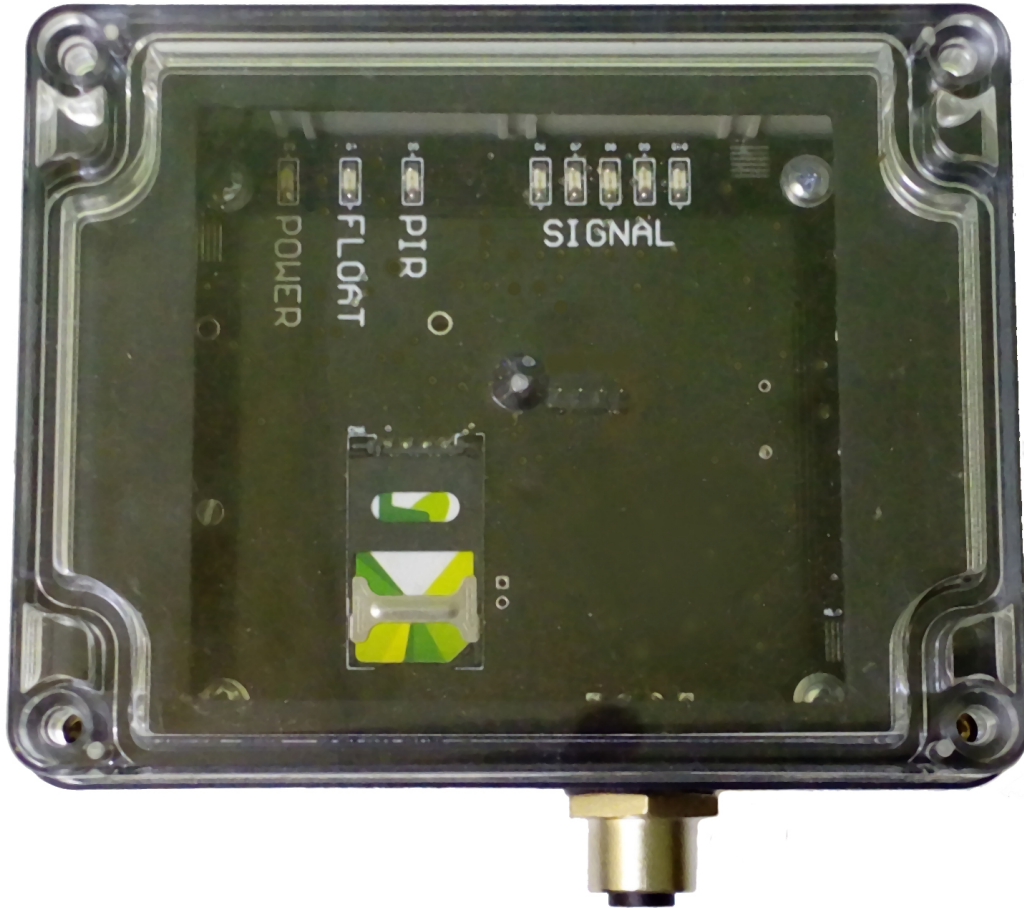# Boat Save

Installation and user manual.

Overview

 The purpose of the Boat Save, is to monitor bilge level, battery condition, and intrusions (optional). It communicates entirely through simple SMS messages, and does not involve apps, internet data, or any cloud services. The unit is hermetically sealed to protect the electronics from condensation in humid environments.
 The unit has a dedicated float switch, and will alert the owner immediately if the bilge exceeds this level, or if the battery drops below 11V. Optionally, a PIR detector can be fitted, which will alert the owner of intruders. Also, if power is lost completely, the unit holds enough charge to send a "Power lost" message.
 SMS messages regarding bilge level, low battery, or intruders may be limited to once every N hours. This is user configurable to prevent nuisance messages in circumstances which may generate excessive alerts. Additionally, the unit will also respond immediately to any "Query" messages from the user, thereby offering constant peace of mind.

Installation

The unit requires installation by someone with competent wiring skills. It contains an internal 3G antenna, and should be orientated as shown in the picture to achieve the best signal strength. The enclosure is not UV stable and it must not be mounted in direct sunlight.

