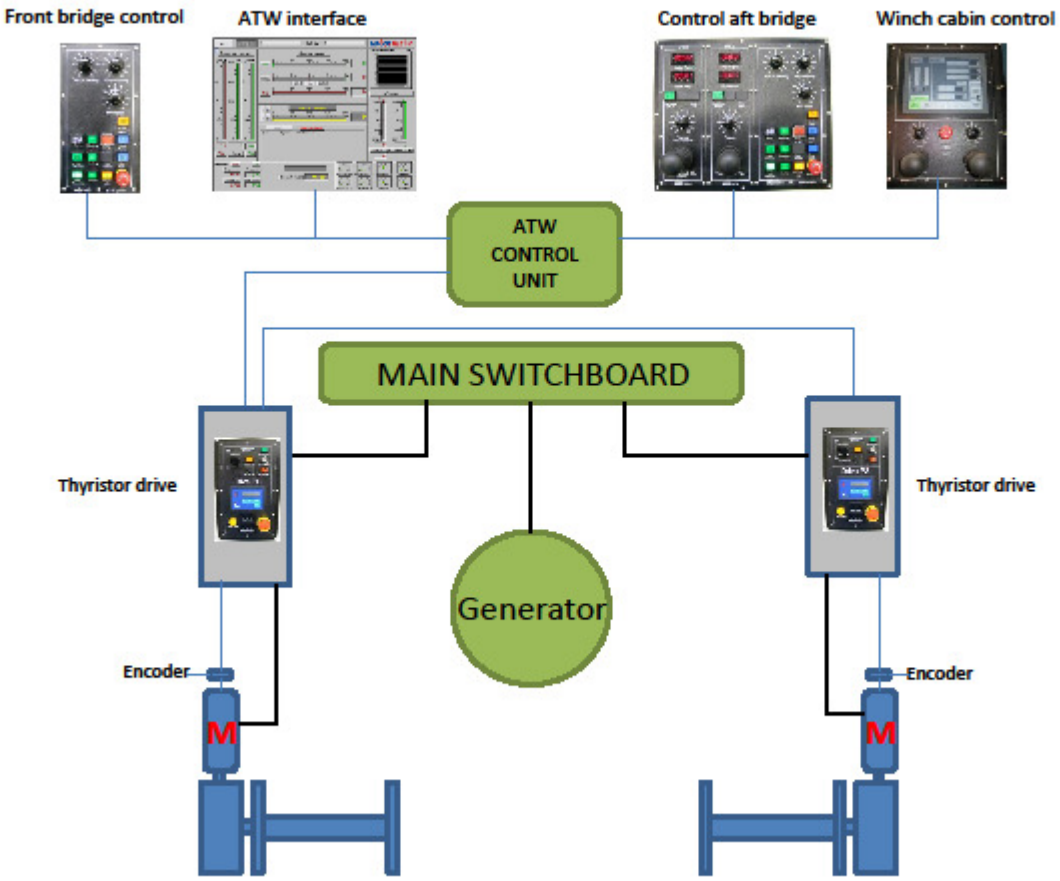
ATW

Automatic Trawl Winch Control
DC system for Moonzund trawler

Manual

Contents :

ATW System - One Line Diagram



General description

ATW Catch control:
ATW trawl winch control is based on automatic load control for trawl winch.

ATW software is designed and is assembled by Naust Marine technicians. ATW system shoots the net to pre-set length that is decided by operator each time with equal tension on both wire at all time.
During trawling ATW system keep the trawl in correct geometrical position for maximum fishing capacity.

Measurements:
Load on each wire is measured after Ampere usage on the trawl winch motors, wire length and speed is calculated from rotation of winch motors.
This measurements are also used to set the power that is needed to hold equal tension on both wire.

Computers:
ATW Catch Control is based on PLC industrial computer of highest quality. The PLC run the system but all readout are in PC computer witch has two screens located in front and aft bridge. There is also readout in winch cabin on the Touch screen in winch cabin.
There are all information about the system length and tension on each wire pre-set length and temperature, there are also all information regarding alarms and history event.

The ATW system runs even though PC computer in bridge brakes down. Then all readouts are in winch cabin.

Winch cabin:
Touch screen and controls are located in the winch cabin and from there the winch are operated. In the touch screen are all information regarding the ATW system.

Introduction to ATW CatchControl

Aft bridge controls:

This control plate is placed in aft bridge. On this control plate there are all controls to run the winch manually, and set automatic control. On the control plate are following controls:

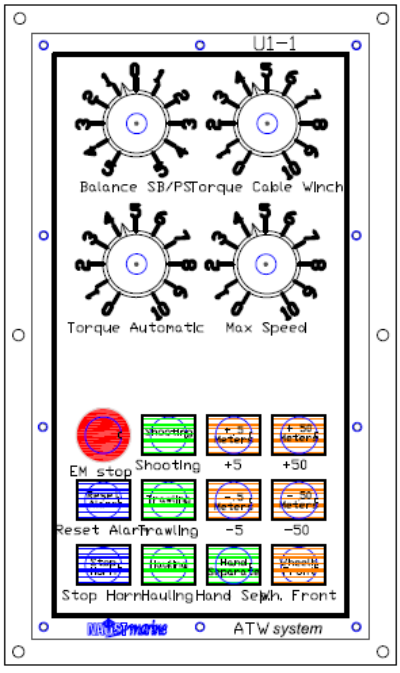
- Joystick for steeples speed control.
- Adjustments for torque on motors.
- Speed adjustments.
- Read out for AMP and RPM on motors.
- Reset length button.
- Stopping alarms and reset button.
- ATW automatic settings, trawling, hauling and shooting.
- Hand separate and hand synchronic mode.
- Control choose for wheelh. Aft or winch cab-in.
- Emergency stop.

Aft bridge controls.

Control plate in front bridge:

This control plate is placed in front bridge. On this plate are following controls:

- Control torque Automatic. In trawling, hauling and shooting mode.
- Plus Minus 5 or 50 meters in pre-set length.
- Balance torque settings between starboard and portside.
- Torque button for cable winch.
- Set buttons for automatic operation, trawling, hauling and shooting.
- Hand separate button.
- Stopping alarms and reset button.
- Emergency stop.



Front bridge control

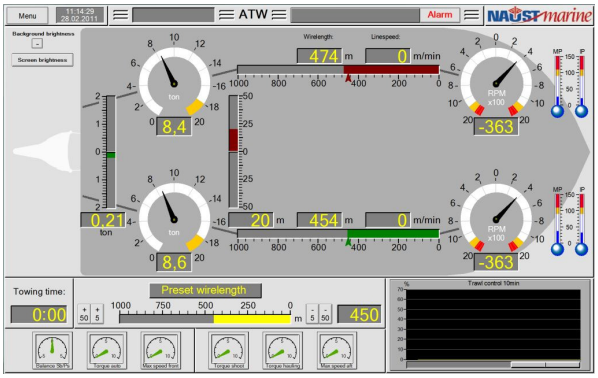
Introduction to ATW CatchControl

ATW - HMI-Interface:

PC computer with screen in front and aft bridge are connected to the PLC computer. On this computer are displayed all information's regarding ATW system.

In main window are all information regarding load on each wire, length of wire in water in both column and numbers.

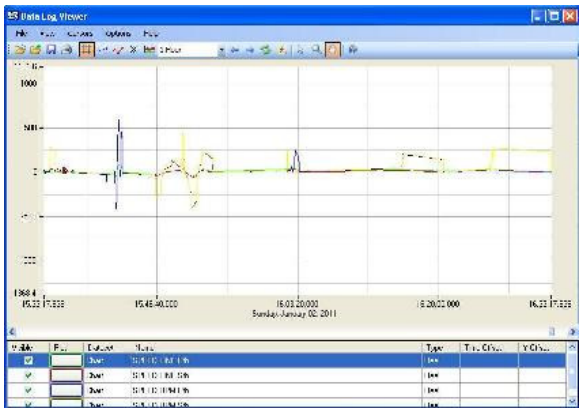
There are also information about line speed, motor speed, motor temperature, alarms, pre-set length, and system status. From main screen log files for history and parameter settings are access able.



ATW - HMI-Interface.

History:

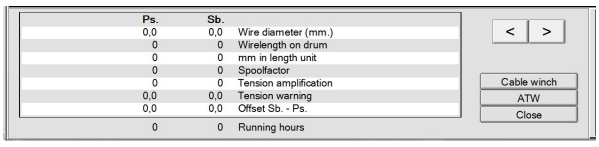
PC computer logs all major information regarding ATW system. These information is possible to compare together by opening log windows and look at history regarding, pull, speed, wire different among other information.



History Log.

Parameters value:

Another window is to set basic parameters. In these window it is very necessary to put correct information about trawl winch, size and wire length. It is very important to have all information correct at all time for correct calculating of wire length and pull.

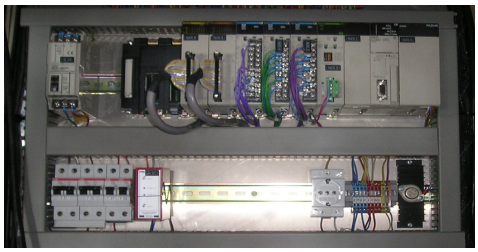


Parameter Value.

Introduction to ATW CatchControl

Programmable controls:

The main unit in the ATW Catch Control system is the Omron PLC industrial computer parts. These parts are located in the bridge inside the ATW consol. They are connected to encoders on the motors, temperature sensors in the motors and Thyristor drive cabinet. All communications are via Profibus and Device network cables between bridge and cabinets.



