
MarineGadget - Radar - V1.0

USB Marine AIS Receiver

Installation Guide

A.5

If you have any questions regarding installation please email tech@radargadgets.com

This product requires you to have loaded on your PC suitable plotting software that can understand AIS NMEA VDM messages on a serial port.

- A trial time limited version of ShipPlotter is included, the full version can be purchased online at www.shipplotter.com for 25 Euros + VAT
- You can also use this free SeaClear software <http://www.sping.com/seaclear/> please take care to read the terms and conditions of use.
- Other mapping software such as SoftwareOnBoard are also compatible

Range varies according to where your antenna is situated, your geographical location and tropospheric conditions. Under normal conditions it is usually line of sight and similar to a marine radio,

A separate antenna is required (you cannot connect it to the same antenna as your marine radio for example)

The MarineGadget-Radar should never be used for primary navigation, it is your responsibility to keep a visual lookout at all times (under maritime law). Most small boats and some ships do not carry AIS transponders, so you cannot rely on it to identify all potential conflicts.

To use the MarineGadget-Radar on your boat you will need a PC compatible GPS receiver (these are available relatively cheaply on ebay) or an adaptor for NMEA from your existing boat GPS. The MarineGadget-Radar does not have an NMEA input.

Use of the MarineGadget-Radar is at your own risk and it is your responsibility to manage and verify any information given.

The MarineGadget-Radar is NOT waterproof.

Do not leave the antenna connected to the MarineGadget-Radar when there is likely to be lightning, this could result in failure of the MarineGadget-Radar and may also hurt your PC! It is your responsibility to ensure that your equipment is safely disconnected in an electrical storm.

This product has been tested and complies to the relevant standards for CE marking in the European Union



Safety Guidance – Please Read

This equipment may not be used as a primary form of navigation

AIS can be used on board a boat to locate the position/speed/identification of vessels with an AIS transponder. It is not a substitute for the obligation to keep a visual lookout, and should never be used as a primary navigation. AIS is a secondary aid to navigation. Many boats do not transmit AIS.

Take care where you use the receiver that you are doing so legally in the country and place of use. When you open the package you are asked to agree that you will not use the receiver in any way that is illegal within the country of use

WARNING:

The MarineGadget-Radar is a miniature light weight pocket sized AIS receiver in a USB dongle and as such it will not take severe “yanking” forces (and neither will your computer!).

Always use the USB extender cable - As with any USB dongle device, if you plug it into your PC directly it sticks out and could be broken/snapped off. This is why the USB extender cable is provided.

Never screw a BNC onto the BNC/SMA adaptor while holding onto the MarineGadget-Radar's case!

You can apply a huge amount of force when screwing in a BNC antenna connection, if you are using this adapter you should firmly hold the adapter and NOT the dongle case.

Introduction

Thank you for purchasing the MarineGadget-Radar USB AIS receiver.

The MarineGadget-Radar is an AIS receiver capable of receiving AIS transmissions from ships on either 161.975Mhz (channel A) or 162.025Mhz (channel B) or alternating between the two, and outputting AIS messages in NMEA VDM format.

The MarineGadget-Radar AIS receiver provides a serial com port over USB. This means that it connects to your PC (Windows 7, Windows Vista 32bit, Windows XP) via USB (no serial adapter required). However your plotting software will see it as a serial com port. So you will need to remember the serial com port allocated on installation (or check in device manager) and put this into your plotting software.

Changing the USB port will result in the allocation of another com port number, so remember which port you have plugged your MarineGadget-Radar into and try to keep to the same one. If you change the USB port you will need to change the com port setting in your plotting software.

WARNING:

The MarineGadget-Radar is a miniature light weight pocket sized AIS receiver in a USB dongle and as such it will not take severe “yanking” forces (and neither will your computer!).

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In the Box

- MarineGadget-Radar USB receiver
- Installation CD
- SMA to BNC adaptor (antenna so you can use both SMA and BNC antennas)
- USB Extender Cable
- Installation Guide

How to use this Installation Guide

This Installation Guide is divided into seven sections

- Section 1: Vista 32 bit Driver Installation
- Section 2: Windows 2000 Driver Installation
- Section 3: Windows XP Driver Installation
- Section 4: Windows 7 Driver installation
- Section 5: Windows 8 Driver installation
- Section 6: Important information on the use of your MarineGadget-Radar
- Section 7: Configuration commands
- Section 8: Specifications

On first installation you will need to install the MarineGadget Radar device drivers and your plotting software (see the cover page of this manual for some recommended software).

Installing the MarineGadget-Radar device drivers is slightly different depending on which version of Microsoft Windows you have. So you need to follow the section below that relates to your specific operating system, whether it is Windows Vista, Windows XP, Windows 2000 or Windows 7.

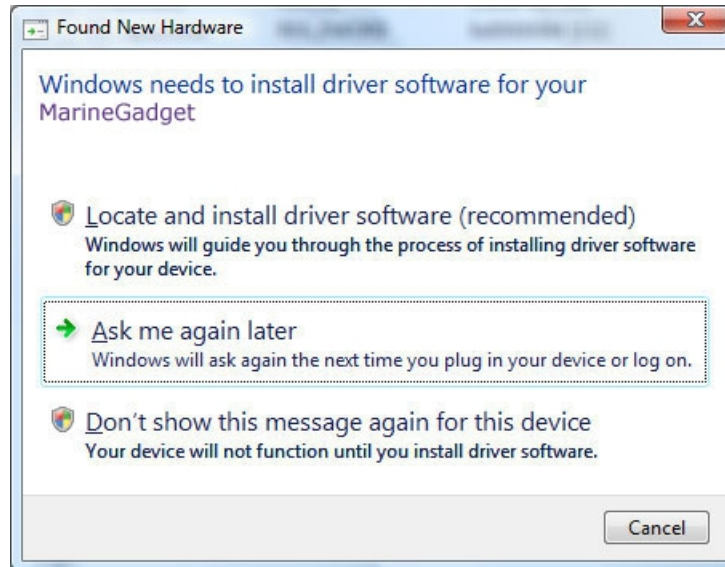
After you have installed the device drivers move on to the section 5 for some important tips on the use of your MarineGadget-Radar.

Section 1: Installation – Vista 32 bit (Vista 64 bit is not supported)

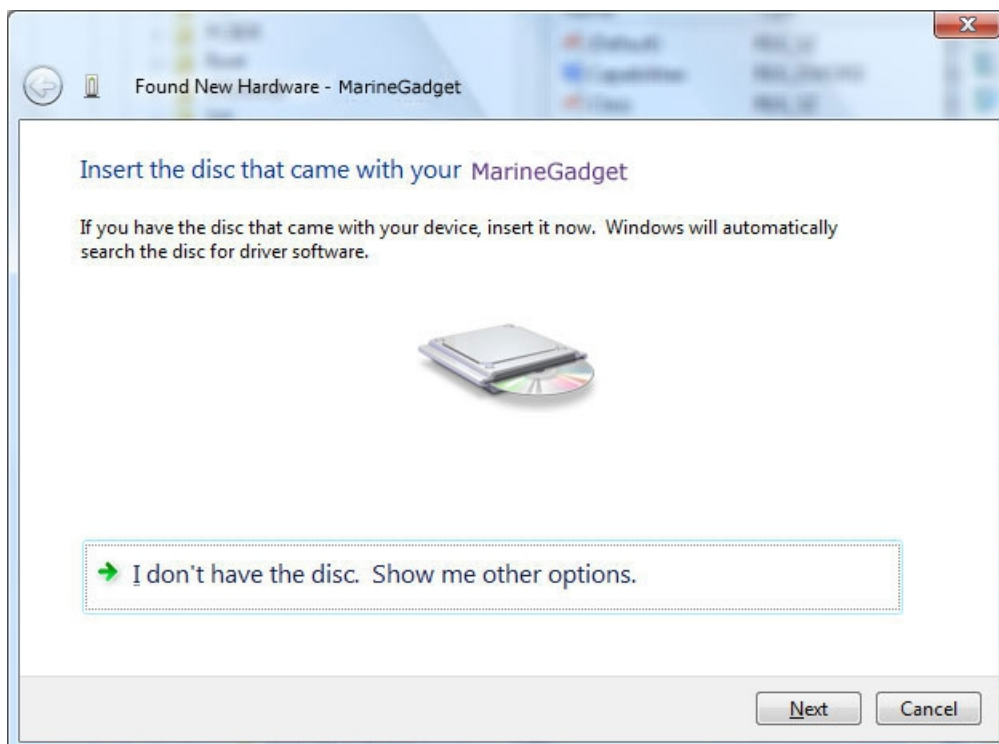
1.1 Installation of the MarineGadget Receiver

Put the CD supplied into your PC's drive and plug in the MarineGadget-Radar receiver using the USB cable supplied.

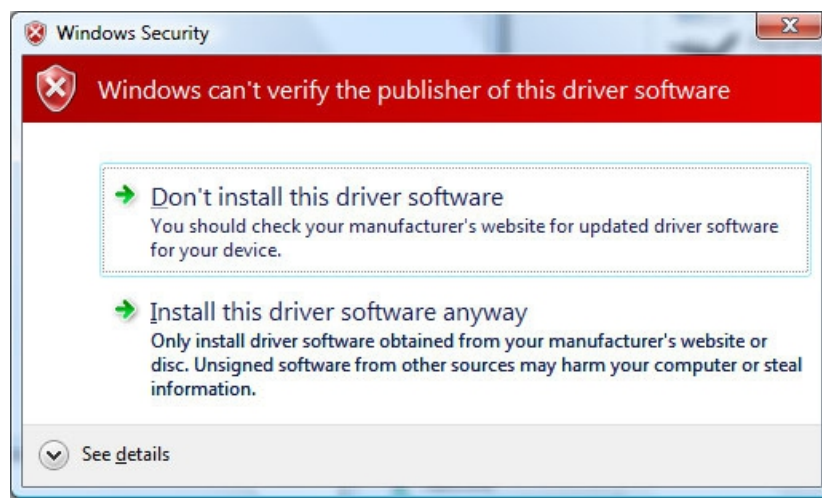
The USB device will be detected and a window will appear.



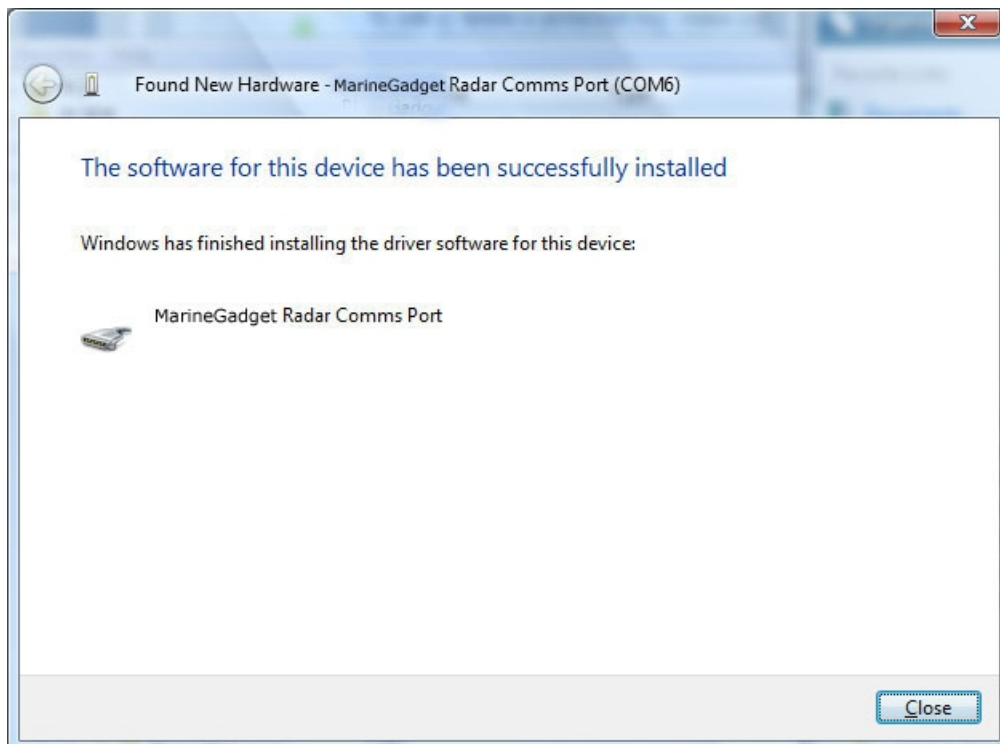
Select the first option "Locate and install driver software". Windows will go off and try to find the drivers for a little while but then come back with this window



Double check you have the CD in the drive then select the NEXT button. You will then see this window:-



Select "Install this driver software anyway" and the next window will look like this:-



Your MarineGadget Radar drivers are now installed, now you are ready to configure your chart plotter software for the correct com port (noted on the above window) to connect with your AIS receiver.