The float switch must be mounted above the float switch for the bilge pump. It is recommended to mount the switch such that it's contacts remain 'normally closed', and open when the bilge level is high. That way if wiring to the float switch fails open, a "Bilge Alarm" SMS will be sent. The Boat Save may be configured for either a N/O (normally open), or N/C (normally closed) contact.

If a PIR sensor is fitted, it is recommended to mount the sensor inside the cabin where it will not pickup people passing by or birds. A wide range of sensors are available from most electronics retailers. If the boat has a small solar panel (~5W), some consideration should be given to the sensors current draw. Typical current draw for a PIR sensor is 5-10mA.

Connections:

Boat save wiring diagram
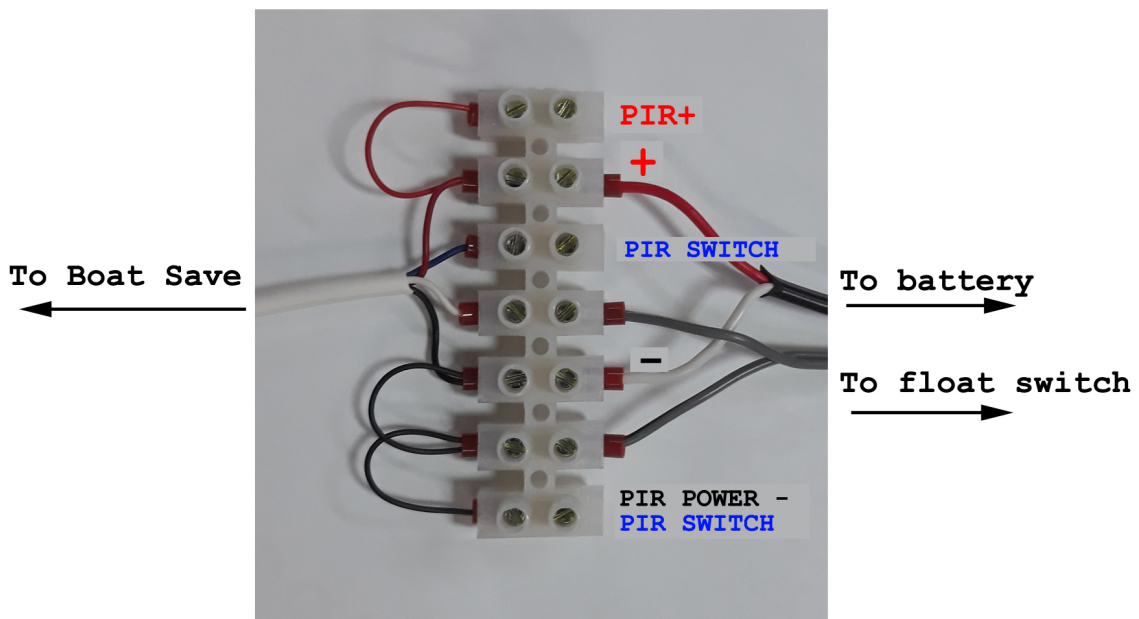
Operation

Power up.
 On power up, the Power LED will flash for 60 seconds, no other functions are available during this time.
 After this, the power LED will light constantly and the unit will register with the mobile network. The Float and PIR LED's will light when either input is active. Once network registration occurs, the Signal LED's will indicate signal strength 1-5 bars. If the owners number has been stored in the device a "Power ON" SMS will be sent. Otherwise the owner must text the device with "Owner" for their number to be stored, the device will respond with "Boat Save ready".

Bilge level alerts:
 If the float switch input remains active for more than 5 seconds, a "*Bilge alarm*" SMS will be sent to the owner. Further "*Bilge alarm*" alerts will be muted for 24 hours. This mute period is configurable from 1 second to 7 days, or bilge alarms may be disabled entirely.

Boarding alerts:
 If the PIR detector triggers, a "*Boarded*" SMS will be sent to the owner. Further "*Boarded*" SMS messages will be muted for 24 hours. Like bilge alerts, this period is also configurable, or it may be disabled entirely.