Omron CJ1 PLC parts

Control on Thyristor cabinets:

On the cabinet door are control unit for the Thyrisror drive. For more information see manual from Answer Thyristor drive manufacture.

Control Thyristor drive

Control on Thyristor cabinets:

On the cabinet there are following controls unit for Thyristor drive.

- Control display for the drive
- Manual operation of the brakes on the winches.
- Индикатор напряжения на якоре двигателя.
- Exciter current meter.
- Start/Stop button.
- Joystick for winch operation
- Light for motor heater.
- Emergency stop button for winch.

Control on Cabinet

Introduction to ATW CatchControl

Winch cabin:

Main winch opperation is in the winch cabin.

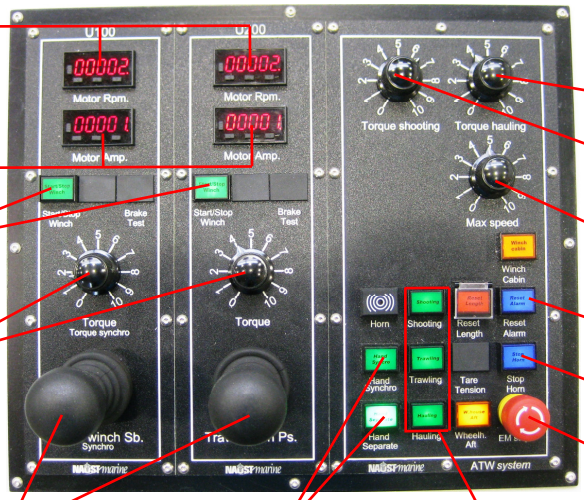
- Controls for each winch.
- Torque control.
- Touch screen with all informations.
- Readout of length, RPM and tension.
- Emergency stop.
- Indication horn.

Winch cabin control

Main benefits of using ATW:

- ATW keeps trawl always in optimal geometrical fishing position.
- Longer lifetime of fishing gear because tension is always same on each side.
- Less maintenance on brakes.
- All controls are in bridge and controlled directly by captain or mate.
- Length is set in bridge.
- Automatic shooting.
- Automatic hauling.
- Automatic trawling.
- Trawling history.
- All warnings displayed in bridge.

Main function and controls on panels.



Control panel wheelhouse aft.
Manual controls

1. RPM meters.

Motor speed measured in rotations per minute **RPM**. The meters show the speed as a plus (+) when the system is shooting but as a minus (-) when the system is hauling.

2. Amp Meters.

Current in motors measured in ampers. The current is proportional to the tension on the wire.

3. Winch On/Off

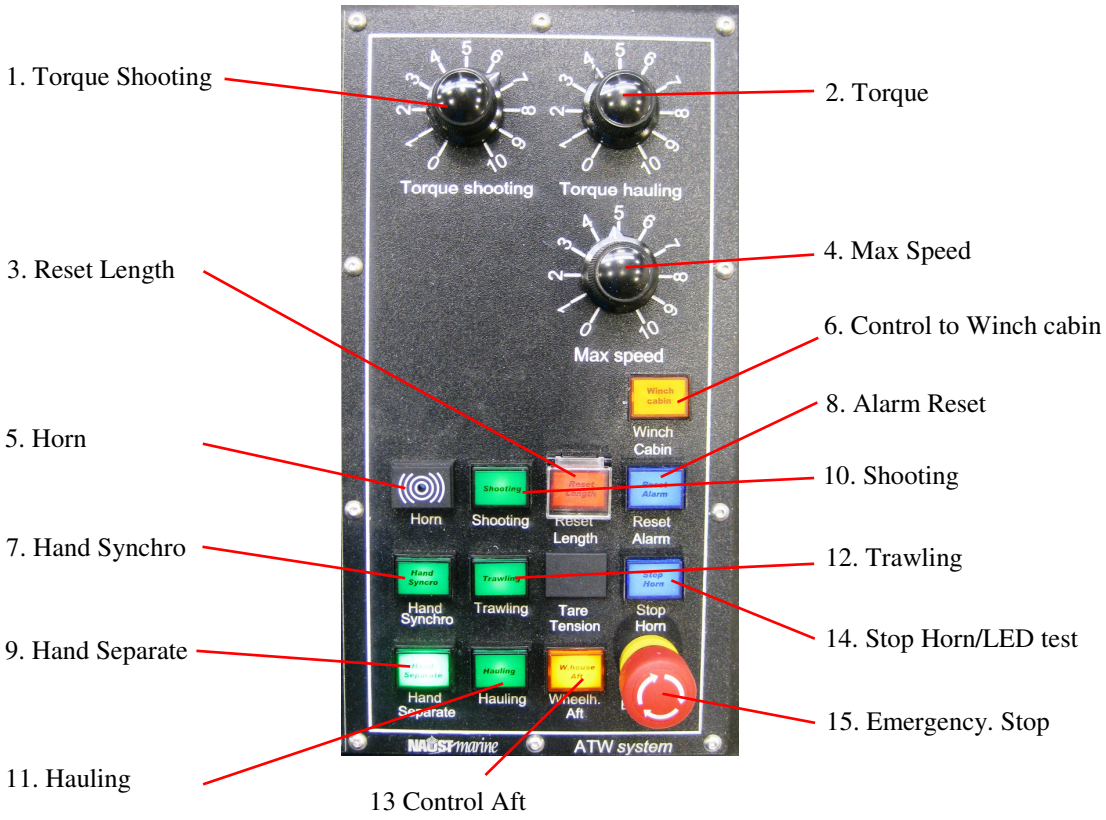
To start up the system use the Winch Start/Stop button. When the button is pressed it start blinking and after approximately 10 second it stops blinking and the winch is ready for use. These buttons are the same for both winches. To turn off push same button again.

Function and controls in weelhouse.

Control Panel weelhouse aft.

		These button do not stop the “OROMAX” braker in the main switchboard in engine room, they only put the system into standby mode. In standby mode Start/Stop button blinks. All emergency stops cause the “OROMAX” to switch off, then the light on the Start/Stop button goes off and they blink for about 10 sec. when started before they are ready.
4.	Torque in manual mode.	These buttons are to control the torque of motor when ATW systems is in manual mode.
5.	Manual Control.	Joy-sticks for speed control when the system is in manual mode (activates buttons 6 or 7). When the joy-sticks are pulled the brakes on the winches open and the pull (tension) moves on to the motor. The speed is controlled by the joy-sticks. The further they are from the center the higher the speed.
6.	Hand Separate.	When the system is set to separate control each winch is controlled separately by it´s own joy-stick.
	Hand Synchro.	This button is pressed when one wishes to control the speed of both winches simultaneously. When the button has been pressed the joy-stick marked “Hand Synchronized” is used to control the speed of both winches. This action can be convenient when the first 50 meters (configurable) are shot and when the trawl-doors are being hauled into the gallows.
7.	Automatic mode.	These buttons is to set the ATW into automatic mode, trawling, hauling and shooting.

Function and controls in wheelhouse aft.



Control panel wheelhouse aft.
Automatic controls

1. Torque Shooting.

This knob controls the torque of the motors in automatic shooting mode. Lower value means lower torque and therefore higher speed in automatic shooting.

2. Torque Hauling

This knob controls the torque of the motors in automatic hauling mode. Higher number means more torque and therefore higher speed in automatic hauling.

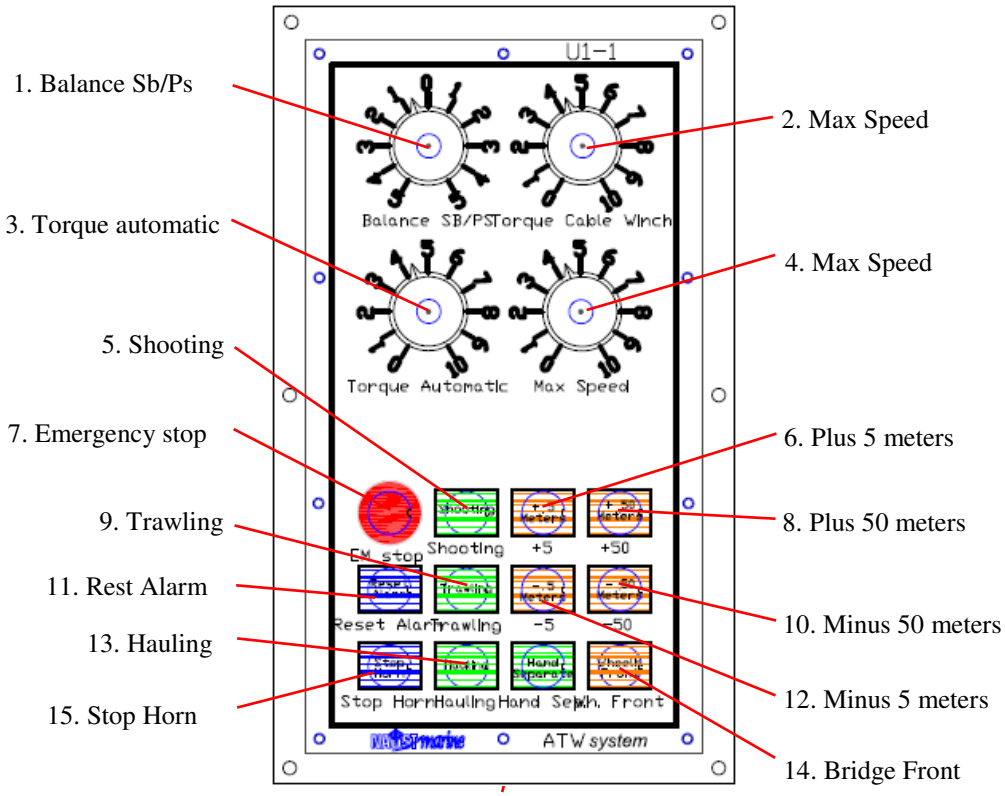
Function and controls in weelhouse aft.

