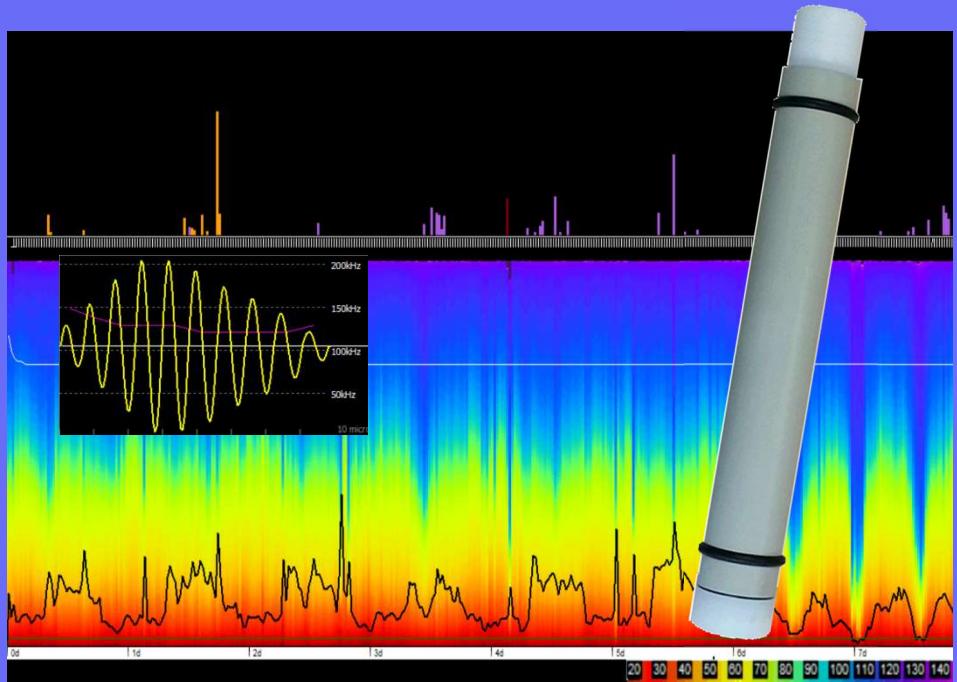




Chelonia Limited
Wildlife Acoustic Monitoring

F-POD User Guide



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1 Introduction

This User Guide describes how to set up, deploy and retrieve data from your F-POD.

F-PODs are fully automated, static, passive acoustic monitoring systems that detect porpoises, dolphins and other toothed whales by recognising the trains of echo-location clicks they make to detect their prey, orientate and interact.

The ability of F-PODs to accept broadband clicks means that:

- different filter settings are unnecessary, making setup very simple
- logging is very uniform between different F-PODs within a project
- there is an opportunity to integrate data from different projects over wide geographical areas.

The F-POD click data are stored on an SD card in the POD.

After deployment, the data are downloaded from the SD card onto a PC and are then analysed using the supplied F-POD PC app. The app automatically identifies the presence of cetaceans by detecting the trains of ultrasonic echo-location clicks they produce. The app can also be used to compare F-POD and C-POD data.

Help and support

We offer full email support and will be pleased to help with queries on any aspect of F-POD use.

Your F-POD purchase also entitles you to free future app upgrades.

We offer a range of additional services, including data analysis and interpretation.

You can find more information and the latest app and documentation on our web site at www.chelonia.co.uk.

Keep up-to-date with important changes by joining the Chelonia User Group, at www.chelonia.co.uk/cug_join.htm.

You can also contact us in the following ways:

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UK

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Email: team@chelonia.co.uk

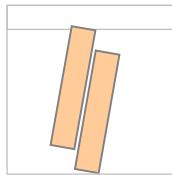
2 Checking parts

Once you have unpacked your F-POD, check to make sure that you have all the correct parts:

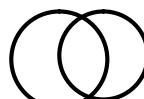


Houses the hydrophone

Contains the battery pack,
SD card and electronics



Silica gel



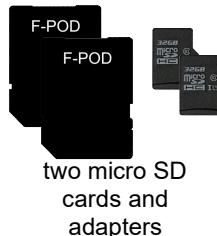
Spare O-rings



F-POD
User Guide



Battery pack
connector spring



two micro SD
cards and
adapters



SD card reader

The F-POD consists of a polypropylene casing with hydrophone housing at one end and a removable lid at the other end.

F-PODs are very robust, but be careful not to drop the F-POD or subject it to hard knocks, as this might interrupt the power supply.

PODs are identified by a unique number that is shown on labels on the SD cards and on the POD housing under the upper buffer ring.

Spare O-rings

O-rings are used to seal the lid and keep it waterproof when it is closed. Use these spares to replace the existing O-rings if they become damaged.

SD cards

Two 32 GB micro SD cards and adapters are supplied with each POD. No setup is required – all the setup information for the F-POD is already in the POD. When the POD is deployed, it writes click data to the SD card. On retrieval, you copy the data from the SD card to a PC running the FPOD.exe app. When you retrieve a POD after deployment, you can replace the micro SD card with the spare and immediately redeploy the POD.

F-PODs can use any *blank* micro SD card up to 32 GB. See *Calculating the maximum deployment time* on page 9 for more information about micro SD card capacity.

Silica gel pack

The silica gel pack is used to prevent condensation on the inside of the F-POD when it is deployed. Two packs are supplied for each POD, one for deployment and one spare.



There may be a risk of corrosion if there is no silica gel to keep the humidity low. Corrosion may cause power loss or failure of electronic components which may lead to data loss.

The silica gel pack slides down between the batteries and the POD (see *Starting the F-POD* on page 15).

