Suggestions Remote Monitoring Your Boat

From Experience gained by Trek Transponder Designers, Manufacturers, Installers and Users

About this document....

If you are responsible for the safety and operation of a vessel its hard to do a good job of it when you aren't there.

Trek Transponder is a 4G Remote Boat Alarm Monitoring System created because of demand. In other words the wishes of boat owners and operators who wanted to know whats happening on their boat remotely were transformed into a device that can do just that.

Since its creation in 2018 hundreds have been installed on sailing, motor and commercial vessels around Australia and New Zealand. Consequently the designers of Trek Transponder have become acquainted with the varied reasons they were purchased. Sometimes because of caution and other times to avoid repeating a disaster.

The author Tony Richardson, based in Sydney, is a scientist/engineer and is part of a team which has developed a laser treatment for prostate cancer often replacing Prostatectomy with 2 hour day surgery. Previously Tony worked on many projects world wide including Boeing Spacecraft, flight control systems and even James Cameron's deep sea submarine. He applied that experience to designing the Trek Transponder.

This document has been produced, not as a text book, but as compilation of observations that will help explain why and how Remote Monitoring is such a valuable tool in the marine world and why if you are responsible for a boat you need it.

Marine Remote Monitoring

Remote monitoring is very widespread in 2023.

The basic idea is you can have a system a long way away and monitor what is happening there, and even better control it as well.

Longest distance examples of remote monitoring are the Voyager 1 and 2 Spacecraft. Their batteries, solar panels and sensors are monitored just like many boats, and the same principles apply. Other very common examples are marine tide monitoring buoys and data gathering marine drones. In this case we want to monitor a boat. Many Trek Transponders are used for world wide monitoring, For example a boat in Pittwater NSW is monitored by its owner in Paris daily and a boat in Tasmania is monitored by its owners in San Francisco.

To remotely monitor most things, you need sensors to measure what you want to monitor, a controller of some kind to operate the sensors, a radio system so you you can control the controller, a source of power and a radio system so you can contact the remote system.

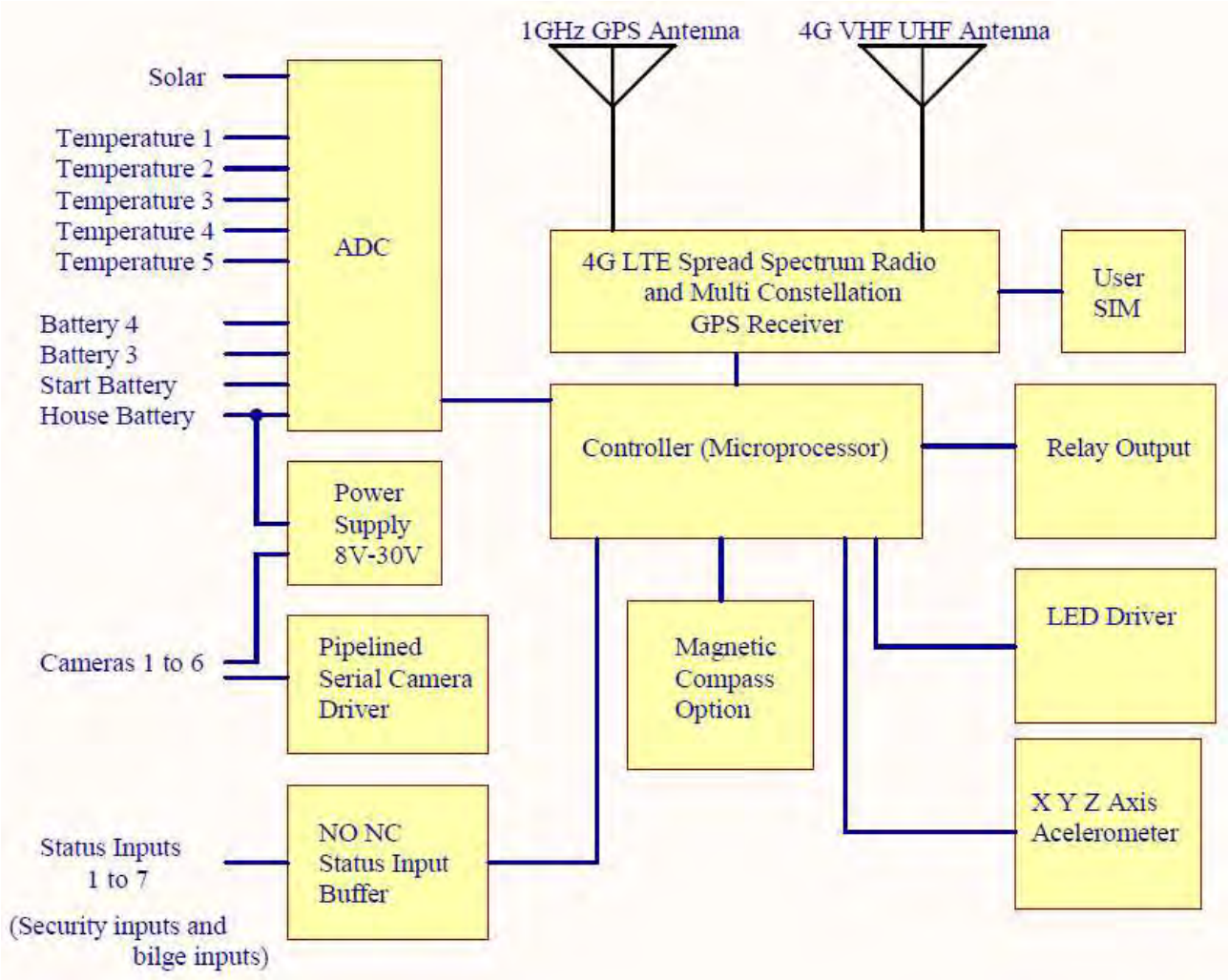
In our boats case we want sensors to monitor batteries and their charging, bilge, security, location, pitch and roll, temperature, smoke/gas and be able to see on board. As icing on the cake if we can control things that's great. And we can.