3.	Reset Length.	The Reset length button is used to reset the length counter to zero. This is only done when the doors are in the gallows.
4.	Max Speed.	This button is to set max in Automatic and Hand mode. When system is opperated with joystick from winch cabin this button is active and sets the maximum speed limit. In automatic modes this buttom works only in hauling mode and trawling mode. Note that this button also sets the max speed for winch cabine joystic. If this is set to 4 then winchman can not haul faster than ca 400 rpm. In hand mode. Defult value is 4.
5.	Horn.	Horn.
6.	Control to winch cabine.	This button is to send control to winch cabin.
7.	Hand Synchro.	This button is to put system in hand syncro mode. In hand syncro mode Sb. winch joystic controls both winches.
8.	Alarm reset.	This button is to reset alarms, and resets the ready command on the thyristor drives. This button might need to pusshed several times and it is also good to hold it down for 2 seconds to reset all alarms.
9.	Hand Separate.	This button is to set the system in hand separate mode. This button will stop all automatic modes, then system stops and brakes go on.
10.	Shooting.	This button is to set the system in shooting mode. When trawl is ready for shooting, sweepline connected to trawl doors, push the shooting button. Then the light in the button will blink and system is ready for shooting. First 50 meters is then shooted out manually. When 50 meters is reached on last wire system changes to automatic shooting. When 20 (adjustable) meters is left to preset wirelength the shooting mode automatically changes on trawling mode and towing counter start count the trawling time.

Function and controls in wheelhouse aft.

11.	Hauling	When this button is pushed, system is set in automatic hauling mode. When 60 (adjustable) meters is left hauling system give sound warning and when 50 meters is reached by the first wire the system switches to hand separate mode. The winch man have to take the control of the winches from the winch cabin in advance to prevent the winches stop while the system switches from hauling to hand separate mode.
12.	Trawling.	The normal way to enter into automatic trawling is from automatic shooting as explained on previous page (10. shooting). If some manual adjustment are required this button is used after that to return to automatic trawling.
13.	Control to aft consol.	When this button is pushed the controls go to aft bridge.
14.	Stop horn / LED test.	This button is to stop horn when alarm goes on. This is also for LED test, by pushing this button for more than 2 sec. all LED should light, both in front and aft panels.
15.	Emergency stop	This is the emergency stop for the system. When this button is pushed system is shut down and brake will close. By pushing this button ATW system will switch off the OROMAX brakers in main switchboard of the engine room.

Function and controls in wheelhouse front.



Control panel wheelhouse front.
Automatic controls

1. Balance Sb/Ps.

The Balance Sb/Ps knob increases the torque on the Sb. or Ps. Motor. If the knob is turned to Sb starbord side, Sb motor will be stronger. If it is turned to portside it will make Ps motor stronger. This is used if there is a difference between the tension in the Sb. and Ps. Motors. And if it is necessary to eliminate the wirelength difference quickly after turning the ship.

2. Torque Automatic

The Torque Automatic knob is used to adjust the tension of the wires when the system is in automatic mode. In trawling mode this button is always active, but in shooting and hauling mode, only when control is active in front bridge.

Function and controls in wheelhouse front.

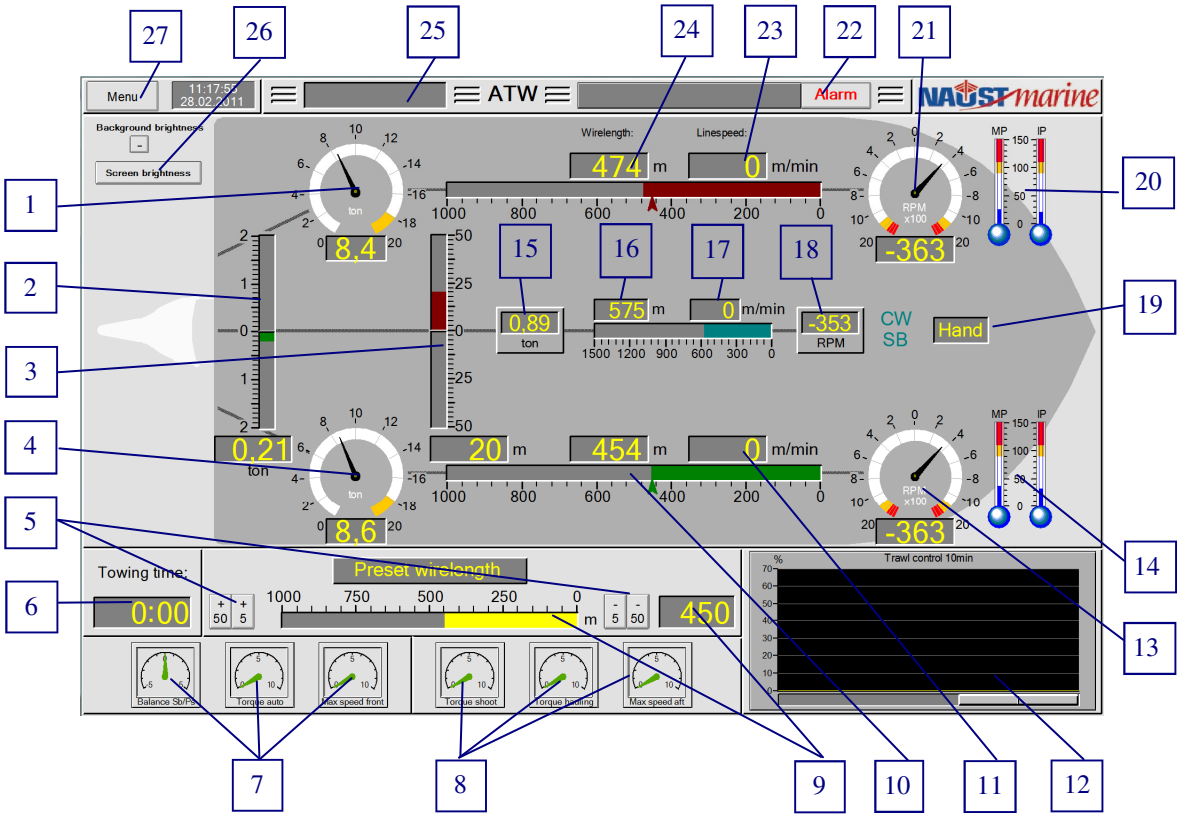
3.	Max Speed.	This button is to set max speed in automatic trawling and hauling mode. In shooting mode speed is controled by torque button. In manual mode speed is set by joystick but max speed button aft bridge always limitates the maximum speed.
4.	Shooting.	Automatic shooting is possible after shooting 50 meters manually, it is possible to change this in parameter window in ATW interface. When 20 meters, also set in parameter window, are left to reach the preset length the system will buzz and change to automatic trawling.
5.	Plus 5 meters.	Button for adding 5 meters to preset length.
6.	Emengency stop.	This is the emergency stop for the system. When this button is pushed system is shut down and brake will close. This will take out the OROMAX braker in engineroom.
7.	Plus 50 meters.	Button for adding 50 meters to preset length.
8.	Trawling.	The normal way to enter into automatic trawling is from automatic shooting as explained before. If some manual adjustment are required this button is used after that to return to automatic trawling.
9.	Minus 50 meters	Button for reduce preset length by 50 meters.

Function and controls in wheelhouse front.

10.	Reset Alarm.	If this buttons is blinking the alarm is on. If it is blinking slowly (once every second) then it is a warning light. But if it is blinking rapitidly then the alarm is of such a serious nature that the system has shut down and the winches can not be operated. What kind of alarm is presented can be read in the alarm list on the ATW monitor screen. Use this button to reset the alarm when the cause of the alarm has been fixed.
11.	Minus 5 meters.	This button is to reduce 5 meters from preset length.
12.	Hauling.	When this button is pushed the system changes from automatic trawling to automatic hauling. When 50 meters are left the system will stop and then it is necessary to continue hauling in hand seperate or hand synchro mode. The winch man have to take the control of the winches from the winch cabin in advance to prevent the winches stop while the system switches from hauling to hand separate mode.
13.	Control to front bridge.	When this button is pushed control panel in front bridge is active.
14.	Stop Horn/Lampt test.	This buttons stops the warning sound from the horn. It can also be used to test the LEDs in both panels. Just press the button for 2 sec. all the LEDs in both panels should light.
15.	Hand Separate.	This button is to put system into hand separate mode. In this mode brake will close and winch will only be operated with joystick.

ATW Screen

Fig. 16 .1



Screen (HMI)

1. Ps tension — Shows the tension of the Port side (Ps) wire. Displayed both as a gauge meater and numberc mode..pæ

2. Tension difference column — A column that shows the difference between the tension on the Star board (Sb) and Port side (Ps) winches. If the tension of the Sb winch is higher the column is green. If the tension of the Ps winch is higher the column is red. Below the column is a window showing the difference in numbers.

3. Difference in wire length — A column that shows the difference between wire lengths. If the column is green the Sb wire is longer than the Ps wire. If the column is red the Ps wire is longer than the Sb wire. The value is also shown numerically.

