

SeaNet-Alarm USB

Installation and Operation

Manual

Hardware Version V 1.1
Software Version 1.00
March 2009



SeaNet-Alarm USB

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Credits / Warning / Disclaimer

The SeaNet-Alarm is designed to provide **assistance** to boat operators. It can not replace good seamanship and close personal observation of the vessel, the environment and weather conditions.

It is the boat operators responsibility to always keep the boat under his/her control.

Hard- and Software are still under development.

Malfunctions of the protocol converter and of any connected device are possible at any time.

The protocol converter could cause damage to connected devices.

Liability **cannot** be accepted for any damages, personal injuries or malfunctions of the SeaNet-Alarm or malfunctions caused by SeaNet-Alarm or any connected devices.

There are no Seataalk technical specifications available from the manufacturer. I have used the Technical Reference of the Seataalk protocol, compiled by Thomas Knauf GmbH. See <http://www.thomas-knauf.de/seataalk.htm> .Thank you to Thomas Knauf for his work.

Do not use as primary navigation or safety device

Function overview

This SeaNet-Alarm monitors a SeaTalk¹ network, different devices on a SeaTalk network, it monitors some built alarm conditions and sets off an alarm when certain conditions appear.

The main functions are

- Produce an unmistakable alarm when a SeaTalk instrument produces a warning.
- Monitor SeaTalk instruments and set off an alarm if an instrument should break.

The SeaNet-Alarm provides

- Remote alarm for ST40, ST50, ST60 depth & wind instruments
- Remote alarm for autopilots
- Remote alarm for SL,RL,C and E series radar
- Built in timer alarm
- Built in SeaTalk network surveillance and alarm if network stops sending data
- SeaTalk instrument surveillance and alarm if instrument stops sending data
- Monitors up to 10 alarms simultaneously
- Solid state switch with short-circuit protection
- Pushbutton for alarm acknowledge and special functions
- LED's to visualize alarm source
- Galvanic isolation between SeaTalk network and alarm voltage
- Powers supply and alarm power independent from SeaTalk network
- Configuration via USB connection to PC and configuration software

SeaTalk Instruments are normally installed in the cockpit or wheelhouse of your vessel. The built in alarms are not loud enough to be heard by the crew inside a vessel or to wake up sleeping crew members.

So even with anchor alarm activated, it is not sure that the crew will wake up if the anchor is dragging.

Single handed skippers often get too little sleep and need a loud warning if depth, windspeed or radar indicates a dangerous situation. They usually also want to be waked up every half hour or hour in order to check if everything is alright.

It's easy to miss an instrument beep while sitting on the chart table while the engine is running.

It's easy to miss a radar beep, when the radar is mounted at the chart table and you are at the helm.

If an instrument should break, without the SeaNet-Alarm it might take a long time before the failure is noticed. Maybe the boat operator would rely on a device that that isn't functioning any more.

¹ SeaTalk is Reg. Trademark of Raymarine Inc. www.raymarine.com

There is clearly a need for loud sound or an optical alarm, that makes you aware of possible dangers and instruments failure.

With the SeaNet-Alarm this needs can be filled in an easy and economic way.

When an alarm condition is recognized, SeaNet-Alarm activates a solid state switch that can activate a powerfull external alarm and/or switch on optical alarm.

Alarm sources

SeaNet-Alarm his highly configurable. It reacts to different instrument alarms and also has it's own built in alarm triggers.

Alarms can be triggered by :

- Internal “wake-up” timer → internally generated
- SeaTalk network failure → internally generated
- Shallow water alarm → from depth instrument
- Anchor alarm → from depth instrument
- Transducer defective → from depth instrument
- High & low windspeed alarm → from wind instrument
- Wind angle high & low alarm → from wind instrument
- Windshift → from autopilot
- Off course & drive stopped & auto release alarm → from autopilot
- Object in guard band 1&2 → from radar
- MOB Alarm → from instrument
- Instrument failure → internally generated

Alarms can be switched on/off individually. A unique alarm sound pattern can be assigned to the different alarms – so that the user can “hear” what caused the alarm.