Low battery alerts:
 If the battery voltage drops below 11V for more than 5 seconds, a "*Low battery #.##V*" message will be sent to the owner showing the battery voltage. Note that this may occur inadvertently during cranking when the engine is started. Further low battery messages will be muted for 24 hours. This period is also configurable, or low battery alerts can be disabled.

SMS commands

The following SMS commands are available for configuring the device, and querying the input status. SMS commands are responded to live (typically within 15 seconds).

Query

The query command will respond with battery voltage, bilge level (high or ok), the last time the boat was boarded, and the signal strength. It will also reset muting of Bilge, Boarded, and Low battery alerts.

Query
10:26 PM

Battery 12.31V
Boarded (never)
Bilge ok
Signal 4 bars

10:26 PM
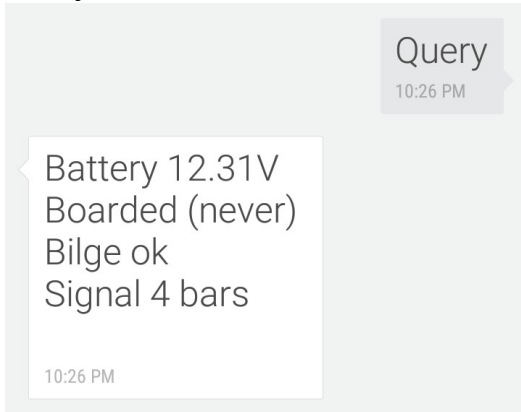
Owner

This command saves the owners phone number. The device will respond with "Boat *Save ready*". If the device is already owned by someone else, it will respond with "*Already owned by PH#*".
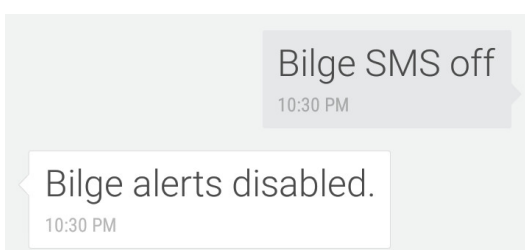
Owner
10:26 PM

Boat Save ready.
10:26 PM
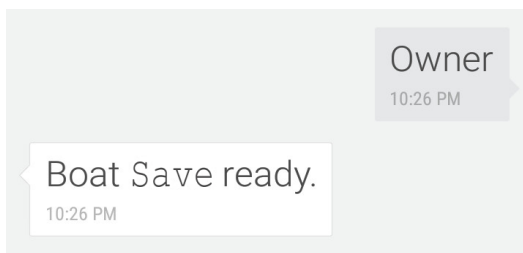
Stop

This command, when sent by the owner, will erase the owners number from the device. The unit will respond with "*Bye*".

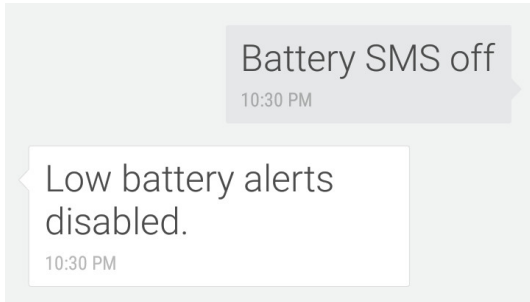Stop
10:28 PM

BYE
10:29 PM
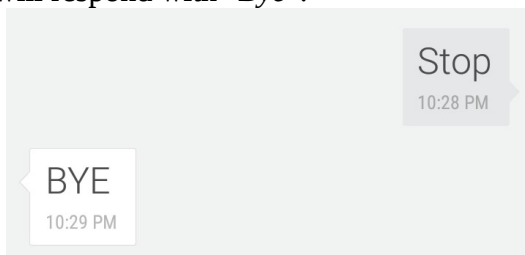
Bilge SMS off

This command will disable bilge alerts.

Bilge SMS off
10:30 PM

Bilge alerts disabled.
10:30 PM

Battery SMS off

This command will disable low battery alerts.

> Battery SMS off
> 10:30 PM

> Low battery alerts disabled.
> 10:30 PM

Boarded SMS off

This command will disable boarding alerts (PIR sensor triggers).