Section 2: Installation – Windows 2000

2.1 Installation of the MarineGadget Receiver

Plug in the MarineGadget-Radar using the USB cable supplied.

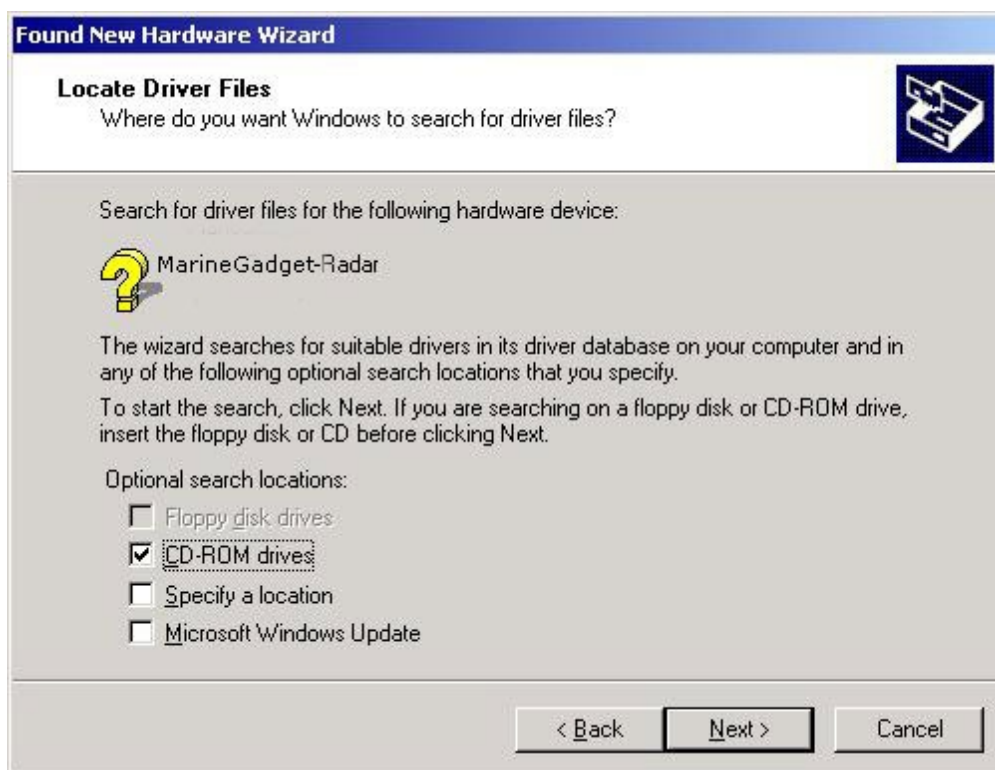
The USB device will be detected and a window will appear.



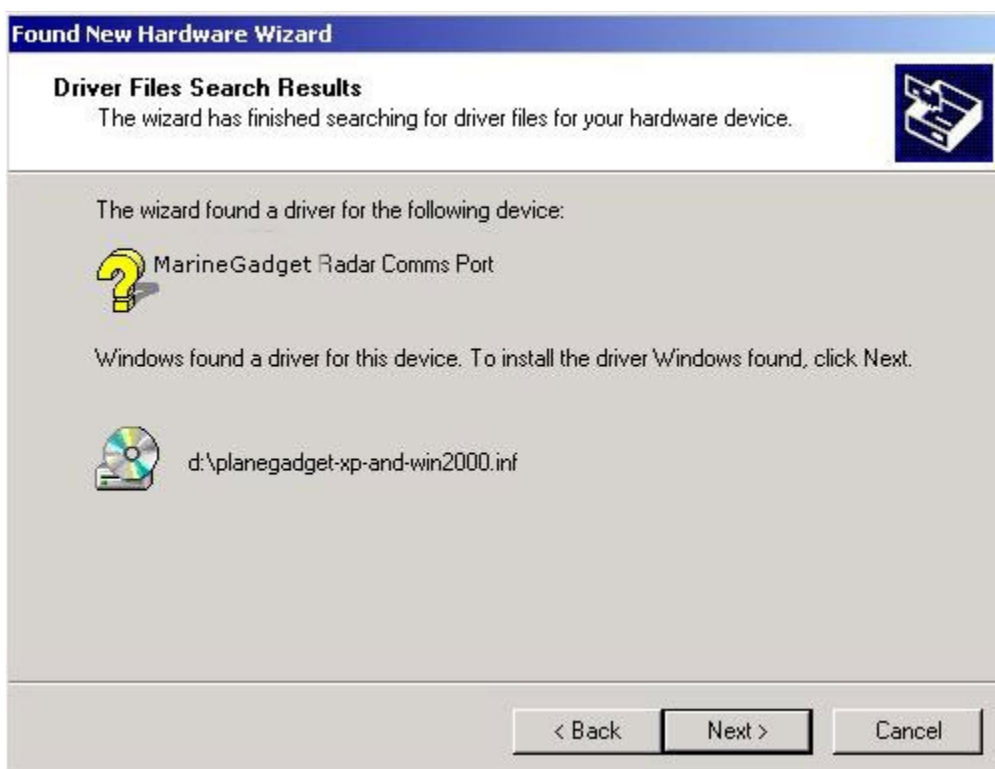
Select Next



Ensure “Search for a suitable driver for my device” is selected and push Next



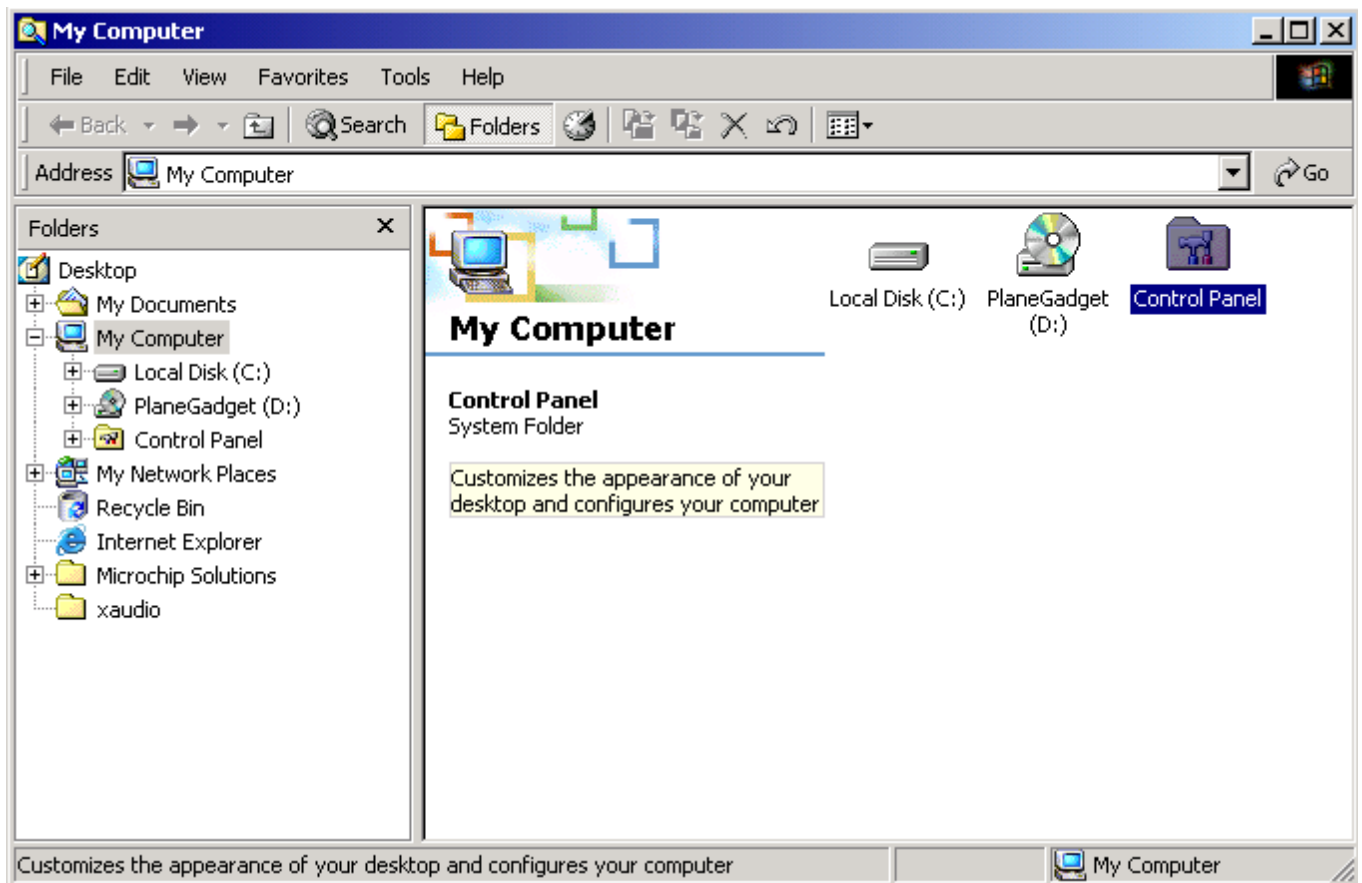
Insert the MarineGadget CD into the driver and Select Next



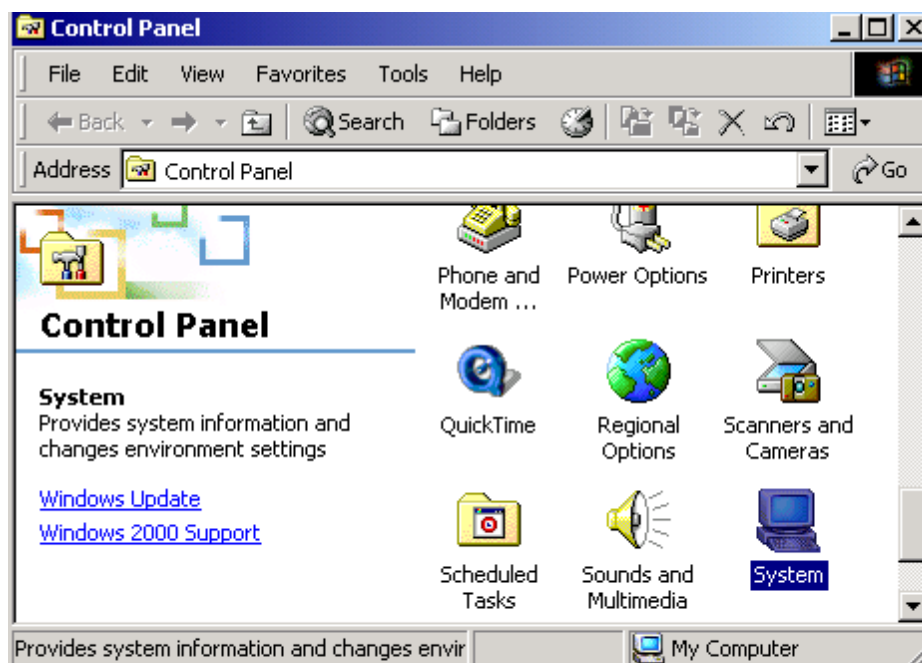
Select Next and Finish on the next window

When setting up your chart plotter software later you will need to know the COM port that has been allocated to the MarineGadget Radar. Note that this will change if you move to another USB port, so try to plug the USB lead into the same port each time.