ATW Screen

Screen

4.	Sb tension	Shows the tension of the Star board (Sb) winch. Displayed both as a gauge meater and numberc mode.
5.	Plus minus 5 or 50	The selected wire length can be changed by clicking the plus/minus (+/-) 5 or the plus/minus (+/-) 50 keys on the screen. The same function as for buttons no 25—28 in fig. 8.1
6.	Towing time.	Clock that mesure towing time. Towing time is reset every time trawl is hauled. This clock also messure opperation time of the system.
7.	Buttons fornt bridge.	Thees button shows the status of the speed and tourqe buttons in front bridge. This is useful durnig nights and also for Naust Marine technitians during remote control.
8.	Button aft bridge.	Thees button shows the status of the speed and tourqe buttons in aft bridge. This is useful durnig nights and also for Naust Marine technitians during remote control.
9.	Preset wire length.	Here the wire lenght for shooting is selected. This value can be changed at all stages during shooting. The new value becomes active as soon as it is entered. During trawling the selected length can also be changed. When a new value is entered the system acts immediately by pulling or paying out wires.
10.	Actual wirelenght Sb	This bar shows the actual wirelength on Sb wire. Also the actual wirelengt in the window above.
11.	Line speed	Shows the speed of the wire in meters by minute or fathoms by minute. The speed is shown as a plus (+) during shooting but as minus(-) during hauling.

ATW Screen

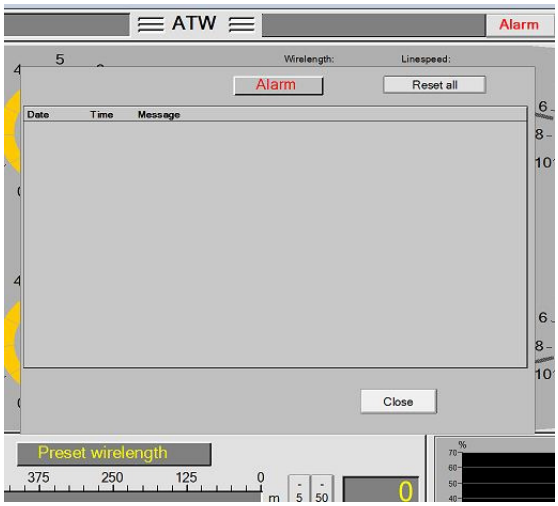
12.	Tention control.	The two red lines indicate the set higher and lower limits of the wire tension. The yellow line shows the real tension of the wires while trawling. The marks can be set to make the system more stable while trawling.
13.	Motor speed.	Meter that shows the motor speed Sb. - value is for hauling and + for shooting.
14.	Motor Temprature.	Motor temprature of main pole and interpole in trawl winch motor Sb side.
15.	Tension CW.	Tension on cable winch.
16.	Wirelength center winch	Window that shows how many meters of wire is in water on center winch. Below there is also bar with wirelength.
17.	Linespeed center winch.	Window that shows linespeed in meters pr. minute on cable winch.
18.	Motor RPM.	Window that shows RPM. on motor cable winch.
19.	Mode center winch.	Window that shows in what mode cable winch is in, hand or auto.
20.	Motor temprature.	Motor temprature of main pole and interpole in trawl winch motor Ps side.
21.	Motor RPM.	Meter that shows the motor speed on trawl winch Ps. - value is for hauling and + for shooting.

Fig. **18.1**

ATW Screen

22. Alarms.

Alarms for the system are shown in this window. When alarm accore the system gives sound to indicate that there is a falure. By clicking on the bar bigger window opens with all alarms.



24. Wirelength. Ps.

Window that shows how many meters of wire is in water on center winch. Below there is also bar with wirelength.

25. System Status.

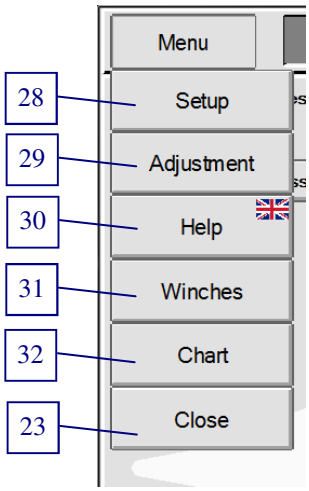
This window show status of the system in Auto mode. Hauling—Trawling—Shooting.

26. Screen Brightness.

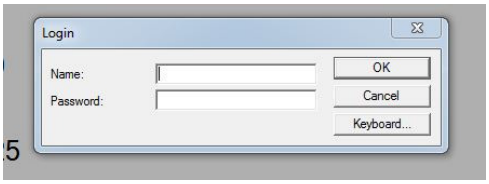
Here is the screen brightness ajusted, when this button is pressed then opens slide bar to ajust brightness.

ATW Screen

27. Menu. When menu is opened the following list appear.

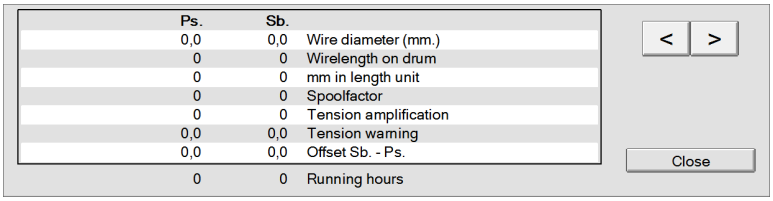


28 Setup. This is only for Naust Marine technicians to set up the system in startup and in maintenance.



29. Ajustment. This button opens a settings window for user settings. Click the < > buttons to browse between windows.

Wire and Tension



Diameter of wire — Here one puts in the exact diameter in mm. The accuracy is 1/10 mm.

Wirelength on wire drum — Here one puts in the total wirelength on the drum to ensure a correct wire counting. One can select between meters or fathoms.

Length units — The length units in mm (1 meter 1000 mm).

Spooling factor — The spooling factor is used to correct the wire counting as it can deform if the reeling is not good. If the reeling is good this factor is around 870. To get an accurate counting it can be nessesary to mark the wires (with paint) and check the counting manually until it comes out right.

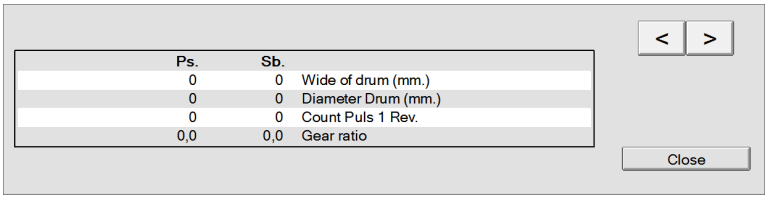
Tension magnifier — Value to correct the reading of screen.

Tension warning — This value determines how hight the tension can go before the warning system activates.

Offset Sb - Ps — Sets offset between Sb and Ps wire.

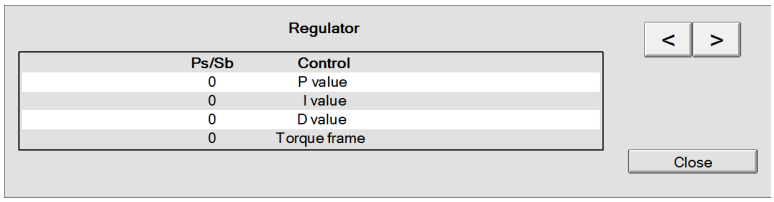
Running time — Shows the total running time of each motor.

Drum Size adjustments



Drum width	Width of drum in mm.
Drum diameter	Diameter of wire drum in mm.
Number of pulses	Encoder of pulse in one round of the motor. (Most commonly 1024)
Gear ratio	Gearbox ratio between motor and wire drum.

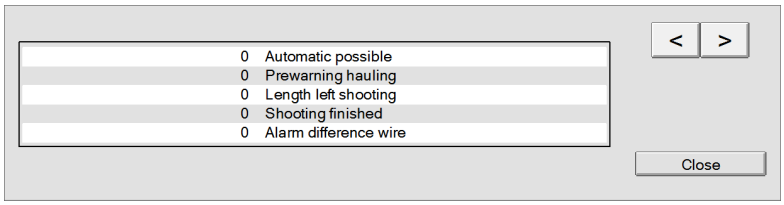
Regulator



P-value	If the value is reduced the winches will work faster. If the value is increased the winches will work slower.
I-value	If the value is reduced the winches will speed up and may become volatile. If the value is increased the winches will become more stable. When set to 9999 this value becomes inactive.
D– value for Sb and Ps	This value should only be used after consultation with Naust Marine.
Torque Frame.	This value defines the space between the red lines in the window for trawling control shown on fig nr. 23.1. These two lines show the value for maximum/ minimum power for Sb and Ps winches.

ATW Screen

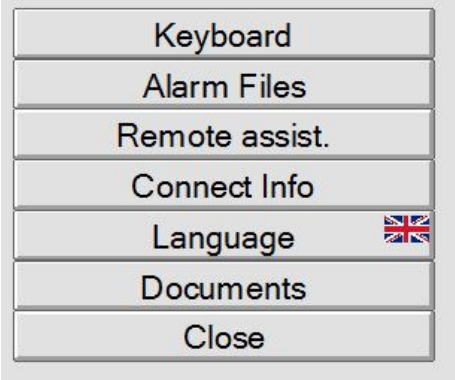
Towing Control



Automatic possible	Defines the length of the wire that has to be released before automatic shooting can start.
Pre-warning hauling	A sound indicates (at a preset wirelength) when automatic hauling is about to finish.
Length left shooting	A sound indicates (at a preset wirelength) when automatic shooting is about to finish.
Shooting finished.	Shows the wirelength left when system turnes from automatic shooting to automatic trawling.
Alarm difference	A value that determines when a warning is given to indicate that the difference between Sb and Ps wire is too big.

