8.8“ Touchscreen Colour Display
AHD 880 TC

Operation Manual

Read this manual before beginning any work!

CE

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BÖNING
Automationstechnologie

Automationstechnologie GmbH & Co. KG
Am Steenöver 4
D-27777 Ganderkesee

Tel.: +49 (0) 4221 9475-0
Fax: +49 (0) 4221 9475-21 /-22

E-Mail: info@boening.com
Internet: www.boening.com

Change History

for Operation Manual AHD 880 TC

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Aug 19th, 2104	AHD_880_TC_DOK_de_V9_20140819	Device drawings updated Description for CAN connections updated	p. 14, p.20 p. 26	Pasuki, Bahram (PaB)
Oct 7th, 2104	AHD_880_TC_DOK_en_V10_20141007	Approvals updated	18	Pasuki, Bahram (PaB)
Mar 27th, 2015	AHD_880_TC_DOK_en_V11_20150327	Required distance to compass added	17, 19	Pasuki, Bahram (PaB)

1 General Information

1.1 About this Manual

Read this manual carefully before beginning any work! It is part of the product and must be kept in the product’s immediate vicinity, so that it is always available to the personnel.

Include this manual when handing the product over to third parties.

This manual includes important product handling instructions. On the following pages, this manual describes the 8.8” Color Display AHD 880 TC.

This manual includes specific instructions, in case further and more detailed documentation is available for individual components.

Adhering to all product safety and handling instructions for the product and all connected components is a prerequisite for safe operation.

In addition, the local accident prevention and general safety rules for the device’s area of operation must be observed.

The illustrations in this manual are intended to demonstrate the contents more clearly. They are not necessarily drawn to scale and can vary from the actual product in minor details.

This manual has to be regarded as a complete unit. Using of excerpts from this manual as stand-alone documentation without considering the complete manual is not allowed.

1.2 Explanation of Symbols

Warnings

In this manual, warnings are marked by symbols. The warnings are introduced by signal words indicating the degree of danger.

It is important to heed these warnings and act with caution to avoid accidents, personal injury and property damage.

DANGER!

… indicates an imminently hazardous situation that can result in death or severe injury, if not avoided.

WARNING!

… indicates a potentially hazardous situation which can result in death or severe injury, if not avoided.

CAUTION!

… indicates a potentially hazardous situation that can result in minor or light injury, if not avoided.

CAUTION!

… indicates a potentially hazardous situation that can result in property damage, if not avoided.

Tips and Recommendations

TIP!

… indicates useful tips and recommendations and information for efficient and error-free operation.

1.3 Limitation of Liability

All information and instructions in this manual have been compiled in consideration of current norms and regulations, the state of technology, and our knowledge and experience of many years.

The manufacturer is not responsible for damages due to:

- Noncompliance with the instructions in this manual
- Unintended use
- Employment of untrained personnel
- Unauthorized modifications
- Technical modifications
- Use of unauthorized spare parts

The actual scope of delivery can vary from the explanations and illustrations in this manual in case of customized models, special ordering options or the latest technical improvements.

In addition, the agreed upon obligations in the delivery contract, the general terms and conditions, the manufacturer’s delivery terms and the legal regulations current at the contract signing are in force.

We reserve the right to make changes to improve the device’s service properties and to further develop the product.

1.4 Copyright

This operation manual is a confidential document. It is intended solely for those persons working with the product. It is not permitted to hand this manual over to third parties without the manufacturer’s prior written permission.

TIP!

The information, texts, drawings, illustrations, and other representations in this manual are protected by copyright laws and are subject to industrial property rights. Any misuse is subject to prosecution.

It is not permitted to duplicate this manual in any type or form – even in excerpts – or use and/or communicate its contents without the manufacturer’s written permission. Contraventions are liable to compensation. We reserve other rights.

1.5 Spare Parts

WARNING!
Risk of injury from incorrect spare parts!

Incorrect or defective spare parts can cause damages, malfunctions or complete failure and jeopardize the vessel’s safety.

Therefore:

– Only use the manufacturer’s original spare parts.

Order spare parts from a contracted reseller or directly from the manufacturer. Refer to page 2 for the address.

1.6 Warranty Terms

The warranty terms can be found in the General Terms and Conditions (GTC) of the manufacturer’s sales documents.

1.7 Customer Care

Our customer care department is available to assist you with technical information.

Information about the corresponding customer contact is always accessible via telephone, fax, e-mail, or the Internet. Please refer to page 2 for the manufacturer’s address.

In addition, our staff is always interested in new information and experiences resulting from the use of the product which can be used to further improve our products.

2 Safety

This chapter provides an overview of all important safety aspects for optimal protection of the personnel as well as safe and error-free operation.

Noncompliance with the handling and safety instructions listed in this manual can cause significant hazards.

2.1 Operator’s Responsibilities

This product is intended for commercial use. Therefore, its operation is subject legal workplace safety regulations.

In addition to the workplace safety instructions in this manual, the current safety, accident prevention, and environmental protection regulations for the product’s place of use must be observed. Especially:

- The operator must stay abreast of the current workplace safety regulations and determine through a risk assessment any additional hazards resulting from the special working conditions of the product’s place of use. He must implement these in the form of operating instructions for the product’s use.
- During the product’s entire period of operation, the operator must verify that his operating instructions are in compliance with current regulations and revise them, if necessary.
- The operator must clearly regulate and define areas of responsibility for installation, operation, maintenance and cleaning.
- The operator must ensure that all employees handling the product have read and understood this manual.

  In addition, he must train the personnel in regular intervals and inform them about any dangers.

Furthermore, the operator is responsible for always keeping the product in perfect working condition.

2.2 Personnel Requirements

2.2.1 Qualifications

WARNING!
Risk of injury from insufficient qualification!

Improper handling can lead to significant personal injury and property damage.

Therefore:

– Only allow qualified personnel to do any work.

This manual lists the following qualifications for various areas of activity.

- **Trained Person**
  has been trained by the operator through an orientation for the assigned tasks and has been informed about possible hazards from improper execution.
- **Specialist**
  is able to execute the assigned tasks and recognize and avoid potential hazards independently due to formal training, knowledge and experience, as well as knowledge of the situational norms and regulations.
- **Electrician**
  is able to work on electrical systems and recognize and avoid potential hazards independently due to formal training, knowledge and experience, as well as knowledge of the situational norms and regulations.

  The electrician is trained for the specific work site in which he is active and knows the relevant norms and regulations.

Only those persons who can be expected to do their work reliably are permitted as personnel. Persons, whose responsiveness is diminished by e.g. drugs, alcohol, or medication, are not permitted.

- Observe the local age and profession specific regulations when selecting the personnel.

2.2.2 Unauthorized Persons

WARNING! Danger to unauthorized persons!

Unauthorized persons who do not meet the requirements described in this manual do not know the occupational hazards.

Therefore:

– Keep unauthorized persons out of the work area.
– When in doubt, approach persons and remove them from the work area.
– Interrupt all work as long as unauthorized persons remain in the work area.

2.3 Intended Use

The 8.8” Color Display AHD 880 TC has been exclusively designed and constructed for the purpose described in this manual.

The 8.8” Color Display AHD 880 TC is a compact and versatile display unit used in alarm systems on board ships and in industrial plants in alarm and monitoring systems. The Color Display AHD 880 TC is connected to other external system devices via CAN-bus data communication and is exclusively used to monitor and display senor data and to alert threshold violations.

WARNING!
Danger from unintended use!

Any use of the product beyond and/or other than its intended use can cause hazardous situations.

Therefore:

- Only use the product as intended.
- Strictly adhere to all instructions in this manual.
- In particular, avoid the following unintended use:
  - Using a supply voltage other than the one indicated in this manual.

Any claims for damages resulting from unintended use are void.

The operator is solely responsible for any damages resulting from unintended use.

WARNING!
Danger from improper operation of the product!

Product failure or malfunctions can lead to personal injury or property damage in the overall system.

Therefore:

- Although the product itself is not dangerous, the effects of failures or malfunctions on the overall system must be considered.
- Always discontinue using the products when they develop smoke or abnormal heat.

3 Design and Function

3.1 General Function

In general, the 8.8” Color Display AHD TC is used as part of an alarm and monitoring system on board of ships, allowing for the capture and visualization of a multitude of measurands from the sensors on board ships.

Fig.: 8.8“ Color Display with Touch Screen AHD 880 TC

The Color Display AHD 880 TC is connected to the other components of the ship’s alarm and system, such as Data Station AHD-SAS 15, via a CAN-bus, and graphically displays their sensor data and alarm information in case of threshold violation on various display pages. Within the system, several color displays in various installation locations can be integrated into the CAN-bus network.

The scope of presentation depends on the project specific measuring point list. The project data of this list are entered into the system configuration file with special configuration software, which is uploaded to the connected system components via the CAN-bus.

The device is operated through the integrated touch screen. Several selected functions, like changing pages and alarm acknowledgement, can also be performed through an external Remote Control AHD650R. It can be installed in a suitable, separate installation location.

For optimal visualization of the systems on board a ship, the visualization of the monitored ship sensors, their measuring points and status messages on the Color Display AHD 880 TC’s graphic user interface is tailored to the project’s specific scope.

To display analogue measurands conveniently and clearly, graphic representations, such as scaled round instruments, bar graphs, and digital displays are used or combined with one another, also allowing for the integration of threshold value ranges, e.g. for pre-warnings and alarms.

As a rule, binary measurands are displayed in tabular format with measuring point names and status display.

When a value reaches a critical level, a warning or alarm is triggered and indicated on the display, depending on the predefined threshold value configuration. In addition, an integrated buzzer sounds an alarm which can be acknowledged with a key press.

All recorded and pending alarms are listed in chronological order in a table. Each alarm is displayed with the measuring point name, current value, alarm type, and time of occurrence.

To indicate alarm conditions, a general alert message with the number of pending alarms is superimposed onto the measuring point pages.

A service page, on which the measuring points and alarm conditions of all sensors can be viewed in a clearly displayed manner, is available for startup and maintenance purposes.

On the configuration page, the user can set the display options for the Color Display AHD 880 TC according to his own needs. He can set the system language for the screen texts, select the unit system (metric or Imperial), and the internal clock time.

Connecting a GPS receiver allows for display of the cruising speed. If the ship is equipped with according engines with motor displays to indicate engine data and alarms, selected data from the engine display can also be used on the ship alarm system’s Color Display AHD 880 TC via an additional CAN-bus communication to calculate and display fuel consumption and remaining range, for example.