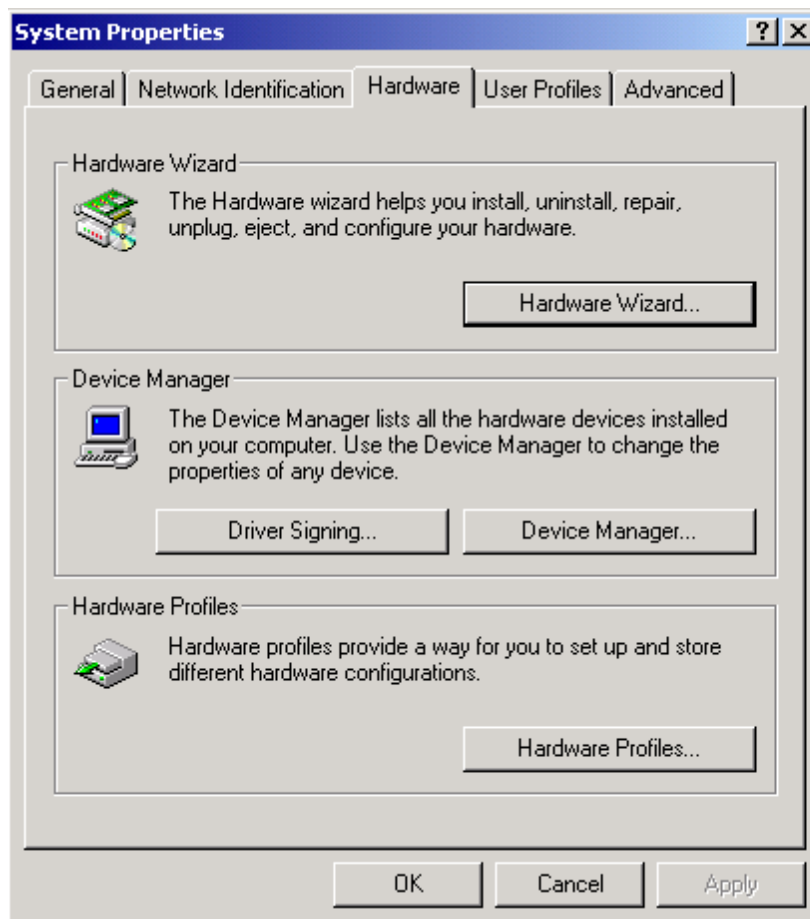
To find out which serial COM port has been allocated go to your Desktop and select My Computer



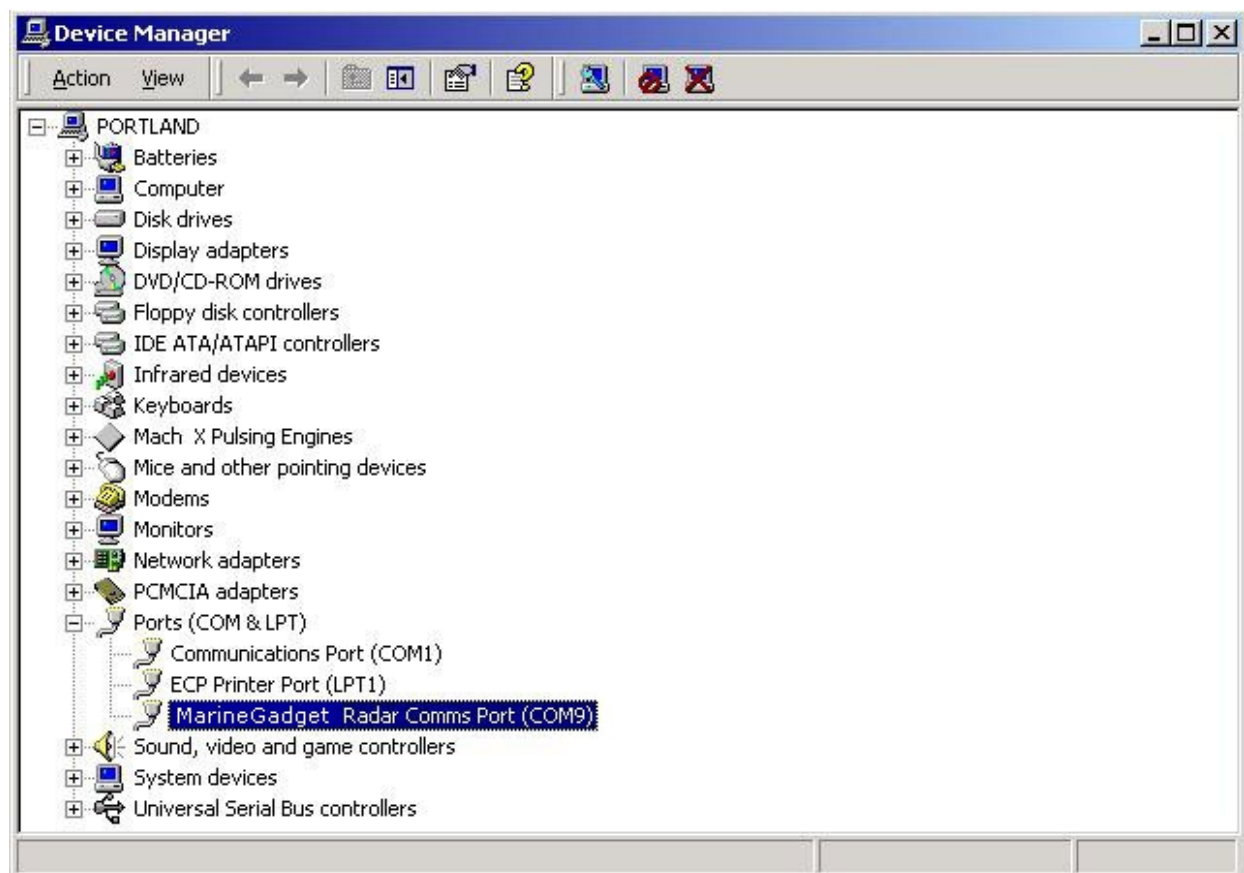
and Control Panel



From here select System



Under the System Properties select the Hardware tab, and click on Device Manager



Under Device Manager go down to Ports (COM & LPT) and click the + to open it up, you will see MarineGadget Radar Comms Port (COM9) or whichever com port has been allocated. Remember this com port as you will need it when you configure your chart plotting software.

Section 3: Installation – Windows XP

2.1 Installation of the MarineGadget Receiver

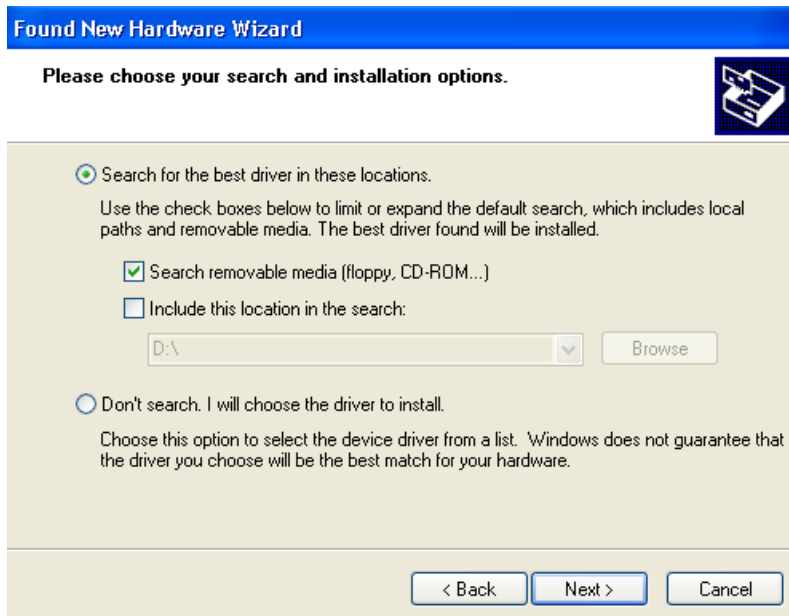
Plug in the MarineGadget-Radar using the USB cable.



Select next



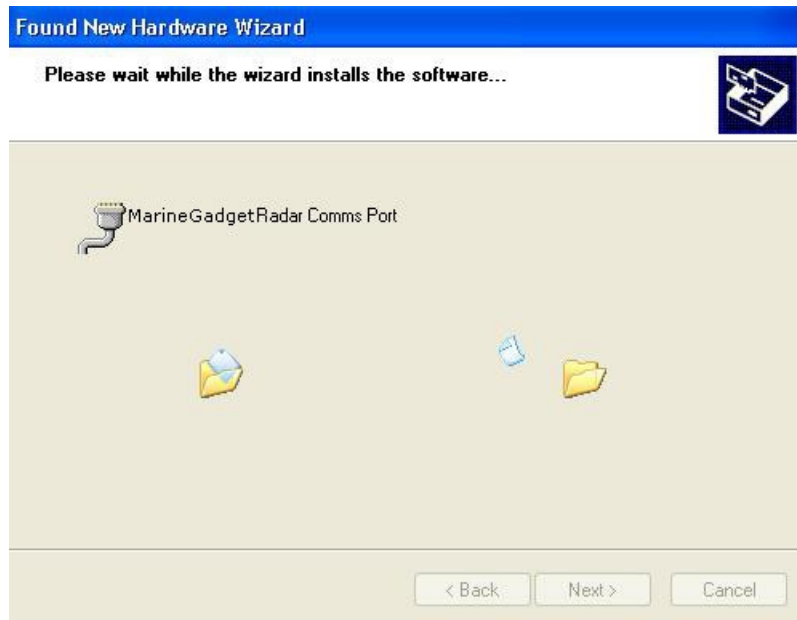
Select Install from a list or specific location (Advanced)



Click Next with Search removable media box checked



Select Continue Anyway



Wait for Windows to install the driver

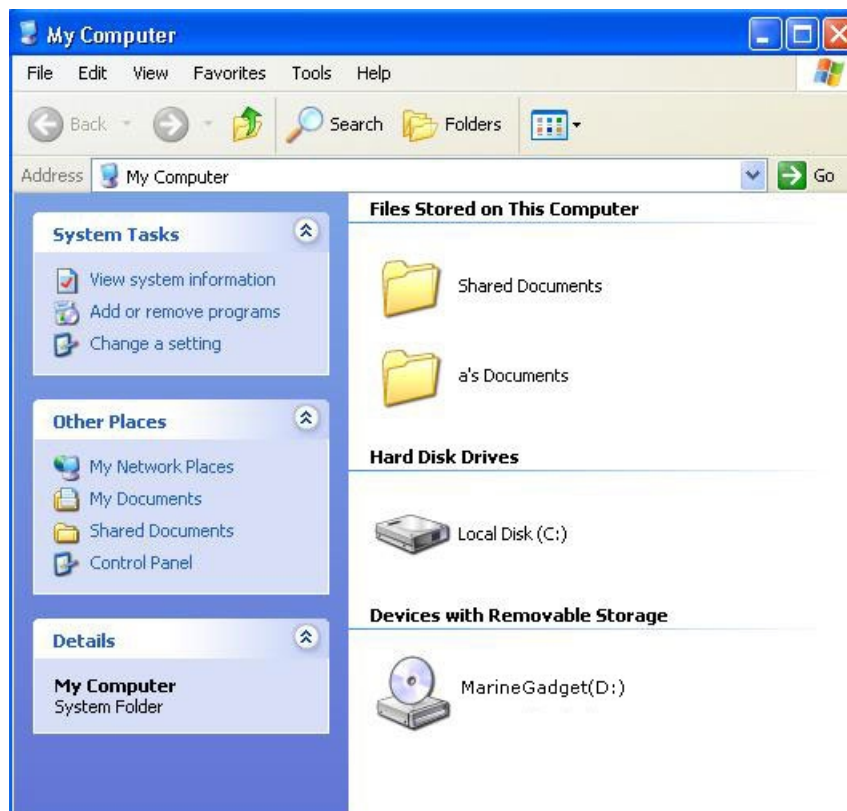


Click Finish to complete the install

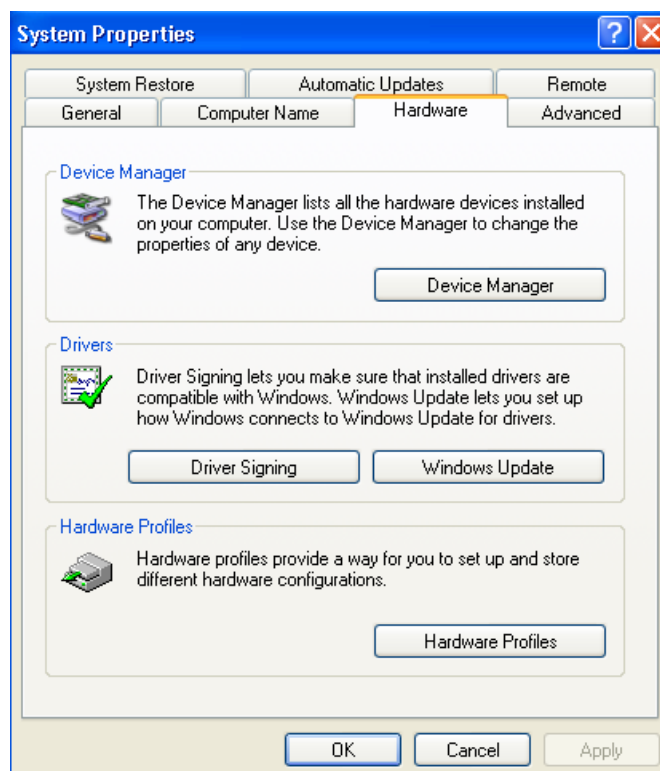
You now need to check which serial com port has been allocated to the MarineGadget Radar receiver.

