer reset to the preset interval is carried out by acknowledgment of the alarm at the corresponding device (Conning Alarm Panel, Central Alarm Panel and Watch Time Monitor see chap. 1.3.3), Watch Alarm Reset button (see chap. 1.3.7) or Radar or ECDIS.


A prolonged pressing of one of these buttons doesn't block the Alarm Transfer System, the watch time interval is released.

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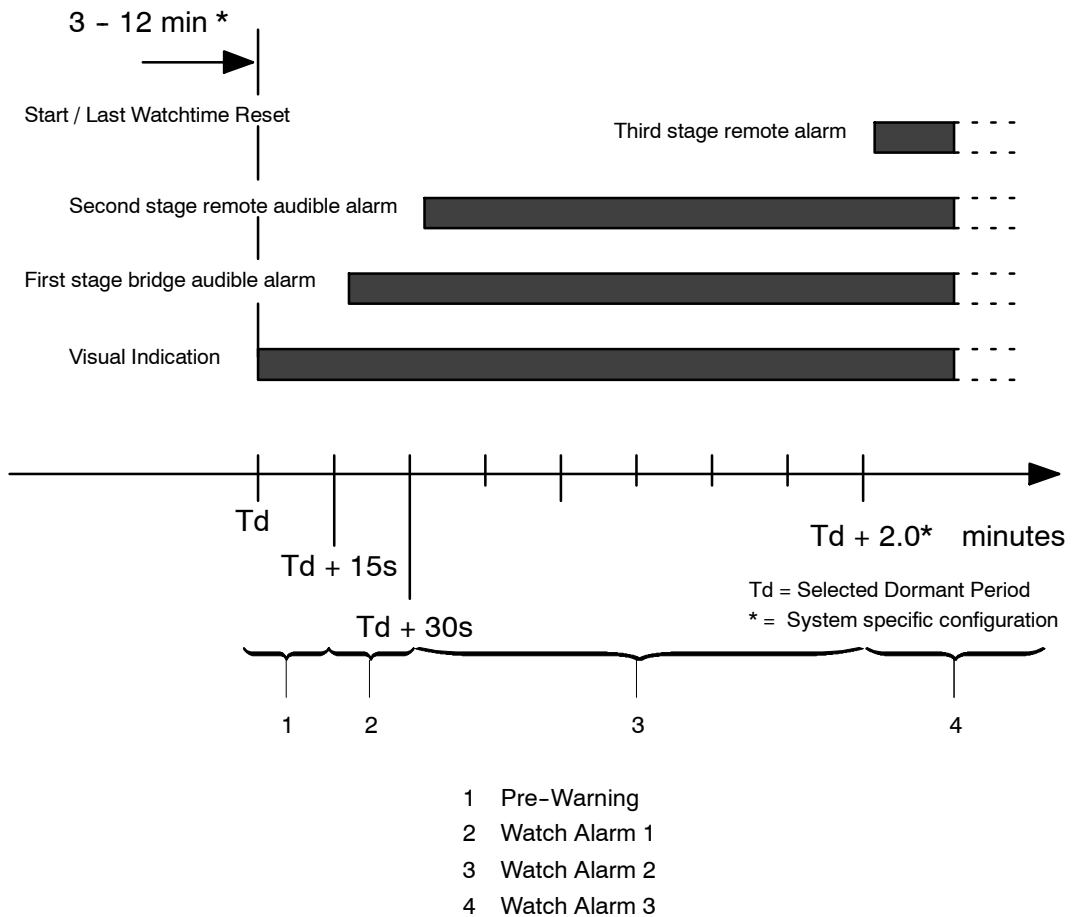
1.3.9 Setting the Watch Alarm Timer

The Watch Alarm Timer is basically set on the CONNING Display. Only if NAUTOCONNING broke down, the watch alarm timer can be set at a Conning Alarm Panel, which has been configured as a Central Panel.



The Watch Alarm Timer can only be set if the key switch of the Watch Alarm Activator has been activated.