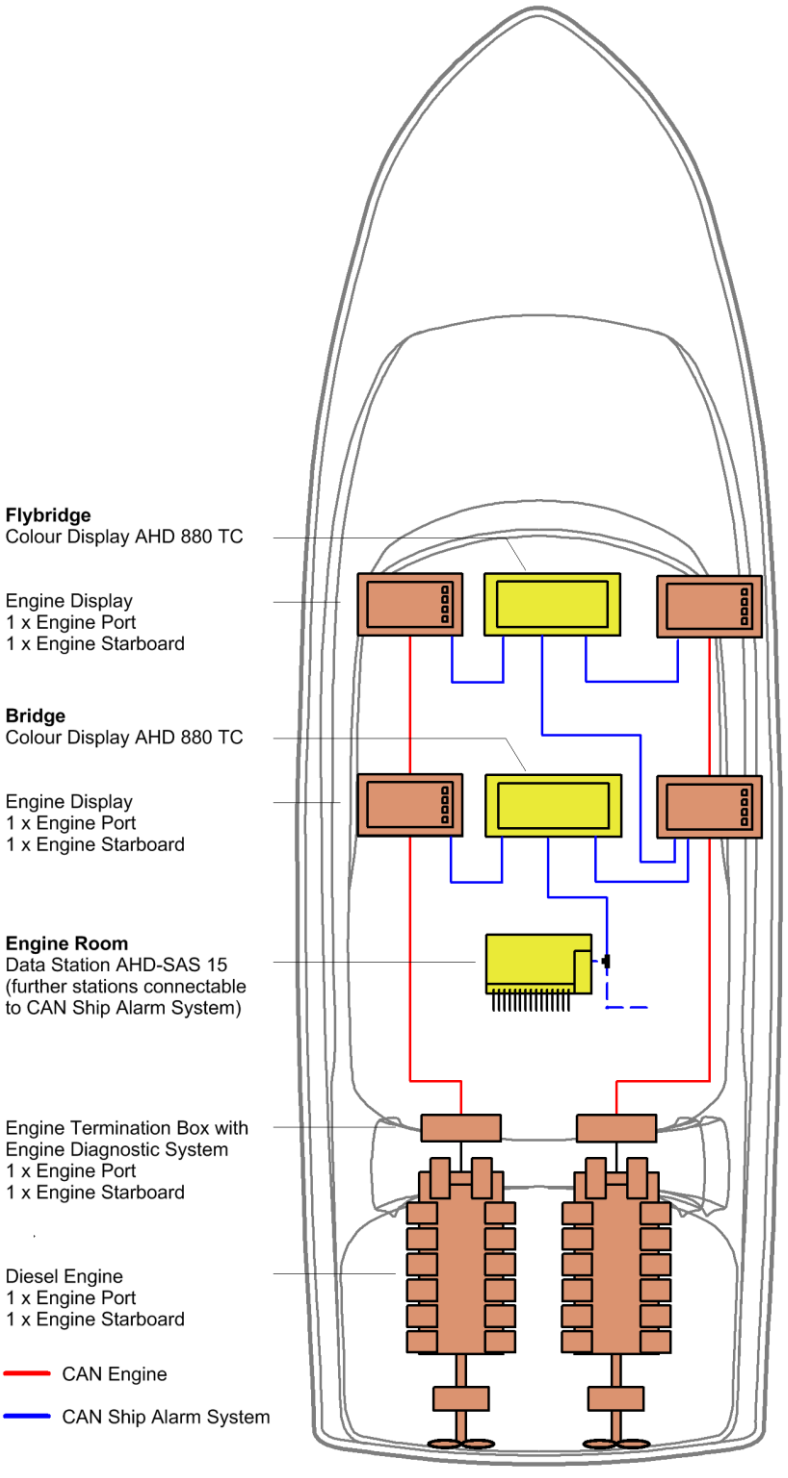


Fig.: Configuration diagram of a ship alarm and monitoring system and engine alarm system, dual engine configuration

In addition, the system can be expanded with other components of the AHD device family communicating via CAN-bus that can handle numerous on board monitoring and control tasks. These system data are also visualized on the AHD 880 TC display.

Among other things, the system can display the following ship data:

- Water and fuel tank levels
- Trim tab angles and rudder position
- Optimal trim tab angle at current cruising speed
- Bilge alarms and pump status
- Monitoring of doors and hatches, ladders, sea water cooled exhaust gas systems and power supply systems
- Condition of navigation lights

  (requires Navigation Lights Monitoring System AHD-DPS 02)
- Fuel consumption and range

  (depending on the engine)

The connected sensors are monitored by one or several Data Stations AHD-SAS 15 (also incl. additional connected Data Station AHD-PS-15, AHD-PS 30 or AHD-PS 47). All data are transmitted to the display units via CAN-bus. Up to 15 sensors (current, power, resistor, switch) can be led directly to the terminal strip of the Data Station AHD-SAS 15.

The additional Data Stations AHD-PS 15, AHD-PS 30 or AHD-PS 47 are current-controlled and can be connected via optocoupler interfaces, increasing the possible sensor range by 15, 30, or 47 binary inputs.

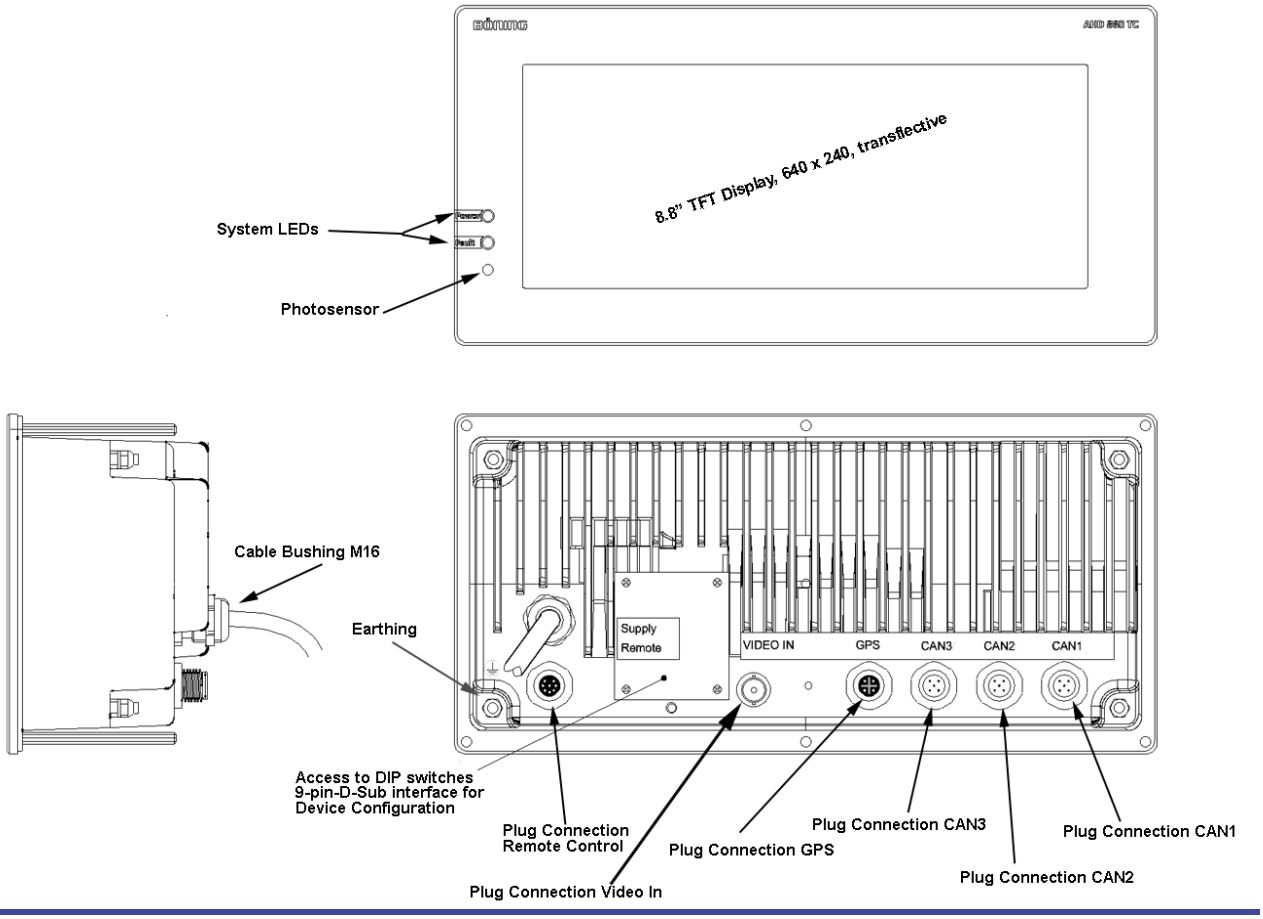
The devices are provided with the project specific system configuration at the factory. Generally, the system can be operated without any further measures. Special configuration software makes it possible to adjust alarm texts or other parameters at a later point. Next the alarm groups “Pre-Alarm” and “Main Alarm,” analogue sensors can also be monitored for plausibility. A damaged sensor therefore immediately triggers a sensor-error message.

Alarm notifications can be acknowledged directly at the display from the touch screen or at the remote control via key press. However, the reason for alarm remains listed on the alarm page until its cause has been resolved and normal values are pending at the input.

3.2 Mechanical Structure

The 8.8” Color Display’s compact design makes it suitable for console or switchboard installation. 2 LEDs and 1 photo element are integrated into the device front next to the transflective TFT-display and touch surface. The photo element serves for the automatic dimming. The front plate is made of 5 mm thick, black anodized aluminum (AlMg1) with an integrated, glare free glass pane. The front plate’s remaining surface is coated with a 0.25 mm thick water tight and UV-light resistant plastic film.

A 2 mm thick flat gasket, made from cellular rubber EP, is located in the support surface between the device and console. This achieves a protection class of IP 56. On the rear side, the device electronics are enclosed by a powder coated housing made from 2 mm thick AlMg1. An opening is located behind the plastic covering, allowing access to a serial interface (D-SUB 9) and DIP switches for configuring the device. Three plug connectors (CuZn, nickel-plated) for communication buses CAN 1, CAN 2, and CAN 3, one video input, one RS232-connection (e.g. for GPS), as well as one remote control connection and one cable bushing (M16, brass) with a led out round cable (power supply and external signaling) are also located on the rear side. The device’s rearside protection class is IP 22.



4 Technical Information

4.1 Technical Data Color Display AHD 880 TC

Description	Value/Unit/Type
General Data	
Installation type	console installation
Dimensions, W x H x D	270 x 130 x 77.3 mm
Panel cutout, W x H	260 x 114 mm
Required installation depth	min. 150 mm
Weight	ca. 2.0 kg
Environmental Data	
Operating temperature	-25°C…~+70°C
Storage temperature	-30°C…~+85°C
Protection class	IP 56 (frontside) IP 22 (rear)
Required distance to compass	Standard magn. Comp.: 70 cm Steering magn. Comp.: 40 cm
Electrical Data	
Power supply	12/24VDC (+30%/-25%)
Power/current consumption	max. 700mA (24VDC)
Display Data	
Display resolution	640(H) x 240(V) Pixels
Visible screen diagonal	8.8”; 209.28 mm x 78.48 mm
Color depth	15 bit
Luminosity	250 cd/m², transflective (typ.)
Viewing angle:	horizontal: min. 40°/typ. 50° vertical: min. 35°/typ. 45°

Description	Value/Unit/Type
Interfaces	
Interfaces	3 x CAN-Bus 1 x RS232 (e.g. for GPS) 1 x plug, 8-pin, for Remote Control AHD 650R 1 x Video In (composite video, PAL 50 Hz)
Outputs	2 x potential free relay contact, 40 V DC / 1A
Inputs	1 x binary (optocouplers)
Approvals	
Classification societies	Germanischer Lloyd Lloyd´s Register of Shipping Russian Maritime Register of Shipping

4.2 Technical Data Remote Control AHD 650R

Description	Value/Unit/Type
General Data	
Dimensions, W x H x D	40 x 130 x 35 mm (housing)
Panel cutout, W x H	26 x 111 mm
Required installation depth	min. 110 mm
Weight	ca. 0.2kg
Environmental Data	
Operating temperature	-25°C…~+70°C
Storage temperature	-30°C…~+85°C
Protection class	IP 67 (frontside) IP 55 (rear)
Required distance to compass	Standard magn. Comp.: 40 cm Steering magn. Comp.: 30 cm
Electrical Data	
Power supply	12/24VDC (+30%/-25%)

4.3 Name Plate AHD 880 TC

The 8.8“ Color Display AHD 880 TC’s name plate is located on the device rear and contain the following information:

- model designation of the unit
- serial number (may be on separate label) and power supply
- terminal diagram of the connecting cable