There are two alarm indication LED's on board the SeaNet-Alarm. The led's can be assigned to different alarms – so that the user can “see” what caused the alarm.

When will alarms be set/reset

SeaNet-Alarm listens to the SeaTalk Bus for coming or going alarm conditions.

Instrument alarms – like shallow water, high wind speed etc. - have to be set and enabled in the SeaTalk instrument.

The Alarm output is activated when :

- An instrument newly sets the appropriate alarm on the SeaTalk Bus
- AND this alarm type is enabled in SeaNet-Alarm. (see Page 14)
- AND the Alarm is active longer than delay time set in SeaNet-Alarm (If delay time is set)
(see Page 13)

The Alarm output is reset when :

- An Instrument clears the appropriate alarm on the SeaTalk Bus
- OR the acknowledge button on SeaNet-Alarm is pressed
- OR alarm duration time, set in SeaNet-Alarm, is expired (see Page 14)

An alarm will be retriggered if the appropriate alarm is **reset** on the SeaTalk Bus and later **set** again.

If an alarm stays active on the seataalk bus and the alarm output is switched off by the acknowledge button or timeout, this alarm will only be retriggered after it has disappeared on SeaTalk and reappeared later.

A „SeaTalk instrument failure“ alarm is triggered, when an instrument (like depth, windspeed etc.) has sent data to the Seataalk network, and than suddenly stops sending data.

It is not possible to announce two or more alarms at the same time.

If two or more alarms are active at the same time, the first one will be announced.

When the currently announced alarm is acknowledged – by pressing the pushbutton or because it's alarm time has exired – the next alarm be announced.

If a second alarm comes and goes while the first alarm is still active, this second alarm will never sound.

Installation

Location

SeaNet-Alarm is build for interior use and for fully water proteced installation. It is not designed for outside use.

Since SeaNet-Alarm has LED's and a pushbutton, it is recommended to install it nearby the chart table or at a place that is easily accessible.

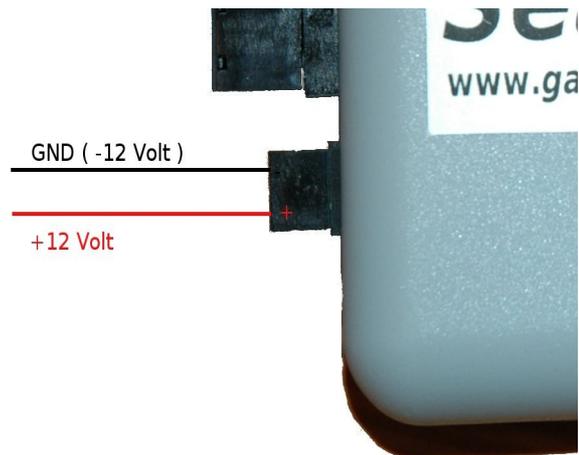
Wiring

SeaNet Alarm will be connected to

- SeaTalk Network
- Power Supply
- Alarm

Power supply

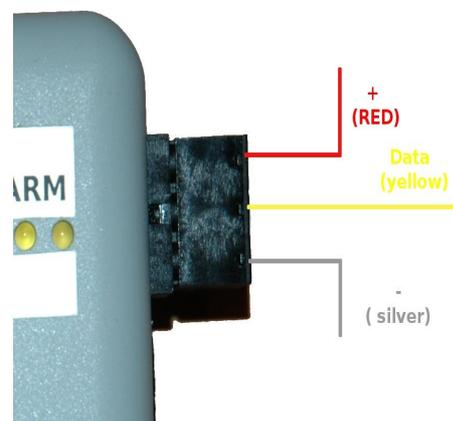
SeaNet-Alarm requires a 12 Volt power supply. This power supply is isolated from the SeaTalk network. This galvanic isolation protects the SeaTalk network and enables the SeaNet-Alarm to react to possible failures of the SeaTalk network – even if SeaTalk power should be disrupted.