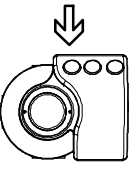
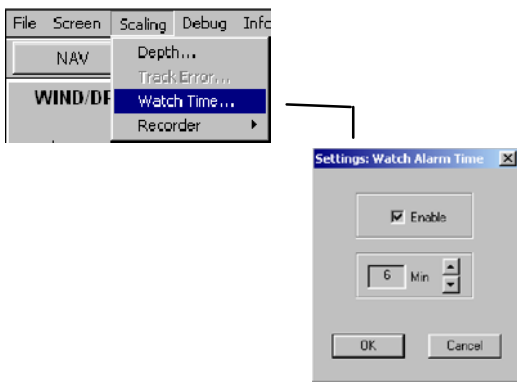
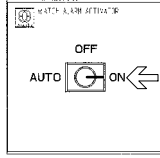

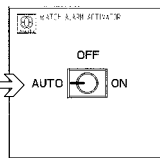

Alarm Sequence without Acknowledgements



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1.3.9.1 Conning Display

	Indications	Comments/Notes
[1] Watch Alarm		
 <p>Watch Alarm Activator</p>	 <p>key symbol</p>	<p>Key symbol is visible; the watch alarm activator is switched to OFF. The preset watch time settings can be selected.</p>
[2] Watch Alarm settings		
		<p>For detailed operation see CONNING DISPLAY System Description (Docu. No. 3886.DOC032).</p>
[3] Activate the Watch Alarm		
		<p>Key symbol is not visible; the watch alarm activator is switched to ON. The preset watch time is running downwards.</p> <p>The watch time settings are blocked know.</p>
[4] Activate the Watch Alarm when AUTOPILOT is active		
		<p>Key symbol is not visible; the watch alarm activator is switched to AUTO. The AUTOPILOT is switched to TRACK or HEADING Control. The preset watch time is running downwards.</p> <p>The watch time settings are blocked know.</p>

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2 Servicing, maintenance and repair

2.1 Safety instructions



Warning!

Take care during maintenance and repair work: avoid touching live electrical connections. The applicable safety regulations such as VDE, VBG 4, OSHA 1919 and other appropriate safety standards must be followed.



Warning!

Maintenance and repair work may only be performed by trained and qualified personnel having knowledge of the national safety regulations for this type of equipment.



Warning!

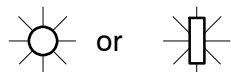
The equipment can be damaged!
Parts may only be replaced when the supply voltage is switched off.

2.2 Servicing and maintenance

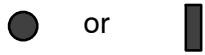
Servicing and maintenance are not needed for the NAUTOCONNING system.

2.3 Repair

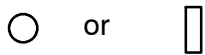
2.3.1 Explanation of the symbols



LED flashes



LED off



LED on

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2.3.2 Control Unit

Figure: 1-11 and the following table show the standard signals during trouble-free operation.

- 1 Power Supply (+ 5 and \pm 15 VDC)
- 2 Alarm Manager
- 3 Alarm Slave
- 4 Power Supply Unit (24 VDC)

