

Remote Boat Monitoring System – Getting Started

This quick start guide should tell you most of what you need to know to get started with the Remote Boat Monitoring System. To get the most from the system you should (must) read the full manual!

The following seems complicated but you only have to do it once! If you have any queries or problems, please do not hesitate to ring Jim on +44 7860 382881 to be talked through the setup procedure.

Notes:-

- After switch on the system may re-start a number of times while registering. This is normal.
- If you think the system is not working while you are away from the boat, phone the number of the SIM card instead of texting. This will cause the system to re-start if it is not receiving text messages.
- When you send a text message you will always get a reply. Normally, wait until you get a reply before sending another message. However, the system will accept up to 8 messages at a time if the network is slow in replying.
- The LCD screen will flash 'Receiving Text', followed by 'Sending Reply' when a text is received.

This is the sequence of events necessary to get your system to accept text messages:-

- ❖ Get your SIM card and 'activate' it. For people living in the UK, we can recommend GiffGaff who provide a 'Goodybag' contract for £6.00 per month for free unlimited text messages and enough data for monitoring on the website. This also works in many other European countries although you will need to add some credit as well as buying the goodybag. This agreement can be cancelled at any time. www.giffgaff.com. Make a note of the sim card phone number when you activate the sim card.
- ❖ Put the full-size sim card into the main control box and switch on. After checking which boxes are present, you will see a 'starting...' message on the LCD screen. (The yellow LED by the sim card will start off flashing about once per second). This will be followed by other messages and finally a registering and registered message showing the network provider you have connected to. In the UK this will be "O2" if you are using a Giffgaff sim card. Other sim card providers may show a different name. At this point the yellow LED should be flashing much more slowly, about once every 2-3 seconds.

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Starting...
Checking SIM
SIM Card  READY
Finding Network
Registering...
Registered Home
"O2"
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- ❖ Next you must send a text message from your mobile phone telling the system that texts from your phone are genuine and should be replied to. To do this send a text from your phone to the sim card phone no. as follows. #0=+44***** (your mobile phone no.). This will store your mobile phone no. in position 0 of the phone no. storage in the main control box. You should receive a text reply saying, [Number stored OK](#).
- ❖ If all that worked OK then can send a trial message such as **STATUS** which should reply with the status message from your main control box.
- ❖ That is all you need to do to make the messaging system work. You can add other mobile phone numbers into locations 1 to 14 using say #1=+44*****. Note that numbers in locations 4-14 can only access monitoring messages and not change any settings in the main control box.

Next you can set up the system to enable you to monitor your data on the website:-

<https://inchargemarine.com>.

- ❖ The system used to connect to the website database is called GPRS. By default, this is disabled when you first set up text messages as described above.
- ❖ Depending on which sim provider you have chosen you may need to set something called an APN. This is not necessary when using giffgaff sim cards in the UK but is necessary if the boat is not in the UK. Some other sim suppliers need the APN to be set even in the UK. The APN can

be found by looking at the sim supplier's website. We have also detailed some common APNs in the main manual addendum.