SeaTalk Input

SeaNet-Alarm has a detachable 3 pin screw terminal for connection to the SeaTalk network.

Make sure to have the SeaTalk cable connected as shown in the picture.



Alarm out

SeaNet-Alarm has a detachable 2 pin screw terminal to connect one or more alarms, sirens or lights.

This output is protected against short circuits, has a thermal protection, an overvoltage and overload protection and current limitation.

Nominal maximum alarm current	3.5 A
Alarm current will be limited to	7.0 A

The Alarm output is a „**Low-Side Switch**“. Make sure to have the alarm horn, lamp etc. connected as shown in the picture.



The terminal “-“ has to be connected to GND (battery -12 Volt)
The alarm device will be connected between the output terminal marked „+“ and battery +12 Volt.

Configuration

SeaNet-Alarm comes with a USB cable and a configuration software for a standard PC. The configuration software is available for Microsoft Windows and for Linux.

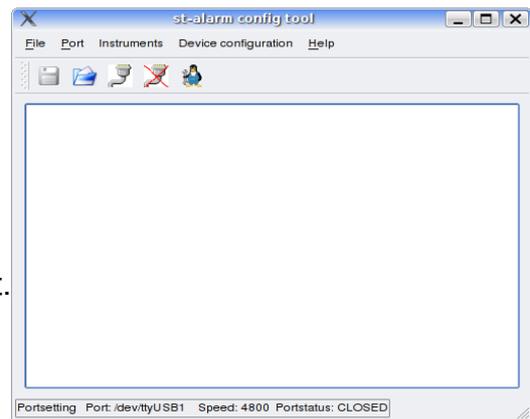
USB Driver installation

SeaNet-Alarm has a standard USB Port chip (FT232). On many systems the driver software is already installed. If it's not already installed on your Windows system - you'll find all the necessary drivers for Microsoft Windows on the CD
Every modern Linux system already has the necessary driver installed. Under Linux, normally there is no need for a special driver installation.

For Windows, the driver has to be installed BEFORE you connect SeaNet-Alarm to your computer. Please check the driver subdirectory on the CD for the driver installation manual.

Configuration software

The configuration software does not require any installation procedure. It consists of just one programme file. Under Windows there are also a few DLL's. Copy the programme file (and the DLL's) into a subdirectory on your computer and just start it. The programme can also be started from the CD directly.



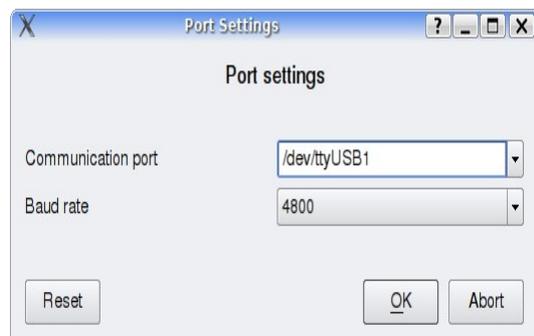
Port settings

When the programme is started for the first time, you have to set the communication port to SeaNet-Alarm.

Click on the Port → Parameter.... in the menu bar. The port settings dialog window will open.

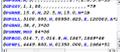
Type in the port at “Communication port”
Select “4800” at Baud rate.

Communication port could be
Windows: COM1, COM2, COM3,...
Linux: /dev/ttyUSB0, /dev/ttyUSB1,...