Voyager 1, Solar Powered Long Range Remote Monitoring

Tidal Flow Buoy, Solar Powered, remotely monitored

Maritime Drone with Vision System, Lithium Battery Powered

The Trek Transponder has been designed to provide these functions and a diagram showing the structure of how it does follows on the next page.



Above is a diagram of the Trek Transponder Remotely Monitored Boat Alarm

On most boats these are the essentials we need the Remote Monitoring to cover:

Bilge flooding

Excessive Bilge Pump Operation

Batteries low

Shore Power fail

Intruder walking on deck

Intruder below deck

Smoke / Fire

Fridge or Freezer Warm

Anchor drag

Vessel not on mooring

Vessel listing

Batteries hot (especially Lithium)

The following pages are a closer look

Bilge

Most boat owners are aware that their boat can sink if the bilge floods. There are many entry points for water that could sink your boat.

Some are listed below with related hazards.

Sea cocks

Sea cocks allow water in and out of your boat for various purposes and are ball valves mounted on “thru hulls” which pass through the hull. As sea cocks age their metal parts deteriorate and corrode creating a risk that they may fail. High quality plastic can avoid much of this problem. But there are still moving parts that you rely on.

Its advisable to know where they are on your boat and have a plan how to deal with any that fail. Sea cocks and the hoses attached to them should be inspected often.

Badly corroded “thru hull” and sea cock

Trudesign Nylon Skin Fitting

Trudesign Composite Ball Valve

Hose Clamps

Hoses inside the vessel are often secured by hose clamps which fail with age. The hoses themselves also fail with age. Its wise to double clamp hoses as far as possible, the second hose clamp being a back up in case the first fails. Unless periodically maintained sooner or later both could fail.

A failed hose clamp can sink your boat

On a fuel line a failed hose clamp can fill your bilge with fuel

Example of double clamping

Hose clamps and hoses need to be inspected often, including on engine cooling loops and fuel lines.

Propeller Shaft Glands

Some propeller shaft glands allow a calibrated amount of water into the bilge as a means of lubricating the propeller shaft. Some should not allow water into the bilge at all. Sometimes this calibrated amount can be excessive. It is advisable to check this by either visual monitoring or you can use a monitor to count how many times your bilge pump operates in a given period.

Rudder Stock

Vessels with rudders hung outside the vessel don't need to worry about this. However many rudders rely on a water proof fitting similar to propeller shaft gland to stop water entering the vessel

Gaskets

As hoses enter and exit your vessels engine the oil, fuel and water inside is contained once again by hoses and hose clamps but also gaskets. A rusty engine could lose a fuel related gasket resulting a a bilge full of fuel.

Rain

This is obvious. Torrential rain can sink a vessel. Its not unusual to see “mooring minders” left unattended for a long time listing as they fill with rain water.

Excess Bilge Pump Operation

Your boat may be afloat simply because your bilge pump runs all the time. Many experienced

boaters on board have heard their bilge pump turn on and were surprised. If you are not there you cant hear it and may think all is well. Checking how often your bilge pump cycles is very important. Otherwise it may show itself as a battery that wont charge. In other words all the charging power is being used keeping the bilge pump running.

Automatic Electric Bilge Pumps

Typical float switch

Commonly used small volume electric bilge pump

Electromagnetic sensor when placed on bilge pump can count its operations per day

The traditional solution to reducing flooded bilge risk is to fit an electric bilge pump to the vessel and water activated float switch. If the bilge floods the float switch turns on the pump which hopefully pumps out the water.

However this relies on the float switch operating (and not fouled with growth), the bilge pump working (impeller not seized or fouled) and being able to keep up with the volume of incoming water. Also your batteries being able to keep the pump running. 12V Bilge pumps are often rated at 13.6V - when batteries are full and charging. If the battery drops 20% that's a problem.A 500GPH Bilge Pump is suddenly a 400GPH Bilge Pump just when its needed.

The bilge high water monitoring system needs to be independent. Its float switch is best located higher than the safe bilge water level so it remains pristine and will always work.