- ❖ If you think you may need your APN to be set then send the following text message if you have a giffgaff sim card:- **APN="giffgaff.com"**. You must include the " " around the APN name. With giffgaff it doesn't matter if you set the APN and then use the system in the UK, the APN will just be ignored. For other suppliers such as EE and Vodafone, you must set the APN even in the UK. Details of the APN names for these suppliers is detailed in the main manual in Appendix 1. Otherwise check the supplier's website.
- ❖ After setting the APN using the text message described above you should receive a reply '**APN stored**'. You can also check this by sending the text message:- **GPRS** which will reply with the status of your connection and the APN name. (Note that at the moment you will not be connected!)
- ❖ Next you need to turn on the GPRS system. Send the text message **GPRS=ON** to turn on the system. You should receive a reply saying '**GPRS now on 5mins**'. This message shows you have turned the GPRS system on, but not necessarily that it has connected yet. The yellow LED should start flashing very quickly (2-3 times per second) if the connection has been successful.
- ❖ You can also check if the connection was successful by sending the **GPRS** message again. The reply should show if the GPRS has connected successfully.
- ❖ The message 'Sending Data' will flash on the LCD screen while data is being sent from the box to the data server.
- ❖ Next you can proceed to look at the website monitoring and check that it is updating the website with your own data. Select the '**Monitoring**' option from the website header and this will take you to the 'Alarms' page of the monitoring system.
- ❖ You need to login here and set your Boat ID number before you can view your own system data. Select the Login/Logout option on the header and select '**Register**'. Fill in as many of the fields as you can (definitely the ones with the red asterisks). You can change any of these details later by using the 'Edit profile' option which will appear if you are logged in. In particular fill in the '**Boat Name**' and '**Box ID**' code fields to be able to see your boat systems data.
- ❖ The Box ID can be found in a number of ways. It will be on the Main box serial number label at the top of the box. It can also be found using the LCD screen by going to the '**Box Names/LCD/Time**' page and then choosing '**LCD Time settings**'. The Box ID is shown on this screen. You can also send the text message **STATUS** to the box which shows the Box ID at the end of the reply text message.
- ❖ You should now be all set up! Go to one of the monitoring pages such as Maps and if your GPS system is working then will see your boat location on the map.
- ❖ If you have already connected other peripheral boxes into your system then you can look at the data being returned from those boxes. Note that at the top of the monitoring pages you will see '**Data last received time and date**' information. By default, the data will be updated every 5 minutes but you can change this to be faster by setting the GPRS time value. Send a message such as **GPRS=ON:1** to set the update rate to the fastest which is once per minute. The slowest is 255 minutes. The web pages should automatically refresh every 60 seconds but you can always 'refresh' your browser to get a faster response and show the latest data the web page has received from your boat.

Once you have got everything working then the Main Control Box should always retain the settings even if you switch the system off, it will turn back on and start up again with everything working. Occasionally the system may reset itself if it detects it has lost the registration, or the GPRS connection. This means that if you no longer have access to the Main Control Box, the system should always sort itself out and keep trying to re-establish the connection under all circumstances.

Note that you can experiment with the system without a sim card, and still monitor peripheral boxes using the LCD display. You can also set 'Local' alarms'. During start up the system will ask you to 'Click Right' on the navigation switch to enable the LCD display menus, and all the box data. If you do not do this within 30 seconds then the system will re-start. Once you have clicked right though, the system will remember this until such time as you put a sim card into the main control box.

The following gives brief description of the various functions, but please read the full manual for a complete description.

1. **Alarm Setup** – This screen is quite important as it sets which alarms are enabled or disabled. The main box has a built-in alarm sounder, and these alarms can be enabled or disabled separately to the text message alarms. By default, all alarms will be disabled and show as 'x'. Use the up/down/left/right presses on the navigation switch to move the flashing cursor to the alarm you wish to enable or disable. Then press on the center of the navigation switch to change the state of the alarm.

| Alarm Enables | | |
|---------------|------|-------|
| | Text | Local |
| Location | √ | x |
| Batteries | x | x |
| Temps | x | x |
| Bilge/Gas | x | x |
| Intruder | x | x |
| AC Loss | x | x |

2. **GPS Functions** – From main screen click the navigation switch to the right to access the GPS menu screen shown here. After the first switch on it may take some time (Possibly even 2-3 hours) to get a satellite fix. The time display in the top row will normally appear quite quickly though if the GPS aerial is in a suitable location. Once locked, your location is held by a small battery backup system and future locks to satellites will be much faster. Pressing and holding the center of the navigation switch will set the range to 0m putting your location in the center of a circle with the radius shown on the screen. Press the navigation switch up or down to change this radius in 5m steps (0-99m). See the manual for a complete description of the GPS operation.

| | | |
|-----------------|-----------|----------|
| Sats 12 | Q 0.8 | 17:52:23 |
| 50° 47.485718¢ | N | |
| 000° 39.650212¢ | W | |
| Radius 36m | Alarm OFF | |
| Range 12m | Direc NE | |

3. **AC Loss detection** – To allow the AC loss detection to work, the main box must still have power when the AC power supply loses its AC! The small 2 pin connector beside the 12v DC input can take any DC power source from 8-36v. This should be connected to a permanent DC supply from the boat batteries with either a separate in-line fuse or via a circuit breaker protected circuit. The average current draw from here is only 45ma so even with no AC supply to keep them charging, the boat batteries will have a very low current drain. This supply provides power to send a text message (or activate the local alarm) if the AC loss alarm is enabled. Note that the local alarm will stop sounding (if it is enabled) after 30 seconds. It can also be cancelled by sending the Text message **ALARM=OFF** or by moving the navigation switch in any direction. This will cancel all the local alarms. They can be re-enabled by changing any of the local alarm settings on the Alarms page on the main box, or by sending the text message **ALARM=ON**.

