

Boat Keeper security & alarm system

To prevent damage or destruction of the security system, PLEASE before using security device carefully read this **USER MANUAL**

Introduction

The "Boat Keeper" is a stay alone security, alarm and control system uses latest technology and low consumption components to help you keep your vessel in safety and under control from wherever you are in the world. This device has been specially designed for any types of boats and it keeps under control 10 main boat parameters, manage a few devices and communicate in real time with three mobile phones.

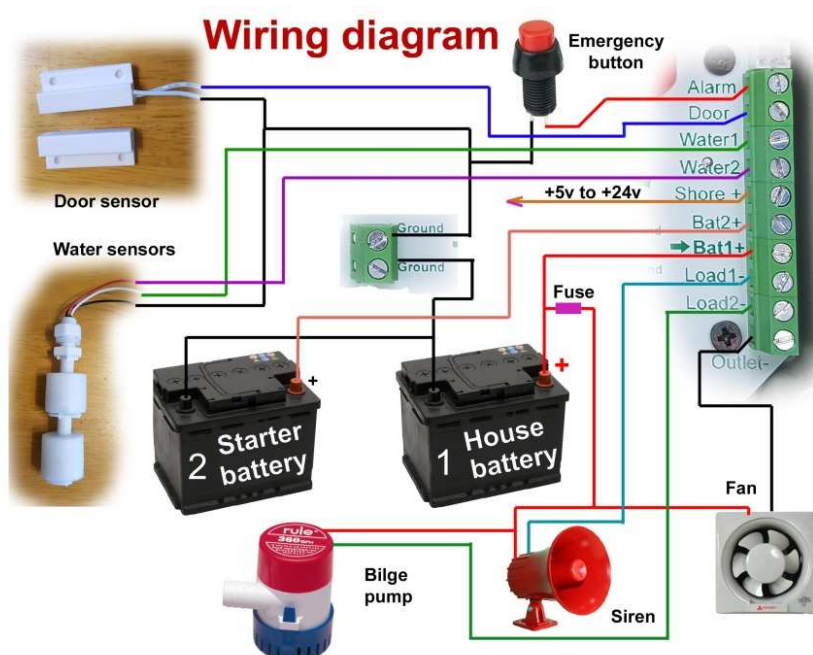
It gives you the best option to know, control and manage some devices on your boat all the time through a mobile phone. The "Boat Keeper" provides this service through the 3G network – this means it has fantastic coverage around New Zealand and up to 120kms offshore.

Overview

- Controls up to 10 main boat parameters: entrance door; two water levels; two batteries; shore power; temperature; humidity; Geo location; emergency button.
- Makes a proper action for each event.
- Report/Alarm message included all parameters.
- Time settings from 1 second to 45 days.
- Change settings for all events and proper actions.
- Arm or Disarm of the system via free short call.
- Arm/Disarm/Disable the system via SMS messages.
- Remote setup via SMS messages.
- Extra one power outlet with timer managed by SMS.
- Stay alone device, no annual fees. Expenses based on customer activities, can be up to NZ\$20 a year.
- Internet version with control panel on a web server will be launched over the next few months.
- Alarm actions to each event have varied repeat time gap.
- GPS location by SMS request or local emergency button.
- Set Geofence by SMS message from 10 to 225 meters.
- All GPS messages included link to Google Maps.
- Speed & direction in GPS report, if boat moving.
- Device communicates with registered numbers only.
- Remote voice listening. Auto answer then user dialing.
- Free smart phone configuration software.

Installation of "Boat Keeper" security and alarm system

Before the installation you need to find an optimal location for the main box, door sensor and water sensor. The main box has a built in antennas and should be located in any area with good reception, not covered by metal screens or walls and held above the outside water level. Non-metal constructions are not a real obstacle for airwaves and do not reduce reception for GPS and GSM networks. The suitable location could be found by using an ordinary mobile phone and viewing the level of reception on the mobile phone screen and GPS functionality. External mobile network and GPS antennas can be connected to SMA socket on the main board, instead of internal antennas. The main box can be mounted by four screws on a wall or by any other safety methods (glue, cable tie) in a reachable place for visual control and manageability. The water level sensor can be fixed in an expected water level area. This area should be protected from mechanical damage. Usually, these sensors mounted under the boat's floor in the lowest section. The magnetic door sensor consists of two parts. First part is the wired switch which can be fixed on a wing of a door or on any other places that is located near a sliding or an opening door. The second part of the door sensor has a magnet inside and does not require any connection. This part should be mounted on the moving part of the door. For stable control of a shut door, the distance between two parts of the door sensor should be close as possible and not more than 14 mm. More attention is needed to provide for cabling between the sensors and main control box. All wires need to be protected from mechanical damages and salt water.