> Boarded SMS off
> 10:31 PM

> Boarded alerts disabled.
> 10:31 PM
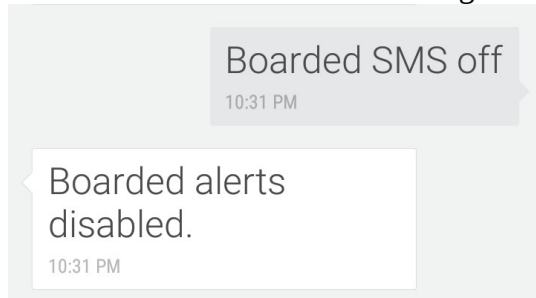
Power SMS off

This command will disable the "*Power ON*" and "*Power lost*" messages that occur on power up, or power loss. The unit will respond with "*Power ON/OFF SMS alerts disabled.*"

> Power SMS off
> 10:31 PM

> Power ON/OFF SMS alerts disabled.
> 10:31 PM
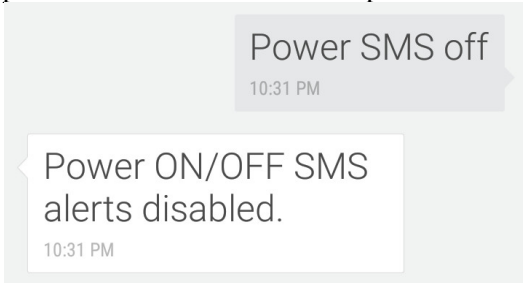
Power SMS ON

Opposite to the above, this command re-enables "*Power ON*" and "*Power lost*" messages. The unit will respond with "*Power ON/OFF SMS alerts enabled.*"

> Power SMS on
> 10:32 PM

> Power ON/OFF SMS alerts enabled.
> 10:32 PM
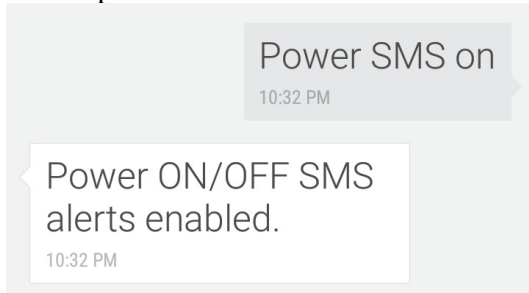
Bilge mute <time>
Where time is a number followed by s/m/h/d for seconds/min/hours/days.

Examples:
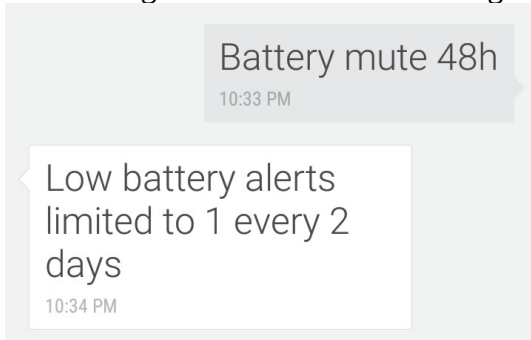**Bilge mute 30m**
Bilge mute 9h
Bilge mute 2d

This command configures the bilge mute period. This means that after a bilge alert occurs, another bilge alert cannot be sent for this period, unless a **Query** command is received, which resets the mute. This setting can be anything from 1 second to 7 days. The default is 24 hours

> Bilge mute 18h
> 10:32 PM

> Bilge alerts limited to 1 every 18 hours
> 10:33 PM
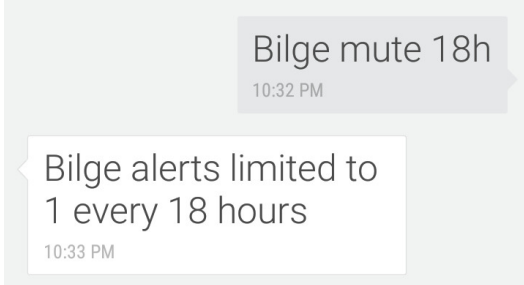
Battery mute <time>
This setting works the same as the bilge mute setting, only for low battery alerts.