Adding additional peripheral boxes – There are four different types of sensor boxes that can be added to the system. All boxes are connected to the main box using standard network cables and connectors, or by RF if you have chosen this option. The main box has 3 sockets but each additional box has 2 sockets so the system can be extended by 'looping' on from one box to another. If you need more than 10 additional boxes, then you should use the RF system to connect additional boxes. Up to 6 of each type of box can be added to the system. If you have more than one of a particular type of box then these boxes must be set to different ID's. There is a small rotary switch inside the box to change the ID. Make sure that you add the 'Termination' plug to the longest network cable run.

Battery Boxes – A single battery box will handle up to 6 batteries in either a 12v or 24v configuration. For 24v boxes which are normal on larger boats, the individual batteries are monitored for both voltage and temperature. The temperature can be a very useful indicator if the battery is being overcharged by an 'intelligent' battery charger which has boosted the charge voltage because of a single faulty battery. Alarms are available for both over and under voltage,



difference in voltage between batteries, and over temperature and excess difference in temperature between batteries. All values for max, min and difference values can be set individually for each of up to 6 battery boxes. See the manual for full details.

Bilge Boxes – A bilge box can detect both water (or other liquid) in the bilge and also levels of CO and other flammable gases in the bilge. The gas detection is also sensitive to leaking exhaust gas which would otherwise go undetected until the engine room is full of soot!



Relay Boxes – A relay box can be used to remotely switch any electrical equipment on the boat. This might include external lighting, small battery chargers etc. AC or DC can be switched at up to 20A current. The relay can be switched either directly in 'manual' mode or by pre-setting a timed on/off function.



Intruder Boxes – An intruder box uses a heat/movement sensor to detect any unwanted intruders on the boat. As with all other boxes, both local and text message alarms can be enabled. The range of detection can be up to 12m so large areas can be covered with a single box. The box also contains a humidity measuring device. The humidity % is shown on all intruder screens and text message alarms/replies. Temperature is also monitored and shown on the website and in text messages from an intruder box.



4. **General notes** – At first sight the system may seem very complex, but in practice it is extremely versatile, and the available features can quickly be learned. Over 30 text messages are available to remotely control and set every function provided by the menu system and LCD display. This means that the main box does not have to be located near the helm and can usually be positioned in the engine room enabling wiring to be kept short and simple.

Most of the features are useful even if you have 'guardiennage' on your boat. The company looking after your boat can be setup to receive any warning messages from your boat or use the system to keep a check and solve any problems highlighted by the system. The web site allows monitoring of multiple boats very quickly and easily by as many people as you give your Box ID no. to....!

- ❖ System fully expandable by adding extra peripheral boxes at a later date.
- ❖ Complete remote control and monitoring of all functions using inexpensive text messages. Mobile friendly web site provides monitoring of all functions.
- ❖ Location monitoring of anchor dragging while you are on the beach or in a pub/restaurant.
- ❖ Individual battery monitoring can detect a faulty battery before others become damaged by overcharging.
- ❖ Gas detection in the bilge/engine room can provide advance warning of potential problems.
- ❖ Relay switching can be used for any remote switching requirements. Possibly turning on external lights or perhaps enabling a small battery charger used to charge a generator battery (not normally charged by the main battery charging system).
- ❖ Intruder detection can be used to provide either a very loud local warning, or a silent alarm. In the case of a loud local alarm, you can cancel this remotely with a text message as you will also have received a text warning you of the intrusion!

Do's and Don't's

- ❖ DO read the full manual as this contains many useful hints, lists of text messages with examples, and full wiring diagrams for peripheral boxes.
- ❖ DO test all the functions before you leave the boat.
- ❖ DO switch off the main box before wiring new peripheral boxes into the system. The battery box connections have fuses in every cable (except the 0v) so try not to short out the cables or the fuses will blow. (Spares are provided. 5x20mm 500ma fuse). Connect the wires to the plug before connecting to the battery to prevent inadvertent short circuits.