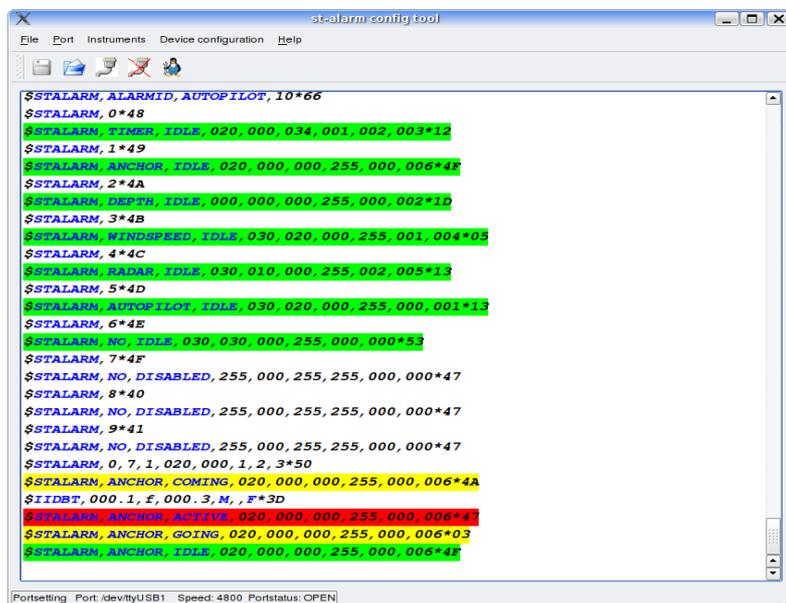
The actual port depends on your system and on other serial devices that might be connected to your computer. Press OK when finished.

The command buttons

Icon	Function
	Save port settings. If port settings are saved, the programme will load and use this settings at the next programme start automatically.
	Manually load previously saved port settings.
	Connect config programme to SeaNet-Alarm
	Disconnect config programme from SeaNet-Alarm
	Open configuration window.
	Toggle logging of raw SeaTalk data

Logging / Status window

The main window shows all commands sent to and received from SeaNet-Alarm.



```

st-alarm config tool
File Port Instruments Device configuration Help
$STALARM, ALARMID, AUTOPILOT, 10*66
$STALARM, 0*48
$STALARM, TIMER, IDLE, 020, 000, 034, 001, 002, 003*12
$STALARM, 1*49
$STALARM, ANCHOR, IDLE, 020, 000, 000, 255, 000, 006*4F
$STALARM, 2*4A
$STALARM, DEPTH, IDLE, 000, 000, 000, 255, 000, 002*10
$STALARM, 3*4B
$STALARM, WINDSPEED, IDLE, 030, 020, 000, 255, 001, 004*05
$STALARM, 4*4C
$STALARM, RADAR, IDLE, 030, 010, 000, 255, 002, 005*13
$STALARM, 5*4D
$STALARM, AUTOPILOT, IDLE, 030, 020, 000, 255, 000, 001*15
$STALARM, 6*4E
$STALARM, NO, IDLE, 030, 030, 000, 255, 000, 000*53
$STALARM, 7*4F
$STALARM, NO, DISABLED, 255, 000, 255, 255, 000, 000*47
$STALARM, 8*40
$STALARM, NO, DISABLED, 255, 000, 255, 255, 000, 000*47
$STALARM, 9*41
$STALARM, NO, DISABLED, 255, 000, 255, 255, 000, 000*47
$STALARM, 0, 7, 1, 020, 000, 1, 2, 3*50
$STALARM, ANCHOR, COMING, 020, 000, 000, 255, 000, 006*4A
$IIDBT, 000.1, 1, 000.3, M, , F*3D
$STALARM, ANCHOR, ACTIVE, 020, 000, 000, 255, 000, 006*47
$STALARM, ANCHOR, GOING, 020, 000, 000, 255, 000, 006*03
$STALARM, ANCHOR, IDLE, 020, 000, 000, 255, 000, 006*4F
Portsetting Port: /dev/ttyUSB1 Speed: 4800 Portstatus: OPEN
    
```

When installing or rewiring the system, it is helpful to see if SeaNet-Alarm is receiving any SeaTalk data from the network at all. The “logging of raw seataalk data” function helps to check the wiring. The button , switches this function on and off.

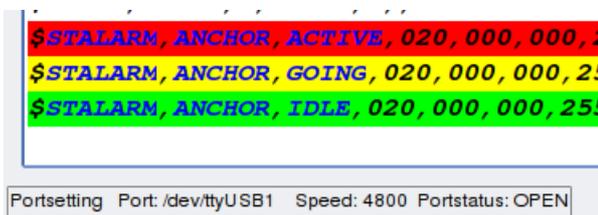
Please use this function with care. Every single successful received SeaTalk sentence will transferred to the PC and printed on the screen. This causes a lot of – normally unnecessary - data communication. In normal SeaNet-Alarm operating mode it could even cause loss of an alarm.