Automatic Bilge Pumps Banned

There's another problem here. If the bilge filled with fuel because a fuel line failed or hose clamp, we don't want the bilge pump to turn on. Increasing numbers of government jurisdictions now forbid automatic bilge pump operation in order to prevent unidentified pollutants entering the environment.

In one unfortunate case a berthed vessels fuel line failed flooding the bilge with diesel which the vessels bilge pump faithfully pumped into the bay outside the boat resulting an a massive fine and clean up bill from the EPA for the owner. 100 litres of diesel creates a large mess.

Its also not uncommon that the smallish electric bilge pumps fitted to various boats cannot bail out a the flood caused by a single failed sea cock..

High Water Alarm

Your best viable option is to make sure you know about your bilge flooding and can do something about it! You need a high water alarm that gets your attention wherever you are.

Sleeping On Board

There aren't many things worse on a boat than waking because your bed is wet, then discovering your boat is sinking and your mattress is starting to float.

Or be motoring along happily with the family and suddenly your engine overheats and seizes, then when you look the bilge is flooded as well, because of a broken cooling system hose.

Its obviously desirable to have a loud acoustic high water alarm that can not only wake you but make a sound louder than engine noise.

A Trek Transponder can be attached to an existing high water alarm system with a relay. Or fit an independent float switch.

Electrics on Board

Batteries, SLA, Flooded Lead Acid and Lithium

Batteries on boat are invaluable, allowing operation of engine stater motors, radios, pumps, lights and many other accessories.

But you need to keep them charged, and make sure they have good capacity. Capacity means they are in good condition and can supply the number of Amp Hours (AH) specified by the battery manufacturer and that you need.

In general there are three types of batteries used on boats. Sealed Lead Acid, Flooded Lead Acid and Lithium.

		
Typical SLA Battery	Typical Flooded Lead Acid Battery	Typical Lithium Battery

All are reversible chemical reactions contained in a box. We rely on being able to push the reaction inside to an extreme one way (charging) and then later as the reaction runs the other way we can take the charge out (discharging) and use it. You need to monitor the battery to make sure it stays within its working voltage and current boundaries.

Charge and Discharge Voltage Limits

So clearly we need to charge them. But not too much. Overcharging a battery can damage it badly. Sometimes leading to gas and maybe even fire. And when using the batteries we don't want to discharge them too far or that could damage them too. This reduces their capacity. So we do want to watch them but obviously that's impossible all the time.

As an example, a badly damaged 12V lead acid 100AH battery may read 13V on its terminals and look good. But connect it to a load and it will last only 5 minutes. So over charge and under charge must be avoided.

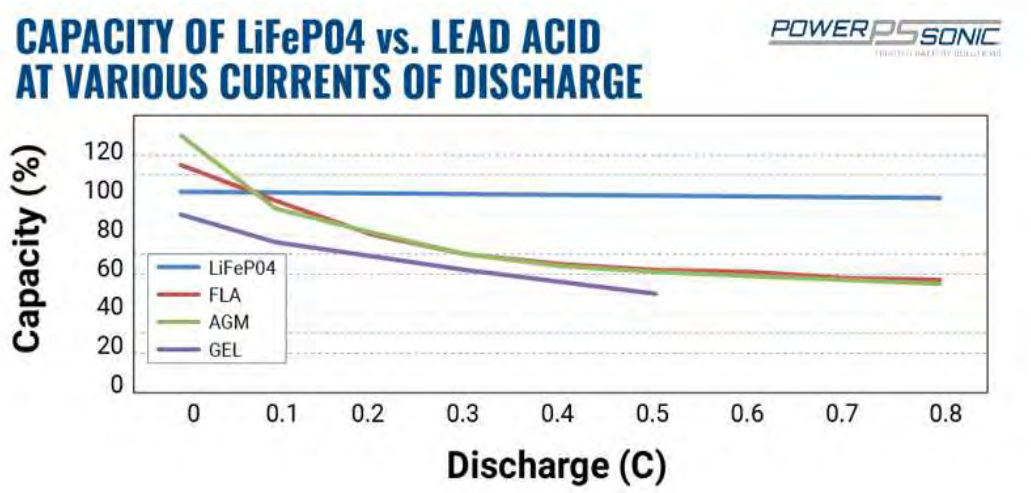
Making sure the charge limits are adhered to is usually controlled by the voltage regulator on the engines alternator, or a solar regulator or a shore power battery charger. The fully charged voltage limits are different for each battery type.

Making sure the batteries don't discharge too far is usually up to you. But time after time banks of batteries are ruined in boats by over charge or over discharge because no one notices the batteries being over charged or excessively discharged.

When you cant start the engine because your battery is flat, this is too late. Even if you can start the engine with back up battery banks the flat battery is now damaged.

Lithium Batteries

Lithium batteries containing a BMS (Battery Management System) can sometimes be immune to over charge/discharge. However if discharged to shut down point often they need a special charge cycle to kick start them again. Power-sonic published this graph which shows lithium battery superiority in many ways to lead acid types. But their voltages still need monitoring.



