V 0.99

SENTINEL
Marine solutions

Sentinel
Boat Monitor BM-50

Installation Guide

(Lite, Standard and Pro versions)

INSTALLATION PARTS - INCLUDED

- Sentinel Boat Monitor device
- Installation bracket
- 4 self-tapping screws
- User manual
- Warranty

OPTIONAL PARTS

- Magnetic door switch (SKU:A1012)
- Bilge float sensor (SKU: A1013)
- Shore power sensor (SKU: A1009)
- External GPS antenna with 3m cable (SKU: A1052)

1. Install the Sentinel App

To start using your Boat Monitor device you should install the “Sentinel Marine solutions” app for your platform and create a Sentinel account.

1.1 Using the Sentinel App

To access the boat's data you need a Sentinel Boat Monitor installed and a Sentinel app for your mobile device. Use Play Store for Android or App Store for iOS and search for “Sentinel boat” app.

1. If you already have have a Sentinel account skip steps 2-6 and select Login, otherwise select Register
2. Enter your email address and choose a password
3. A verification email will be sent to the address you have entered. Please check your “Spam” folder if you haven’t received it

4. To verify your email address click on “Validate email address” button
5. Email address is now verified. You can proceed with using the Sentinel app
6. Terms of Use, Privacy Policy need to be accepted before using the app
7. Select the plus sign “+” in the top of the screen

8. Scan your QR Code (found on the device or in the installation manual)
9. Input the name of the boat. Before boat's data can be received you need to activate the Sentinel Boat Monitor

10. To activate the Sentinel Boat Monitor, follow the instructions to input the activation code
11. Enter the activation 6 digit PIN code (which can be found on the device or in the installation manual)

NOTE! Please note that it might take up to 15 minutes for your device to start sending data to your mobile device.

2. Installation Guide

Selecting a correct installation spot is essential for optimal device performance.

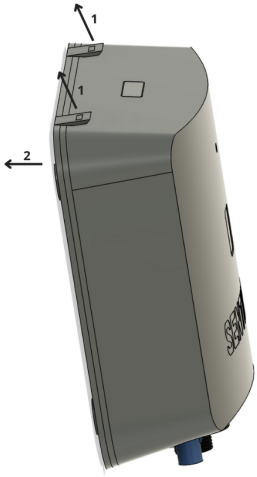
The BM-50 is primarily designed for wall mounting. Connectors should always face down (towards the ground) as shown in figure to achieve optimal positioning accuracy with built-in antennas. Unless an external GPS antenna with extension cable (optional, not included) is used, other orientations of the device will cause poorer satellite reception and will lower the positioning precision. The sky view above the device or GPS antenna with extension cable should not be obstructed with any metal objects, pipes or conductors.

The BM-50 device should be installed in a dry location away from direct contact with water and should not be exposed to direct sunlight. Operating temperatures above 50 degrees Celsius may lead to irregular operation and damage to internal components of the Boat Monitor. It is important to follow these guidelines to ensure the proper functioning and longevity of the BM-50 device.

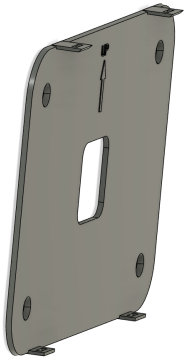
2.1 Wall mounting

The BM-50 features an installation bracket that allows simple device installation and replacement. The bracket is fixed to the wall using 4 screws or adhesive tape.

1. Remove the bracket by gently lifting the clips on top of the device (1), and then pull the bracket away from the device.



2. Attach the bracket to the wall using included self-tapping screws or adhesive tape. Be careful to retain the bracket orientation as the top and bottom clips on the bracket are different. Top clips are longer than bottom ones.



3. Install the device back to the bracket inserting the bottom clips first (1) and pushing it towards the bracket at the top (2).