Use this function only when newly installing SeaNet-Alarm or when rewiring the SeaTalk network, to check if the network is operational and if SeaNet-Alarm is receiving SeaTalk data properly.

When you see SeaTalk data arriving – please switch this function off again.

Port Status

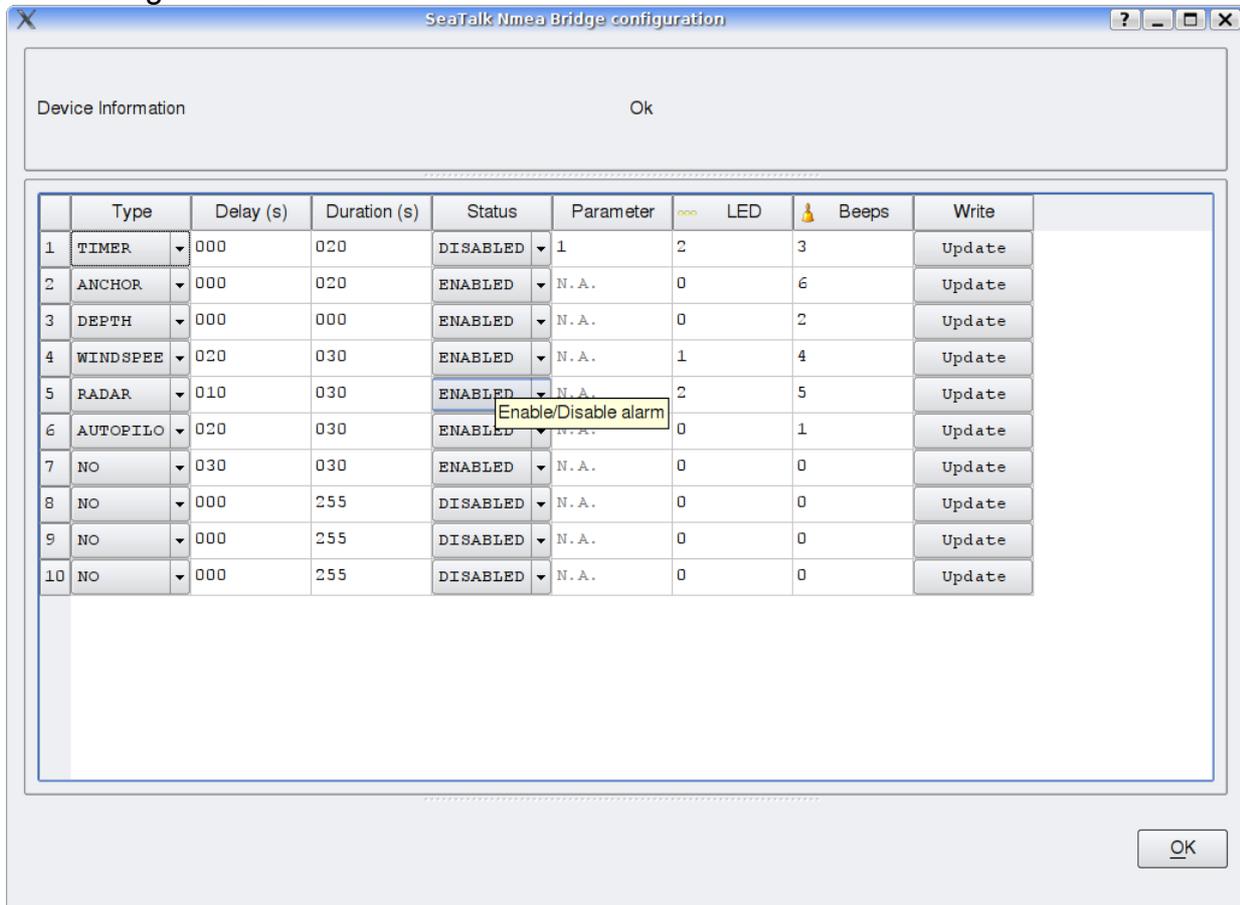
At the bottom of the main window the “Port Status” is displayed



Configuration window

When a port is selected and the programme is connected to SeaNet-Alarm (📡), the configuration window will be activated by pressing .