Shore Power

Shore Power is handy as long as it stays on, the charger is reliable and no-one takes your extension cable

You can charge your on board batteries with shore power

If your vessel is in a marina you can often use shore power to charge your batteries. And rely on a mains powered charger to regulate. However this can be unreliable.

In one case a cruisers batteries failed because shore power to the vessel was disconnected causing a freezer full of seafood to melt all over the vessels floor.

This occurred in summer and the owner was unaware for weeks. The resultant mess and smell took months to clean up. The batteries cost $4000 to replace.

Trek Transponder can monitor marina shore power connection to a vessel and alert you if it fails.

Solar Power

If your vessel is on a mooring you are usually relying on solar power to keep the batteries charged ready for engine start, the bilge pumps online and the boats electronics available for use. Making sure your batteries are kept charged without over charge or under charge is important. From time to time solar panels are stolen and if yours is you want to know.

Typical solar panel

There are many good quality lithium battery solar chargers but who checks them every day

What to do about your batteries?

You need to watch what voltage they are sitting at all the time. If you accidentally leave lights on in the boat, or your boat leaks and your bilge pump runs constantly or someone borrows your shore

power cable (or steals your solar panel – yes true) your batteries will start discharging and won't stop.

You can measure your batteries by hand but this is impractical when you are not on board

There are high quality panel meters available but your cant read them at home

When your batteries fail or are low, other problems can arise. Your bilge pumps may not work, your refrigeration may fail and your radios and navigation equipment may fail. Keeping your batteries in good shape is important.

Trek Transponder can continuously monitor high and low voltage limits of 4 banks of batteries, Lead Acid or Lithium, and warn you if their charge/discharge limits are exceeded.

Security

Intruder walking on deck

Boats and their valuable equipment are easy targets for thieves when unattended, and are often in isolated locations.

Wouldn't it be great if you could invisibly detect someone standing on your deck.

Before this happens
You can.

Aside from the risk of your equipment and valuables being stolen from your boat the boat can be damaged when an intruder breaks and enters your boat. (Some boat owners prefer to leave their boat unlocked and keep nothing valuable on board to avoid such damage).

Detecting a person walking on the deck of your vessel would be invaluable. Especially if you had cameras on board to check out who and what was happening when you get an alarm. You can with Trek Transponders Near Field Sensor.

You can invisibly protect your boat here

and here

and here

Near Field Sensor Unit

This is a device about the size of two bars of soap which can “see” through walls and decks and sense a calibrated volume of an object moving. Near Field Sensors have the advantage they do not disfigure the boat since they can be hidden on the other side of a wall or under a deck, and they are very largely immune to almost anything moving except something large like a person.

Intruder below decks

Its possible to detect a person moving below decks on your boat with a device called a PIR (Passive Infra Red) sensor which detects movement. These are common place on shore in shops and homes.

Usually large and ugly white devices with Red blinking LEDs on them. But in these places nothing moves. On a boat there is usually motion all the time due to the local wind and waves, birds and flapping tarps. Down below decks its moving curtains. This makes them normally impractical for use on a boat unless the installation is done with great care.

		
Typical PIR Detectors	Mini PIR, 1/10th the size of conventional PIRs	Mini PIR installed in cockpit wall of yacht. Similar appearance to reversing sensor on a car

There are also sometimes flashes of sunlight as the boat moves and the PIR can detect these. Especially if the boat is on a mooring. So PIRs are normally almost impossible to use outside such as in a cockpit.

Also, no-one wants a large ugly PIR on their boat, so the Mini PIR is much better choice and quite inconspicuous.

Using Mini PIR's and the Dual PIR technique can dramatically reduce the false triggering problem. This is done with an alarm system that requires two PIR alarm signals at the same time before triggering.

The set up is like this. Place two PIR units apart but facing each other. For example on opposite sides of the saloon or opposite sides of the cockpit.

Fitted like this neither PIR can “see” what the other one can. So a flash of light on one side of the saloon may be seen by one PIR but it won't be seen by the other. Similarly a curtain moving.

However if something moves between them both PIR units will see the movement and both trigger at the same time and the alarm system will trigger. Trek Transponder has this feature.

Hatches and Doors

Innumerable reed switch type devices are available to detect a hatch or door opening. These consist of a magnetically activated switch (reed) and a magnet. Fit the reed on the door or hatch frame and the magnet on the moving part of the door or hatch such that they are adjacent when the door or hatch is closed.

When the magnet is adjacent to the reed it closes providing current flow which tells the alarm system the door or hatch is closed. When they separate because the door or hatch opens the switch opens and the current flow stops, triggering the alarm. This is called “normally closed”.

Reed and magnet pair

Recessed reed and magnet pair

Reed and magnet pair with terminals

Button, not requiring magnet

This method of securing an area is highly reliable and required virtually zero power when in use. However wiring many entry points can be laborious.

Location

Knowing where your vessel is is very important! If it moves off its mooring or drags anchor its a lot cheaper to rescue it before it runs aground.