4.4 Dimensions

4.4.1 Device Dimensions Color Display AHD 880 TC

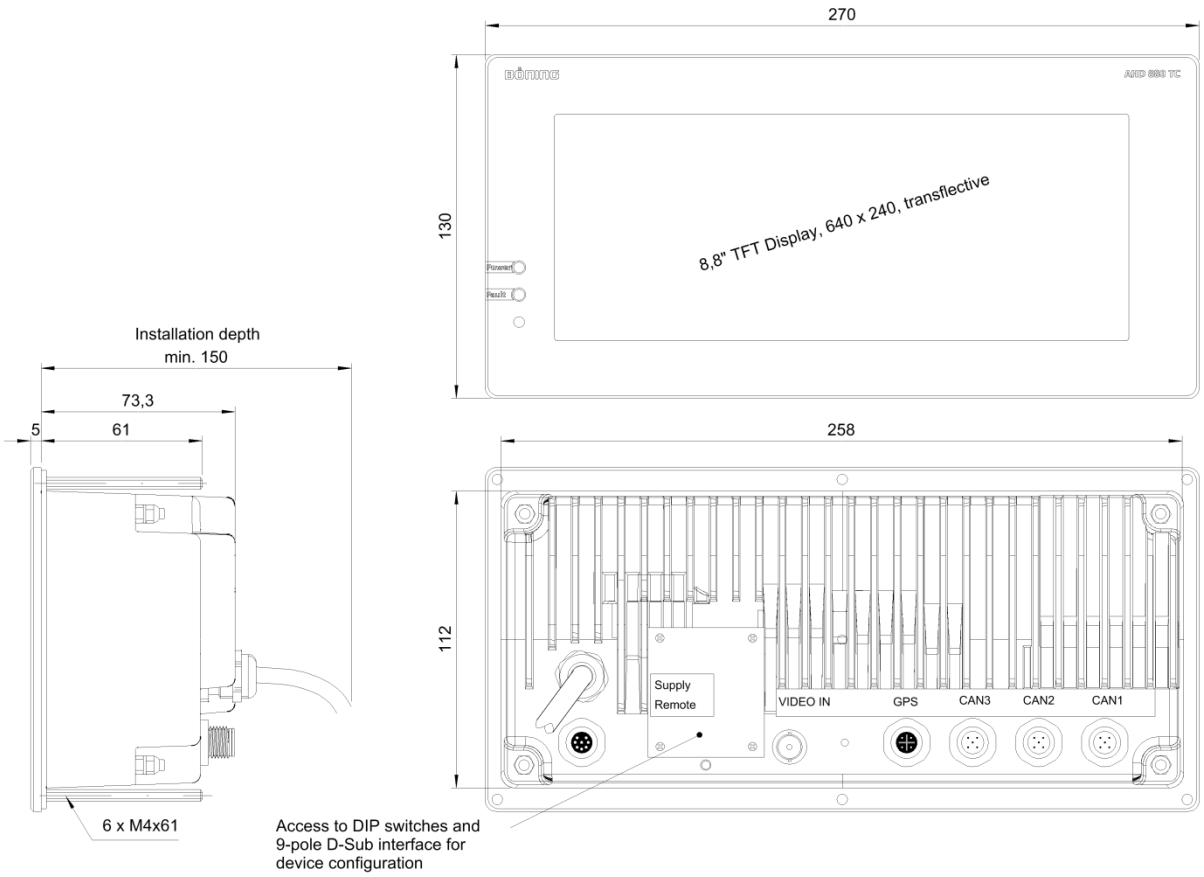


Fig.: Device dimensions AHD 880 TC

4.4.2 Panel Cutout and Drill Holes AHD 880 TC

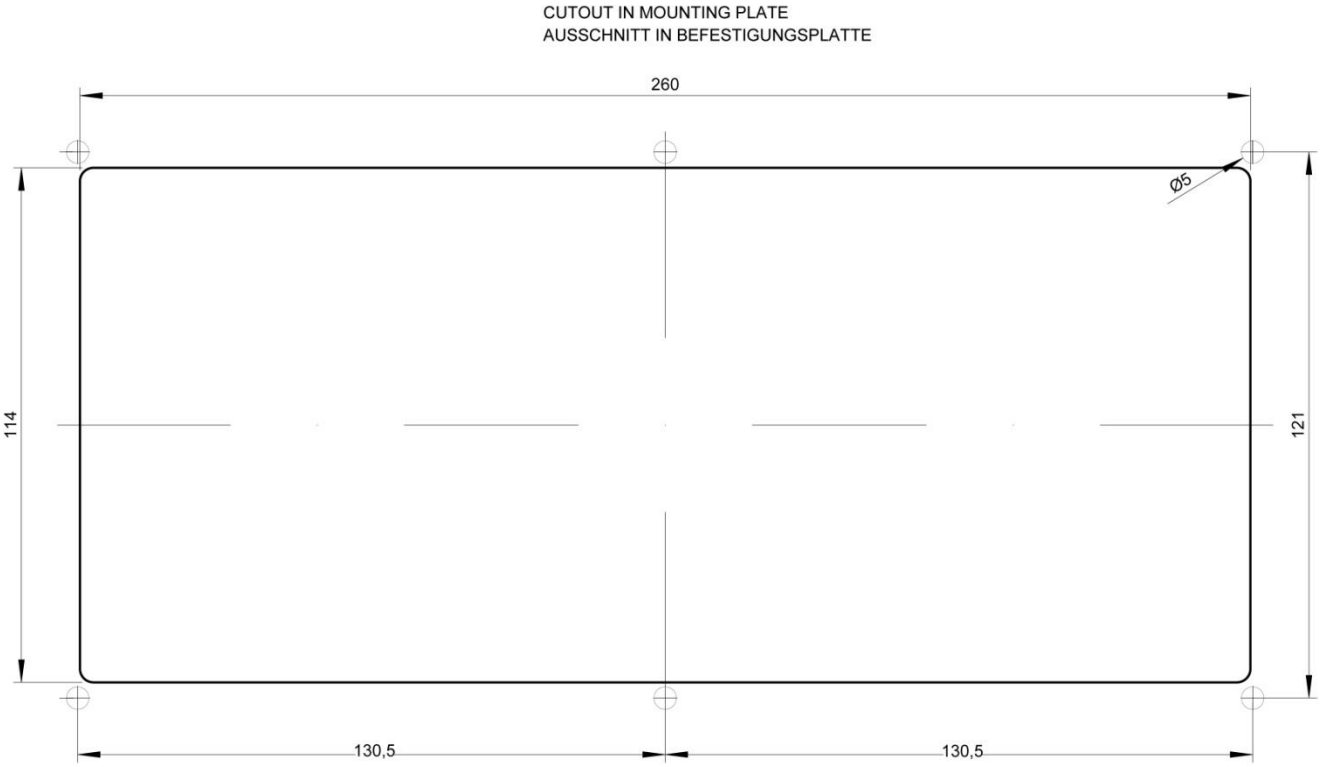


Fig.: Panel cutout and drill holes AHD 880 TC

4.4.3 Device Dimensions Remote Control AHD 650R

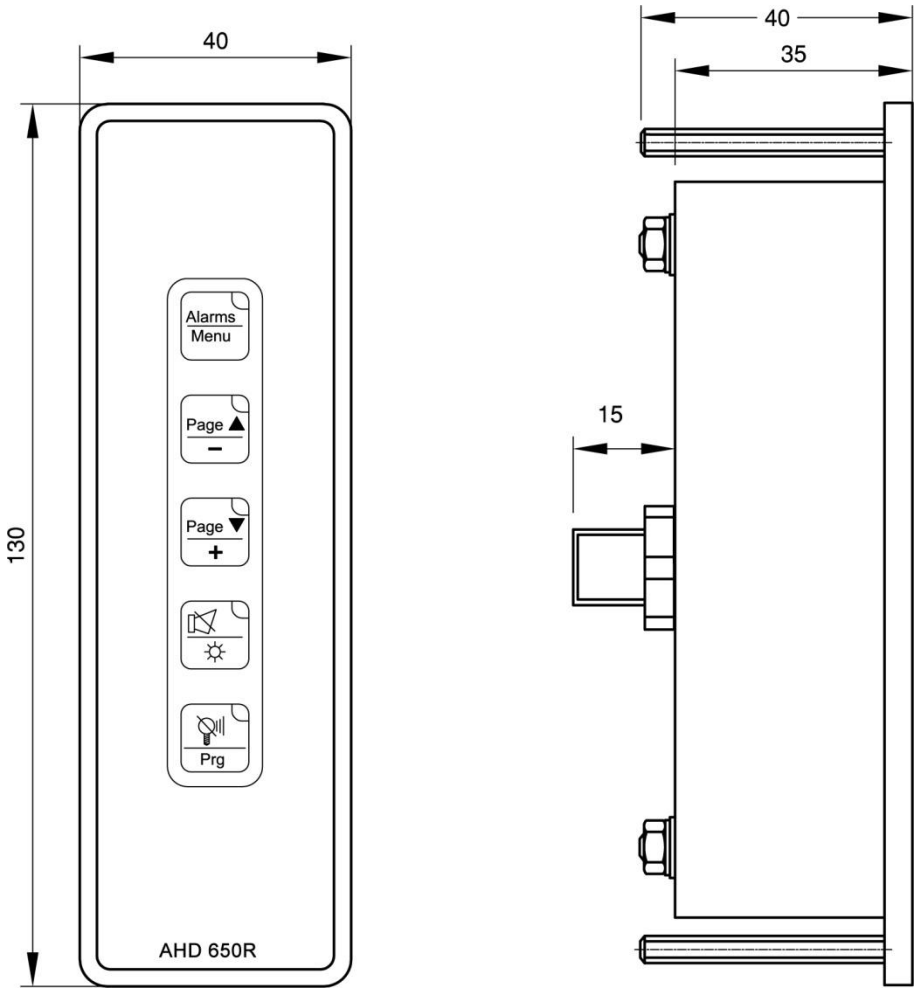


Fig.: Device dimensions Remote Control AHD 650R

4.4.4 Panel Cutout and Drill Holes AHD 650R

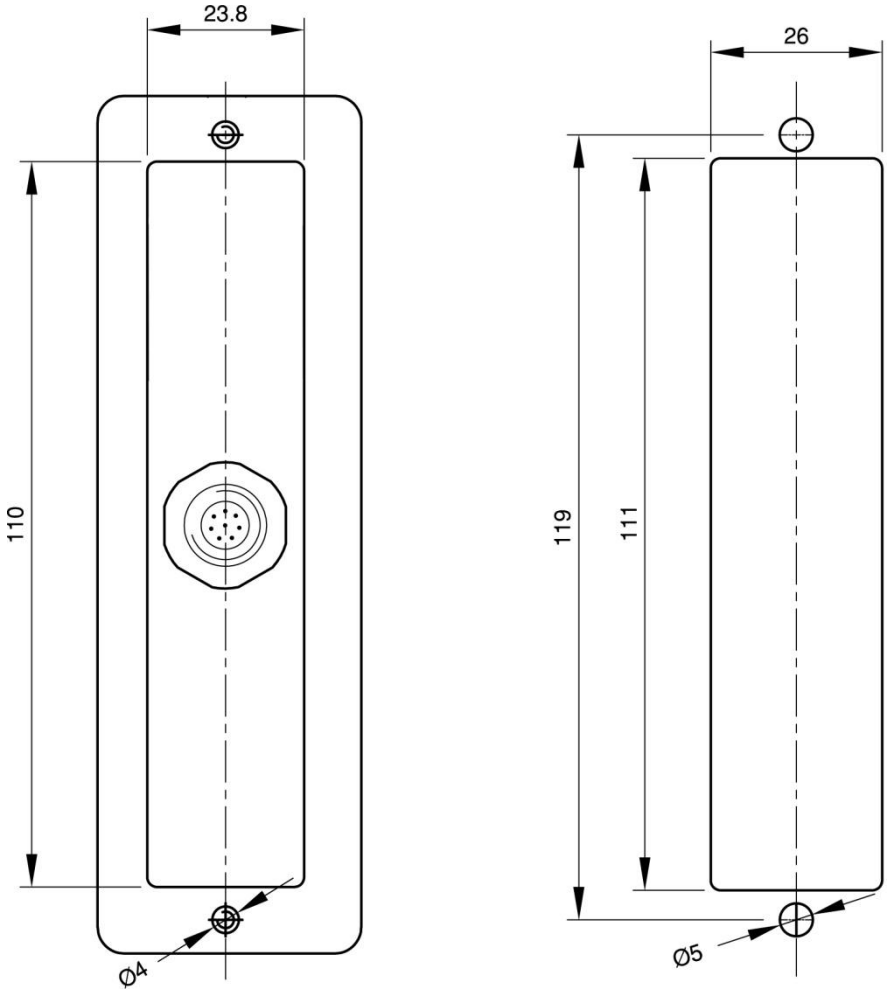


Fig.: Panel cutout and drill holes AHD 650R

4.5 Connections

4.5.1 Device Connections

A 2 m long cable (LiYY 9 x 0.75 mm²) is led out through a cable bushing (M16). It is responsible for the 24 V DC power supply, the connection of the control outputs “horn” and “group alarm,” and the contact input for alarm acknowledgement.