Main config Window



The software will read the current setting from SeaNet-Alarm.

Changes in the settings are sent to SeaNet-Alarm by pressing

As long as is not pressed, changes will not be transferred to SeaNet-Alarm.

Alarm Types

Type	Description
No	No alarm will be generated for this line.
SeaTalk	SeaTalk Network monitor. This alarm will trigger, if the SeaTalk Network should stop sending data altogether. It is not related to a special device. This alarm type checks if ANY seataalk activity is available. It indicates a wiring fault or power loss in the seataalk network.
Depth	This alarm will trigger when the depth instrument activates it's shallow alarm. Additionally this alarm will trigger if the depth instrument fails and stops sending data.
Anchor	This alarm will trigger when the depth instrument activates it's anchor alarm.
Windspeed	This alarm will trigger when the wind instrument activated it's „High Windspeed“ or it's „Low Windspeed“ alarm. (true or apparent windspeed) Additionally this alarm will trigger if the wind instrument fails and stops sending data.
Windangle	This alarm will trigger when the wind instrument activated it's „High Windangle“ or it's „Low Windangle“ alarm. (true or apparent windangle)
Transducer	This alarm will trigger when the depth instrument activated it's „Transducer defective“ alarm.
Radar	This alarm will trigger when the radar activated it's „guard band 1“ or it's „guard band 2“ alarm.
Timer	This type is an wake-up alarm clock. Alarm time can be set from „every minute“ to „every 254 minutes“ (4 hrs 15 minutes)
Autopilot	This alarm will trigger when the autopilot activates one of it's „auto release“ , „drive stopped“ , „off course“ or „wind shift“ alarms. Additionally this alarm will trigger if the autopilot fails and stops sending compass heading data.
XTE	This alarm will trigger when the autopilot activates it's „large cross track error“ alarms.
MOB	This alarm will trigger when an instrument sends a Man Over Board alarm.

Delay

Function : Supress alarm indication for a period of time.

In the field “Delay” you defined how long – in seconds - an alarm must be active before SeaNet-Alarm will signal it. If it comes and goes within this delay time, SeaNet-Alarm will not trigger it's alarm output.

Example :

You only want to be alarmed if Cross Track Error is active more than two minutes. If the autopilot brings the vessel back on course within two minute, the alarm should be suppressed.

Type "120" in the field "Delay" on that line, where XTE alarm defined.
Maximum delay time is 255 seconds

Duration

Function : How long the alarm will sound.

In the field "Duration" you define for how many seconds the alarm shall be active. After this time, the alarm sound will be switched off.
A value of 0 or 255 indicates that this alarm will not be switched off automatically. This alarm will stay active until the operator presses the acknowledge pushbutton or the alarm is cleared by the SeaTalk device that triggered it.

Status

Function : Enable or disable an alarm

Select "Enabled" or "Disabled".
An alarm will never become active when it is disabled.
To activate the alarm, select "Enabled"

Parameter

Some alarm's require additional parameters.
I.e. for the Timer alarm, the number of minutes is entered here.
This field is only active for alarms that require an additional parameter.
Just place the mouse cursor on the filed to get additional information.

LED

An alarm can additionally indicated by one of two LED's.
"1" = Led 1 will be switched on when alarm becomes active.
"2" = Led 2 will be switched on when alarm becomes active.
"3" = Led 1 and LED 2 will be switched on when alarm becomes active.

