COP-05 ALC Panel

Hardware Module Description

Kongsberg Maritime Part no.603526

300977/B
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Document history

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Rev. A	June 2006	First version.
Rev. B	October 2006	Minor corrections.

Note

Comments

To assist us in making improvements to the product and to this manual, we welcome comments and constructive criticism.
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Glossary

CPLD	Complex Programmable Logic Device
DI	Digital Input
DO	Digital Output
ESD	Electrostatic Discharge
GND	Ground
IE	Instrumentation Earth
IO	Input/Output
LED	Light Emitting Diode
PE	Protective Earth
PWM	Pulse Width Modulation
USB	Universal Serial Bus

1 OVERVIEW

The COP-05 ALC Panel is used for Command Control and Alarm Control by pushing dedicated buttons, and it displays and sounds system status by its status lamps and buzzers.

The light intensity of the backlights and the status lamps can be dimmed from the operator station the panel is a part of.

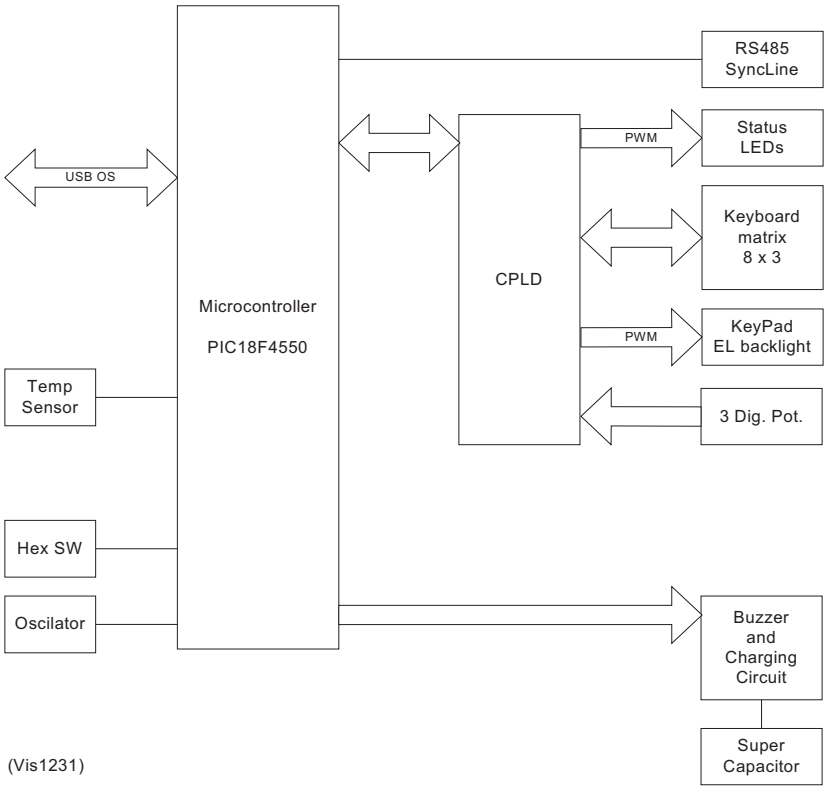
The COP-05 ALC Panel is powered and communicates through a single USB cable.

The COP-05 ALC Panel contains the following controls and indicators:

- Three status lamps (**POWER**, **FAULT** and **ALARM**)
- Three command buttons (**TAKE**, **GIVE** and **STATUS**)
- Three alarm buttons (**ACK**, **“Silence"** and **ALARM VIEW**)

2 FUNCTION

Figure 1 NA1148 controller function diagram



The COP-05 ALC Panel is a status and command panel module used in a larger operator station panel. It provides buttons and lamps for command control, and buttons, lamps and buzzers for handling alarms.

The COP-05 ALC Panel is built around a micro controller handling mainly the communication via USB and a CPLD handling mainly I/O for keyboard buttons and lamps.

The COP-05 ALC Panel electronics part is encapsulated to resist ESD and dust.

See Figure 1 for block/function diagram of the COP-05 ALC Panel.

2.1 Power supply

The COP-05 ALC Panel accepts 5 Vdc as supply voltage. Power is provided via the USB.

2.1.1 Voltage monitoring

VCC (5 Vdc) and 3.3 Vdc are monitored as analog signals to discover any change over time (trending) or if being outside defined limits.