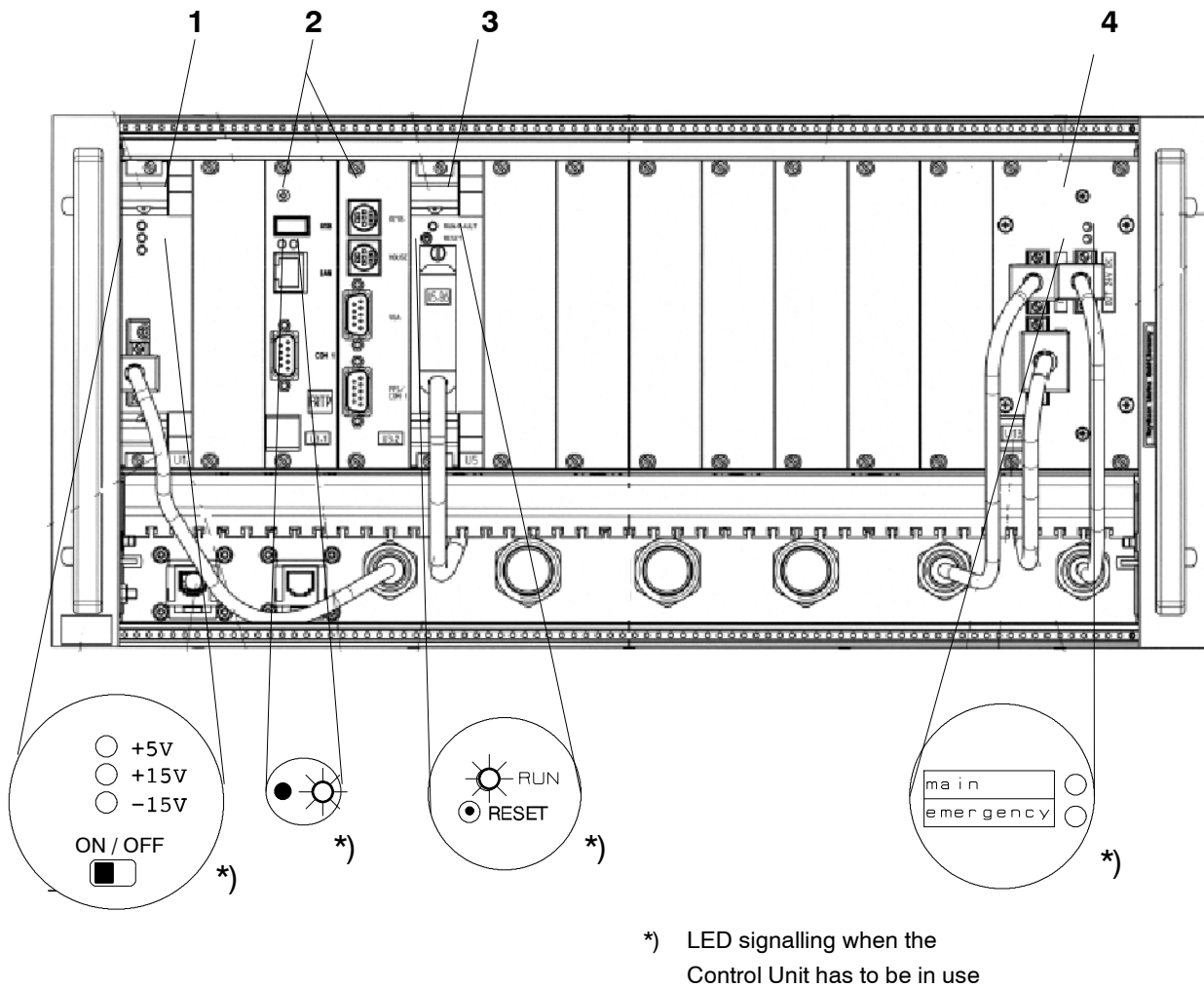





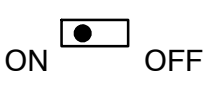
Figure: 1-11: Signals on the Control Unit




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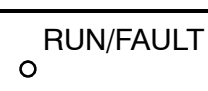

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

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Power supply +5 V, ± 15 V Pos 1			
LED	Color	Standard	Comment
	green	○	+ 5V
	green	○	+15V
	green	○	-15V
		ON	Toggle switch ON for Control Unit ON OFF for Control Unit OFF

Alarm Manager Pos 2			
LED	Color	Standard	Comment
	red	●	
	green		flashing Program is running

Alarm Slave Pos 3			
LED	Color	Standard	Comment
	green		flashing Program is running

Power supply 24 V Pos 4			
LED	Color	Standard	Comment
	green	○	230 VAC
	green	○	24V Emergency

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If one of the LEDs behaves other than in the standard fashion, it is recommended as a first step to exchange the corresponding card (see chap. 2.3.2.1).

If either the **"RUN"** or the **"FAULT"** LED of one of the cards does not correspond to the standard signal, the first step is to perform a **restart**.

Proceed as follows:

- Switch the device off (see ON/OFF switch, Figure: 1-11) and wait for about 5 seconds
- Switch the device on again.

If the fault is not overcome in this way, appropriately trained service personnel should be called.

2.3.2.1 Exchanging the control unit pcbs

- Undo the cross-headed fastening screws and remove the cover.
- Undo the fastening screws of the connector on the front side of the pcb to be exchanged and pull out the plug.
- Loosen the pcb's two fastening screws, and pull the pcb out from the back-plane by pushing the levers apart, removing the pcb then in a forwards direction.
- Configure the new pcb



The pcb configuration is software controlled (flash memory and program controlled) and has to be done by trained and qualified personnel only.