When you are not there you can only assume your boat is where you left it, and we know how risky assuming can be.

The reasons a boat is not where it should be can be varied. In one case a vandal let loose a boat from its mooring, in another case a relative “borrowed” the boat and in many other cases the boat departed its location because the mooring apparatus failed.

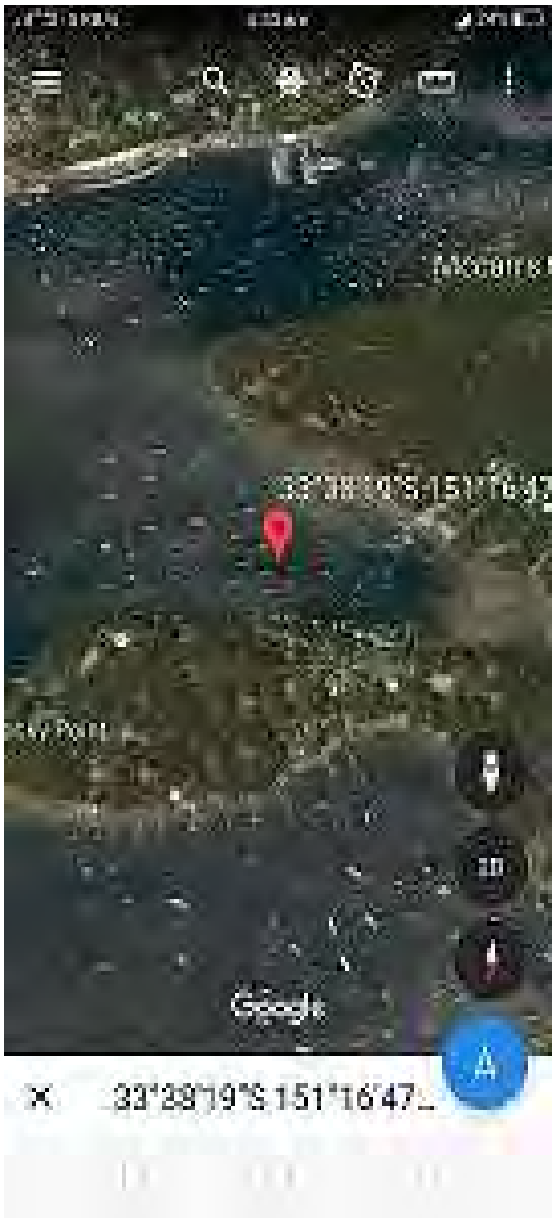
In which ever case you need to know your boat is moving.

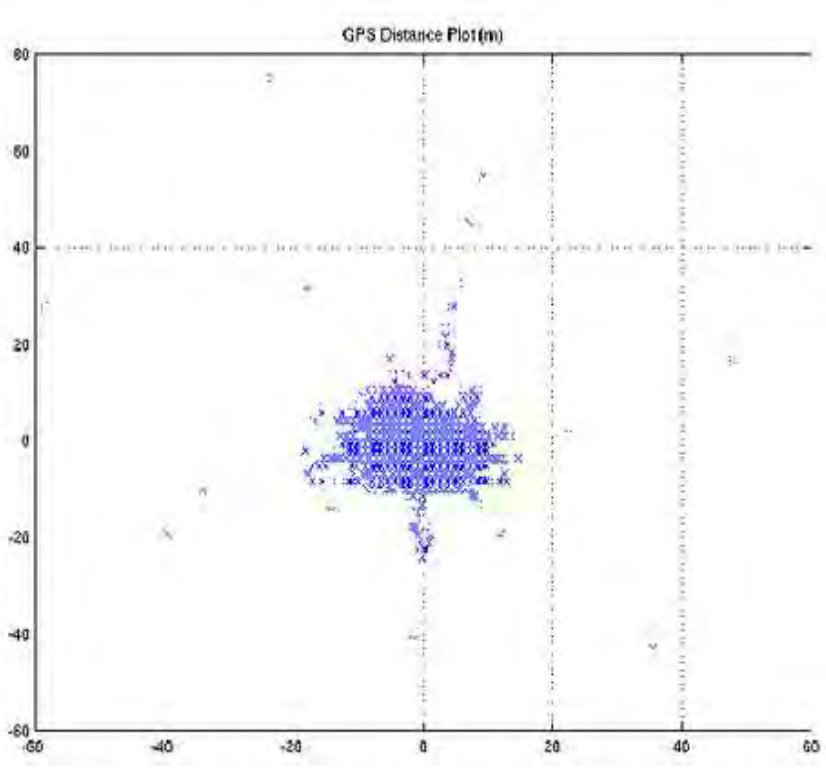
In one case a 60ft live-aboard boat in Balmain NSW broke off its mooring in a gale and eventually ran aground. Fortunately on sand. The owner didn't know for two days but all the locals milling around it knew. In another case during a southerly gale a 44ft yacht broke from its mooring at Saratoga on the NSW Central Coast and took off across the bay running aground in Caroline Bay.