30. Help button opens window with help options.

Help options allow access to the following items.



Keyboard: Open screen keybord.

Alarms files: Open list of alarms in the system.

Remote assistance. Allowe access to Team Viever for remote assistance.

Connect info: Window with connection information with in the system.

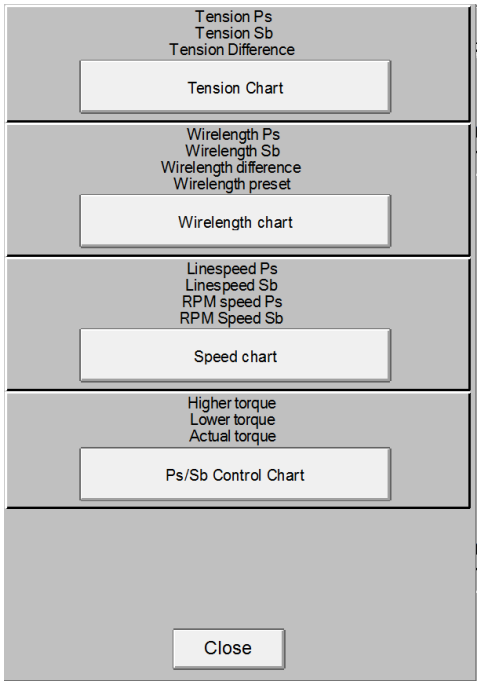
Language: To change the language in the system.

Documents: Access to all documents for the system sutch as manual and tecnical info regarding ATW.

Close: To close the window.

ATW Screen

24. Chart This button opens menu for charts.



25. Chart for different parameters, such as wirelength and tension

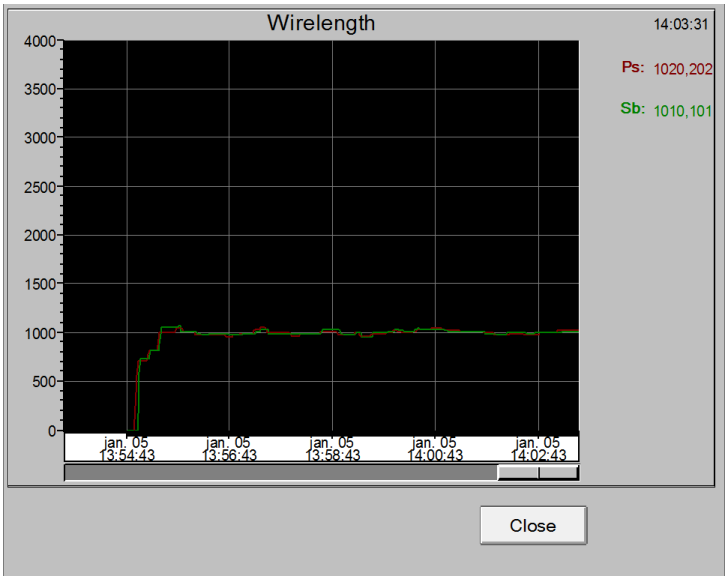


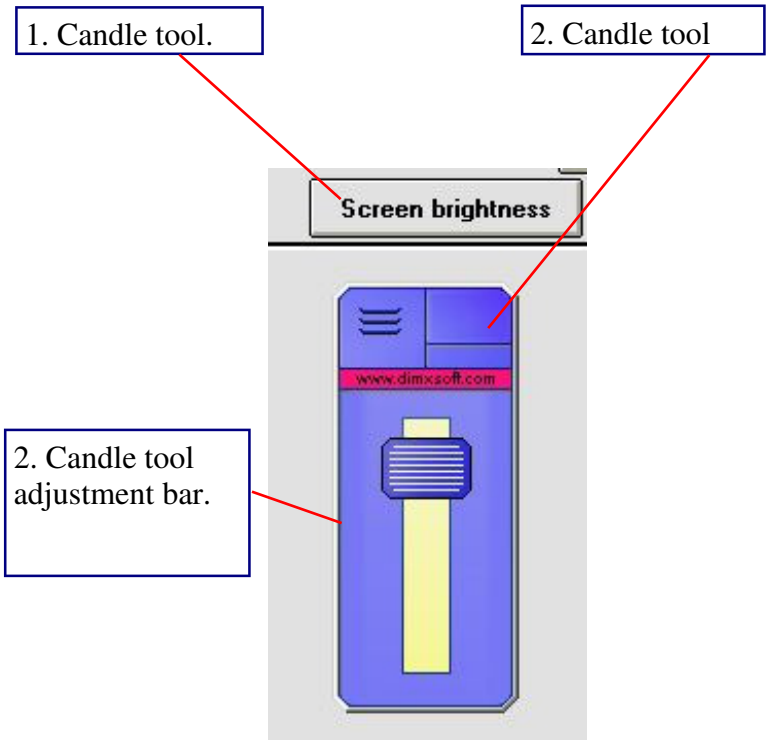
Fig .18.2

ATW monitor picture

CANDLE LITHTER TOOL:

Naust Marine have added new feture to its ATW interface. This is small program that enable the operator to damp the contrast of ATW screen.

1. Turn on the tool by pressing the candle.
2. Adjust the bar for correct brightness of the screen.
3. Close the candle bar by pushing OK in the upper right corner.



Emergency running for winch

Switch Gear Panel

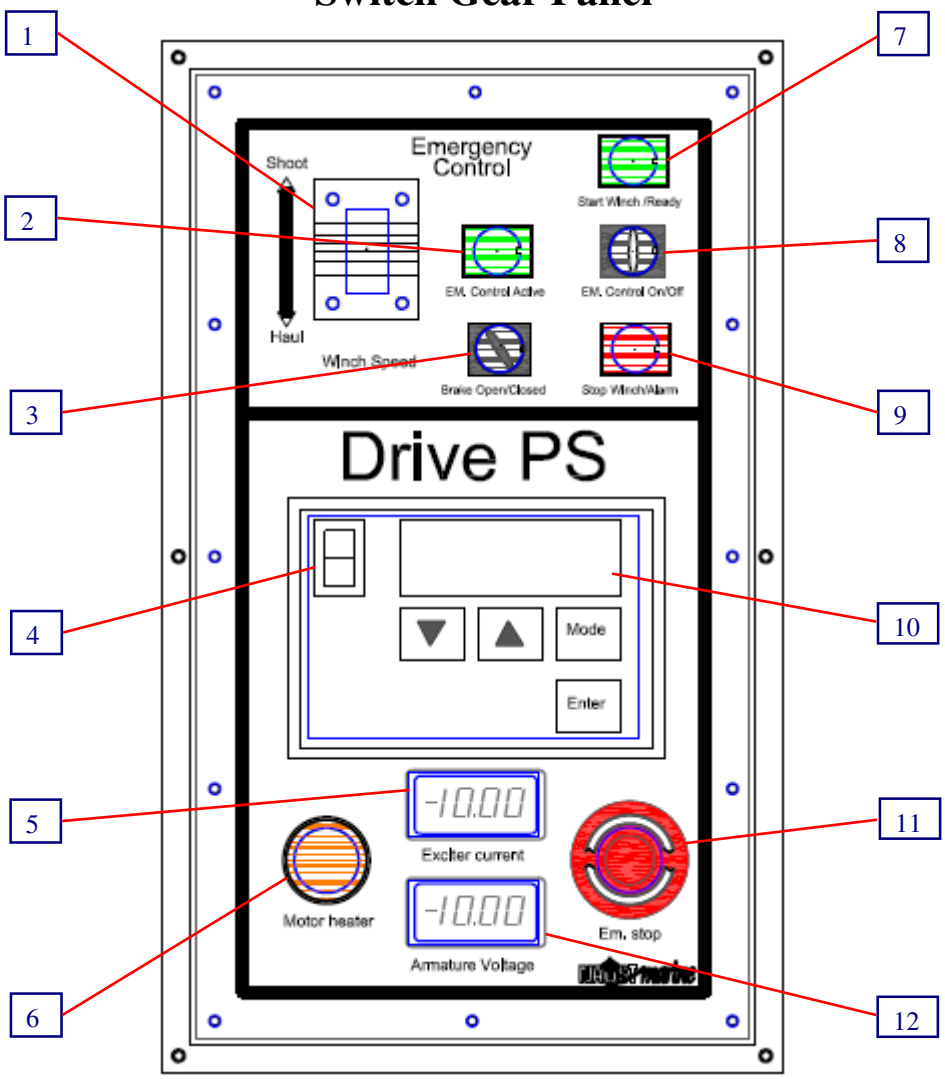


Fig. 2

Emergency panel : Functionality.

This panel allows emergency running for trawl winch

1. Speed controling — This joystick controls the speed of the trawl winch. Arrow beside the joystick indicates the rotation on the winch hauling/shooting.

2. EM. control active — This light indicates when Emergency control is active.

Emergency running for winch

Emergency control: Functionality

3.	Brake open/closed.	This switch open and close the brakes on the motor. When brakes are open this switch get signal from the brakes and will light green.
4.	Status display.	This particular display shows the condition on the thyristor drive. Display shows if the drive is running and also if there are some failure in the drive, see manual from Answer drives.
5.	Exciter current.	This Analog display shows the actual current on the exciting field of the motor. This measurement is in Ampere.
6.	Motor heater.	This will light every time the winch is stopped and the motor will be heated by thermal resistor or the exciting current on the field.
7.	Start winch/ready.	This button is for starting the winch in emergency control. Button will light green.
8.	Emergency lock key.	This key allow the user to take full control over the winch. If the key is turned then emergency control will block all other controls to the winch. If user need to work with winch in safety he can turn to emergency control and take the key.
9.	Stop winch.	This button stops the winch when running in emergency control.
10.	Display thyristor drive.	This display is for programming the thyristor drive and is also information screen.
11.	EM stop cubical.	This emergency stop is only for stopping the thyristor drive and do not affect the ATW system at all. It only blocks the ready signal for drive.
12.	Armature Voltage.	This Analog display shows the armature voltage on the Rotor of the motor. This measurement is in voltage.