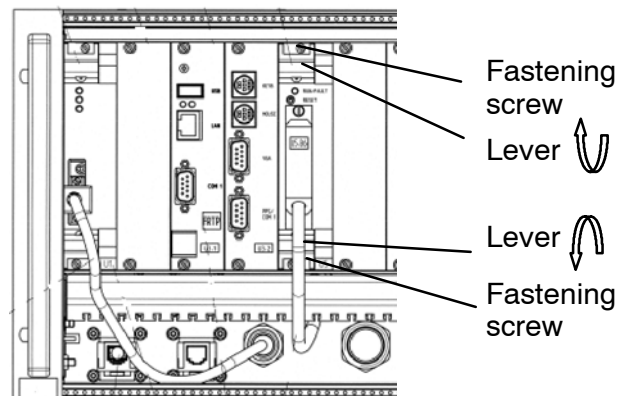
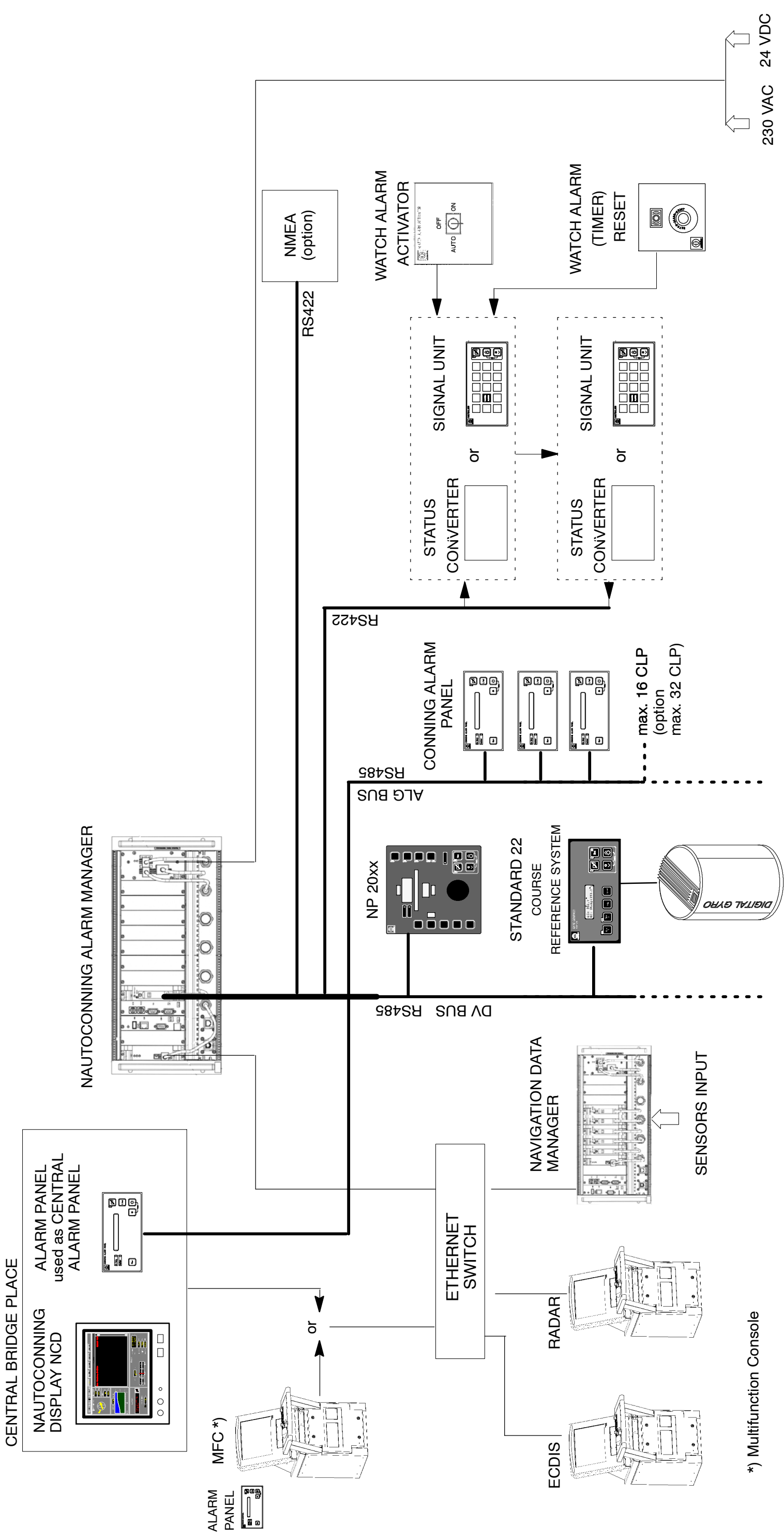


Figure: 1-12 Control Unit, fastening points

- Insert the configured pcb and fasten it
- Plug the connector in and fasten it
- **Place the cover on and fasten it**

ALARM TRANSFER SYSTEM
Bridge Navigational Watch Alarm System - BNWAS
Block Diagram



*) Multifunction Console

ALARM TRANSFER SYSTEM
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Block Diagram