Two supply inputs of equal priority (supply 1, supply 2) are available. They are galvanically uncoupled from one another through internal switching logics. Therefore, in case of dual engine propulsion systems, the corresponding engine battery can be directly accessed as a power source. The system is automatically fed by one of these sources, independently of which engine is currently active – or whether both engines are active.

The independent CAN-bus systems (CAN 1, CAN 2 and CAN 3) can be connected with a corresponding 5-pin plug connector (plug), according to “DeviceNet Standard.” The CAN-bus handles the data transfer and communication with all other devices connected to the system. The system configuration is also uploaded via the CAN-bus. Prior to upload, it is created with a separate configuration software.

If present, Remote Control AHD 650R is connected to the device with the 8-pin plug.

The integrated RS232 interface is primarily used for connecting an external GPS receiver. The data transmitted by the GPS receiver can be used to calculate and display e.g. cruising speed and distance related fuel consumption.

The Color Display AHD 880 TC’s firmware is uploaded via an RS232 interface located behind a plastic covering on the device rear.

As far as the color display’s serial interfaces are concerned: the Color Display AHD 880 TC is a terminal device. This means that a 1:1 cable must be used (not a twisted wire, null modem cable or lap link).

4.5.2 Terminal Assignment

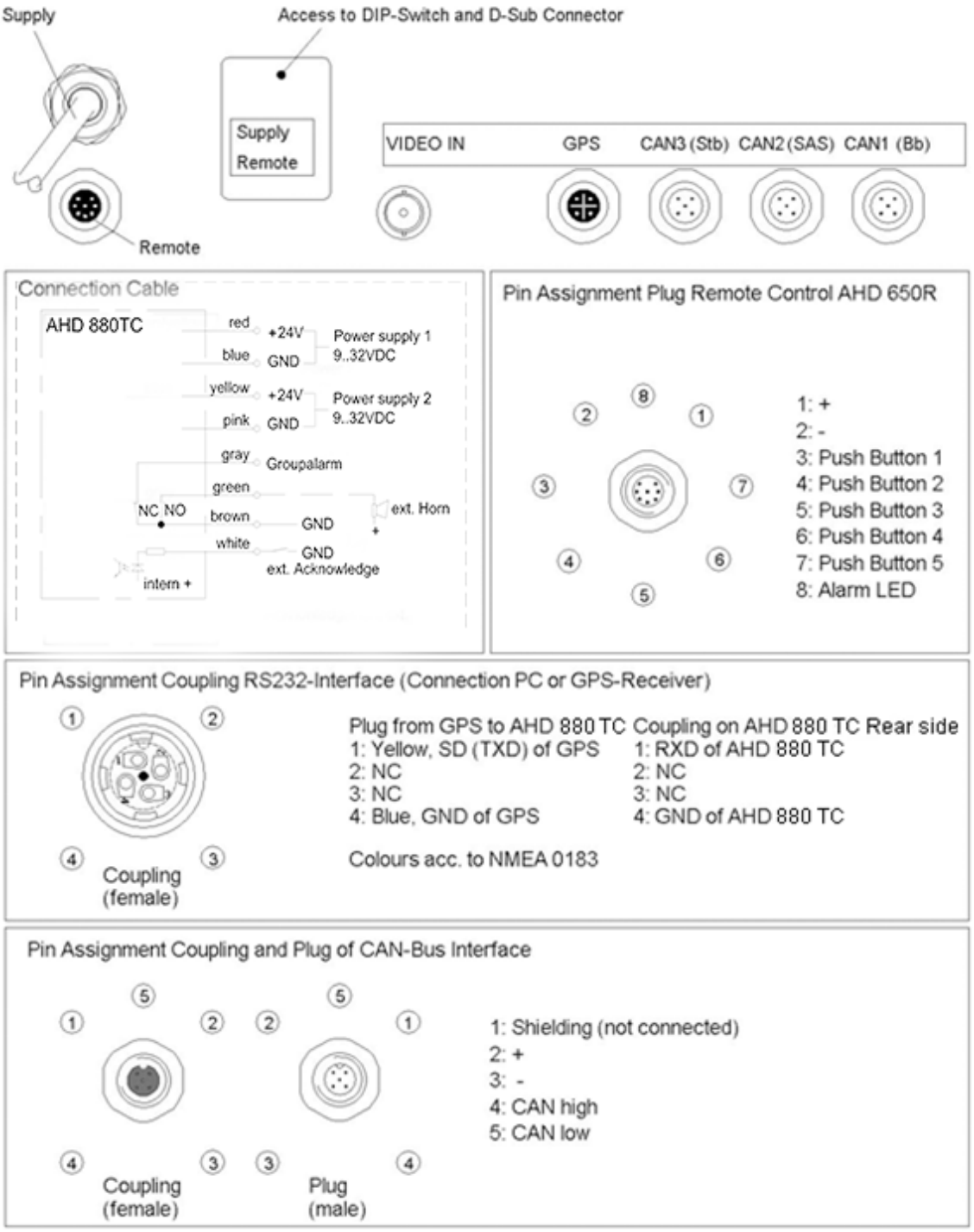


Fig.: Terminal assignment

4.5.3 CAN-Connections

The Color Display AHD 880 TC includes three separated CAN bus connections. Each of these connections is used for the device’s integration into certain CAN-bus networks.

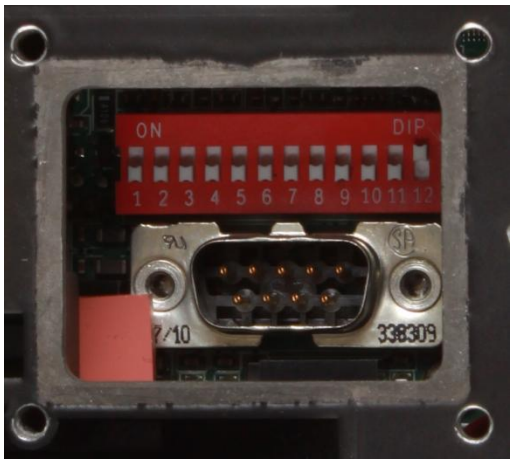
The Can connections are configured with the AHD-Deviceconfig software.

4.5.4 DIP-Switch Functions

Under the protective cap on the device rear, a group of DIP switches (SW 1 /1-12) is located. Certain settings that deviate from the standard configuration can be made with these DIP-switches.

CAUTION!

Since incorrect settings can cause functional errors, only authorized technicians should change the settings on the DIP-switches.



DIP switches display AHD 880

The following table explains the DIP-switches and their corresponding functions.

The switches marked “Customer Specific Configuration” or “Not Relevant” only serve device internal purposes and may not be changed. The switches marked “Free” have no function.

To activate a function displayed in the table, the corresponding switch must be set to the ON position.

TIP!

The following table uses the term “Switched Off Display.”

A complete shut-down of the device with the button “Power” is not possible. With this button the device is switched to stand-by. The device itself remains powered on.

The device is switched on again by touching the screen.

See also Chapter 7.9

TIP!

If a DIP switch is moved into another position, this change is effective only after a restart of the device (switching power supply off and on again).

Exception: Switching the DIP switch SW 1-12 is directly effective without the need for a restart of the device.

Switch	Function
SW1-1	The device is equipped with switch-on protection (3 second delay). This function can be deactivated with this switch, i.e. the display powers on immediately after the touch surface has been touched.
SW1-2	When the display is switched on, it starts with the last viewed page. If the switch is set to the ON position, the display always starts up with the first page, regardless which page was last active prior to switching it off.
SW1-3	If the switch is set to ON, the time for the recognition of device failures is extended from 5 seconds to 1 minute.
SW1-4	If the switch is set to ON, the display only allows local acknowledgment of acoustic alarms (internal buzzer). The acknowledgement message is not forwarded.
SW1-5	If a new alarm is reported, the display automatically switches to the alarm page. If this switch is set to the ON position, the display remains on the current page when a new alarm occurs.
SW1-6	If the switch is set to ON, the display powers on autonomously with new alarms.
SW1-7	Free
SW1-8	Free
SW1-9	When this switch is set to the ON position and the display is restarted, the device configuration of the display is deleted (the graphical configuration however is not deleted). After the deletion of the configuration the switch must be set back to the OFF position before the display is restarted, otherwise the configuration is deleted with every restart of the display.
SW1-10	Free
SW1-11	Setting this switch to the ON position forces the display during startup into the configuration mode. In case of an invalid configuration the device can still be reached and a valid graphical configuration can be transmitted to the device.
SW1-12	This switch must be set to ON for the installation of new firmware.

4.6 Cable Configuration

4.6.1 Transmission of configuration to the device

The transmission of the configuration to the device is described in a separate document:

AHD651 Software Update

TIP!

*The configuration instruction **AHD651 Software Update** is valid for both the displays AHD 880 TC and AHD 651.*

This document is part of the delivery.

TIP!

For a configuration of the display the DIP switch SW 1-12 must be set to ON (refer to page 26). The DIP switches are on the rear side of the device beneath the protection plate (refer to page 20).

After configuration of the device the DIP switch SW 1-12 must be set back to the OFF position..

TIP!