Emergency running for winch.

Fig. 3

Emergency panel : Running in emergency mode.

Description of changing to emergency and running.

If it is necessary to run winch with emergency control it should be turned on as following:

Key is switched to emergency control (5) and orange light (2) will indicate that the system is now in emergency mode.

Next thing to do is pushing start winch button (4) and it will light green. Then it is necessary to release the brakes by switch to brake open (3) and when the brakes are open the switch will light green.

Now the user can haul or shoot with the Joystick (1).

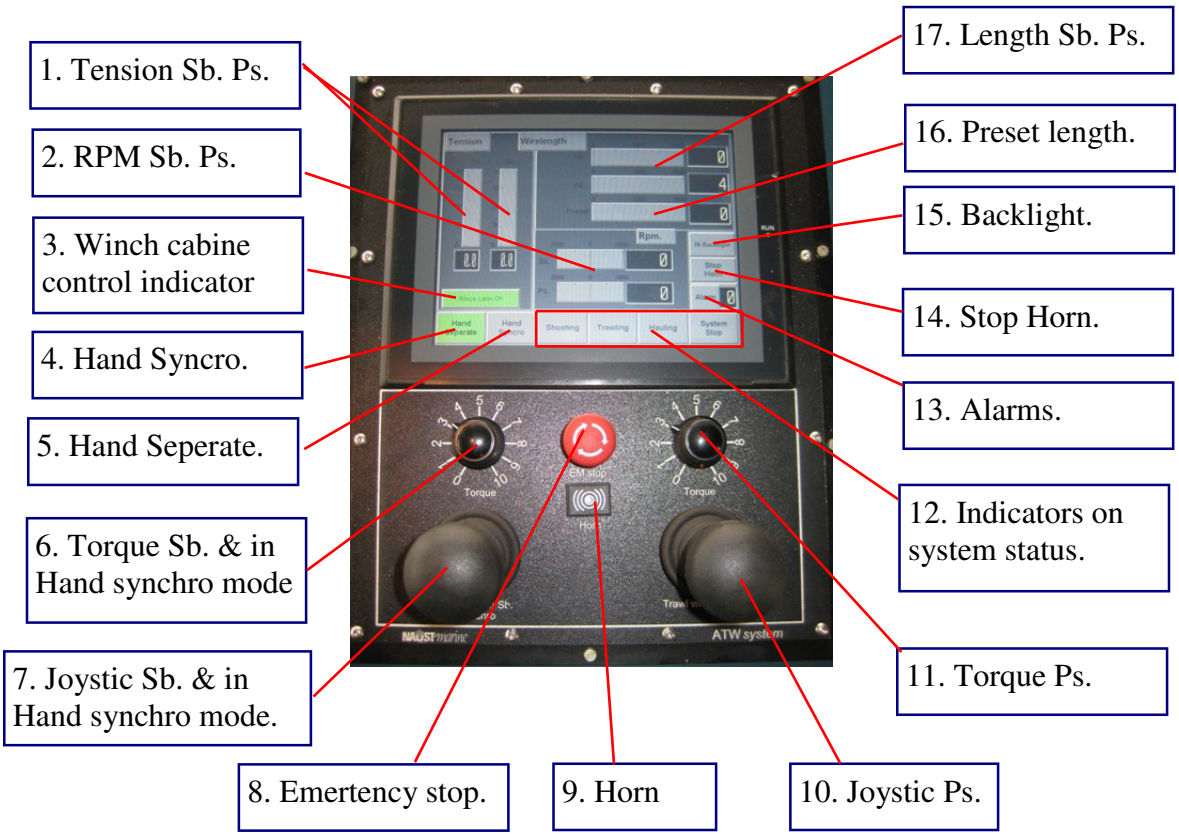
When user take the system off emergency control following steps should be done:

Stop the winch by release joystick (1) to zero position, then close the brakes (3).

After that user push stop winch button (6) and turn the key to former position.

Now is the winch Controlled by the ATW system.

Winch cabin control



1.	Bar tension Sb. Ps.	These bars shows the tension of the Sb. and Ps. winch, under the bars are the same value in digits.
2.	Motor RPM.	These bars shows the motor RPM on Sb. and Ps. motor. On the right side are the same values in digits.
3.	Winch cabine control indicator light.	When winch cabin is active this light is green, when controls are in bridge this light goes off. To take control to winch cabin just take the joystick on Sb. or Ps. side.

4.	Hand synchro mode.	Active button that puts the system in hand synchro mode. When button is active the light goes green in the button. In hand synchro mode only one joystick and tension control works for both winch.
5.	Hand seperate mode.	Active button that puts the system in hand separate mode. When button is active the light goes green in the button. In hand separate mode both joystick and tension control works for both winch.
6.	Torque Sb. & in Hand synchro mode.	Torque button that control torque on Sb. side winch. This button control also torque of both winch when in hand synchro mode.
7.	Joystic Sb. & in Hand syncro mode.	Joystick Sb. winch and both winches in hand synchro mode. When the joystick is pulled brake opens and winch starts to turn. The joystick is the speed regulator so by pulling the joystick all the way it gives max speed command. Remember that Max Speed button in aft bridge sets the Max Speed limit for hand mode.
8.	Emengercy stop.	Emergency stop. When this button is pushed the system stops and the brake goes on.
9.	Horn.	Horn for indicating alarms.
10.	Joystic Ps.	Joystick Ps. winch. When the joystick is pulled brake opens and winch starts to turn. The joystick is the speed regulator so by pulling the joystick all the way it gives max speed command.
11.	Torque Ps.	This button control the button on Ps winch.

12.	Indicators on system status.	These lights indicate the system status, when system is in shooting, hauling or trawling mode. This indications turns green and indicate the activity of the system.
13.	Alarms.	This button is to enter the alarm mode. In the alarm mode there is only possible to view the alarms, there is not possible to reset active alarms, only read alarms. When alarm have been acknowledged in bridge and turned off, it is possible to clear all alarms from alarm log window.
14.	Stop Horn.	This is to stop horn when alarm is active.
15.	Backlight.	This button is to dim the the backlight contrast of the touch screen.
16.	Preset length.	This bar is to indicate the preset length on the system. This is only possible to set in bridge.
17.	Length Sb. & Ps.	These bars is to indicate the actual wire length on Sb. and Ps. wire. The window on the right side of each bar indicates the length in digits.

Shooting and hauling from winch cabin

SHOOTING:

When shooting the trawl from winch cabin do the following procidures:

Put the system in hand separate mode.

When the trawl is ready for shooting, put both tension control between 5 and 6. Push the joystick in shooting direction. The more the handle is pushed forward the more speed is on the winch.

When 50 meters is reached the winches changes to automatic shooting.

HAULING:

When the trawl is hauled in, the ATW haul automaticly to 50 meters. On 65 meters (set in bridge) system gives warning sound for one second indicating that it is time to haul in hand mode, pull both the handle and wait until 50 meters are reached.
When 50 meters are left system changes from automatic to hand separate mode, without stopping. Control the speed with the handles.

Note: In Hand Separate and Hand Synhro mode Max Speed limit is set in bridge aft.

Shooting in Hand Synchro Mode

SHOOTING:

Other method to shoot is to shoot the trawl in hand synchro mode.

When trawl is ready for shooting put the Torque button on ca 3 or when the system is in ballance not hauling or shooting.

Set torque to ca 3.

Next lower the Torque setting to 2 then the winch should give out slowly.

This is good method as opperator have one hand free and can control the speed with torque setting.

Set torque to ca 2.

Note: In Hand Separate and Hand Synhro mode Max Speed limit is set in bridge aft.

Shooting in Hand Syncro Mode

By putting higher torque value the winch slows down and stops. If the value is put even higher the winch starts to haul.

Set torque to ca 4.

This method is useful as both the winch have the same control, of speed and torque.

In this mode the winch shoots on tension and if there is different between tension on wire between 0 and 50 meters the system equals the length.

HAULING:

It is also possible to haul in hand synchro mode, then one joystick controls both winches.

Put the torque on Sb winch between 5 and 6 and then both winches haul on the same speed.

Set torque to ca 5 to 6

Note: In Hand Separate and Hand Synhro mode Max Speed limit is set in bridge aft.

Taking new wire on trawl winch, and hauling between winches under load.

With ATW system it is very easy to take wire from one drum to another under load. This load can be set as high as prefered.
Select hand separate mode.

Hand separate mode

After wire is connected between the drums, put both the tension control button to zero.

Set torque to 0

Pull both the handle at the same time.

Now both the winch are in hauling mode. Both the tension control is on 0. Now both brakes are open and winch not hauling as the tension control is set on 0.

Set torque to 0

Now slowly turn up tension control on the winch that you want to pull the wire too. On the winch that is holding the wire turn up the tension control until the prefered load is reached.

On the picture the Ps. winch is stronger and is pulling the wire from Sb.

Sb side is set to ca 1

Ps side is set to ca 2

Ps is now pulling the wire as Ps winch is stronger.
Sb winch is weeker and is giving out.

If more tension on the wire is required turn up both tension control.