2.2 Data communication

The panel module communicates with a controller computer through a single USB. The controller computer is the master and polls the panel module at given time intervals.

The panel module software can for service purposes be reloaded with parameter values and program software via the USB using a local Boot Loader program (see Table *Address switch values and functions* on page 7).

2.2.1 Address switch

The panel has a fixed address part that is panel-type specific. In addition the panel is provided with a hexadecimal switch, which defines the lower part of the address for the panel. Allowed addresses are 0 to F. Address value 0 (default) is used when only one of this panel type is used or for the first one if more panels of the same type are used. The second panel of this type will then have the address value 1 etc.

The Table *Address switch values and functions* on page 7 defines the hexadecimal-switch values and corresponding functions.

Table 1 Address switch values and functions

Value	Function
0	Default Product ID (First panel of this type)
1	Sub-panel 1 Product ID (Second panel of this type)
2	Sub-panel 2 Product ID (Third panel of this type)
3	Sub-panel 3 Product ID (Fourth panel of this type)
4	Sub-panel 4 Product ID (Fifth panel of this type)
5	Sub-panel 5 Product ID (Sixth panel of this type)
6	Sub-panel 6 Product ID (Seventh panel of this type)
7	Sub-panel 7 Product ID (Eight panel of this type)
8	No function
9	No function
A	No function
B	No function
C	No function
D	No function

Table 1 Address switch values and functions (cont'd.)

E	For development and manufacturer use only (Loads fixed Product ID via Boot Loader to regain communication contact)
F	For service use only (Reloads software via Boot Loader)

2.2.2 COM LED

A LED is located on the rear side of the panel and is blinking green as long as the communication on the USB is OK.

2.3 PANEL group lamps

The PANEL group comprises two lamps.

- **POWER**

  The lamp is lit green when power is OK.

- **FAULT**

  The lamp is lit red when lost contact with the computer, else it is off.

2.4 COMMAND group buttons and lamps

The COMMAND group comprises two buttons with lamps and one button without lamp.

- **TAKE**

  This button needs a double-press for activation. This means that it must be pressed twice within a limited period of time to be activated.

  When the button is activated it provides a signal to the computer. The lamp is lit green when button has been activated.

- **GIVE**

  The button, when activated, provides a signal to the computer. The lamp is lit green when button has been activated.

- **STATUS**

  The button, when activated, provides a signal to the computer.

2.5 ALARM group buttons and lamps

The ALARM group comprises one lamp, three buttons without lamp.

- **ALARM**

  The lamp is blinking red when an alarm has been detected. The lamp is steadily lit when the ACK button has been pressed and the alarm is still active.

- **ACK**

  The button, when activated, provides a signal to the computer.

- **“SILENCE"**

  The button, when pressed, silences the buzzer locally and provides a signal to the computer.

- **ALARM VIEW**

  The button, when activated, provides a signal to the computer.

2.6 Backlight

The backlight is integrated in the panel film and has yellow colour. The backlight intensity can be adjusted from the computer via USB and is implemented locally using PWM.

2.7 Buzzer

There are three buzzers. All are controlled by the local controller. On of them is, in addition, controlled directly by power. If power is lost, an alarm sounds for at least 60 seconds. The sound intensity is controlled by the number of buzzers activated, and the intensity setting can be configured. The sounder can be silenced both when power is lost and by the local controller.

2.8 Temperature sensor

A temperature sensor is provided within the module to monitor the operation temperature. If the temperature rises above a specified and configured limit, a system alarm is given.

3 TECHNICAL SPECIFICATIONS

Table 2 Technical specifications

Power specifications	
Input voltage	5 Vdc
Power consumtion	1.3 W nom, 2.5 W maximum
Current consumtion	260 mA nom, 500 mA maximum
Connections	
USB (X3)	USB B-type connector
USB interface	
Standard	USB ver 2.0
Data transfer rate	12 Mbit/s
Mechanical specification	
Size (WxHxD)	96 x 76 x 35 mm
Weight	0.25 kg
IP	IP22
Environmental requirements	
Operating temperature	-15 - +55 °C
Storage temperature	-25 - +70 °C
Refer to Kongsberg Maritime Environmental Specification, reg. no.: 848-161011	
Life cycle specifications	
MTBF	not yet available