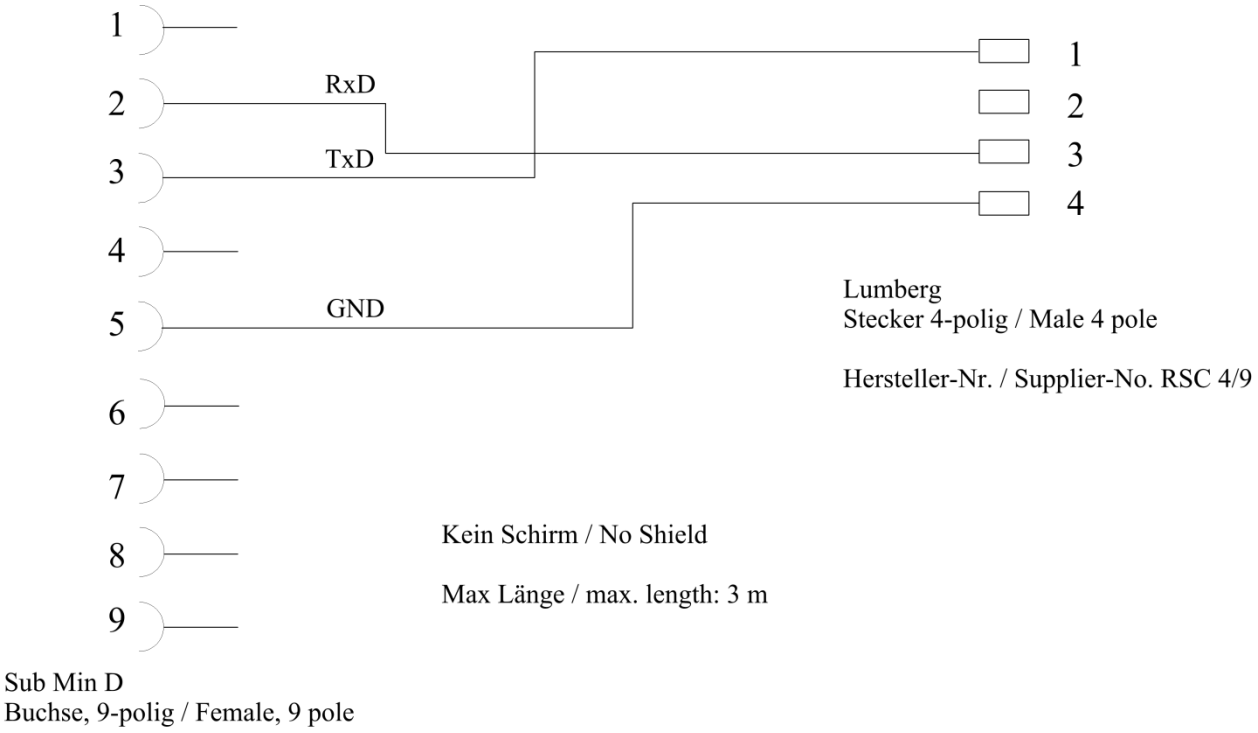
If a new configuration is loaded into an already configured display AHD 880 TC, it may – under certain circumstances – lead to a non-operational status of the display (the Fault LED flashes and the display flickers slightly).

The following procedure represents a solution for solving this problem:

- Separate the display from the power supply.
- Move DIP switch 9 on the rear side into position „ON“.
- Restore the power supply to the device. By this the existing configuration will be deleted. Wait approximately 10 to 20 seconds.
- Separate the display from the power supply again.
- Move DIP switch 9 on the rear side into position „OFF“. →Important, as the configuration is otherwise deleted during the startup.
- Restore the power supply to the device.

4.6.2 Graphics Configuration

For the transmission of a new graphics configuration to the display AHD 880 TC a special cable is required.



The cable is connected to the GPS connector on the rear side of the device.

For best data transmission the length of the cable should not exceed 3 meters.

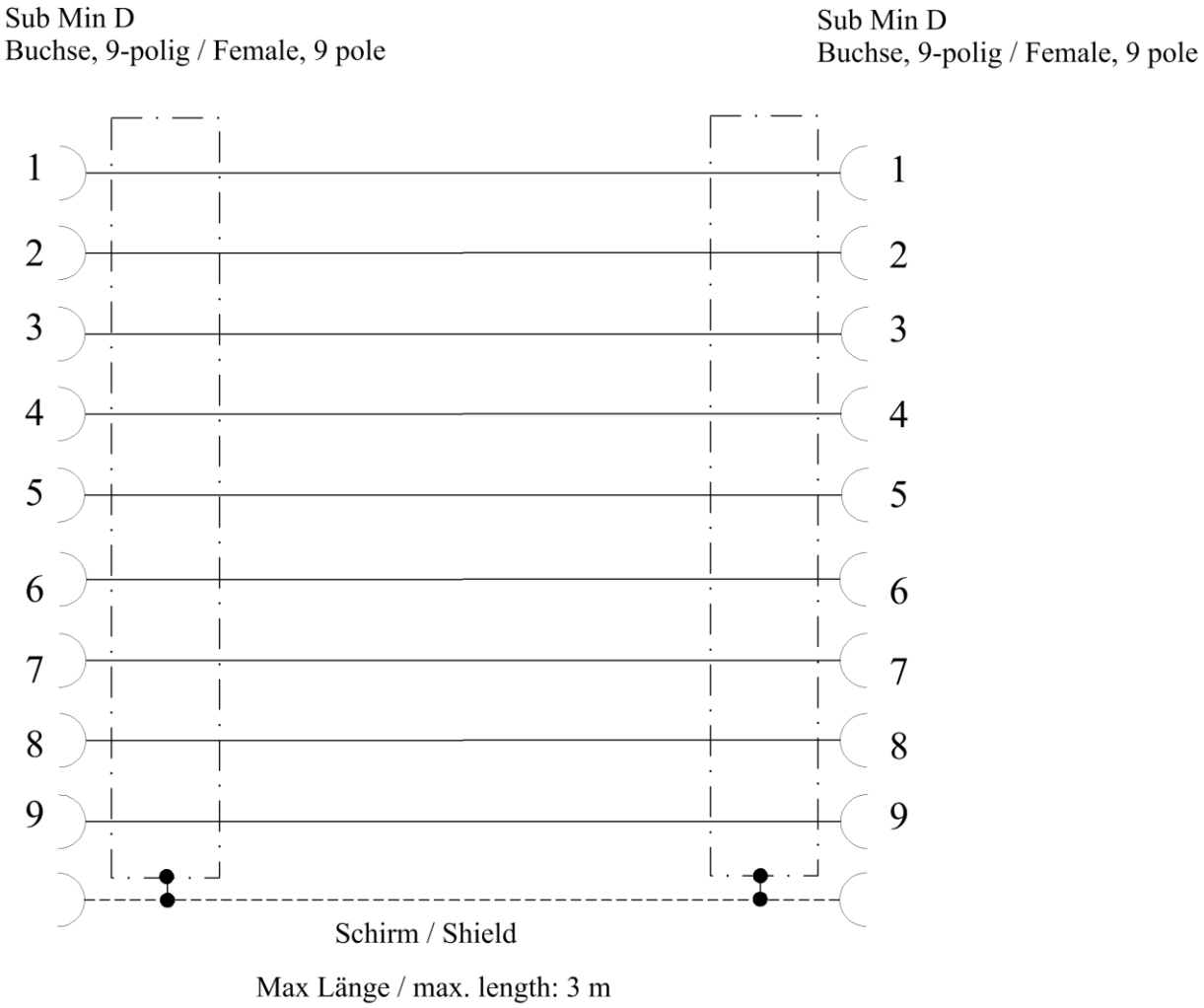
Prior to configuration the DIP switch SW 1-12 must be set to position ON.

After the configuration has successfully transmitted to the device, the DIP switch SW 1-12 must be set back to position OFF.

4.6.3 Upload of Firmware and graphics configuration

For the transmission of new firmware to the display AHD 880 TC a special cable is required. With this cable the graphics configuration can also be transmitted to the device.

The Sub Min D connector is located on the rear side of the device beneath the protection plate (refer to page 20).



Prior to configuration the DIP switch SW 1-12 must be set to position ON.

After the configuration has successfully transmitted to the device, the DIP switch SW 1-12 must be set back to position OFF.

4.6.4 Configuration with Software Tool AHD-DeviceConfig

To a limited extent the configuration of the display AHD 880 TC can be performed with the software tool AHD-DeviceConfig.

The following parameters can be configured:

- Integration into the system
- Languages
- Units
- Measuring Points list
- Colour sets
- Display textsfor:
  Binary state
  Alarm
  Inteface

The extension of the configuration to be performed with the AHD-DevcieConfig is currently under development and will be available in the near future.

TIP!

The upload of new firmware as well as the upload of new graphic configuration is described in section 4.6 of this document..

TIP!

A detailed description of the configuration with the software tool AHD-DeviceConfig is available in the according documentation (AHD-DeviceConfig). This documentation is part of the delivery of the software tool, but can also be separately ordered at the manufacturer (see page 2)

5 Transport, Packaging, and Storage

5.1 Transport Safety Instructions

Improper Transport

CAUTION!
Damages from improper transport!

Improper transport can cause significant property damage.

Therefore:

– Use caution when unloading the packages during delivery and during on-site transport and observe the symbols and instructions on the packaging.
– Remove the packaging only shortly before installation.

5.2 Transport Inspection

Inspect the delivery for completeness and damages in transport immediately upon receipt.

Proceed as follows when recognizing external transport damages:

- Do not accept delivery, or accept it only with reservation.
- Note the scope of the damage on the transport documents or the deliverer’s bill of lading.
- File a claim.

TIP!

Claim any fault as soon as it is noticed. Damage claims can only be filed within their respective reclamation periods.

5.3 Packaging

About the Packaging

The individual parts are packaged according to the expected transport conditions. Only environmentally safe materials have been used for the packaging.

The packaging is intended to protect the individual parts from transport damages, corrosion and other damages. Therefore, the packaging may not be destroyed, and it may only be removed shortly before installation.

Handling the Packaging Materials

The packaging materials must be disposed according to current legal regulations and local ordinances.

CAUTION!
Environmental damages from improper disposal!

Packaging materials are valuable raw materials and can often be reused or meaningfully processed and recycled.

Therefore:

– Dispose packaging materials in an environmentally safe manner.
– Observe the local disposal regulations. When necessary, contract a specialist company.

Storage

Store the packages under the following conditions:

- Do not store them outdoors.
- Store them in a dry, dust free environment.
- Do not expose them to aggressive media.
- Protect them from sunlight.
- Observe the storage temperature (refer to technical data).
- Avoid mechanical shock.
- When storing longer than 3 months, regularly inspect the general condition of all parts and the packaging. If necessary, refresh or renew the preservative.

TIP!

In some cases, the packages contain instructions which extend beyond the requirements listed in this manual. These must be observed accordingly.

6 Installation and Initial Startup

6.1 Safety

Personnel

- Installation and initial startup may only be performed by specially trained personnel.
- Only electricians may work on the electrical system.

Basic Information

Caution!
Risk of injury from improper installation and initial startup!

Improper installation and initial startup can cause personal injury and property damage.

Therefore:

– Ensure sufficient installation space before beginning any work.
– Handle parts with exposed sharp edges carefully.
– Observe orderliness and cleanliness in the work area!
– Install parts properly.

6.2 Installation

General Information

CAUTION!
Property damage from improper handling and selection of installation locations!

Installing the products in locations that to not meet the requirements of the technical specifications and improper handling can lead to system errors and property damage.

Therefore:

– Observe the products’ technical specifications when selecting the installation location.
– Only trained personnel may perform the installation.
– Never install the products in areas that are not of the required protection class.
– Never install the products in extreme high or low temperature areas.
– Never install the products on ceilings that cannot support their weight.
– Never bump or shake the products vigorously.

Installation Requirements

- All required connecting cables are of the required version, equipped with plug connectors according to technical specifications or project drawings, led to the intended installation location, and are properly installed and stripped. Free cables are of sufficient installation length and are secured against short circuit and earth fault.
- The product is not connected to the supply voltage and switched off-circuit.

CAUTION

Earth the device before switching on the power!

Before switching on, earth the device with the earthing lug (located on the device rear in the left bottom corner).

Installation

1. Install the Color Display AHD 880 TC properly in the intended installation location according to technical specifications or project drawings.
2. Wire all inputs and outputs of the unit according to project drawings.

> **CAUTION!**
> **Property damage from incorrect cable connections!**
>
> Improperly connected cables can cause system errors and property damages.
>
> Therefore:
>
> – Always verify cable and wire designations before connecting them. Check for secure seating of the connecting wires in the terminals.
> – To avoid short circuits, verify that all wires are connected in the terminal.
> – To not over tighten the terminal clamps.
> – When using pluggable terminal strips or plug connectors, it is imperative, to ensure insertion in the correct socket and secure seating.