When PlanePlotter is installed you need to know this com port.

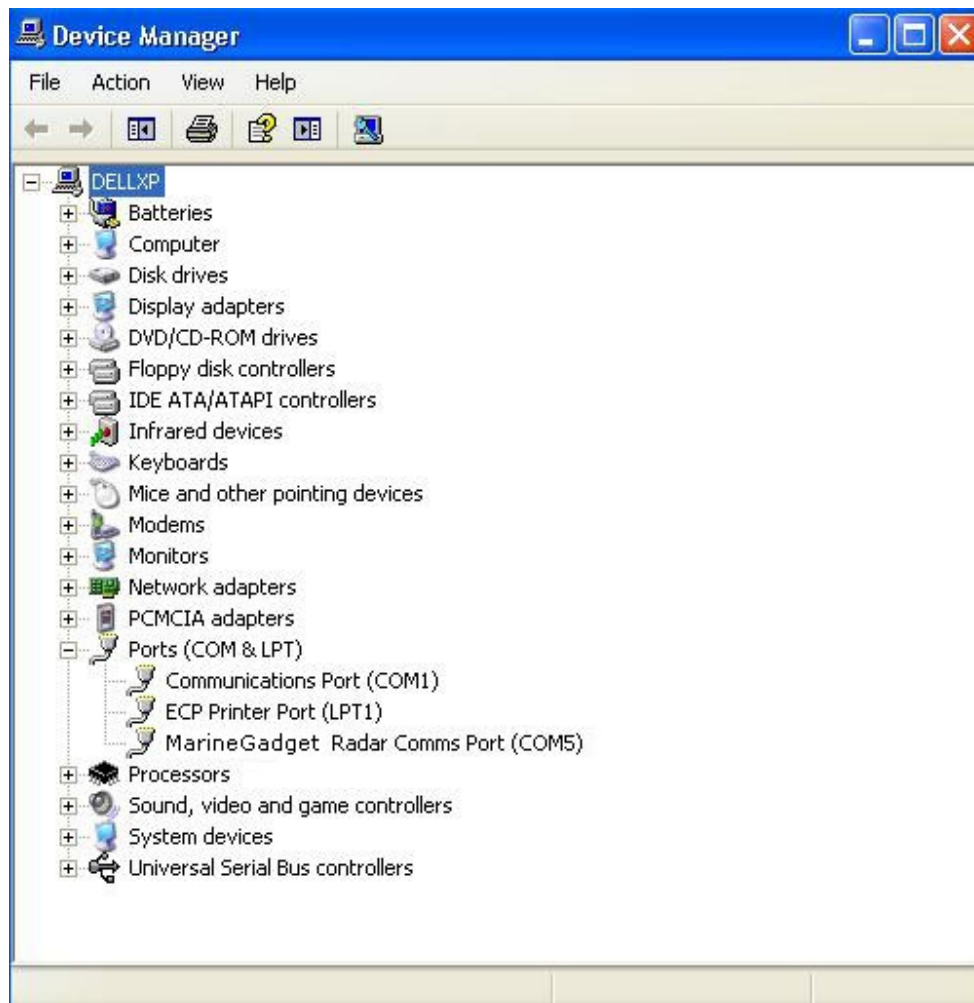
Go to Start and select My Computer



Now select View System Information from the panel on the left hand side (under System Tasks)
This opens the System Properties window, select the Hardware Tab.



Select the Device Manager button



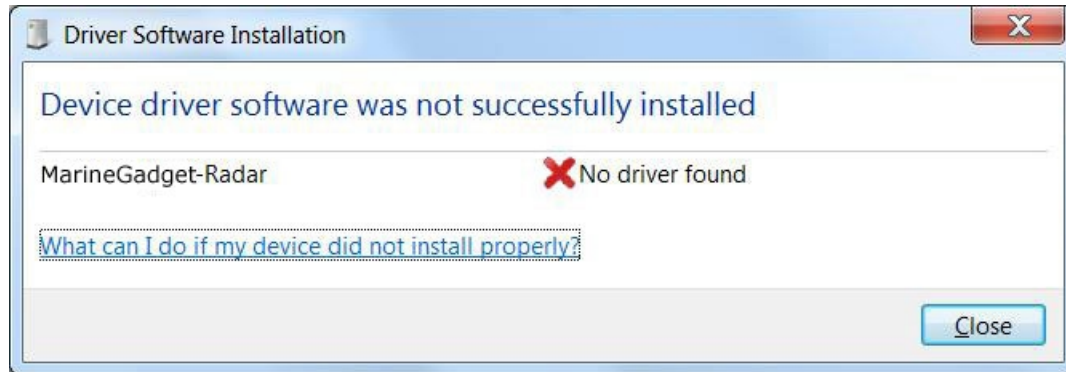
Go down to Ports (COM & LPT) and click on the + to open it out as shown above.
Now make a note of the port allocated to the MarineGadget Radar Comms Port, its COM5 in the example above

Section 4: Installation – Windows 7 (32 bit and 64 bit)

1.1 Installation of the MarineGadget Receiver

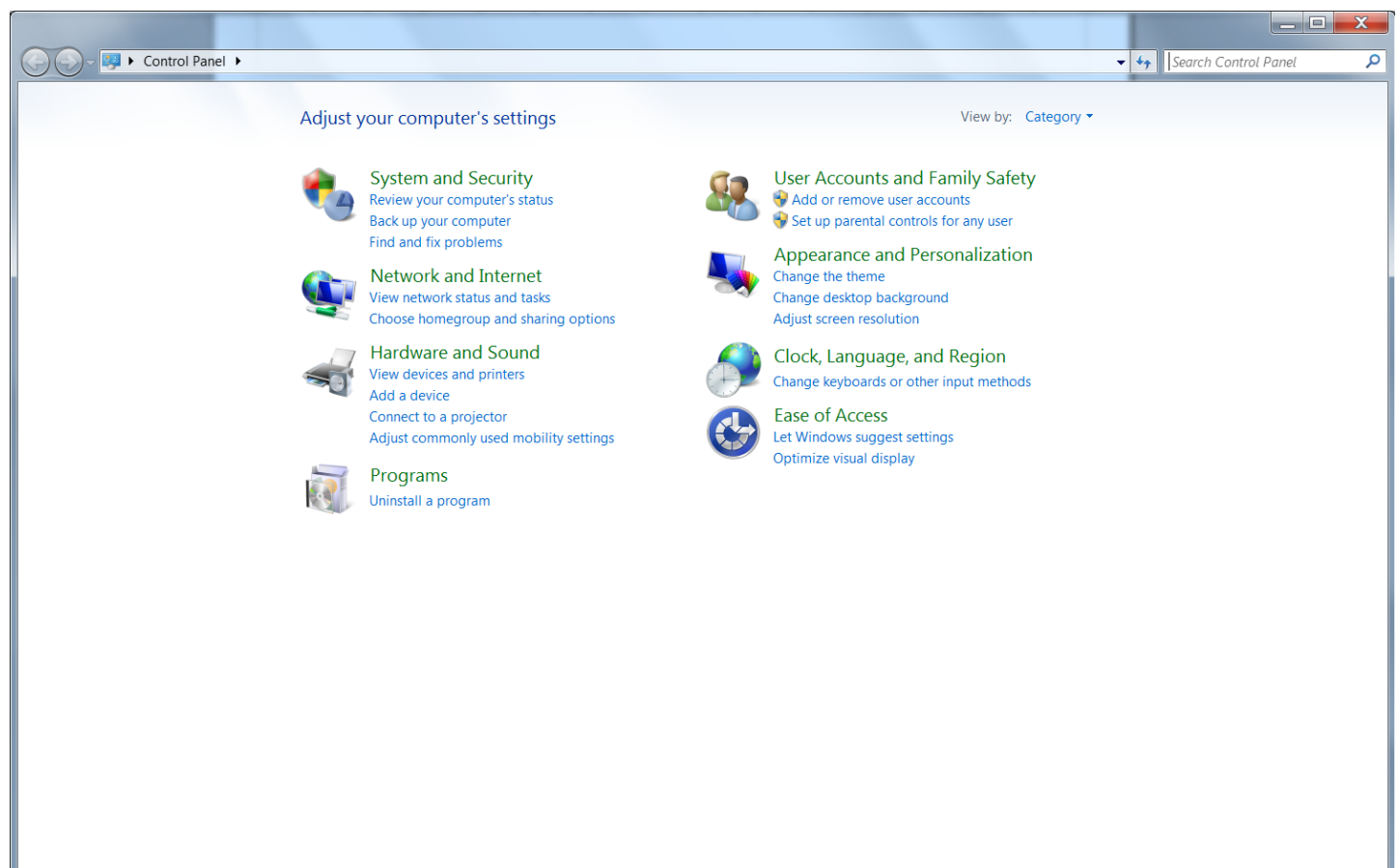
Put the CD supplied into your PC's drive and plug in the MarineGadget-Radar receiver using the USB cable supplied.

Windows will try to find the device and display

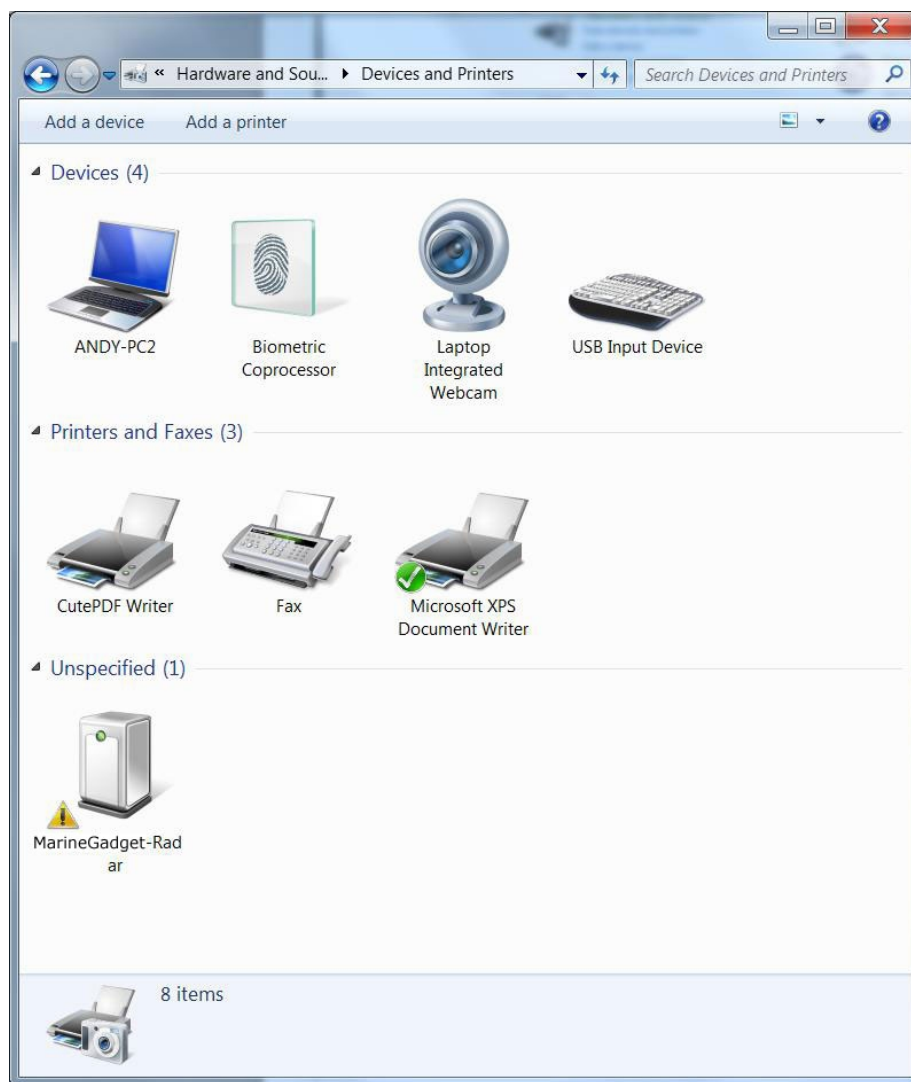


Click Close!