*** We recommend an installation service provided by a certified boat electrician.**

Wiring connection

Turn off all power sources by removing the positive cable from all boat batteries before starting wiring work. When all parts have been mounted, it is time to connect all wires to the main controller. Main box connector for peripheral sensors is located inside of the antispray case on the same board with the main microcontroller. It has 12 connect points which should be connected as shown on the recommended wiring diagram. Please insert the SIM card before powering the system or when GSM module is switched off. When all wires and batteries have been properly connected, the cool start of the security device can be up to 1minute time.

Manage and control

“Boar Keeper” security system can be controlled and managed by five light indicators and one reset connector. This table shows light conditions and proper system states.

System Status light (Green led)	
Continuous lighting	system is busy
One blink every second	system waits for fist owner call
One short blink in 3 seconds	normal system functionality
Approximately 1.5 seconds on and off	read GPS coordinates
5 times On and Off in one second	mobile phone network activation
Mobile Phone Network light (Blue led)	
One short blink in one second	Network module works, but not connected to network
One short blink in 3 seconds	Network module works, normal mobile phone reception
No light	Network module is switched off
Load indicators light (Yellow)	
L1 / L2/Outlet continuous lighting	Load1 / Load2 / Outlet - switched on
L1 / L2/Outlet no light	Load1 / Load2 / Outlet - switched off
Reset connector	
Shorting pins for 3 seconds	switch on/off mobile network (for SIM replacement)
Shorting pins for 6 seconds	clean owner’s phone number (keep other settings)
Shorting pins for 12 seconds or more	clean all data, return to factory settings

When the power has been connected, the microcontroller will try to prepare all systems for normal functionality. This process requires up to 1 minute or more if there are any problems with the SIM card or reception. During this process the status light will be switched on. The SIM card should be installed or replaced before powering on or when the mobile network module is switched off (shorting reset connector for 3 seconds). After initialisation, if the system does not have the owner’s number, it goes to a special mode waiting for a first call from owner. In this mode the status LED blinks every second. The network LED should have one short blink every 3 seconds. These states of LEDs mean that the system is ready for communication through the mobile network and waits for first call to save this number as owner number. It is time for owner to make a first call to the mobile number of the installed SIM card in the system. During one or two rings the owner’s number will save in the non-volatile memory and the system will be ready to work with default settings and receive any commands or configuration settings from owner’s phone number only. Please mind about alarm gaps if you already received alarm message and try to test the same sensors again. All alarms and report gaps reset after the settings update or alarm activation. (send SMS “Alarm on”)

Default (factory) settings

Once the system starts up for the first time or after a full reset, it has the following default settings:

SYSTEM EVENT	ACTION
Door alarm	Make a call and send SMS alert to registered phone
Water on level 1 (more than 9 seconds)	Send SMS alert and switch load1 on (pump)
Water on level 2 (more than 9 seconds)	Make a call, send SMS alert and switch load1 on
Critical voltage on the battery1	Send SMS alert and switch off load1 and load2
Critical voltage on the battery2	Send SMS alert and switch off load1 and load2
Critical temperature	Send SMS
Critical Humidity	Send SMS

PARAMETER	VALUE
Minimal voltage on house battery(battery1)	10.7V
Time interval before next alert for same event	24 hours. Once a day (from 0 to 999)
Time interval for automatic report	168 hours. Once a week (from 0 to 999)

Maximal temperature	40°C
Maximal humidity	90%RH
Time delay to confirm water on level 1 and 2	9 seconds
Minimal working time for load 1 and 2 (if started)	6 seconds.*
Maximal working time for load 1 and 2	90 seconds
Waiting time before powering again	60 seconds
Power mode	0 (from 0 to 4)**
Call out duration	15seconds (from 0 to 99 seconds)***

* Extra working time for load 1 and 2 can be used to take more water out, extra time for siren or for any other reasons to prevent very short time device usage after event. (Bilge pump, siren)

** Power mode 0 – all system switched on and ready for communication in real time.

Power mode 1 – Mobile network transmitter works 15 minutes every hour, to check incoming messages.

Power mode 2 – network transmitter is switched on for 15 minutes to check messages every 4 hours.

Power mode 3 – network transmitter is switched on for 15 minutes to check messages every 12 hours.

Power mode 4 – network transmitter is switched on every day for 15 minutes to check messages.

Anyway the system will be activated by any internal events or automatic report in all power modes. Immediately the mobile network transmitter will start and send a SMS message or make a call. After any sent message or call the network module stay switched on and ready to receive messages and calls. Without network activity in 15 minutes the system goes to sleep state if power mode is not zero.

*** Call out duration includes time to establish connection and make a call. The connection time is not stable and can be different in your area and the day time. Call duration time should be enough to recognize this call by recipient and not reach time to start answering machine. Free short call will not spend any money on your account (miss call).