2.2 Electrical connection overview

Device features 5 external connectors (cables). From left to right there are:

1. External GPS antenna connection (Standard and Pro version),
2. 5-pin M12 CAN2 connector (Pro version),
3. 18-pin Main cable (Standard and Pro version) or 10-pin Main cable (Lite version),
4. RJ45 ethernet connector (Pro version),
5. 5-pin M12 CAN1 (NMEA2000) connector (Standard and Pro version).

Main device connection is achieved through an 18 wire main cable harness (or 10 wire in case of Lite version). Power is supplied through red and black wires of the harness; individual wire functions are listed in the table below.

2.3 Wire color code description

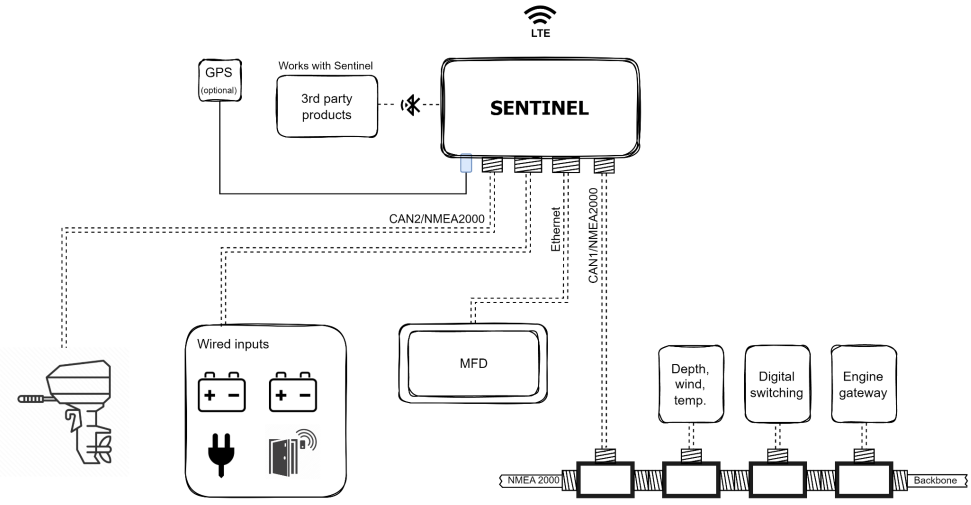
Color	Function	Description	versions
Yellow	VIN2	Voltage Input 2 - Engine battery (port)	Lite , Standard, Pro
Blue	Shore	Digital input 1 - Shore power**	Standard, Pro
Red	VIN1/Supply	Voltage input 1 - Service battery + BM-50 power supply	Lite , Standard, Pro
Green	Door	Digital input 3 - Door sensor**	Lite, Standard and Pro
Black	GND	Ground	Lite , Standard, Pro
Purple	Bilge	Digital input 2 - Bilge sensor**	Lite , Standard, Pro
Brown	VIN4	Voltage input 4 - general purpose	Standard and Pro

Color	Function	Description	versions
Red-blue	PIR	Digital input 4 - PIR sensor**	Standard and Pro
Pink	VIN3	Voltage input 3 - Engine battery (starboard)	Lite, Standard and Pro
White-green	RS485_N	RS-485 A (-)*	Standard and Pro
Grey-brown	GND	Ground	Standard and Pro
White-yellow	RS485_P	RS-485 B (+)*	Standard and Pro
Pink-grey	RS232_RX	RS-232 Rx*	Pro only
White-grey	Relay Common	Relay Common	Standard and Pro
Green-brown	RS232_TX	RS-232 Tx*	Pro only
White	Relay 2	Relay 2 Contact	Pro only
Yellow-brown	Unused	unused	
Grey	Relay 1	Relay 1 Contact	Standard and Pro

* contact Sentinel for more information on supported protocols

** bilge, door, PIR and shore power inputs can be changed to other digital sensor types. Use Web or Mobile App to change sensor type from their default values

Typical installation block diagram is shown below



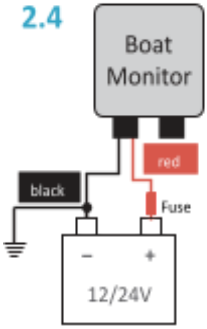
2.4 Power supply connection

To ensure continuous monitoring, the device should be connected to a constant power source. When connecting any power or voltage input directly to the battery, it is important to protect the battery and electrical circuit from

potential damage by installing a fuse holder with a 1 A fuse on the positive (+) power cable as close as possible to the battery terminal.