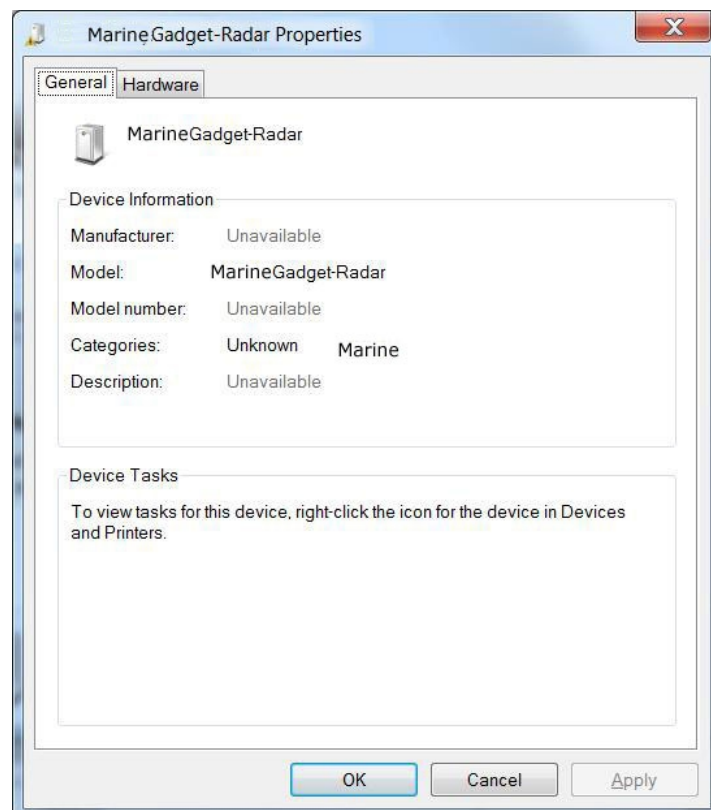
Now go to windows start (bottom left) and select Control Panel



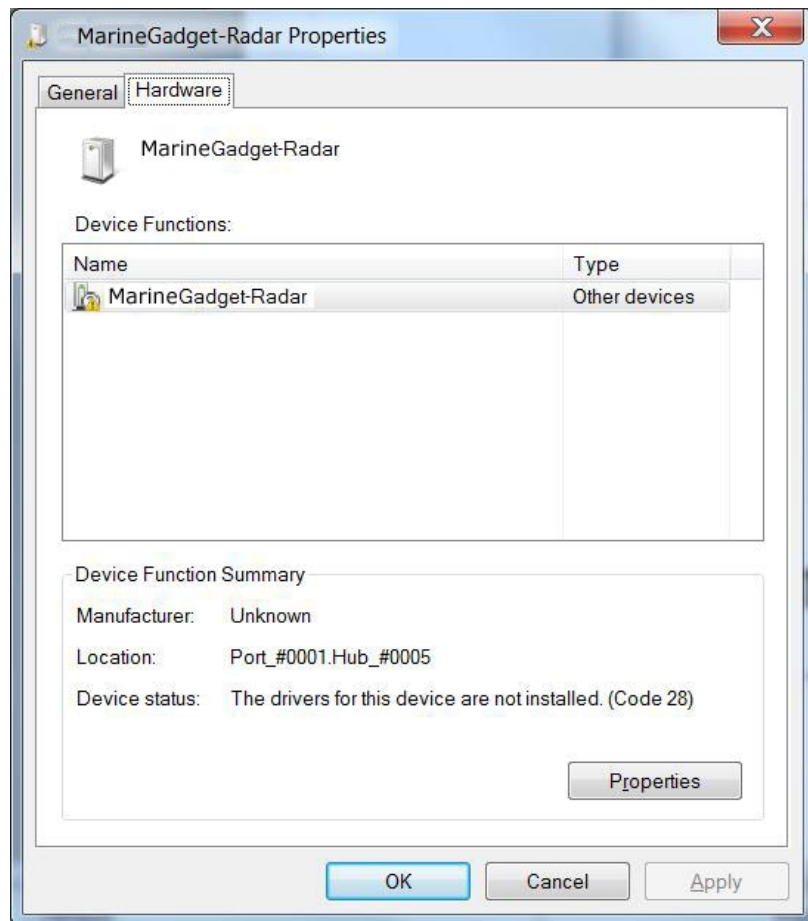
Under Hardware and Sound, select View devices and printers



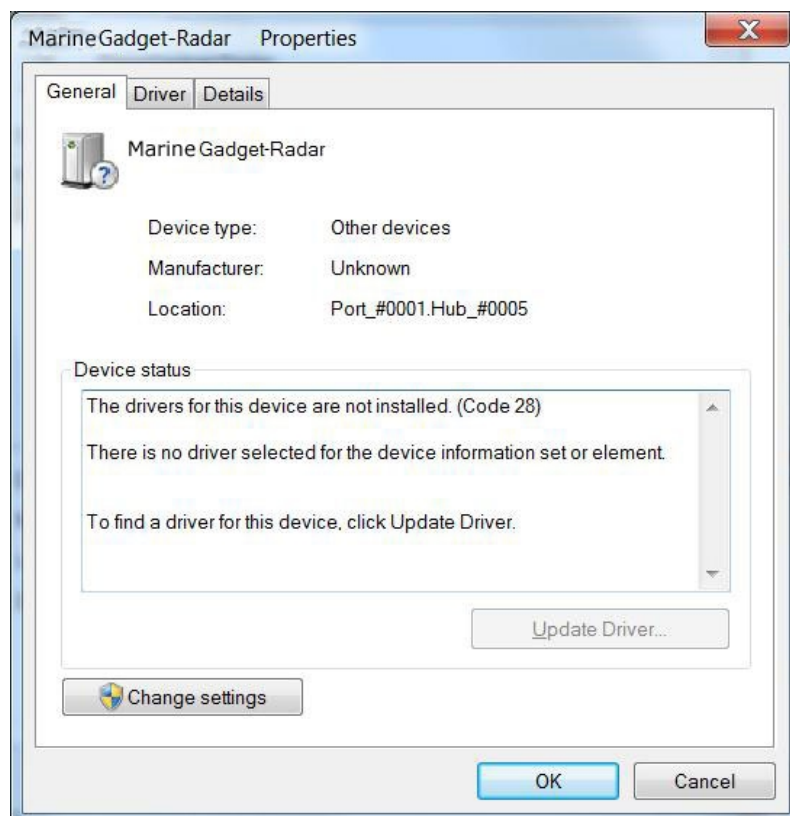
You will see the MarineGadget-Radar near the bottom as here. Double Click on it and you will see