- ❖ DO contact us if you have any queries or problems, you can't sort out.
- ❖ DO remember to plug the network terminator into the furthest box from the Main Control Box. Without this the boxes may not connect reliably to the Main Control Box.
- ❖ DON'T add peripheral boxes to the network without first switching off the main box. This should not cause any damage, but you must switch on again before the main box will detect new boxes added to the system.
- ❖ DON'T forget to turn off any location or AC loss alarms before setting out on a boat trip.
- ❖ DON'T use 'cross over' network cables, they must be straight through 1:1 cables with all 8 wires present.
- ❖ DON'T connect this systems network cables into any existing boat networks. This will not work, and you may cause damage.

Website

If you have got everything installed and checked that the GPRS data has been turned on and has connected to the database, then you can check the status of the peripheral boxes by using the website. This is by far the best way to monitor the status of everything.

The web address is <https://inchargemarine.com>.

Initially, the 'Monitoring' option will take you to a page with various headings showing the state of any peripheral boxes you have fitted to the main box.

The leftmost heading is 'Alarms'. This shows similar data to the 'Alarm Setup' on the main box LCD screen. Other headings are all fairly obvious and show data as you would expect.

If you have not 'logged in' yet, then you will see demo data to check the sort of results you can expect from each peripheral box. The 'Maps' heading shows the boat location and the radius of the pre-set circle. You can also set the centre of the map to the boat location or the pre-set (centre of the circle) location.

Before you can login you need to register.

Use the login/logout drop down to do this. Fill in as many of the form items as possible but those you may not know can always be filled in later using the 'Edit profile' option.

The most important thing is to fill in your Box ID code as you will not be able to see your own boat data until you have done this. If you fill in the 'Boat name' just above the box ID then your boat name will be displayed on each page showing the boat data. This is most useful if you have more than one boat! Once you have registered you will be able to login and select other headings on the web page to see data from your own boat.

Once you have logged in you will also see an extra heading on the right saying, 'Choose Boat'. This page has a drop down menu allowing you to choose any extra boats you have setup using the 'Add boat' option in the login/logout drop down menu.

To add extra boats, you need to know the Box ID code for each boat. The name of the boat should also be added to make it show in the drop down 'Choose boat' menu.

After selecting a new boat to view, click the 'Submit' button and you will be taken straight to the 'Alarms' page for the chosen boat. You can then move around the other headings to see the data for that particular boat.

Webpage timings

In order to understand the data showing on any web page there are a number of things to be aware of.

The main box scans all the peripheral boxes once every 10 seconds. This includes the GPS location of the boat.

You can set the frequency at which the data is transmitted from the main box to the data server. The default for this after you turn on the GPRS data is 5 minutes. You can set it to be faster though by sending the text message **GPRS=ON:1** This sets the update frequency to be once per minute. The amount of data used by the SIM card is very small. No more than 50mb per month even running 24 hours a day with 1 minute updates.

The web pages are set refresh every 30 or 60 seconds (depending on the page you are viewing). This means that in the worst case there could be a 2 minute 5 sec delay before any changes on the peripheral boxes are reflected on the web page. In practice the delay will be less than this and you can always refresh the page yourself on the web browser to get as fast a response as possible.

The best way to check that the data system is working and when it most recently updated is to check the top left of each web page. This shows the time and date of the most recent update from the main box.

Be aware that this time is always in your local time and not the boat time.

The Bilge, Intruder and Maps page have graphs showing the data over the last 10 updates. If you have multiple boxes all showing on a single graph then you can click the box name on the graph to remove a box from the display and make the display of other boxes clearer. After a page refresh the display will revert to showing all box data.

The values can be changed for the graph to show many more than just the last 10 readings. Also, the date and start time can be set as well as the count of the number of entries in the graph. Currently these values reset to their defaults when the page updates. This may be changed later though. When a graph with many entries is displayed it is also possible to select a section of the graph to 'magnify' the area selected.

The number of graphs available will be increased to include other box readings in due course. Please let us know what features you would like to see on the website.

Finally, please always contact us if you think of any improvements you would like to see on the website and/or operation of the overall system.