When monitoring a vessels location a vessel in a berth can be monitored with higher accuracy as it doesn't move. But there is still GPS jitter accuracy. On a swing mooring the vessel itself can move a long way depending on tide and wind so location accuracy includes swing and jitter. It is not as good.

For a 10m boat on a swing mooring an expectation that the boat will be within 50m of the same place is common. For a boat on a berth or anchored bow and stern the radius can be much less.

This is a mobile phone screen shot from a Trek Transponder Showing Vessel Location. If the vessel moves more than 50m (adjustable) from where you set its location you will get an SMS alert. Trek Transponder checks the boat location once per second.





A plot of repeated GPS Location Data of a Stationary Point Shows GPS Location Jitter. This needs to be allowed for when monitoring your boats position.

Smoke, Gas and Fumes

This Australian Made Gas Detector from Peel Electronics has a relay contact output for remote monitoring

A smoke detector is mandatory in many apartment buildings and they should be on boats!

A smoke and heat detector like this can be connected to Trek Transponder if it has relay contact output

Every summer we hear of disasters and fires caused by the owners being unaware of the presence of smoke, or a poisonous or combustible gas.

If you have toxic, LPG or petrol fumes waiting for you on board its a good idea to know in advance. Detectors such as this one from Peel Electronics can be connected to remote monitoring devices so you will know. Whichever detector you choose make sure it has a relay output for external alarm or remote monitoring.

If something on your boat is overheating and smouldering you have a chance of saving your boat if you know about it.

A smoke detector connected to your Trek Transponder can do that. All you need to do is make sure it has a relay contact output.

Cameras

When you get an alarm from your boat being able to see whats happening is a fantastic asset.

It gives you the option of doing nothing if you see there's no problem. Maybe a family member or worker on board that you forgot about.

It also give you the option of taking action. You may see an intruder on board, or a the beginning of a fire, or if placed below to watch the bilge you can watch the rate of filling in an emergency. Not uncommon with timber boats.

Thats why we added HD Cameras to the Trek Transponder. They can even do “motion detect”. (But tricky on a boat!).

Snap shots or video? Video usually requires the cameras and a WiFi system to be on all the time. This is heavy on batteries and also data. Video cameras with IR lighting are very heavy on batteries. Most times if an alarm occurs a look is all you need. Or you can snap a series of images.

Trek Transponders HD cameras are OFF unless taking a photo, and Infra Red (IR) lighting is always off automatically until darkness threshold is reached. Trek Transponder SM100W can support WiFi video cameras if you need 24 hour continuous recording, but generally we support fast HD snap shots when there is an alarm.

Using the Trek Transponder standard HD cameras there is no unidentified data use, and no batteries are going flat.

Photo from Trek Transponder SM100HD

Photo from Trek Transponder SM100HD

Alarms

Alarms generally are two types, either 24/7 type, or one you want to turn on and off.

A common boat 24/7 alarm is the bilge monitoring. Even if you are on the boat you still want this on. Especially if you are asleep.

Trek Transponders cover this with a 24/7 command. If you do want to watch your bilge 1 24/7 send the Trek Transponder a command 24HR BILGE1. Then every time your high water alarm triggers you will get an alarm text message.

But you don't want security alarms on when on board. Otherwise whenever you go to the boat or are on board alarms will trigger all the time. So the other type of alarm is like a simple home alarm where you turn the key to “ARM” to turn the alarm on when you go out, and turn the key to “DISARM” when you get home. This is accomplished on the Trek Transponder by sending A to arm the security inputs of the unit when you leave the boat, and D to disarm them when you are going aboard.

Trek Transponders have a key input. You can hide a key switch on board if you like, to allow arm and disarm without a phone. You simply need the key. This is also handy if you have tradesmen on board and don't want to give then your boats phone number.

Automatic Alarm Phone Calls

If you are a heavy sleeper or in a noisy environment you might worry about missing an alarm at night.