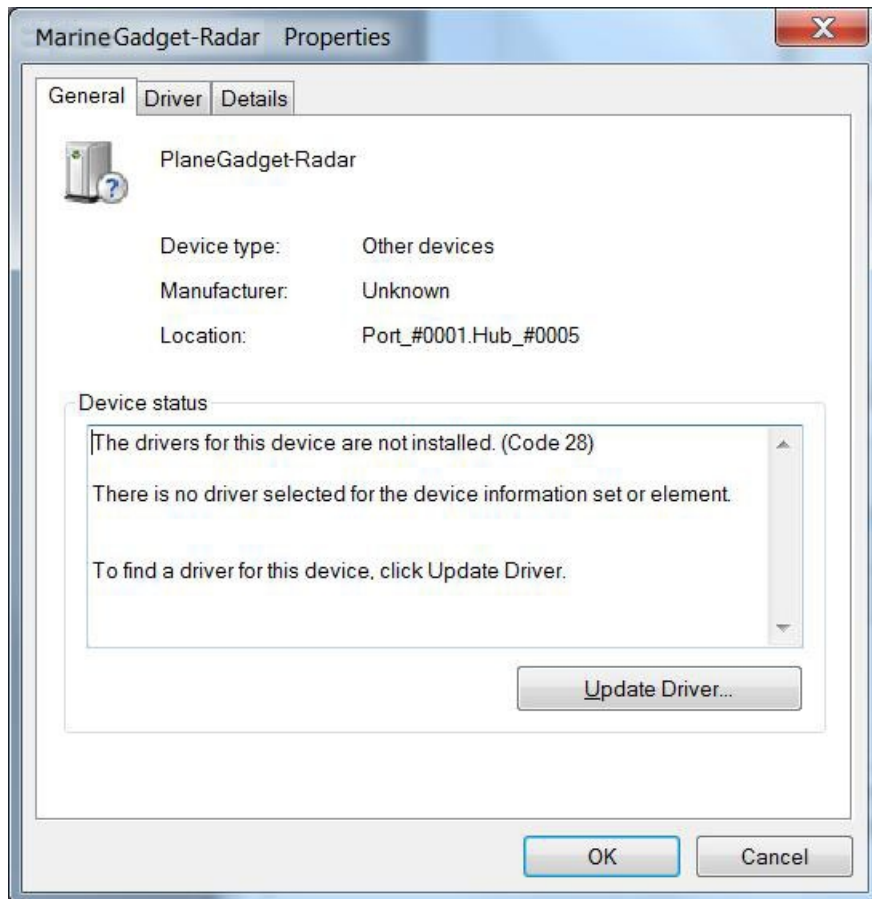
Now select the Hardware Tab to show



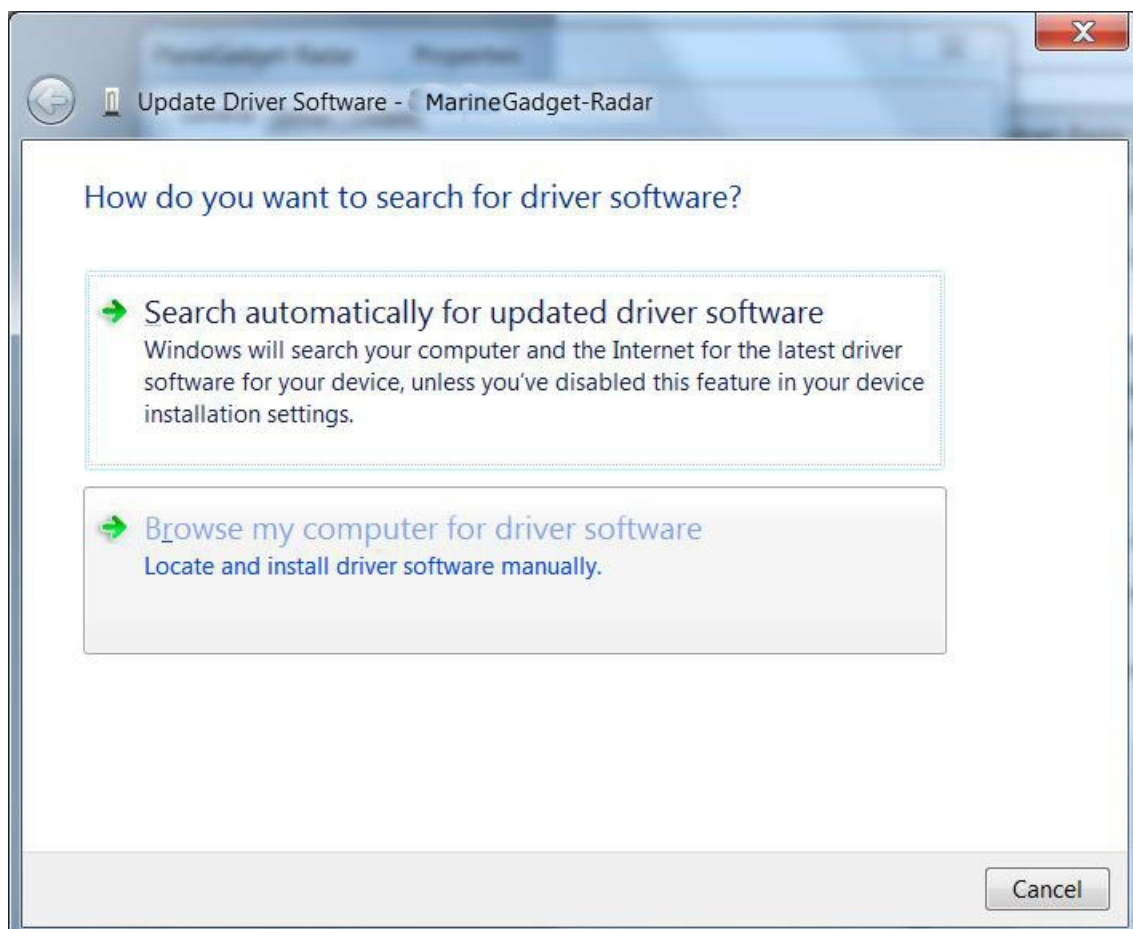
Select Properties bottom right



Now Select Change settings bottom left

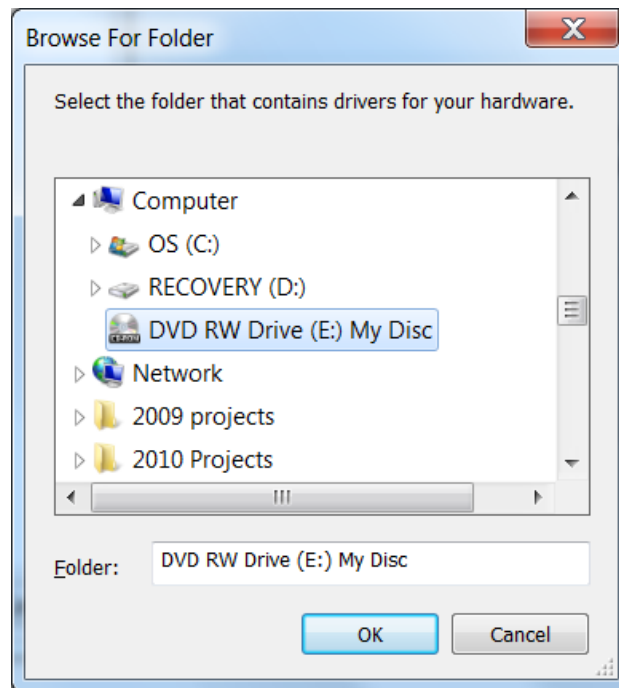


And select Update Driver

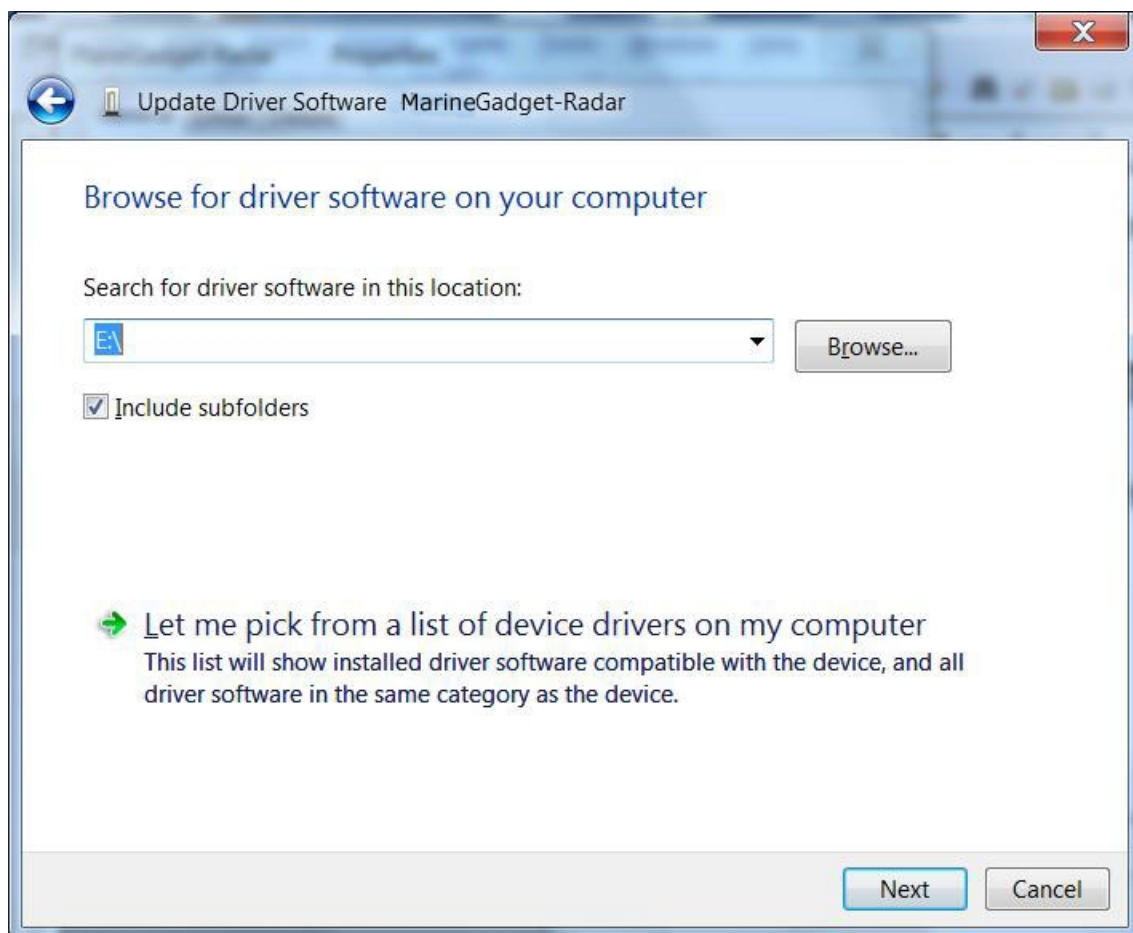


Select Browse my computer for driver software

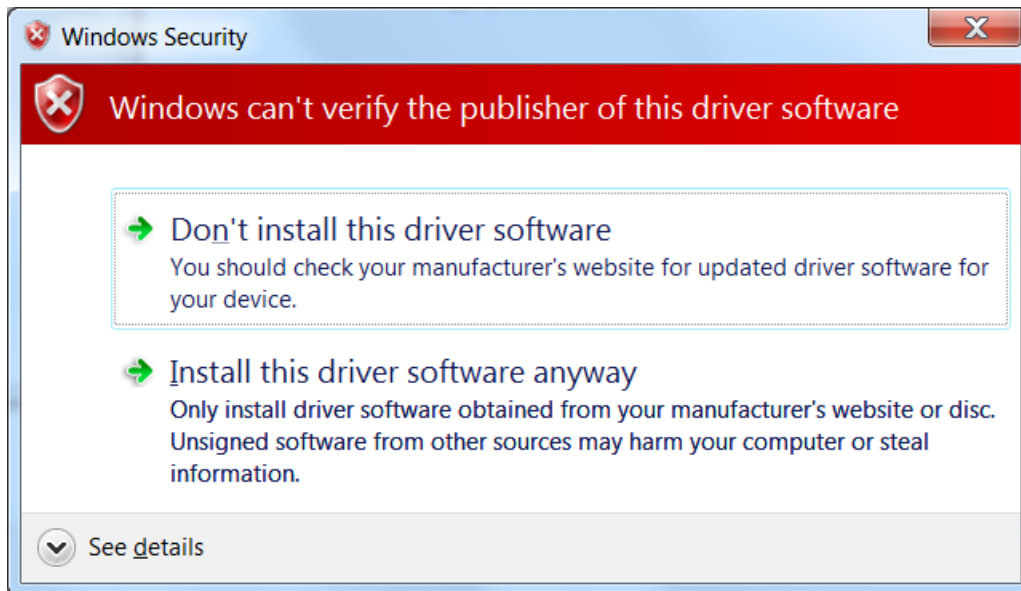
Navigate and select the folder for your CD drive



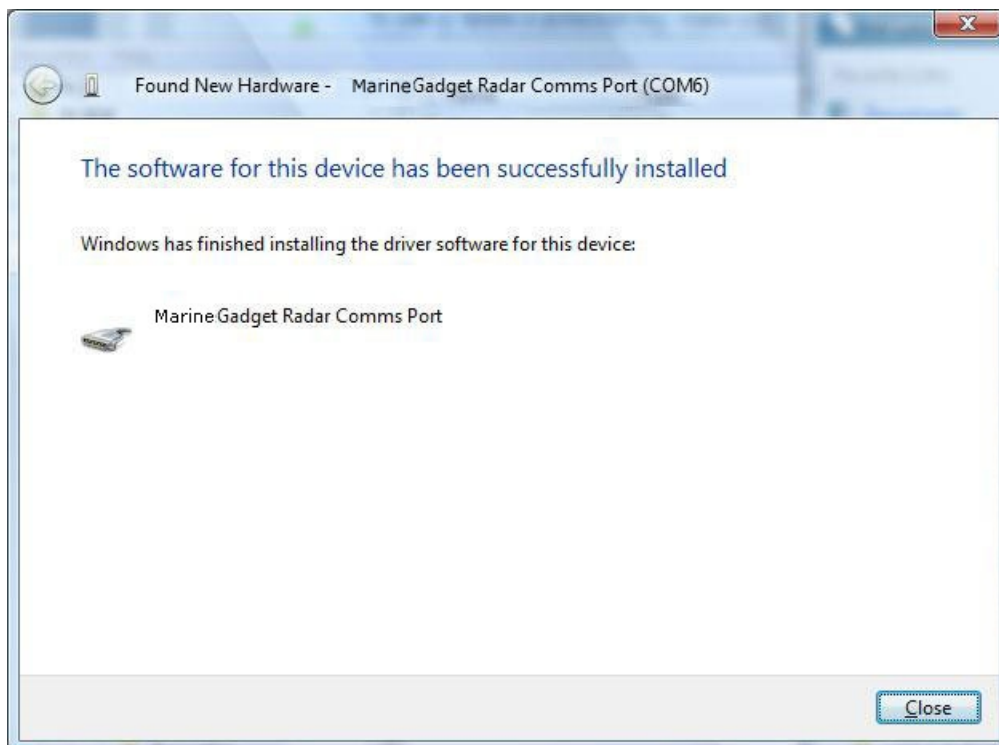
And select OK



Once the CD drive is selected click Next



Select "Install this driver software anyway" and the next window will look like this:-



Don't close this window yet...look at the COM port allocation first...its COM6 above in this example. You will need this when you configure your plotter software.

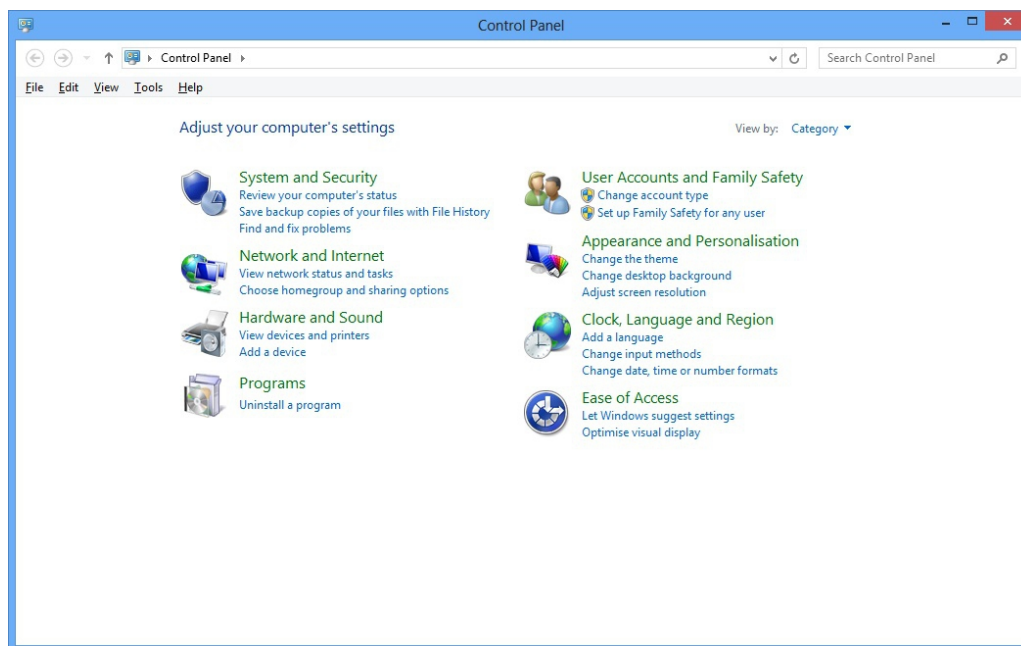
Your MarineGadget Radar drivers are now installed.