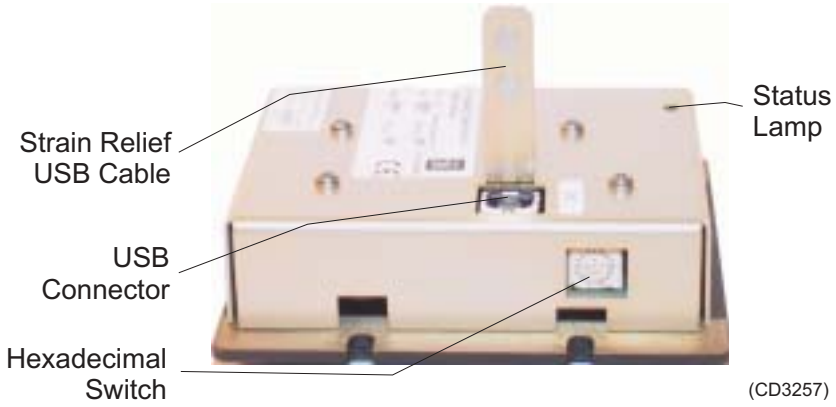
4 CONFIGURATION

The illustration below shows the front layout of the COP-05 ALC Panel.

Figure 2 Front layout of the COP-05 ALC Panel

The illustration below shows the location of the status LED, hexadecimal switch and USB connector on the rear of the COP-05 ALC Panel.

Figure 3 Rear layout of the COP-05 ALC Panel



4.1 X3 - USB connector

The connector is a USB type B. The USB cable can be strapped to a provided strain relief (see Figure 3).

Table 3 X3 - USB connector terminal allocation

Pin no.	Name	Function
1	VBUS	Power supply, positive terminal
2	D-	Data signal, negative terminal
3	D+	Data signal, positive terminal

Table 3 X3 - USB connector terminal allocation (cont'd.)

4	GND	Power supply, ground reference
Shell	Shield	Cable shield

5 INSTALLATION

5.1 Mechanical preparation before installation

1. Make a cut-out in the panel plate according to dimensions shown in drawing HA464010 located in Attachment 1.
2. Attach bolts to the panel plate on its rear side for the four fixing nuts of the COP-05 ALC Panel.

5.2 Electrical installation

1. Set correct USB address for the module on the hexadecimal switch.
2. Place the COP-05 ALC Panel in its position and fasten the four bolts attaching the COP-05 ALC Panel to the panel plate.
3. Connect the USB cable to the X3 connector.
4. Strap the cable to the strain relief.
5. Provided the corresponding operator station (computer and monitor) is up and running, verify that the COP-05 ALC Panel is functioning OK.

6 REPLACEMENT

1. Remove bolts that fixes the panel plate to its console body.
2. Place the panel plate in a position you can gain access on both sides.
3. Unstrap the USB cable from the strain relief and remove the USB cable plug from the COP-05 ALC Panel.
4. Release the four nuts attaching the COP-05 ALC Panel to the panel plate.
5. Lift the COP-05 ALC Panel out of the panel plate.
6. Label the old panel with its error symptoms and put it aside.
7. Set the correct USB address for the new module on its hexadecimal switch.
8. Place the COP-05 ALC Panel in its position and fasten the four nuts attaching the COP-05 ALC Panel to the panel plate.
9. Connect the USB cable plug to the X3 connector.
10. Strap the USB cable to the strain relief.
11. Provided the corresponding operator station (computer and monitor) is up and running, verify that the COP-05 ALC Panel is functioning OK.