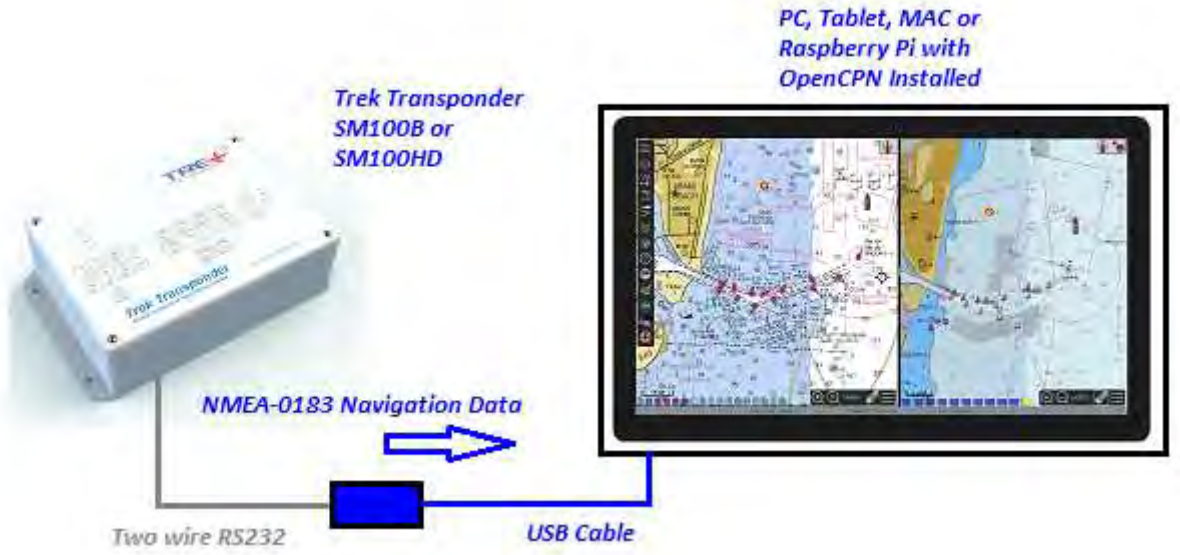
You can cover this two ways with the Trek Transponder. It has 5 mobile phone number memories. It sends alarm text messages to these numbers as well as your own. You could put your own number in these 5 times and get 5 alarm text messages each time! Or better put your family, friends or crew numbers in.

The is another feature that would come in handy. If you send the command AD ON whenever there is an alarm the Trek will call you!

Bonus Free Chart Plotter with Remote Monitoring!

Trek Transponder contains a high quality GPS, primarily used to monitor and report your boat location. However there is a bonus to having this on board – you can use OpenCPN.

OpenCPN is a **free** Open Source Chart plotter and Marine GPS Navigation Software suite that will run on a PC. (This document will refer to a "PC", in fact it can be a Tablet, Mac, Linux PC or Raspberry PI) saving you the large cost of a traditional Chart Plotter and you can use an HD screen.



OpenCPN needs NMEA-0183 Navigation Data fed from a GPS. Trek Transponder contains an excellent precision GPS and this function allows you to access that GPS and feed its data to OpenCPN.

You need a pair of Trek wireless adaptors ($220) to wirelessly connect the Trek Transponder to your PC. This allows the OpenCPN screen to be viewed anywhere onboard such as at the helm or below decks. (Or use a cable and USB/RS232 Converter as illustrated). See hardware connection guide. You also need Charts for the area you want to navigate which are a low cost – refer to OpenCPN website. For example the East Coast of Australia charts are $70 at the time of writing this document.

You can select the baud rate the data is sent at from the three most common speeds, 9600, 38400 or 115200. (Baud rate means the speed the data is sent at in roughly characters per second).

The commands are simple. Use any one of the following and send to Trek Transponder.

nav 9600
nav 38400
nav 115200

Data sent from the Trek Transponder to OpenCPN in the PC consists of five NMEA-0183 sentences updated once per second and transmitted at your selected baud rate.

You dont need to interpret or understand the NMEA data, OpenCPN does it for you. The data is represented as your vessels position, speed, track and other nformation graphically and numerically clearly.

To use simply connect the Trek Transponder to your PC containing OpenCPN. Set the PC serial port to your selected baud rate.

How to Turn ON/OFF the NMEA-0183 Function

To turn ON the Trek Transponder NMEA-0183 Function SMS the Trek Transponder the command **NAV ON**. To turn it off SMS the Trek Transponder the command **NAV OFF**.

When on, the five NMEA-0183 sentences GPGGA, GPRMC, GPGSV, GPGSA and GPVTG will be updated and transmitted once per second from the Trek Transponder to OpenCPN in the PC.

The sentences look something like below.

```
$GPGGA,041133.00,3348.262905,S,15101.992516,E,1,09,0.8,28.8,M,24.0,M,,*42
$GPRMC,041134.00,A,3348.262905,S,15101.992512,E,0.0,0.0,270623,5.6,E,A*2C
$GPGSV,4,1,13,02,10,081,25,05,09,257,22,07,50,098,23,08,23,133,19*7D
$GPGSA,A,3,05,07,08,09,13,14,17,19,30,,,,1.1,0.8,0.7*34
$GPVTG,0.0,T,354.4,M,0.0,N,0.0,K,A*25
$GPGGA,041138.00,3348.262909,S,15101.992495,E,1,09,0.8,28.7,M,24.0,M,,*40
$GPRMC,041140.00,A,3348.262916,S,15101.992485,E,0.0,0.0,270623,5.6,E,A*22
$GPGSV,4,1,13,02,10,081,23,05,09,257,20,07,50,098,25,08,23,133,19*7F
$GPGSA,A,3,05,07,08,09,13,14,17,19,30,,,,1.1,0.8,0.7*34
$GPVTG,0.0,T,354.4,M,0.0,N,0.0,K,A*25
```

This data contains information used by OpenCPN such as:

RMC -Recommended Minimum Navigation Information

1. Time (UTC)
2. Status, V = Navigation receiver warning
3. Latitude
4. N or S
5. Longitude
6. E or W
7. Speed over ground, knots
8. Track Made Good, degrees true
9. Date, ddmmyy
10. Magnetic variation, degrees
11. E or W
12. Status A - Data Valid, V - Data Invalid,