Connect the red wire through a fuse (fuse should not be inserted until installation is complete) to permanent power source (battery).

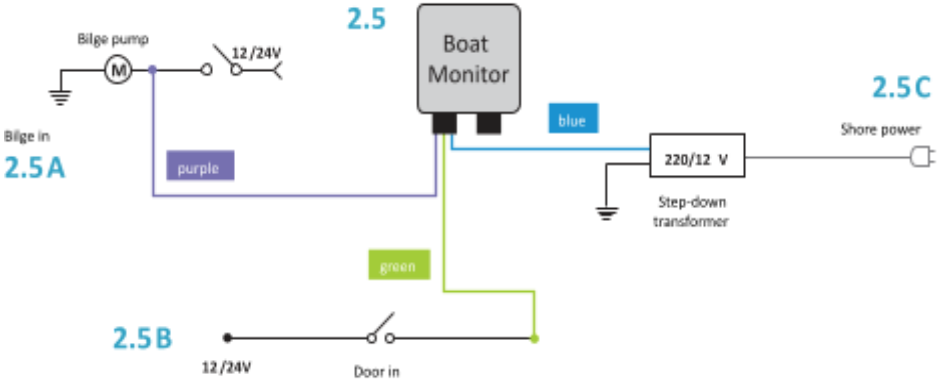
Connect the BLACK wire to system ground.



Power supply / Voltage 1

2.5 Bilge, door switch connection and shore power detection

Boat monitor comes with predefined digital input configuration shown on wiring diagram 2.5. If a different configuration is required, digital inputs can be reconfigured in the Sentinel app.



DEFAULT DIGITAL INPUT CONFIGURATIONS

A: Purple - bilge sensor: used for float switch or bilge pump activity detection as shown in fig. 2.5A. The input uses ACTIVE HIGH logic by default. If active low logic is required please contact support.

B: Green - door sensor: used for door alerts. Connect magnetic switch as shown in fig. 2.5B. The input uses ACTIVE LOW logic by default (switch open when the door is open). If active high logic is required please contact support.

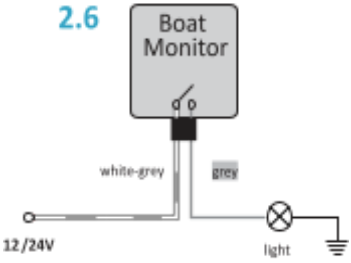
C: Blue - shore power presence detection: used for alerts on shore power disconnection. Connect a step-down transformer (not included) as shown in fig. 2.5C.

D: Red-Blue - Motion sensor (PIR), used for detecting motion events on a boat. The input uses ACTIVE HIGH logic by default. If active low logic is required please contact support.

2.6 Relay output (Pro and Standard version only)

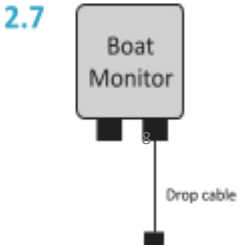
The Standard version has one built-in low power relay while the Pro version has two. In the Pro version, one contact of both relays is connected to the Relay Common wire. The other side of the first relay is connected to the gray wire, and the other side of the second relay is connected to the white wire. To ensure proper functioning, the current must not exceed 1 A on each relay. The maximum allowed switching voltage is 60 V. For switching loads that require more power, an additional power relay is needed.

Example: switching low power LED light with Boat monitor.