3. Test the system for earth/ground fault.

> **CAUTION!**
> **System failure or malfunction!**
>
> During earth/ground fault, incorrect data can be transmitted and lead to overall system failure or malfunctions.
>
> Therefore:
>
> – Immediately correct any discovered earth/ground fault.

6.3 Initial Startup

1. Establish the 24VDC power supply for the Color Display AHD 880 TC according to technical specifications or project drawings.
2. Establish the power supplies for all devices connected to the Color Display AHD 880 TC according to the corresponding operation manuals.
3. Test the power supplies.

CAUTION!
Property damage from improper voltage!

Connecting an incorrect supply voltage can lead to property damage.

Therefore:

– Review all relevant project documents and operation manuals of the devices used and verify their correct supply voltage and polarity before connecting them.

CAUTION

Earth the device before switching on the power!

Before switching on, earth the device with the earthing lug (located on the device rear in the left bottom corner).

4. Switch on the power supply of the Color Display AHD 880 TC and all connected external devices from the corresponding circuit breakers in the power distribution and the device internal starting devices according to the corresponding operation manuals.
5. Verify the correct startup sequence according to the chapter titled “Operation.”
6. Log any errors or functional deviations that may occur and correct errors through proper measures, referring to the errors described in the chapter titled “Errors.”
7. You may need to review the installed configuration and adjust it to the necessary operating conditions. Log the final configuration for the project documentation.

7 Operation

The Color Display AHD 880 TC is generally used in ship alarm systems whose components (data stations, control and display units, etc.) are connected to one another by a by a CAN bus for communication and data transfer.

In this process, the Color Display AHD 880 TC monitors and displays analogue and binary sensor data in case of threshold violations. To increase clarity and ease of operation, information is displayed on different graphics pages:

- Measuring Points Pages
  Display of analogue and binary sensor data in graphics supported and table format.
- Alarm Pages
  Tabular representation of recorded alarm conditions with differentiation of acknowledged and unacknowledged alarms. Display of status messages for engine stop or load reduction conditions.
- Configuration Page
  Set time, language and measuring unit system.
- Service Pages
  Displays channel data with status messages.

TIP!

The graphics and displayed measuring point data of the Color Display AHD 880 TC can be adjusted to the individual project requirements. The following images of the measuring point pages are therefore only for demonstrative purposes to explain the operating functions via the device’s keys.

7.1 Startup

CAUTION

Earth the device before switching on the power!

Before switching on, earth the device with the earthing lug (located on the device rear in the left bottom corner).

Start Page

The Color Display AHD 880 TC is automatically powered on and begins the boot up process when the connected power supply is activated.

After Startup:
During the device initialization, a Start Page first appears on the display (standard page or optionally, customer specific version):

During the initialization process, the internally stored system configuration is loaded, and the current sensor data are transmitted to the Color Display AHD 880 TC via the CAN-bus:

After the process is completed, the display automatically switches to the first measuring point page.

During normal condition, the two frontside LEDs display as follows:

- green LED “power” = power supply to the device established
- red LED “failure” = flashes, when the CAN bus communication is disturbed

7.2 Key Functions

The Color Display AHD 880 TC is equipped with a touchscreen surface. All operating elements are represented as virtual operating keys and must be touched to execute the corresponding function. The touch is visually simulated as a key press, so that the user receives feedback every time.

The following table shows the virtual standard keys:

Functions of Standard Operating Keys (Instrument and Standard Pages)	
	Key “Alarm Page” Key press switches the display to the Alarm Page (list of currently pending alarms). Key colors: White: → no pending alarms

	Red: → at least 1 currently pending alarm
	Key for acknowledging the acoustic signal (“Quit Horn”) Key press switches off internal horn and any externally connected signal devices. Key colors: White: → no unacknowledged acoustic alarms pending. Red: → at least 1 unacknowledged acoustic alarm pending.
	Key for pulling up Configuration Page Key press switches the display to the configuration page for changing the basic settings.
	Key “Next Page” Key press switches the display to the next standard page. If no further page is available, the system display switches to the first page.

TIP!

Additional keys and their functions are described within the context of their appearance in the corresponding chapters of this documentation.

7.3 Measuring Point Pages

7.3.1 General Information

TIP!

The Color Display AHD 880 TC’s graphics and sensor data displayed on the measuring point pages can be adjusted to the individual requirements of each project. The following images of the measuring point pages are therefore only for demonstrative purposes to explain the operating functions via the device’s keys.

The measuring points page consists of a header line, containing the following information:

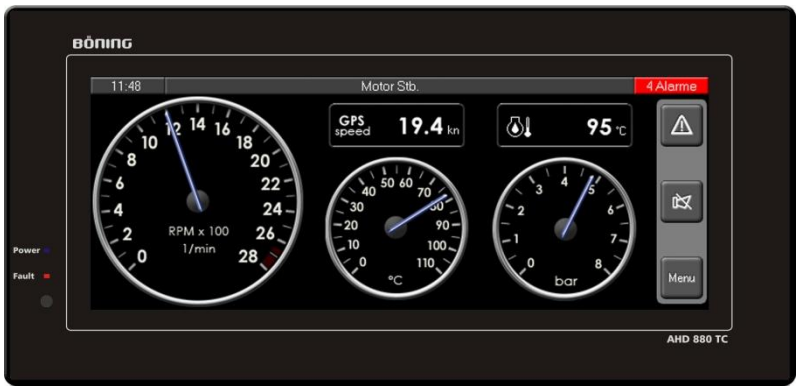
- Left display field: current time
  (time configurable via configuration page)
- Middle display field: designation of page
- Right display field: a logo during normal operating conditions; in case of alarm, an alarm message and display of the number of current system alarms

The data field representing the corresponding analogue and binary measuring points is located below the header line. For analogue measuring points, graphic representation (e.g. instruments or bar graphs) or, as is usually the case for binary measuring points, tabular format, is supported.

7.3.2 Graphic Measuring Points Page with Round Instruments and Digital Displays

The following example shows a measuring point page for monitoring an STB propulsion engine. The red indicator at the top right points to 4 current alarms. These are listed on the alarm page.

Measuring points page with round scale instruments and digital displays



Display Elements:

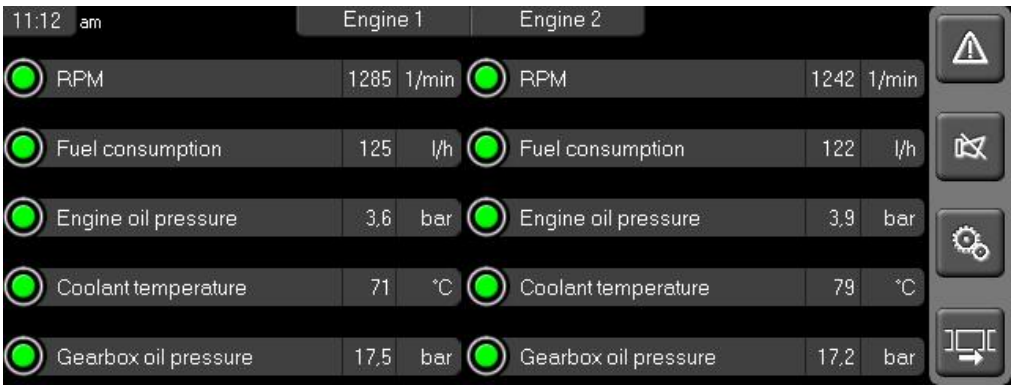
- 1 engine speed
  (analogue round scale instrument)
- 2 cooling water temperature, engine
  (analogue round scale instrument)
- 3 oil pressure, engine
  (analogue round scale instrument)
- 4 GPS speed
  (digital display – in conjunction with connected GPS receiver)
- 5 oil temperature engine
  (digital display)

TIP!

Measurement units and instrument scales according to user specific settings on the configuration page.

7.3.3 Measuring Points Page in Tabular Format

Measuring points pages in tabular format can be used for analogue or binary measuring points:



Each measuring point displayed in tabular format covers a complete display line, consisting of:

- Status LED display
- Measuring point text
- Analogue measuring point value (for analogue measuring points)
- Unit (for analogue measuring points)

7.4 Alarms

7.4.1 Colors and Status LED Display

Status LED Display

Warnings or alarm messages are displayed with the alarm message (top right) and the measuring point’s status LED display. The status LED display can color code the following measuring point conditions:

- Red: alarm
- Orange: pre-warning
- Yellow: sensor error
- Green (or no color): normal

TIP!

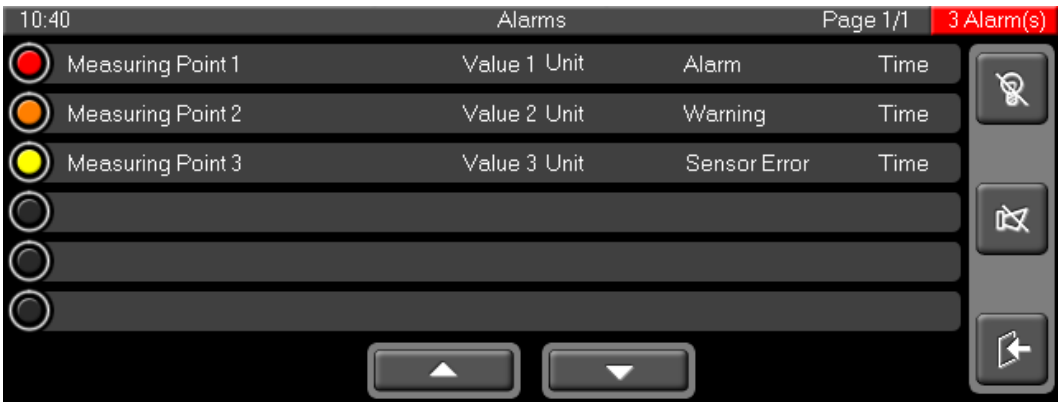
The status messages’ color assignments can be adjusted for each measuring point separately in the project specific configuration.

By default, the above listed color designation is used.

We urgently recommend a uniform color designation for the corresponding status messages in the overall project.

7.4.2 Alarm Page

If the data stations in the system record an event, the corresponding information reaches the display AHD 880 TC via the communications bus. The message is evaluated according to its category – pre-alarm, alarm, or sensor error – and then displayed. The display automatically switches over to the alarm page and enters the alarm with its date and time into the alarm list. A blinking color LED marks an unacknowledged alarm. The internal alarm buzzer is activated simultaneously.



All events are listed on the alarm page in tabular format. The order is chronological and corresponds to each message’s date and time. The last recorded alarm is always at the top of this list.

TIP!

The alarm page was designed to always display the six most current events. If more alarms are active, more pages are automatically generated. These can be accessed with the arrow keys  *. The screen’s uppermost line displays the currently existing alarm pages.*

Alarm Line

Each alarm line begins with a virtual LED, color coding the message category:

- Red: alarm
- Yellow: warning, pre-alarm
- Orange: sensor error, wire break

Each alarm line’s columns is supplemented with the following information:

- Measuring point text
- Measured value
- Measured value unit
- Type of event
- Date and time of alarm event

Alarm Counter

A red indicator at the top right of the screen displays the number of currently active alarms (acknowledged and unacknowledged messages).

Function Keys on the Alarm Page	
	Key “Exit Page” Key press switches the display to the previous measuring points page.
	Key for acknowledging acoustic signal (“Quit Horn”) Key press deactivates internal horn and any connected signaling devices. Key colors: White: → no unacknowledged current acoustic alarms. Red: → at least one unacknowledged current acoustic

	alarm.
	Key “Optical Acknowledgement“ Key press acknowledges all pending alarms optically. A blinking LED/display changes to a continuously lit display.
	Key “Next Alarm Page“ Key press pulls up the next existing alarm page. Unless another page exists, the key press is ignored.
	Key “Previous Alarm Page “ Key press pulls up the previous alarm page. If the first page is already up, the key press has no function.