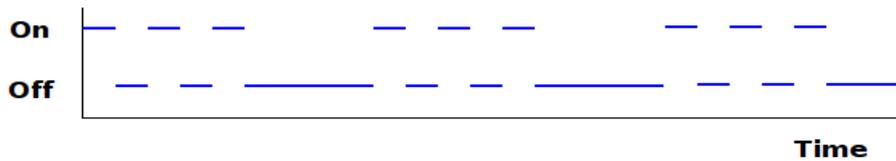
Beeps

Different sound patterns can be assigned to different alarms. With this function, it can be “heard” which alarm has been activated.

The number entered here is the number of beep's for this alarm.

Example : Beeps set to “3”

The Alarm will sound 3 times for one second, after a short period silence it will sound again 3 times and so on.



Pushbutton and LED's

SeaNet-Alarm has 1 pushbutton and three LED's.



The pushbutton has two functions:

1. Alarm acknowledge
If an alarm is active, it can be acknowledged by pressing the pushbutton for about 1 second. Acknowledge will switch off the alarm.
2. Temporarily disable Timer Alarm

The main purpose for timer alarm is to wake single handed sailors after a period of time so that they can check the boat and the cruising environment. During daytime this function might not be needed. It can be switched off without having to have the computer connected.

Press the pushbutton for more than 7 seconds.
The status led will blink slower (approx every 4 seconds)
Timer alarm is now disabled.

Press the pushbutton for more than 7 seconds again.
The status led will blink faster again (approx every second)
Timer alarm is now enabled again.

LED's

Status Led blinking every second	: Device active, Timer alarm enabled
Status Led blinking every 4 seconds	: Device active, Timer alarm disabled

Hardware test

St-Bridge has a function to test

- LED's
- Pushbutton
- Alarm Output

After SeaNet-Alarm is switched on, it will run in hardware test mode for 10 seconds. During hardware test mode, the led's will be switched on one after the other.

When the pushbutton is pressed, the alarm output will be activated.
When the pushbutton is released, the alarm output will be deactivated.

Software Update

The Board Software can be updated by using the built in Bootstrap-Loader function.

If you find anything missing in the Software, if you should find any software errors or if you have new ideas – just sent a mail to alarm@gadgetPool.de

New / revised software can be sent by E-Mail and the SeaTalk-NMEA-Bridge owner can update the controller software him/herself.

Bootstrap method advantages :

No Hardware programmer needed.

Just a USB connection to PC and a PC Software is needed.

Fuses and Bootstrap Software can not be erased accidentally.

Latest Software versions can be found at <http://www.gadgetPool.de>

Connect SeaNet-Alarm to your PC (using USB Port)

Open a terminal programme (i.e. hyperterm) and set it to **4800 Baud**, 8 Bit, no parity, no handshake.

Type “ \$xxx “ and press ENTER 

The device responds with “ \$xxx “. If you receive the \$xxx, connection to your device is ok. If \$xxx does not appear after you pressed ENTER, check connection, setting of Com-Port, Baudrate etc.

Enter \$SWUPDATE 

The bridge will respond with

Software Update Function will start in 40 sec.

...

Close the terminal programme.

Start the supplied bootstrap software (Megaload) on the PC.

Open the Image file you would like to program into the Bridge.

Select your serial port in bootstrap software

Select **9600 Baud**

After the 40 sec timeout, the Bootstrap Software finds the SeaTalk NMEA Bridge and flashes the new software.

The default timeout of 40 seconds can be adjusted.

Just enter \$SWUPDTE,xxx  , where xxx is the timeout in seconds.

News and Info on the web.

If you have any questions or suggestions – there is a SeaNet-Alarm forum on our web page. <http://www.gadgetPool.de> or you can send mail to alarm@gadgetPool.de

Technical Data

Power input	:	9-15 Volt DC
Current draw	:	~ 16,8 mA (all LED's off)
	:	~ 1,2 mA (per LED)
Maximum switched current	:	3.5 A, 11-15 Volt DC. Low Side switch.
Dimensions	:	8 cm x 5,5 cm (without Plugs)
Dimensions	:	11 cm x 5,5 cm (with Plugs)