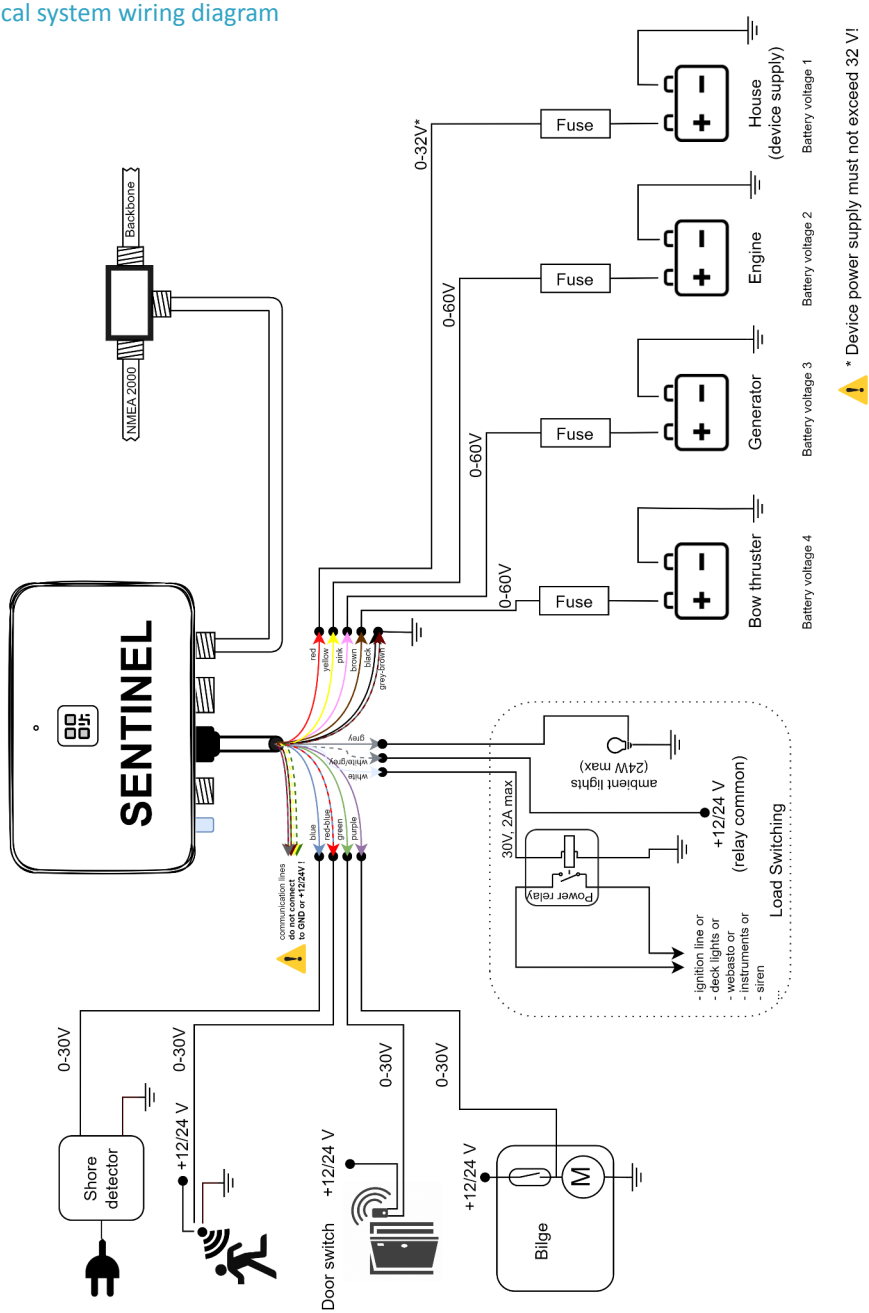


2.7 NMEA 2000® connection (Pro and Standard version only)

Boat monitor BM-50 is equipped with two CAN interfaces. CAN1 / NMEA2000 connector is a primary NMEA 2000 interface that connects to the boat instrument NMEA2000 backbone. CAN2 interface is a multipurpose CAN interface (Pro version only). Contact Sentinel support for more information. Connect the CAN1 connector to the NMEA 2000® backbone (bus) via a drop cable and T-connector. Important: Boat Monitor cannot be powered from the NMEA 2000® backbone.