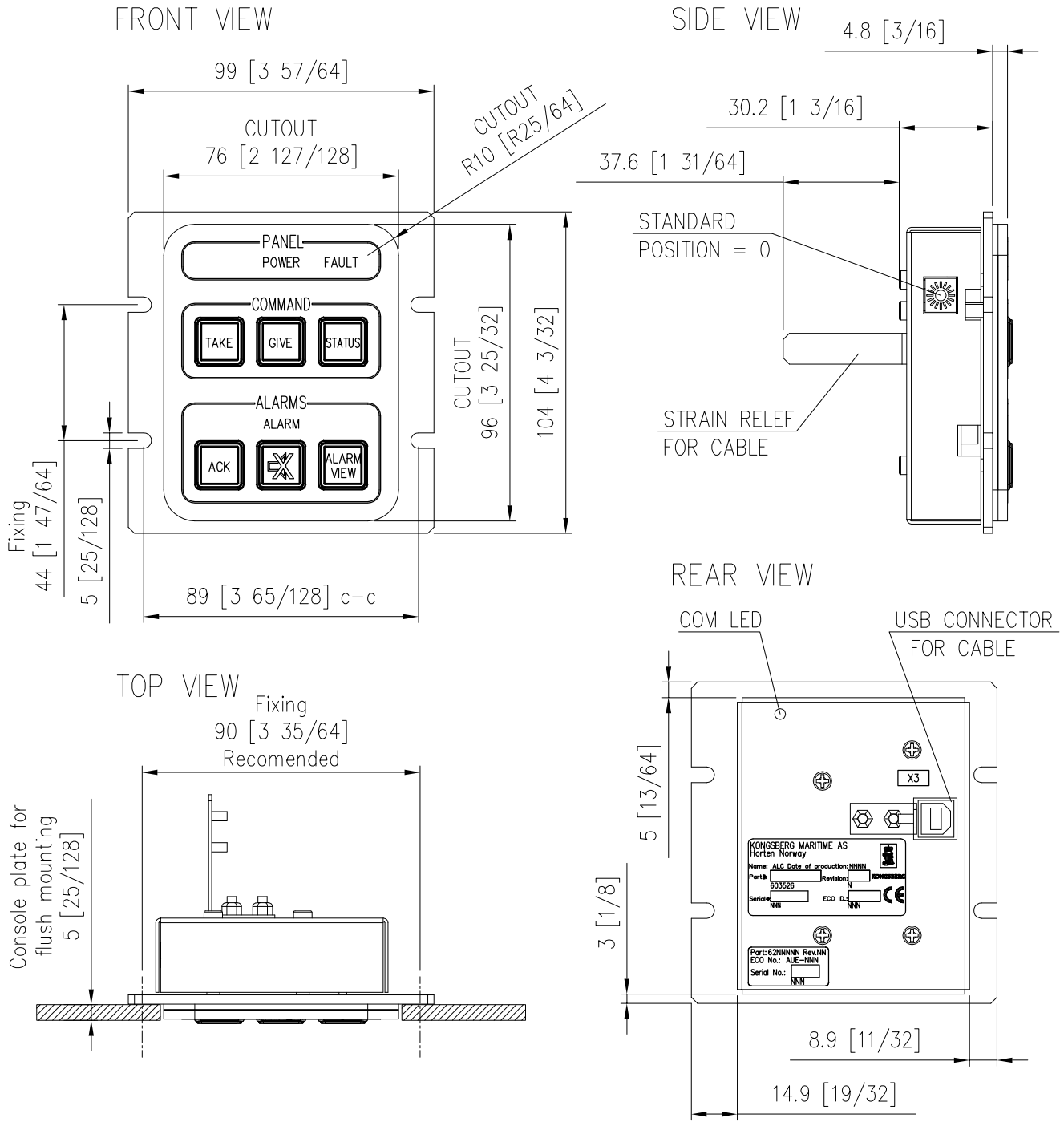
7 ATTACHMENT

HA464010/A

ALC PANEL, DIMENSIONS AND CUTOUT, STANDARD MODULE DRAWING

DOC.NO.: S-0653-E

ECO: AOE-011890



NOTES

GENERAL TOLERANCES : +/- 0.2mm [1/128inch]
CUTOUT TOLERANCES : -0 +0.4mm [+2/128inch]
INGRESS PROTECTION : IP22
WEIGHT : 0.25kg [0.55lbs]
COLOUR : BLACK
REAR MOUNTING IN CONSOLE PLATE.

CONNECTION : USB CABLE
POWER CONSUMPTION : 1.3W nom
: 2.5W max

ISSUE	CHANGE	DATE	SIGN
A	1.PROD.ISSUE	05-10-28	BSK

ALC PANEL

DIMENSIONS AND CUTOUT
STANDARD MODULE DRAWING

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SCALE 1:2	DESIGNED 2005-10-28 BSK	CHECKED 2005-11-03 JTT
	TRACED	APPROVED 1
PROJ.METH.		APPROVED 2 2005-11-03 NHT
FILENAME	REPLACEMENT FOR	REPLACED BY
DWG.NO. HA464010		REV. A
REF.		PAGE 1 of 1

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