GGA - Global Positioning System Fix Data

1. Universal Time Coordinated (UTC)
2. Latitude
3. Longitude
4. GPS Quality Indicator
5. Number of satellites in view, 00 - 12
6. Horizontal Dilution of Precision (HDOP)
7. Antenna altitude above/below mean-sea-level (geoid)
8. Units of antenna altitude, meters
9. Geoidal separation, the vertical difference between the WGS-84 elipsoid and the geoid
10. Units of geoidal separation, meters
11. Age of differential GPS data, time in seconds since last SC104
12. Differential reference station ID, 0000-102

GSV and GSA - Satellites in view, detailed satellite information

1. Number of sentences for full data / sentence 1 of 2
2. Number of satellites in view
3. Satellite PRN number
4. Elevation, degrees
5. Azimuth, degrees
6. SNR - higher is better / for up to 4 satellites per sentence

VTG - Track Made Good and Ground Speed

1. Track Degrees
2. T = True
3. Track Degrees
4. M = Magnetic
5. Speed Knots
6. N = Knots
7. Speed Kilometers Per Hour

	8. K = Kilometers Per Hour 9. Status A - Data Valid, V - Data Invalid, FAA mode indicator

Viewing NMEA-0183 Sentences Remotely by SMS

You can view the Trek Transponder NMEA-0183 Sentences by SMS to check GPS function and installation. Such as checking number of satellites in view and signal to noise ratio. This will give you a guide as to the sky view and signal quality the Trek Transponder has where it is installed.

Simply SMS the relevant command below to see the current NMEA sentence. To interpret the data in the NMEA Sentence returned you need to refer to a suitable NMEA-0183 Reference Guide.

NMEA Function must be turned ON before you can access this data or an error will be returned.

SMS this: NAV GGA Data returned- Global Positioning System Fix Data
SMS this: NAV RMC Data returned- Recommended Minimum Navigation Information
SMS this: NAV GSV Data returned- Satellites in view
SMS this: NAV GSA Data returned- Over all satellite data
SMS this: NAV VTG Data returned- Track Made Good and Ground Speed

A typical SMS query requesting NMEA-0183 GPGSV data and reply is below (Note: send nav not nmea due to SW update):

A typical SMS query requesting NMEA-0183 GPGGA data and reply is below (Note: send nav not nmea due to SW update):

Get a Trek Transponder here:
www.trektransponder.com.au

GetOpenCPN here:
www.opencpn.org

NOTE: The official NMEA 0183 standard was not consulted at any point, thus this document is not a derivative work of that standard.

App or SMS

Trek Transponders can operate with an App or SMS/MMS. (MMS is the picture version of SMS). To use the SMS method you can grab any phone and send SMS messages to your boat and get an immediate SMS reply. To use the App method you need a smart phone and install the App.

Advantages of an App over SMS are hard to find. Here's why.

1. Telcos put their name on their SMS network. They want it to work properly all the time and put a huge effort into making it reliable. Their reputation is at stake.

   Apps are third party. If you call Telstra and tell them your Apps slow or not working they can reasonably tell you the App is the problem. If you call your App supplier he will say the slow communication or errors is because of the Telco. When your boat communications fail you have no reliable support.

2. Apps nearly always rely on "The Cloud". This is a marketing name for someone else's computer. App makers do this because running a Static IP is expensive. (That's another story). If you use SMS your communications travel simply from your phone to the Telco (Telstra for example) and then to your boat. **Fast**.

   If you use an App your boat communications will go via somewhere unknown between your phone and boat. Usually "The Cloud" which could even be in another country. But who actually knows where! This relies on many many things belonging to many companies and all gateways, links, interfaces and passwords must work correctly. The result is **Slow**.

3. Anyone who studied reliability knows a long data path is a very very bad idea. Thats why Apps freeze and you will never know why or where. The proof of that is in the recent NSW power black outs. Apps and the Internet failed in many places but SMS stayed working. The Police and State Emergency Services use SMS for alerts. A big reason is reliability.
4. If you use SMS you don't need to install anything on your phone to communicate with your boat. In fact ANY phone will work. This means you dont need to search for the right App. If your crew or family want to check the boat they can, just tell them the number. If you are using an App then every user has to download the correct App. You have to guide them.

They need a smart phone. They need a reasonable amount of internet data. No data = no App = No alarms. Not good. Then there's updates!

5. Power consumption of the Trek Transponder is tiny because it is capable of operating by SMS only. Power consumption is around 0.05A at 12V. This is tiny. If the Trek Transponder is powered up and communicating continuously in App mode power draw is much much higher. Thats another reason why, although we can communicate with the Trek Transponder by App, we prefer the quick and light weight SMS/MMS method.

The only real advantage of an App is they can be prettier.

But we are in this to monitor a boat quickly and reliably. That's what want right!?

SMS 'S" to get a Status Report from a Trek Transponder on your boat. Easy!