2.8 Typical system wiring diagram



CAUTION!

The device contains an internal battery. Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

MORE INFO

For details on pairing Bluetooth devices, troubleshooting, CZone integration and other application notes, see http://www.sentinelmarine.net/boat-monitor/docs/

INSTALLATION COMPLETE

To power up the device for the first time insert the fuse on the supply wire (see fig. 2.2). The device should power up and LED should light up. When the subscription is active it takes approximately 1 minute until LED lights up green. This pattern signals normal operation.

3. Troubleshooting

In case of issues first check the device LED. Firmware version from 0.55 support the following LED patterns:

LED	Status	Action to be taken
Red	Device is unable to connect (SIM inactive, no coverage, communication issue)	Check subscription, make sure there is cellular coverage. If no issue can be detected, contact support via the mobile app.
Yellow	Device is registered to the network but cannot send data (low signal, network problem)	Wait a few minutes, make sure cellular signal is sufficient for normal operation. If no issue can be detected, contact support via the mobile app.
Green	Device is up and running normally	No action needed
Blinking (any color)	GNSS (GPS) signal is low or non-existent	Device is unable to acquire current position. Check for metal objects obstructing the sky view of the device and/or move the device to another location.
Changing colors	Device busy	Wait for the color to turn red/yellow/green

If the device LED is off, check the fuse and make sure the power supply to the device is higher than 12V! If the issue cannot be resolved, contact Sentinel support by using the report issue feature built into the Sentinel application.

3.1. Technical specification

Parameter	Minimum	Typical	Maximum
Supply Voltage	11 V	12 V -32 V	34 V
Input resistance of digital and analog inputs (except power supply)	500 kΩ		
Input Voltage Range: Voltage 1 Voltage 2/3/4			 30 V 60 V
Digital input Voltage threshold		5 V	
Relay switching voltage Relay switching current			60 VDC 1A

POWER SUPPLY: 12 to 30 V DC 4 W Max
ENERGY CONSUMPTION (12 V)*: Nominal: average 35 mA r.m.s,
OPERATION TEMPERATURE: -10 °C to +55 °C
STORAGE TEMPERATURE: -40 °C to +60 °C
STORAGE RELATIVE HUMIDITY: 5 to 95 % (no condensation)
* when internal battery is charged

Boat monitor compliance

CE This product is marked with logo and uses radio frequency bands that are harmonized throughout the European Community and others. Declaration of conformity is located in the box together with warranty list.

CONTACT • KONTAKT • CONTACTO •
CONTATTI • CONTACT
Sentinel d.o.o., Zagreb, Gradišćanska ulica 34, Croatia
support@sentinelmarine.net
www.sentinelmarine.net

Appendix A
List of receiving NMEA2000 PGNs

PGN ID	PGN Name
130316	Temperature Extended Range
65280	Proprietary pgn 65280
130306	Wind Data
127251	Rate of Turn
127257	Attitude
127258	Magnetic Variation
128259	Speed
128267	Water Depth
129026	COG & SOG, Rapid Update
129284	Navigation Data
130310	Environmental Parameters
130578	Vessel Speed Components
127488	Engine Parameters, Rapid Update
127489	Engine Parameters, Dynamic
127493	Transmission Parameters, Dynamic
127497	Trip Parameters, Engine
127498	Engine Parameters, Static
127508	Battery Status
127506	DC Detailed Status
127245	Rudder
127507	Charger Status
127509	Inverter Status
130312	Temperature
130313	Humidity
130314	Actual Pressure
127501	Binary Switch Bank Status
127504	AC Output Status
127503	AC Input Status
127250	Vessel Heading
127496	Trip Parameters, Vessel
130311	Environmental Parameters
127505	Fluid Level