Sb side is set to ca 2

Ps side is set to ca 3

ATTENTION:
The settings on the torque control is different each time, all depending on the wire on the drum each time. These settings are just estimation.

If spooling from the other side from Ps to Sb just make Sb side torque button higher than Ps. In these settings wire should go from Ps to Sb.

Sb side is set to ca 3

Ps side is set to ca 1

Note:

Speed is controlled as before with the joystick. It is also possible to control speed with adjusting the torque control button.

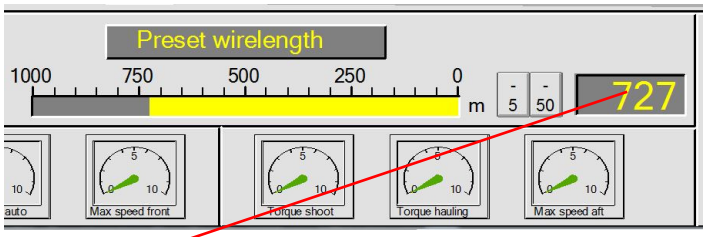
The settings on the torque control is different each time, all depending on the wire on the drum each time. These settings are just estimation and for explanation.

In Hand Separate and Hand Synhro mode Max Speed limit is set in bridge aft.

Shooting in Auto Mode from front bridge.

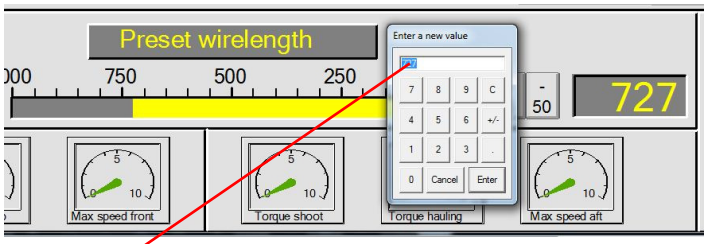
1. When shooting trawl in automatic mode first set the preset length.

This can be done by pressing plus 50 or 5 meters until correct length is reached.



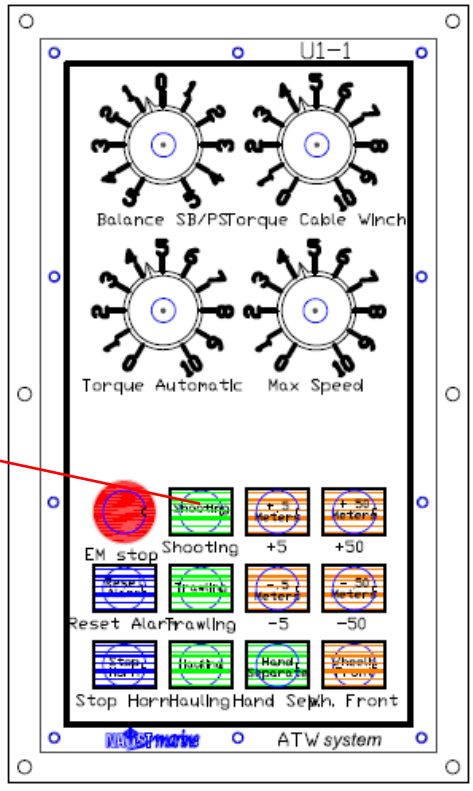
Value for preset length.

2. It is also possible to put the cursor over this value box and click on the box. Then calculator opens and allow you to enter new value.



New value for preset length.

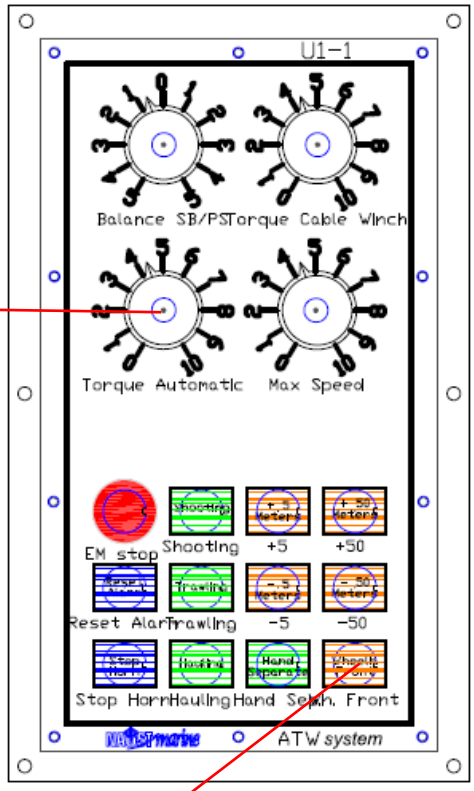
3. Push shooting mode. Then shooting mode blink which means the sysem is ready for shooting.



Press shooting.

This button can be pressed at any time during shooting. When trawl doors are in gallow. When 50 meters is reached. The system switches to automatic shooting and the light becomes constant.

4. When system is shooting in automatic mode the standard settings for Moonzund trawler is as follows.



Torque Automatic button should be set to ca 4.

This should give shooting speed around 400 rpm on the motors. This of course depend on ships speed. This value needs to be ajusted during shooting time for regulating speed.

By increasing Torque Automatic to 5 system slows down shooting.

By decreasing to 3 system shoots faster as torque is lowered.

The torque button in front bridge only works when control is in front bridge

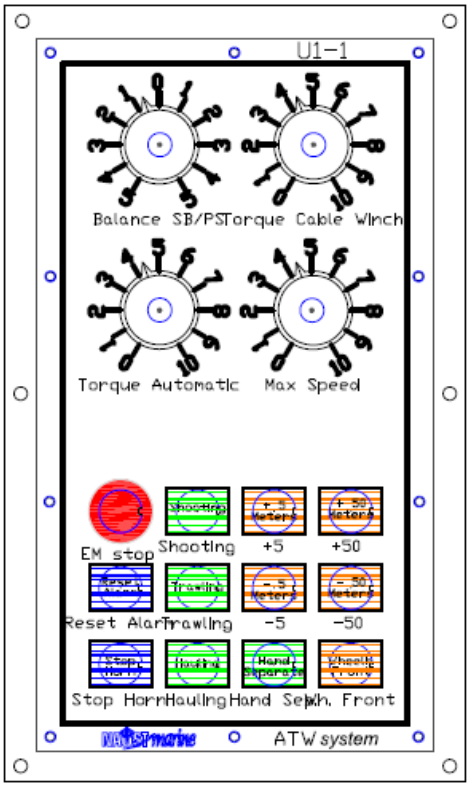
If front brigde is not selected the control is in aft bridge, then speed during shooting is control with, Torque button in aft panel.

NOTE:
During shooting time Max Speed button do not work. To slow down shooting adjust Torque shooting in aft birdge or if control is in front bridge adjust Torque Automatic. Higher torque slow down shooting, lower torque increase shooting speed.

When 100 meters left shooting (adjustable in parameters in ATW monitor screen) the ATW system give sound for 2 sec. At that time it is necessary to reduce speed of shooting, this is done by the Torque Automtic in front bridge, or Torque Shooting in aft bridge. Depending on what control is active. Also it could be necessary to reduce speed of the vessel so when the system changes to Trawling mode the speed should not be more than estimated towing speed.

If speed of the vessel is higer that normal towing speed this could cause that last 20 meters the speed will be to high and system could overshoot for few meters.

Note: The length 20 meters before preset length is reatch and system change to Trawling, is ajustible in ATW computer in birdge. (See. No 25 page 26)



There are many ways to reduce risk of overshooting. One method is as follows.

Put preset length longer that you expect to shoot ca 50 meters
Shoot trawl in regular way. When 100 meters is left shooting, slow down speed of the winches by increasing the torque. When you reach the length and winches are stopped shooting put the system to Hand Separate. Adjust the length of preset length to actual and push trawling, then the system will soon be in balance.

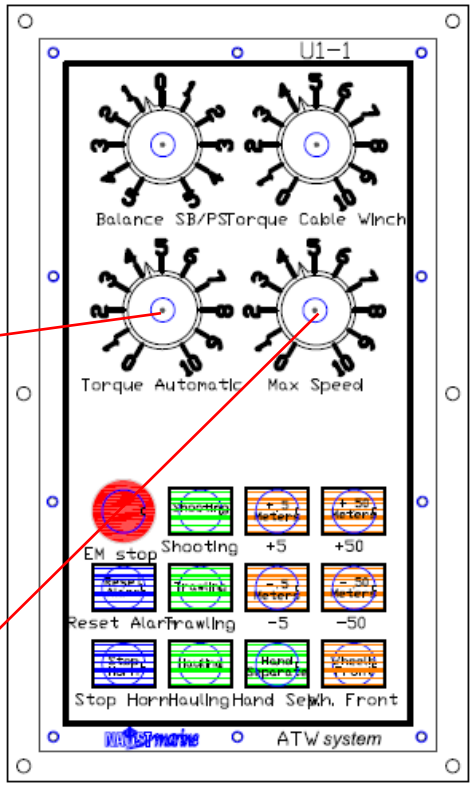
Hauling the trawl.

When trawl is hauled in, do the following procedure.

1. Put the trawl in hauling mode, then the hauling button lights green.

2. Adjust the Torque button for smooth start, normal setting is 4 same as in trawling mode, by turning the button to 3 system slows down, as the system have less power.