Communication with system

“Boat Keeper” can recognise SMS messages and calls from three registered phones only. The requests from any other numbers will be ignored and deleted. Incoming calls from registered numbers can be recognized as two different commands, depending on calling time duration (number of rings in the call session).

✓ Make a call with **one ring** only – recognised as a request to arm the door alarm and send confirmation SMS.

✓ Make a call with **three rings** – recognised as a request to disarm the door alarm and send SMS.

✓ Make a call and wait before the auto answer - remote voice listening. (For master phone only)

These Three type of calls work in power **mode0** or when GSM module is still active in other power modes.

All SMS messages from registered phones will be tested and compared with the next commands:

COMMANDS	DESCRIPTION
<u>Report</u> or <u>report</u>	Send back to requested phone number the current system state report
<u>Gps</u> or <u>gps</u> or <u>GPS</u>	Start GPS module, calculate GPS coordinates and sand current boat location, move direction*, speed* and link to Google Map
<u>Alarm on</u> or <u>Alarm off</u>	Arm or disarm door alarm only
<u>Disable</u> or <u>disable</u>	Disable all alarms and automatic reports completely.
<u>Confirm on/off</u>	Activate or deactivate send confirmation message for most commands.
<u>Fence on 75</u>	Request to establish Geo-Fence alarm area in 75 meters.(10m to 225m)
<u>Fence off</u>	Deactivate Geo-Fence control and alarm monitoring.
<u>Outlet on 15</u>	Powering outlet for 15 minutes or constantly if no number.(1-65500min.)
<u>Outlet off</u>	Cut off power from outlet.
<u>Beep 18</u>	Set the local beeper alarm duration in 18 seconds.
<u>Microphone 7</u>	Set local microphone sensitivity to 7. Available from 0 to 15.
<u>Help</u> or <u>help</u>	Request for help message. Any wrong command activates help message.

* This parameter is not appearing if speed near zero.

Emergency Button

Once when emergency button has been pressed, the Boat Keeper will do next actions:

starts local beeper alarm; read current coordinates; make a short call to every registered number; send alarm message to every registered number as this sample: **SOS! Alarm button has been pressed! Geolocation**

<http://www.google.com/maps/place/-36.90187,174.86861> NO_Water1 NO_Water2 Bat1:12.7v,Bat2:12.9v

This button can be used to capture exact location of your boat for many reasons.

Shore power control

This option is appear in reports and will be monitored automatically when positive voltage from 5 to 24 volts will applied to “Shore+” input for more when 1 minute. Alarm message will be activated and sent in 15 minutes after disconnect power from “Shore+” input. Boat Keeper remembers shore activities one day, after that time this option disappear from reports.

Report message

This message can include the next content: **Report: Door_Shut Armed NO_Water1 NO_Water2 Shore_OK Geo34m-1,3 Bat1:12.5v,Bat2:12.8v Temp: 23.8C,Humid:53%RH Recep:63%,0 L1:OFF/35 Outlet_ON:37Min.left Bals:\$16.80 Run:15Day(s) R1**
Abridgement: Geo34m-1,3 – Geo Fence established for 34 meters and controlled from first and third registered phone numbers. Recep:63%,0 – Level of radio signal(reception) and collisions. L1:OFF/35 - Load1 is OFF and it worked 35 seconds totally. Not appear in the report if zero. The number resets monthly. Outlet_ON:37Min.left – Outlet is ON and will be switched OFF in 37 minutes. SIM card balance before send this message. Run:15Day(s) – Running time from last system restart. R1 – Number of system restarts.

Alarm message

If any monitored event will happen on the boat, a short call or an alarm SMS message will sent to proper phone numbers. The next alarm message for the same event will be sent again after time expiration set for “Alarm Gap” in the settings.

The alarm message points critical parameters by exclamation marks as next sample:

!ALARM: Door_Shut Armed !!WATER1 NO_Water2 Bat1:12.0v,Temp: 25.2C,Humid:59%RH Recep:42%,0 L1:0N/6,Run:21Day(s) R1

Account Balance

The balance control can be activated in system settings with appropriate request for mobile service provider. In New Zealand this request available through the SMS message included text “Balance”. For 2degrees need to use 233 number, for Vodafone 777. Account balance automatically updated in 5 minutes after any sent message or made a call. The report or alarm message included previous balance amount that was read before sent last message.

Change parameters

All settings can be changed in mobile phone application “Boat Keeper” and sent these new settings to the security device by ordinary SMS message. This configuration message can be accepted from owner mobile number only. After successful settings update, the owner will received SMS message “Device settings have been received and applied”, all alarm and report values will be restarted.

For more details, please contact us by e-mail: info@keeper.nz