Section 5: Installation – Windows 8 (32 bit and 64 bit)

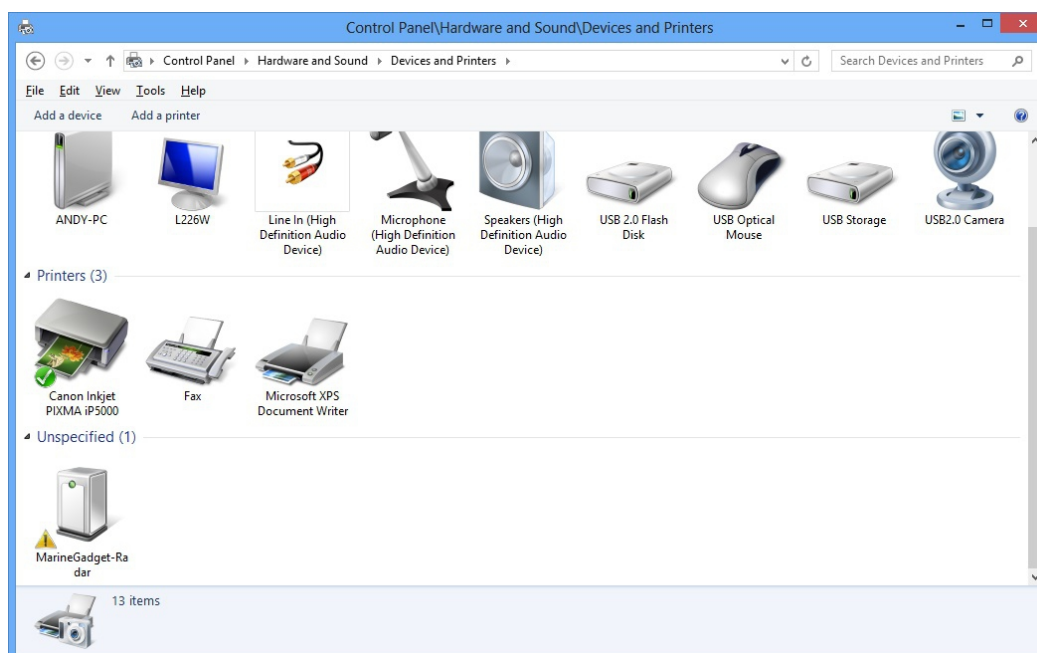
1.1 Installation of the MarineGadget Receiver

Make sure you are in desktop mode - Choose Start by clicking bottom left on the screen and select the Desktop tile. Put the CD supplied into your PC's drive and plug in the MarineGadget-Radar receiver using the USB cable supplied.

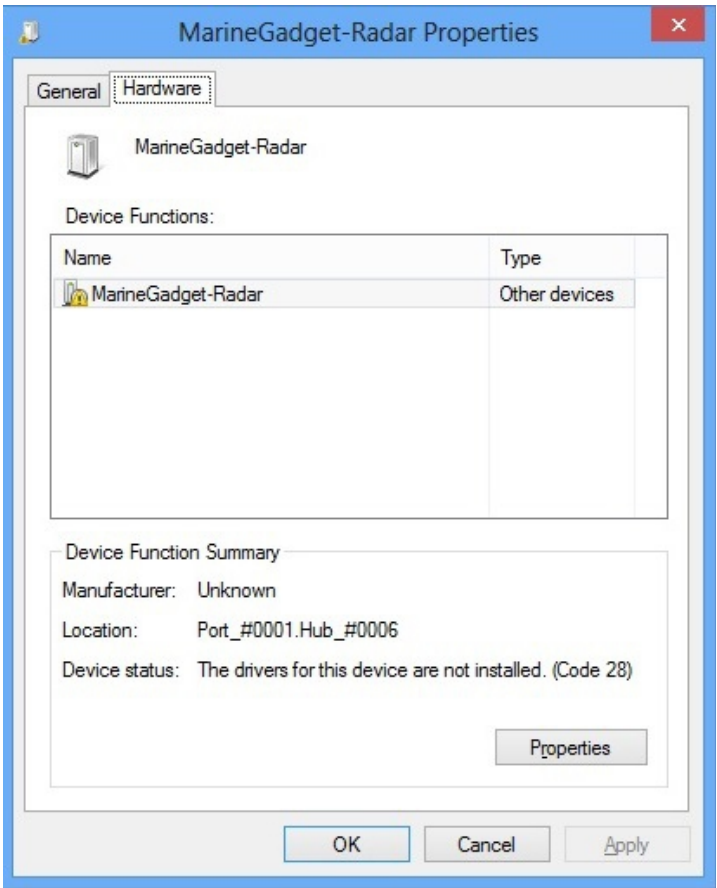
Wait 30 seconds or so (Windows will try to install from its own set of drivers and fail first!), then move the mouse pointer (or touch) the top right of the screen to reveal the menus. Select the bottom SETTINGS option (looks like a sun!). Then select Control Panel from the list (near the top under Desktop).



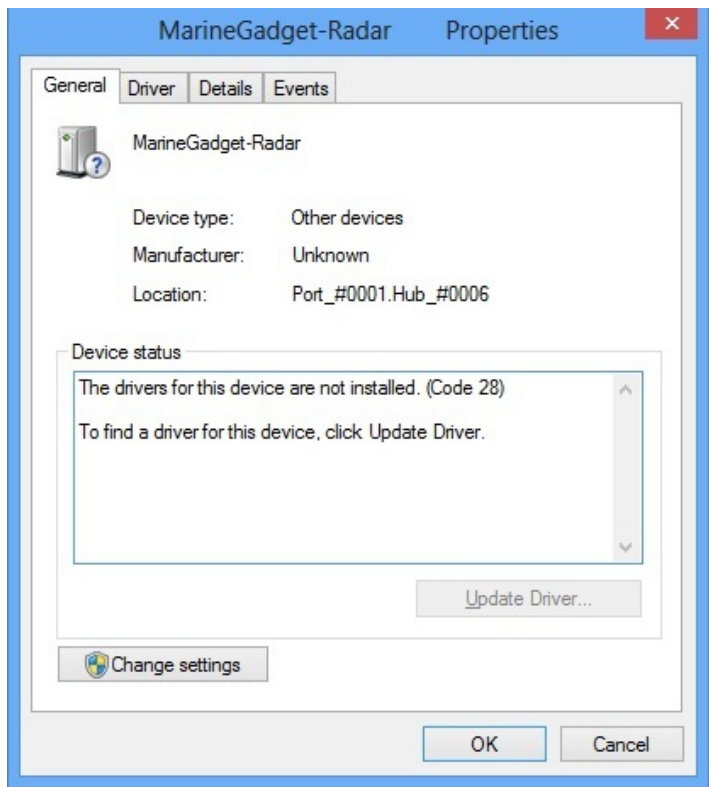
Choose "View devices and printers" under Hardware and Sounds



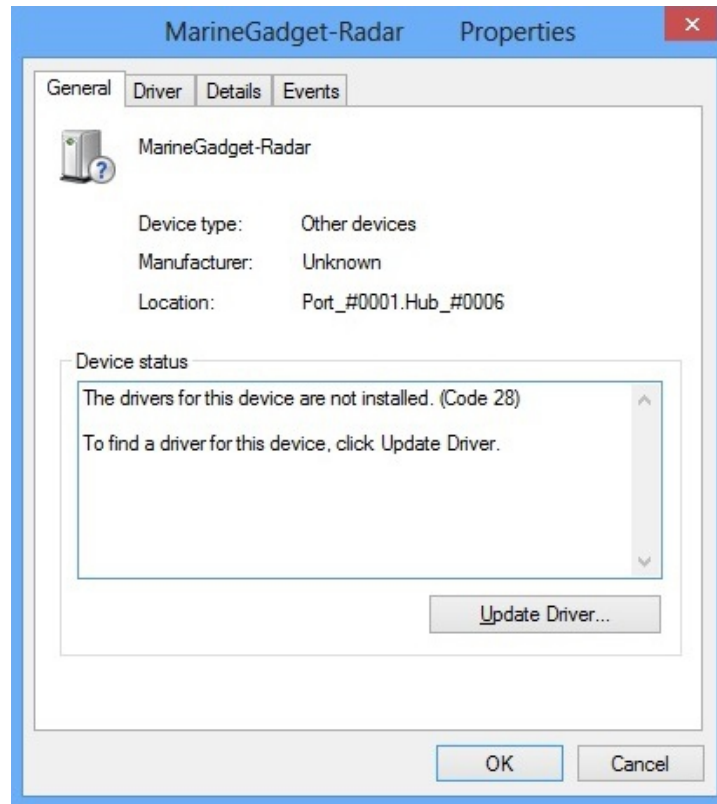
Double click on the MarineGadget-Radar (near the bottom) and choose the “Hardware” tab



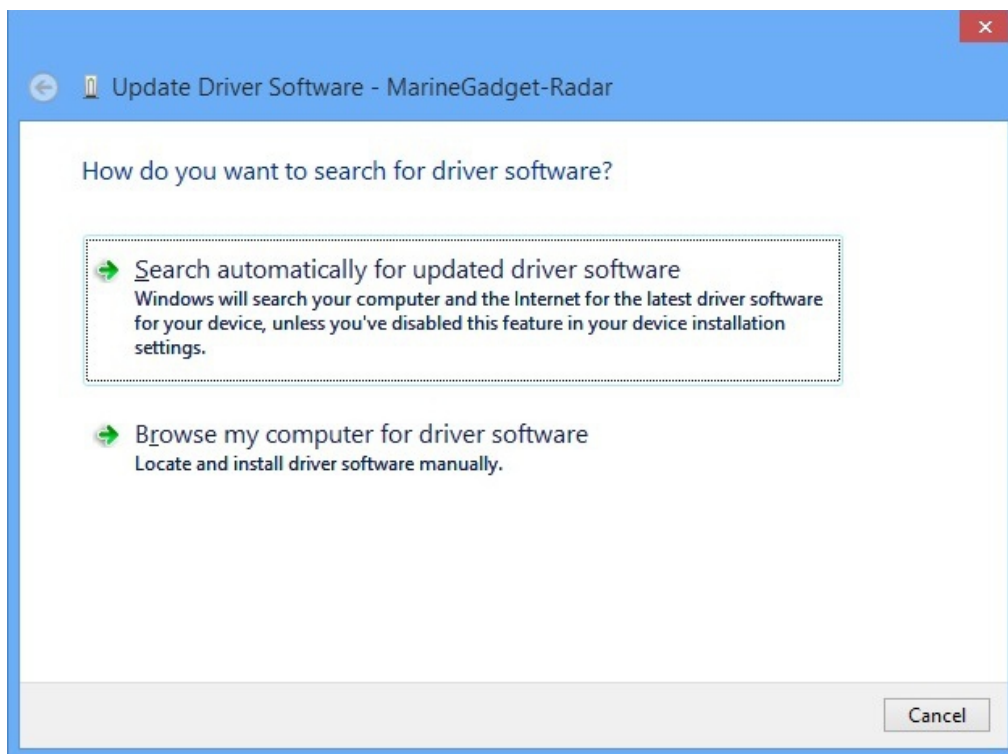
Choose “Properties”