7.4.3 Alarm Acknowledgement

Process Alarm Acknowledgement

Every error message, alarm, or warning must be noted and fully acknowledged, before the system returns to its normal operating condition.

Please observe the following sequence when acknowledging an alarm:

1. **Acoustic alarm acknowledgement**
2. **Optical alarm acknowledgement**
3. **Verify and correct the alarm cause, if possible**

TIP!

Full alarm acknowledgement can only be performed via the acknowledge keys on the alarm page.

Only acoustic acknowledgement is possible from the instrument pages.

CAUTION!
Alarms that have not received the proper attention can impair the ship systems’ functionality and operational safety!

Any error message’s, alarm’s, or warning’s cause should be resolved as quickly as possible.

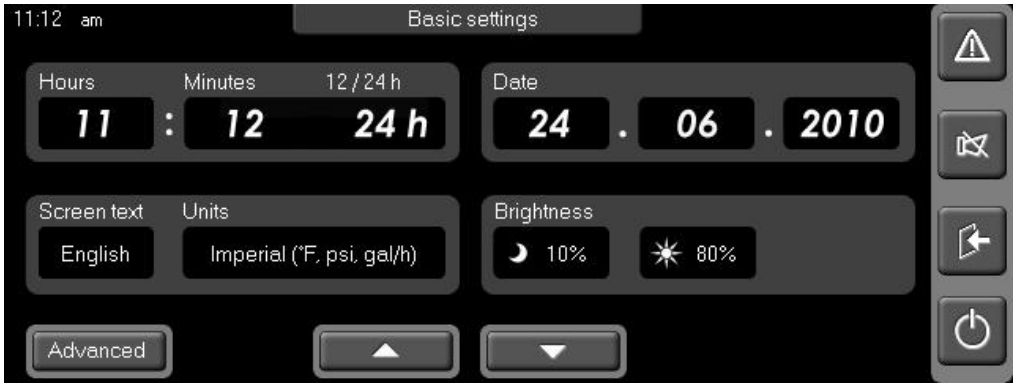
7.5 Configuration Menu

7.5.1 Configuration Page Standard Settings

Launching the Configuration Page

This key launches the configuration page.

This page displays the current device configurations and the currently selected display options.



Operating Key Functions on the Configuration Page Standard Settings	
	Key “Switch to Alarm Page” Key press changes the display to the alarm page. Key colors: White: no pending alarms Red: at least 1 pending alarm
	Key for acknowledging the acoustic signal (“Quit Horn”) Key press deactivates the internal horn and any connected signal devices. Key colors: White: no pending unacknowledged acoustic alarms Red: at least one pending unacknowledged acoustic alarm
	Key “Exit Page” Key press switches the display to the previous measuring points page.
	Key “Display Off” to activate standby mode A key press switches off the display lighting. The device remains active via the power supply and reports new alarms acoustically. Touching the touch surface activates the display and returns the de-

	vice to its normal operating condition.
	Key “Advanced” Key press switches to the configuration page with the advanced settings.
	Key “Next Step / Increase Value” After selecting and marking a parameter that is to be changed, activating this key selects the next possible step or increases a numeric value by 1. A quick key press increases a numeric value by one step. During a longer key press, the device counts up incrementally until the key is released.
	Key “Previous Step / Decrease Value” After selecting and marking a parameter that is to be changed, activating this key selects the previous step or decreases a numeric value by 1. A quick key press decreases a numeric value by one step. During a longer key press, the device counts down incrementally until the key is released.

7.5.2 Making Changes

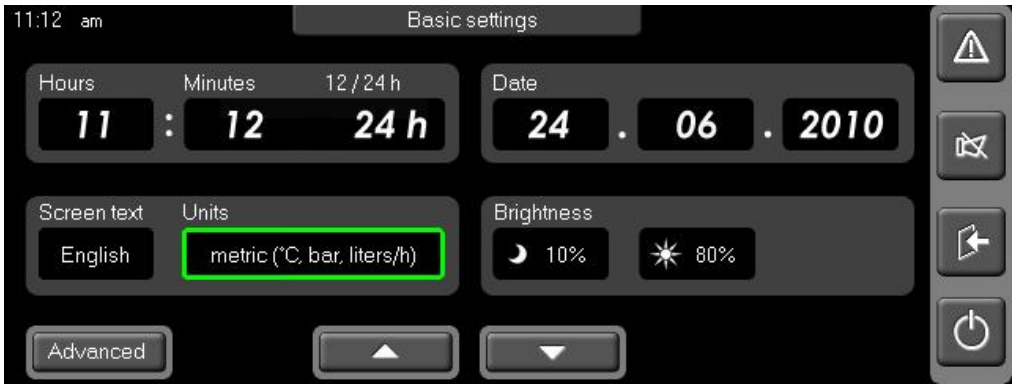
Parameter Selection

The parameter to be set is selected by simply touching the touch surface.

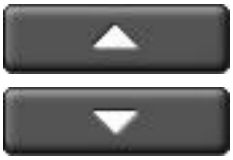
The current selection is marked by a green frame surrounding the parameter to be adjusted.

Example: setting the unit system (metric / Imperial)

The parameter is selected and marked by touching the display surface “Units” (see illustration).



Change Parameters



The selected parameters can be set to the desired value with the “Next Step / Increase Value” or “Previous Step / Decrease Value” keys:

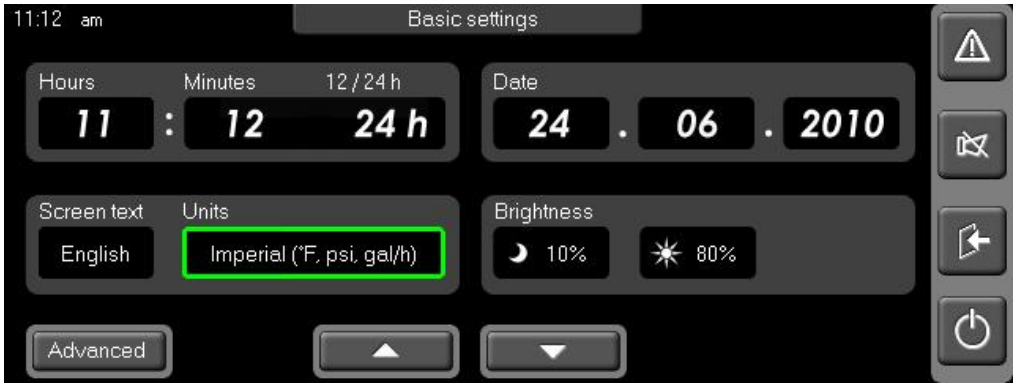
The parameter “Units” allows to switch between the two following unit systems:

- metric display (°C, bar, liters/h)
- Imperial display (°F, psi, gal/h)

In this case, the only option is to switch to Imperial display (see list of available parameters).

The green selection frame remains until another parameter has been selected or the configuration page is exited.

After the change has been completed, the configuration page is displayed as follows:



Accept New Settings

The new setting is automatically accepted as soon as another parameter has been selected of the configuration page is exited.

TIP!

Accepting a parameter change does not require a special confirmation. In case of erroneous input, the previous value must be restored prior to leaving the selected field!

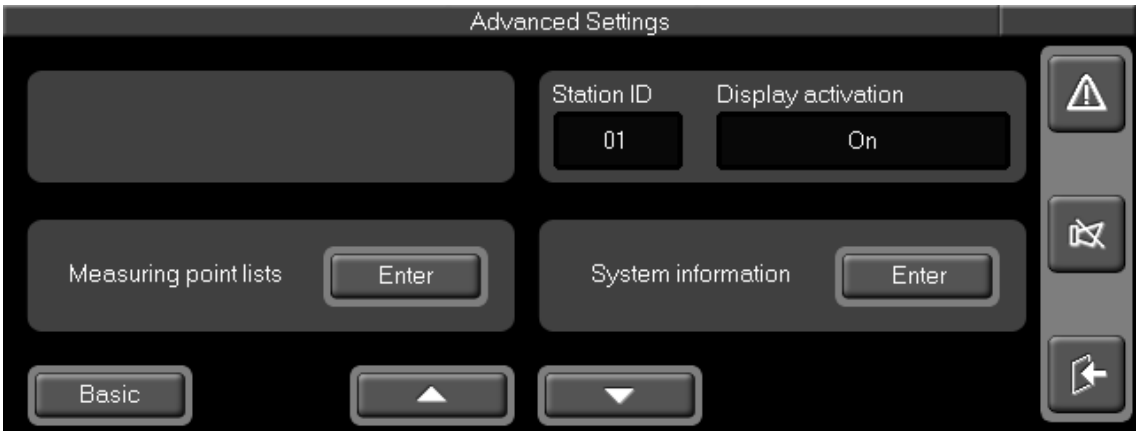
Available Parameters – Configuration Page Standard Settings		
Parameter	**Value Range**	
Hours	00 – 11	(when parameter 12/24h is set to “am/pm”)
	00 – 23	(when parameter 12/24h is set to “24h“)

Minutes	00 – 59
12/24h	am/pm for 12h display 24h for 24h display
Display Language	German English Italian Spanish French Chinese, traditional Chinese, simplified *TIP!* *The selected language is used on the instrument and alarm pages. Measuring point texts are displayed correspondingly.* *The display language for the configuration menu on the service and information page is always English.*
Units	metric (°C, bar, l/h) Imperial (°F, psi, gal/h)
Brightness  	“minimum“ 0 – 100 % This value determines the display’s minimum brightness and is mostly relevant for nighttime use. The default setting at the time of delivery is: 0% “maximum“ 0 – 100 % This value determines the display’s maximum brightness and is mostly relevant for daytime use. The default setting at the time of delivery is: 70% *TIP!* *The brightness parameters “minimum” and “maximum” limit the control range of the automatic display dimming. Using a photo-sensor, it sets the luminosity to an optimal value, depending on the ambient brightness.*

7.5.3 Configuration Page Advanced Settings

Launching the Configuration Page

Pressing this key launches the configuration page with the advanced settings:



The configuration page with the advanced settings offers additional parameters.

- Logo
- Power up

The parameters are set as described in the previous chapter.

Station ID In this field the physical station IF is set.

Power Up Modes Two power up modes are available:

Display activation: On In “On” mode, the display is always activated immediately after power up.

Display activation: Off In “Off” mode, internal activation also follows immediately. However, the display remains in standby mode. To activate it, the user must touch the touch surface.

TIP!

Alarms are immediately active, even in “Off” mode. The internal buzzer signals a new alarm. In this case, the user must activate the display by touching the touching the touch surface once. The alarm can be viewed on the alarm page.

Operating Key Functions on the Configuration Page Advanced Settings

	Key “Switch to Alarm Page” Key press changes the display to the alarm page.
	Key for acknowledging the acoustic signal (“Quit Horn”) Key press deactivates internal horn and any connected signal devices.
	Key “Exit Page” Key press switches the display to the previous measuring points page.
	Key “Display Off” to activate standby mode A key press switches off the display lighting. The device remains active via the power supply and reports new alarms acoustically. Touching the touch surface activates the display and returns the device to its normal operating condition.
	Key “Basic” Key press switches to the configuration page with the basic settings.
	Key “Next Step / Increase Value” After selecting and marking a parameter that is to be changed, activating this key selects the next possible step or increases a numeric value by 1. A quick key press increases a numeric value by one step. During a longer key press, the device counts up incrementally until the key is released.
	Key “Previous Step / Decrease Value” After selecting and marking a parameter that is to be changed, activating this key selects the previous step or decreases a numeric value by 1. A quick key press decreases a numeric value by one step. During a longer key press, the device counts down incrementally until the key is released.
	Key “Enter” Depending on the selected field, a key press switches to the selected display range of the measuring point list or service page or displays additional system information.