> Battery mute 48h
> 10:33 PM

> Low battery alerts limited to 1 every 2 days
> 10:34 PM

Boarded mute <time>
This setting works the same as the bilge mute, and battery mute settings, only for Boarded (PIR) alerts.

> Boarded mute 6h
> 10:34 PM

> Boarding alerts limited to 1 every 6 hours
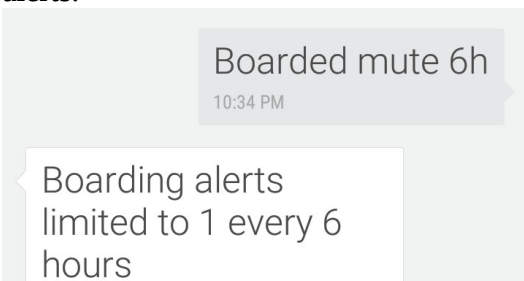
Float N/C

This command configures the unit for a normally closed float switch contact, (contact closed when bilge is low, open when bilge is high). This is the default setting.
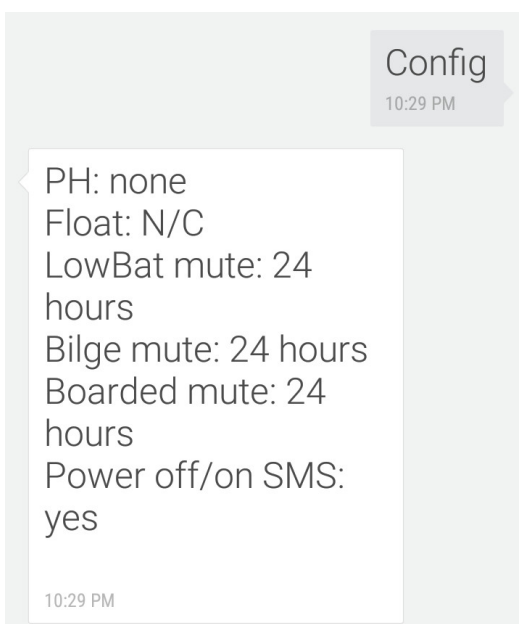
> Float n/c
> 10:35 PM

Float switch normally closed.
10:35 PM
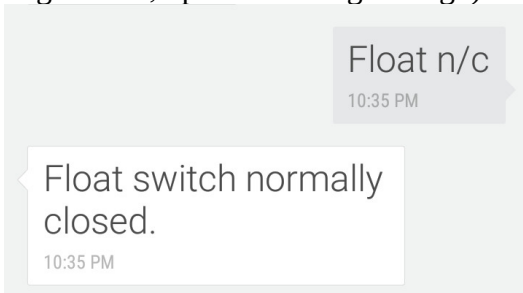
Float N/O

This command configures the unit for a normally open float switch contact, (contact open when bilge is low, closed when bilge is high).

> Float n/o
> 10:34 PM

Float switch normally open.
10:35 PM
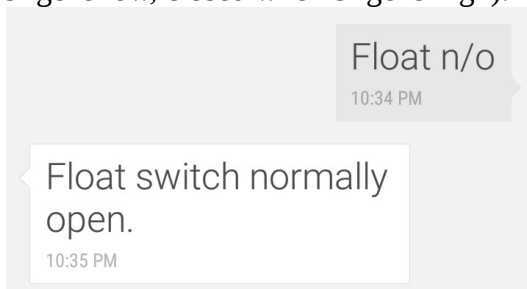
Config

This command responds with the devices full configuration, including:

       Owners phone number
       Float input N/C or N/O
       Low battery mute period
       Bilge alarm mute period
       Boarding mute period
       Power on/off SMS enabled/disabled.

> Config
> 10:29 PM

PH: none
Float: N/C
LowBat mute: 24 hours
Bilge mute: 24 hours
Boarded mute: 24 hours
Power off/on SMS: yes

10:29 PM

Specifications:

Operating voltage:	7-18V
Network:	3G
Power consumption:	0.25W
Temperature range:	0-40°c
Input characteristics:	Ground switched, internal 15k pullup to Battery+