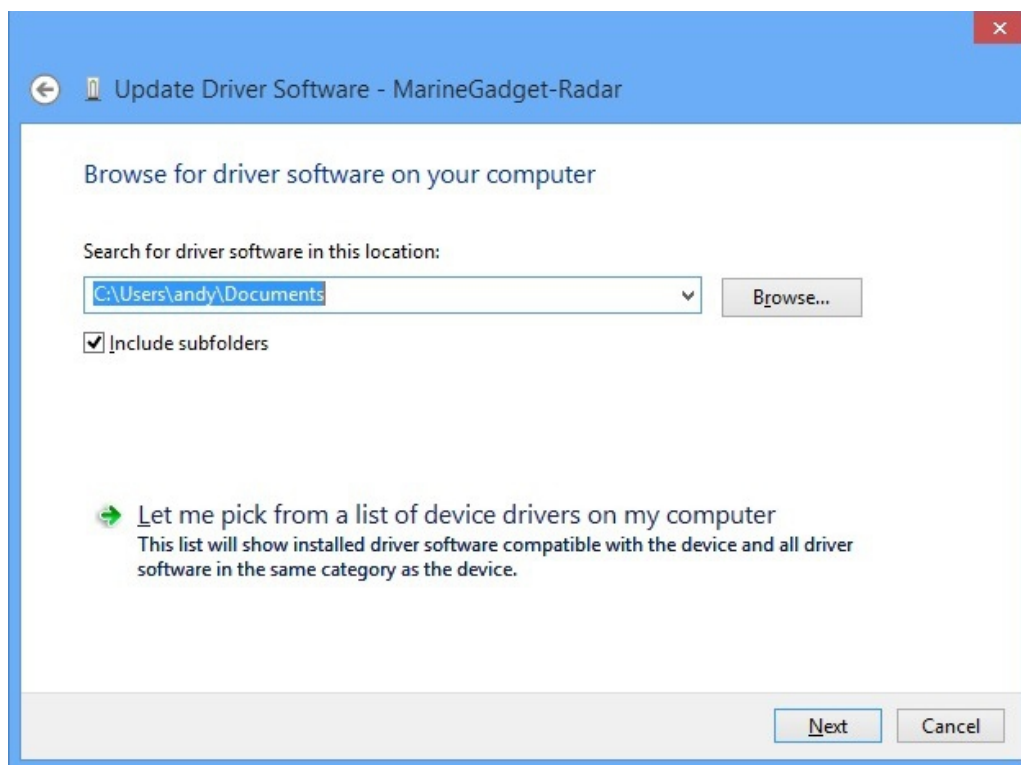
Click on “Change settings” at the bottom left



Choose “Update Driver”



Choose “Browse my computer for driver software”



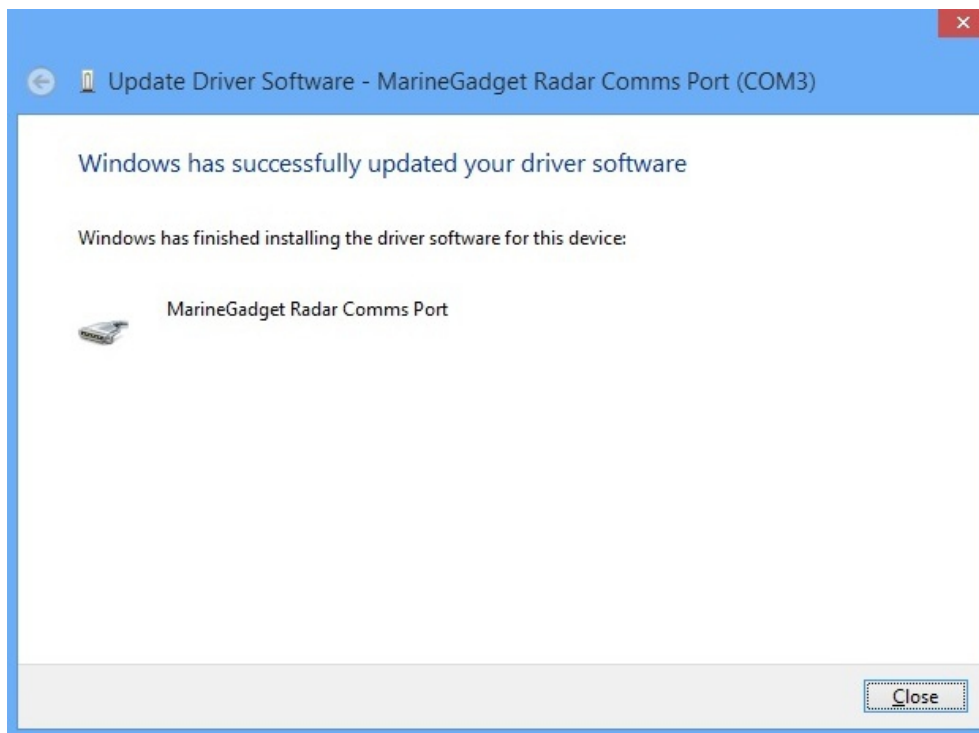
Select “Browse” and locate the drivers for windows 8. This will be your CD/DVD driver (perhaps D:) if you are using the supplied CD or a location on your computer if you downloaded the drivers from our website. If you downloaded them, make sure you unzip them first.

When you have the correct location (directory) selected click “Next”

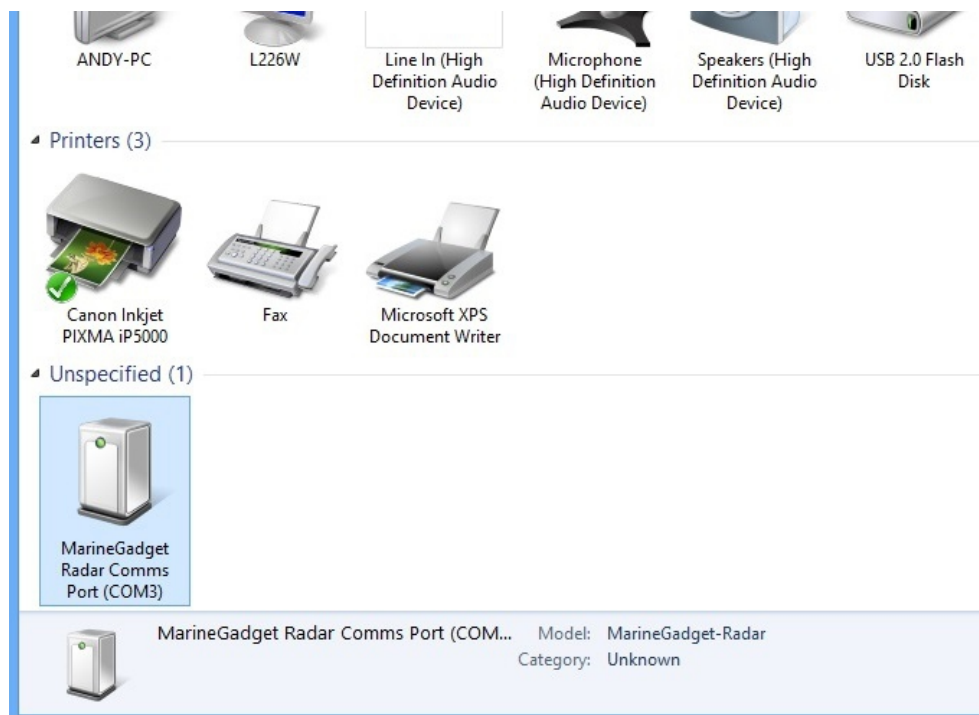


Click “Install”

Your will now see this



In this case the COM port (which you will need to setup your plotting software) is shown at the top of this window, here COM3. If for any reason it is not shown, or you need to find it later, go back to the control panel as shown at the start of these instructions for Windows 8. You will see the COM port in brackets after the device name as in the picture here



Note that if you change the USB port the MGR is plugged into, the COM port will change, you will need to change the setting in your plotting software. So best to always plug into the same port.

Section 6: Important information on the use of your MarineGadget-Radar

Connections

Your MarineGadget-Radar has a small SMA connector on the back. You can use this to connect an antenna directly or you can use the supplied SMA to BNC adaptor.

Please note that the most vulnerable part of the MarineGadget-Radar to damage is through pulling the antenna cable, which will put stress on both the MarineGadget-Radar itself and your PC's USB port. You must ensure that cables have sufficient play and are located in such a way that they cannot be snagged or pulled.

A USB extension cable is provided to make installation easier where the usb port is tight on space. This is a cable that connects to your USB port at one end and at the other had a connector that is exactly the same as the one on your PC. It means you have a cable to provide flexibility and strain on the receiver and USB port is reduced.

When using the BNC adaptor YOU MUST hold firmly the adaptor (NOT THE PLASTIC CASE OF THE RECEIVER!) when connecting the BNC cable. Connecting a BNC puts considerable pressure on the adaptor, and if you were to hold the plastic case of the MarineGadget-Radar or rely on your USB port something is very likely to break. Screw the adapter lightly onto the back of the MarineGadget-Radar without it being connected to your PC, then hold the adaptor firmly on the grip provided and connect the BNC cable. Then plug the MarineGadget-Radar into your PC.

Antennas

You can use any marine of VHF antenna that is 50R. For portable use a taxi magnetic mount antennas is suitable if it covers the band around 162Mhz.

Do not leave the antenna connected to the MarineGadget-Radar when there is likely to be lightning (a storm), this could result in failure of the MarineGadget-Radar and may also hurt your PC! It is your responsibility to ensure that your equipment is safely disconnected in an electrical storm.

Loss of communications...port errors

If you unplug the receiver from the USB port and then plug it back in while your plotting software is talking to it you are likely to get a port error. This can also happen if you have a PC that likes to power down the USB ports to save power (you should disable this feature in windows if it causes you a problem).

First check you have the correct com port set (remember if you swap USB ports the com port allocation will change and your plotting software will give a port error until you change it to the correct new port).

Otherwise to reset the interface, unplug the MarineGadget-Radar, close down your plotting software. Start your plotting software and plug the MarineGadget-Radar, then enable to AIS input on your plotting software.

Section 7: Configuration Commands

Your MarineGadget-Radar can monitor one of the two main AIS frequencies, Channel A (161.975Mhz) or Channel B (162.025Mhz). Ship information is transmitted on channel A then on channel B so in principle you should get all the information on one channel. However interference on one channel may cause one to be better than the other.

Your MarineGadget-Radar comes pre-set to Channel B. You can change these default settings by sending commands to your receiver. Some plotting software allows you to do this, in other cases you may need a terminal program.

The commands are: (you type/send what is in **Bold** the information in *italics* is just an explanation of the command

RADFA *Channel A is set all the time*

RADFB *Channel B is set all the time (default)*

RADF1 *Alternative ChannelA and Channel B every 10 seconds*

RADF2 *Alternative ChannelA and Channel B every 20 seconds*

RADF3 *Alternative ChannelA and Channel B every 30 seconds*

RADF4 *Alternative ChannelA and Channel B every 40 seconds*

RADF5 *Alternative ChannelA and Channel B every 50 seconds*

Note: The ship's AIS transmission will itself alternate between the two channels, if the receiver switches just before the next transmission of a particular vessel there may be several switching cycles before the ship is acquired. This is why the default setting is to channel B only and not alternating. However in some circumstances where there is unpredictable interference on either of the channels an alternating setup can prove advantageous.

The setting is stored permanently on the MarineGadget-Radar and will be remembered.

You can check communication with the MarineGadget-Radar by sending **RADC**

The receiver will reply **0010OK** for example

The first 0 is the mode, this will change depending on what mode is stored.

0 is Channel A all the time, **1** is B on all the time, **2** is 10 sec alternate, **3** is 20 seconds alternate etc

The next two digits **01** are the firmware version. The last digit is the modulation mode **0**=RADFW, **1**=RADFX etc, **OK** is, well ok.

Advanced Commands:

These commands should only be used with care. They allow fine control of the MarineGadget-Radar

The MarineGadget-Radar is capable of demodulating the AIS signal in a number of ways. The most sensitive setting is using the correlator demodulator while the linear demodulator has a much greater tolerance for errors in the transmission frequency.

The Demodulator Commands are:

RADFW *Correlator Demod standard BW - (IF filter 18kHz) – Standard Setting*

RADFX *Linear Demod - (IF filter 18kHz) large frequency error tolerance – little lower sensitivity*

RADFY *Linear Demod - (IF filter 25kHz) largest frequency error tolerance – lowest sensitivity*

RADFZ *Correlator Demod standard BW - (IF filter 12kHz)*

You might use these settings to fine tune and experiment in your local area. There is normally no need to play with these settings. SETTINGS ARE STORED AND REMEMBERED THROUGH POWER DOWN.

*AS MOST TRANSMISSIONS ARE LIMITED BY LINE OF SIGHT AND NOT SENSITIVITY, YOU MAY FIND THAT **RADFX** FOR LINEAR DEMODULATION IMPROVES RECEPTION IF SOME SHIPS ARE TRANSMITTING AT A FREQUENCY WHICH IS SLIGHTLY OFF CENTRE.*

Section 8: Specifications

- Channels A (161.975Mhz) or B (162.025Mhz) single channel or alternating channel
- Input connector SMA female (to mate with SMA male) 50 Ohm, or BNC through the supplied adaptor
- Sensitivity -110dBm
- PC connection – USB virtual serial port (connects via USB but appears as a serial com port to plotting software. Baud rate 38400bps
- Output NMEA 0183 style VDM messages
- Decodes AIS messages 1,2,3,4,5,9,18,19,21,24
- USB powered, no external power supply necessary
- Dimensions only 75x23x8mm (small pocket sized)