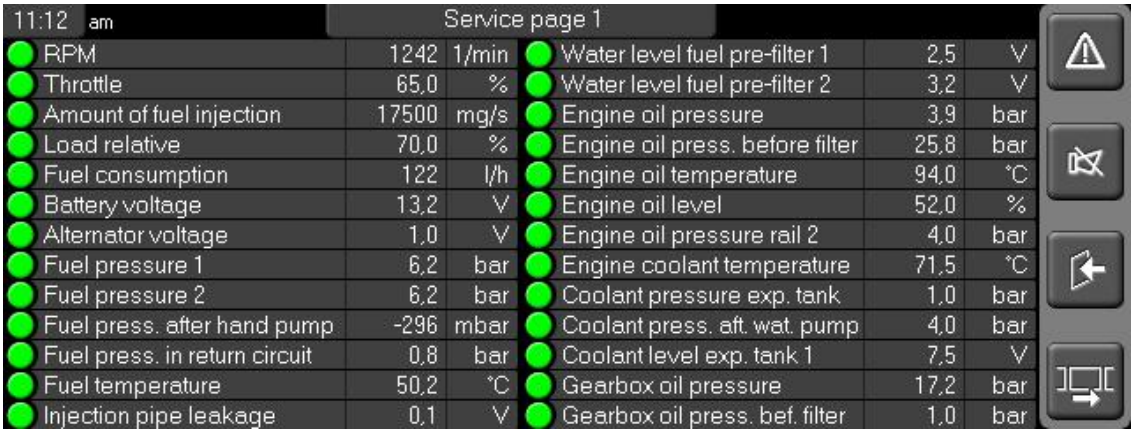
7.6 Measuring Points List / Service Page

This page allows for a full overview of all measuring points in the system, which are visualized on the display. This function is especially helpful when searching for errors.

Launch the Measuring Points List

Mark the field “Measuring Points List” in the expanded configuration menu, and press the “Enter” key:

Pressing the key switches to the display area of the measuring points list, displaying the first available service page.



Service Page

The number of available service pages depends on the number of existing measuring points. Each page displays 26 measuring points. The measuring points are displayed in two columns of 13 items each.

Measuring Points Line

Every measuring point contains a virtual LED, colour coded according to its message category:

- Red: alarm
- Yellow: warning, pre-alarm
- Orange: sensor error, wire break

Each measuring point on the service page also includes the following information:

- Measuring point text
- Measured value
- Unit of measured value

Functions of Operating Keys on the Configuration Page Advanced Settings	
	Key “Switch to Alarm Page” Key press changes the display to the alarm page.
	Key for acknowledging the acoustic signal (“Quit Horn”) Key press deactivates internal horn and any connected signal devices.
	Key “Exit Page” Key press switches the display back to the configuration page -- advance settings.
	Key “Next Page” Key press changes to the next available service page. If already on the last page, the first service page is displayed.

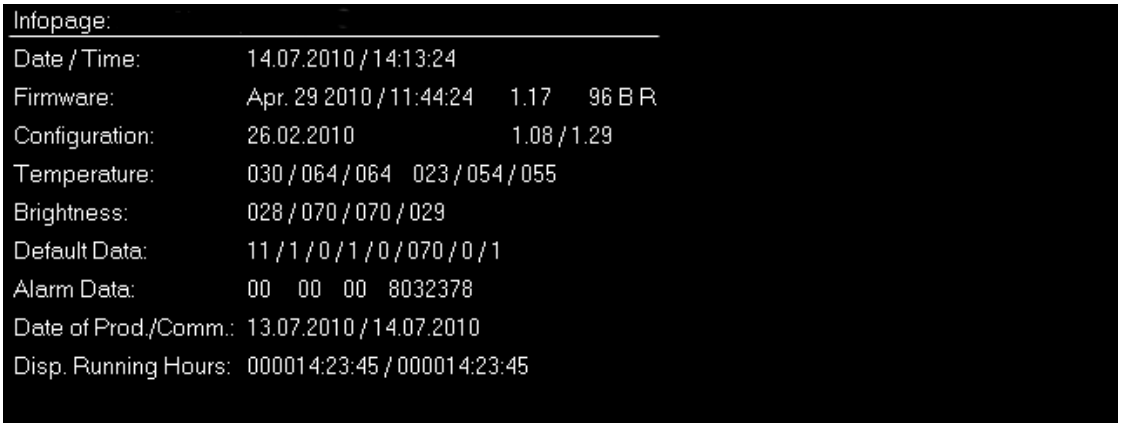
7.7 Information Page

The information page contains general information, such as the software version, manufacture and commissioning dates, as well as internal “settings” and the display’s hours of runtime.

Launch the Information Page

Mark the “System Information” field in the expanded configuration menu, and press the “Enter” key:

Pressing the key switches to the display area of the measuring points list and displays the information page.



Available Information

The following general information is displayed:

- Header line : Display type
- Date / Time: Current date and time
- Firmware: Current version number
- Configuration: Current version number.
- Temperature: Internal settings for temperature monitoring
- Brightness: Current setting display lighting
- Default Data: Default setting display lighting
- Alarm Data: Internal alarm data (cont. update)
- Date of Prod./Comm.: Manufacturing/commissioning dates
- Running Hours: Current display runtime

Exit Information Page

Exit the information page by touching the touch surface once. The system changes back to the configuration page – advanced settings.

7.8 Brightness Control

The Color Display AHD 880 TC’s operating elements include glare-free lighting for nighttime use. The light sensor in the device front is used to automatically adjust the brightness, depending on the ambient lighting.

The TFT-screen’s brightness is also dimmed via the light sensor and is additionally temperature controlled. It follows these guidelines:

- The brighter the environment, the brighter is also the TFT-screen’s background lighting.
- The darker the environment, the darker is also the TFT-screen’s background lighting. The darkest point can be set by the user and is stored.

TIP!

When a certain interior temperature of the housing is exceeded, the TFT screen’s background lighting’s power is reduced or completely switched off.

The brightness is primarily dependent on the ambient brightness. If the device operates in high environmental temperatures, it automatically dims to avoid overheating the unit and to protect the hardware. The brightness is reduced by up to 20%. If this is not sufficient to reduce the temperature, the lighting is completely switched off. If the device cools off, the lighting automatically powers back on.

7.9 Power Off

The Color Display AHD 880 TC is completely powered off by switching off the connected power supply.

TIP!

It is not possible to fully power off the device with the “Power” key. This key only put the color display into standby mode. The device’s power supply remains active.

The device can be reactivated at any time by touching the touch surface.

8 Maintenance

TIP!

Generally speaking, the Color Display AHD 880 TC is maintenance free. Maintenance of the units is limited merely to external cleaning and inspection.

Only use solvent free and nonabrasive detergents for cleaning.

CAUTION!
Risk of injury from dangerous voltages and other hazards!

Opening covers can expose you to dangerous voltages or other hazards.

Therefore:

– Never perform device repairs yourself.
– Do not remove the covers for maintenance or inspection.
– In case of product malfunctions, contact the manufacturer or an authorized representative.

9 Errors

The following table describes errors that may occur during the operation of the Color Display AHD 880 TC and provides information regarding causes, diagnosis, and error correction.

9.1 Safety

Personnel

- Some work may only be performed by specially trained personnel or the manufacturer. This is indicated in the description of the individual errors.
- As a rule, only electricians may work on the electrical system.

Basic Information

CAUTION!
Risk of injury from dangerous voltages or other hazards

Opening the covers can expose you to dangerous voltages or other hazards.

Therefore:

– Never perform device repairs yourself.
– Do not remove the covers for maintenance.

WARNING!!
Risk of injury from improper error correction!

Improper error correction can cause severe personal injury or property damage.

Therefore:

– Only the manufacturer may repair the device.
– Ensure sufficient installation space before beginning any work.
– Observe orderliness and cleanliness in the work area! Parts and tools that are loosely stacked or lying about are accident sources.
– Observe correct installation procedures when parts have been uninstalled. Reinstall all mounting elements and observe torque limits.

In Case of Error

As a rule:

1. Determine the cause of the error.
2. Immediately inform a responsible party on-site.
3. Depending on the error type, have an authorized specialist correct it, or correct it on your own.
4. Correct the error by replacing or repairing the defective parts (e.g. cables, plugs, etc.).
5. If the error cannot be determined through the error table, a device defect cannot be excluded. For repairs, send the device to the manufacturer’s address or to an authorized specialist company.

9.2 Power / Fault LED

The LEDs on the device front provide information about the condition of the Color Display AHD 880 TC.

The Power LED is lit continuously as soon as the device is connected to the supply power. When it extinguishes, the supply voltage is either too low, or it is interrupted.

The Fault LED can indicate the conditions “OFF,” “ON,” or “BLINKING.” If no error condition is determined, the Fault LED is not lit. If the fault LED is blinking, the CAN data communication is interrupted, and the device receives no data from the other ship alarm system components connected to the network. The blinking commences after a 5 second delay.

If the Fault LED is continuously lit after booting during the startup process, the device does not have a valid configuration. In this case, the manufacturer or an authorized representative must be contacted.

	Continuous ON	**Continuous OFF**	**BLINKING**
Power LED	Device operational	Device has not supply power	-
Fault LED	Device not configured correctly. Contact manufacturer.	Device functions error-free.	Interruption of CAN data communication

9.3 Error Correction

Error	Possible cause	Diagnosis / Error Correction
Device does not power up.	- circuit breaker in the corresponding power distribution not switched on - connecting cables for power supply not connected correctly - wire break	- check connections
Interruption of CAN data communication Fault LED is blinking	- wire break - plug connection not correctly inserted into the device	- check connections
Display powered off Power LED lit	- Display in standby mode (not a device defect)	- activate the display by touching the touch screen
Display too dark	- brightness offset not set correctly (not a device defect)	- increase brightness offset (see menu)
No function	- Device defect	- If the device is not functioning properly in spite of all measures, return the device to the manufacturer for diagnosis.

10 Disassembly

After the device has reached its end of life, it must be disassembled and disposed in an environmentally safe manner.

10.1 Safety

Personnel

- Only specially trained personnel may disassemble the device.
- Only an electrician may work on the electrical system.

Basic Information

Caution!
Risk of injury from improper disassembly!

Stored residual energies, edged parts, points and corners on and inside the device or the required tools can cause injury.

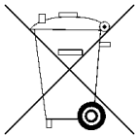
Therefore:

– Ensure sufficient installation space before beginning any work.
– Use caution when handling parts with exposed sharp edges.
– Observe orderliness and cleanliness in the work area! Parts and tools that are loosely stacked or lying about are accident sources.
– Uninstall parts properly.
– When in doubt, consult the manufacturer.

10.2 Disassembly

- Before beginning disassembly: disconnect the device from the power supply and secure it against reconnection
- Disconnect the cable connections and mark them, if necessary. Secure free wire ends against short circuit and earth/ground fault.
- Loosen the device mountings.
- Uninstall the device through proper measures.
- Clean and disassemble the device for selection according to workplace safety and environmental protection regulations.

10.3 Disposal



In the absence of a return or disposal agreement, recycle the disassembled components:

- Scrap metals.
- Recycle plastic components.
- Dispose the other components according to their material properties.

CAUTION!
Environmental damages from improper disposal!

Electrical scraps, electronic components, lubricants, and other auxiliary materials are subject to hazardous waste regulations and may only be disposed by licensed specialist companies!

Your local authorities or specialized disposal companies can provide you with information about environmentally safe disposal.

11 Index

Index

Devices, System Installation, Monitoring and Control Technology, Ship Automation

Böning Automationstechnologie GmbH & Co. KG
Am Steenöver 4
D-27777 Ganderkesee
E-Mail: info@boening.com
Internet: www.boening.com