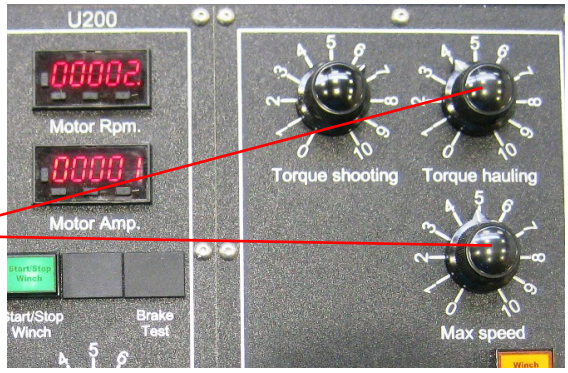
3. It is also possible to control speed with max speed button, this button should be set to max prefered value. On 3,5 it is about 350 rpm. If it is set on 5 max speed should be around 500 rpm. This buttons only work if control is in front bridge



ATTENTION:
If the control is in aft bridge the Torque hauling and Max speed in aft panel are active.

It is necessary to have this buttons always correctly adjusted.

Defult is to put both buttons on 4.



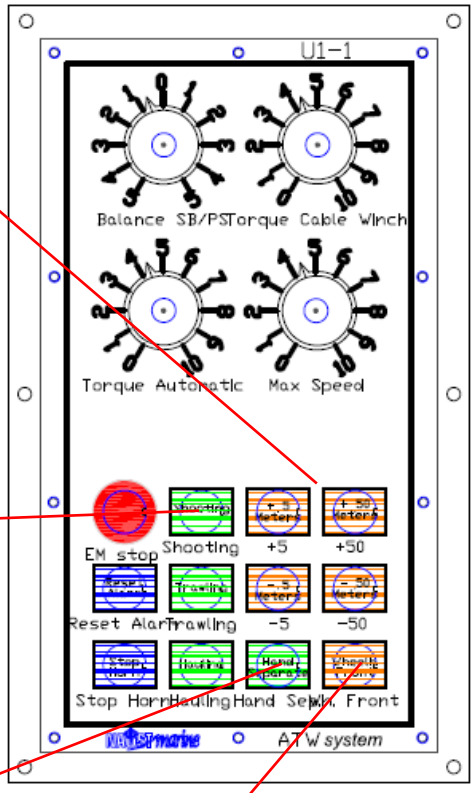
DURING FISHING.

During trawling time it is possible to operate the system in many ways.

1. Preset length can be changed to any value within wire length during trawling. Best is to use + - 5 or 50 buttons to do so.

2. If the system are in trawling mode and you add 100 m. to wire length, system starts to shoot slowly ca 200 rpm on motor. If more speed is required it is good to put the system into shooting mode and control speed on Torque automatic button.

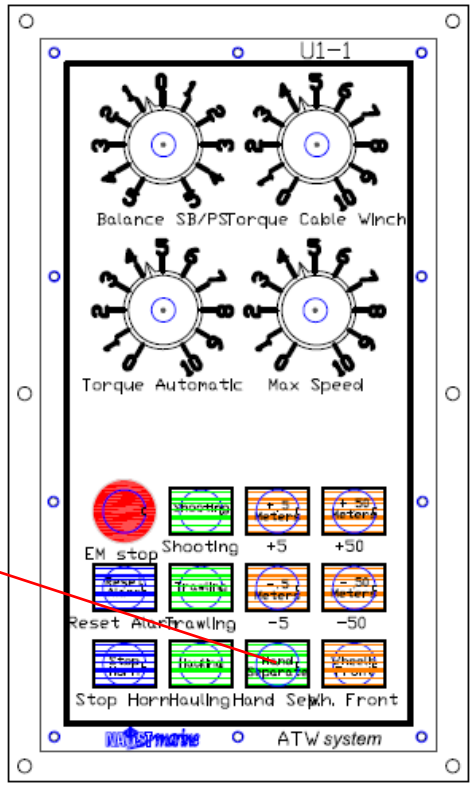
3. If for some reason you want to turn off automatic mode just push hand separate button. Then the systems stops slowly, brake go on and system is stopped in hand separate mode.



ATTENTION:
This panel is only active if Wh. Front button is active. If not the control is in aft bridge. By pushing this button you take control to front bridge and button will have orange light.

Fishing close to surface.

When fishing close to surface it always change that one trawl door will hit surface. If this happens then the trawl door that hits the surface have less tension than the other and you will quickly have different in tension ca 2-3 tons. The ATW system then starts to haul in the trawl door that is flying. To avoid this do the following.



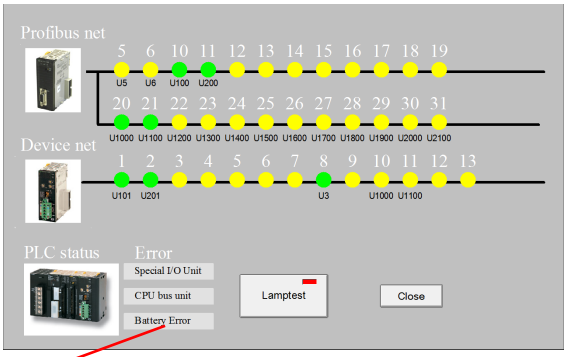
1. Put the ATW system into Hand separate mode. Then ATW system stops working and brake goes on.

2. Go to the aft panel and shoot out manually about 20 meters, or what is necessary to get the trawl door under surface.

3. When you are finish shooting out just put the system back into trawling mode by pushing trawling. Then the system starts immediately to work and equal the length and tension again.

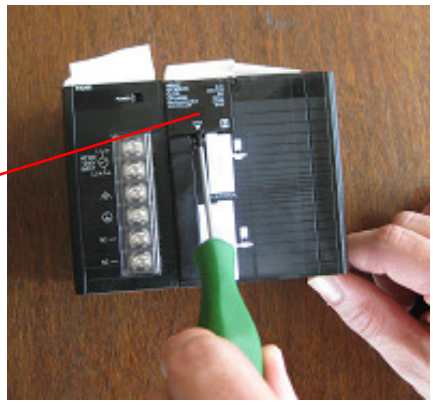
Protect PLC computer from loosing data.

PLC computer is installed in Bridge control cabinet U1. This computer is the heart of the ATW system and the software is stored in it. This computer have a battery to prevent of loosing data if the system loose the power.
This battery should be changed for a new one after 4-5 years. It is possible to monitor the battery in the ATW system. That can be done by choose menu in monitor system, then Help and connect info. If the battery is not good enough it will light red for battery error.

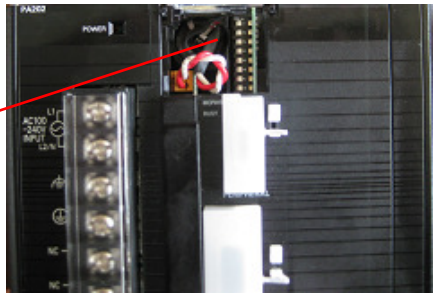


To change battery without loosing data:

1. On the PLC computer is a opening for changing battery like showed with the screwdriver. Open this closure.



2. Now it is possible to see the battery and the connection for it. When changing the battery it is VERY IMPORTANT to have full power on the PLC computer, othervise the computer will loose the data.



3. Keep power on PLC computer, then change the battery by disconnect the plug and pull the battery out. Place new battery and connect and then it is alright to turn off the power on PLC.

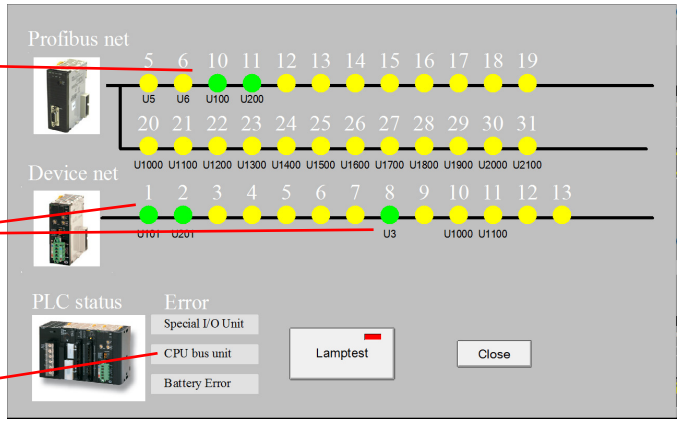
Connect Info:

Under Ajustment page there are page Connect Info, this page is to see the status of the system if all connections are in order.

Profibus net should have 2 green light on U100 and U200, this means that all connections on profibus net are in order.

The same is for the Device net U101 and U201 are the cabinet in winch control room. And U3 is the Winch Cabin control.

There are also warning lights regarding CPU unit



Service

Service contacts.

When in need of service or advice please contact Naust Marine's service technician at the following address :

Naust Marine hf
Miðhellu 4
221 Hafnarfirði
Iceland
Phone: +354 414 8080
Fax : +354 565 2150
E-mail : naust@naust.is

More information on emergency service can be located on Naust Marine's web-side : www.naust.is
www.naustmarine.com

For futher assistance:
To contact directly.

Gunnar Sigurdsson
Captain
Phone: 00354 414 8083
Moble: 00354 693 8083
Email: gunnar@naust.is

Eiríkur Jóhannsson
Electric Engineer
Phone: 00354 414 8095
Moble: 00354 693 8095
Email: eirikur@naust.is

Warranty

Warranty.

Naust Marine HF guarantees that obvious faults of production and workmanship which may occur within 12 months from delivery of the equipment, will be remedied in accordance with the UNECE 188 General Condition for the supply of Plant and Machinery for exports.

Warning.

This equipment should be installed, adjusted and serviced by qualified electrical maintenance personal familiar with the construction and operation of the equipment and the hazard involved.

Warning.

HAZARD OF ELECTRICAL SHOCK. DISCONNECT INCOMING POWER BEFORE WORKING ON THESE UNITS.