Additional requirements

In order to run the POD app and download data from the SD cards, you need a computer running Microsoft Windows.

The F-POD uses 10 alkaline, lithium, or NiMH rechargeable D-cell batteries (not supplied). See the section *Calculating the maximum deployment time* on page 9 for advice on how to plan your deployment time.

The section *Retrieving F-PODs* on page 19 contains a recommended kit list for deploying and retrieving PODs.

3 Software installation

The F-POD app is used to analyse and automatically identify the presence of cetaceans by detecting the trains of ultrasonic echo-location clicks they produce. The app can also be used to compare F-POD and C-POD data.

The installation procedure consists of downloading files from the Chelonia web site.

Tip: Visit the links below on a regular basis to check for updates and modification information and join the Chelonia User Group at www.chelonia.co.uk/cug_join.htm.

Installing the app

Tip: The F-POD app is being developed and improved continuously. Make sure you have the latest version of the app as well as the Software Guide.

To install the F-POD app:

1. Create a folder called **FPOD** on your computer.
2. Go to the F-POD downloads page at:
https://www.chelonia.co.uk/fpod_downloads.htm
3. Download the file **FPOD.ZIP**.
4. Double-click on the ZIP file to open it. The ZIP file contains:
 - **FPOD.EXE** which is the F-POD app that analyses, displays and exports F-POD data
5. Drag and drop FPOD.exe into the **FPOD** folder.
6. Download any other support documents such as setup videos, Software Guides and example files.
7. Create another folder for your data files.

Installation is complete.

Other files

Download the latest version of this *User Guide*, the *Software Guide* and example files from:

https://www.chelonia.co.uk/fpod_downloads.htm

Uninstalling the app

To uninstall the F-POD app:

1. Delete the **FPOD.EXE** application from the FPOD folder.

4 Planning your deployments

This section contains advice and information to help you plan your deployments.

Calculating the maximum deployment time

The F-POD can use the following types of D-cell batteries, with nominal maximum values supplied by manufacturers:

- Alkaline: 1.5V 20Ah ~30Wh
- Lithium: 3.6V 17Ah ~61.2Wh
- Nickel Metal Hydride (NiMH) rechargeable: 1.2V 1.0Ah ~12Wh

Maximum deployment time is dependent upon the following factors:

- The capacity of the D-cells.
- The capacity of the SD card. Noisy environments fill SD cards a little more quickly than quiet ones. The FPOD.exe app has a field on the Analysis tab that tells you how long your SD card will take to fill up, based on existing data. See the *F-POD Software Guide*.
- To extend deployment time, the F-POD can be set to record data intermittently: 1 minute in 2, 1 minute in 5 or 1 minute in 10. See the *F-POD Software Guide*.



Deployment environments are very variable and therefore you should consider carrying out preliminary tests of battery consumption and memory use at sea, before full deployment.



If you plan to reuse batteries, be aware that no-load voltage readings can give a very misleading view of remaining battery capacity. The FPOD.exe PC app has an option for checking the battery levels found during a deployment.



NiCad rechargeable batteries are not recommended as they are heavy and are likely to sink the POD. They also have a high self-discharge rate so that the running time is shorter than you would expect from the capacity of the cell.

Lost and found

Write your contact details on the outside of the POD using indelible ink. Place a label inside the POD as well.

If you prefer not to write your contact details on the POD, the lid has the web site address www.phonehome.org.uk etched in the top.

This is a simple web site that will allow someone who finds a POD to contact us. We will then contact you to arrange its return.

Moorings

This section provides general information and guidelines that you should consider carefully when designing your moorings.

Buoyancy

When deployed, F-PODs have a positive buoyancy of approximately 0.7 kg with alkaline batteries and 1.2 kg with lithium batteries.

This means that PODs can be moored and allowed to float with the hydrophone housing upwards.

Location

The seabed is a source of noise from sand movement and crustaceans and the surface is a source of ultrasound from rain and breaking waves.

In shallow water, PODs should be moored midway between the bottom and the surface. In deep water, any position between 10 metres up and 10 metres down is good. The POD's polypropylene housing can be used down to 100 metres.

Deep diving cetaceans can be heard by a shallow water POD set to point downwards. Please contact us for more information.

Directionality

All PODs show lower sensitivity directly along the long axis of the housing, especially in the battery pack direction.

Security

The main problems with moorings are theft, being moved by trawlers or storms and abrasion of lines.

Theft

This is a serious risk in many areas. Some possible solutions are suggested below:

- Get cooperation and advice from local fishermen, who may allow you to use their gear.
- Use a very small marker, for example, a single fishing float on a thin line that is only at the surface at low slack tide. The disadvantage is that it may wind itself around weed or anything else and sink.
- Do not use buoys. Use a line between two anchors that can be located via GPS using a grapple.
- Use pop-ups. These are commercially available acoustic releases. However, currently they are very expensive.

- Use C-links that dissolve after a set time in the water and then release a recovery buoy from the bottom.
- Use divers to deploy and recover your PODs.

Mooring lines

Design the mooring using a mixture of sinking ropes and buoyant ropes. Use sinking ropes so that no loops of cordage float at the surface to entangle propellers and buoyant ropes that do not lie on the bottom and suffer excessive abrasion.

Use knots or fixings that grip the POD lid so that there is no possibility of continual movement, creating noise that may fill the SD card. If you use a shackle you can tape this with electrical tape.

The POD lid has three 10 mm diameter holes for attaching mooring lines such as double-braided 8 mm polyester mooring line. The mooring line should go through all three lid holes and under the loop created between the first two. We have never seen this move, but we still put an overhand knot in the end of the line just to be sure.



Using anchors

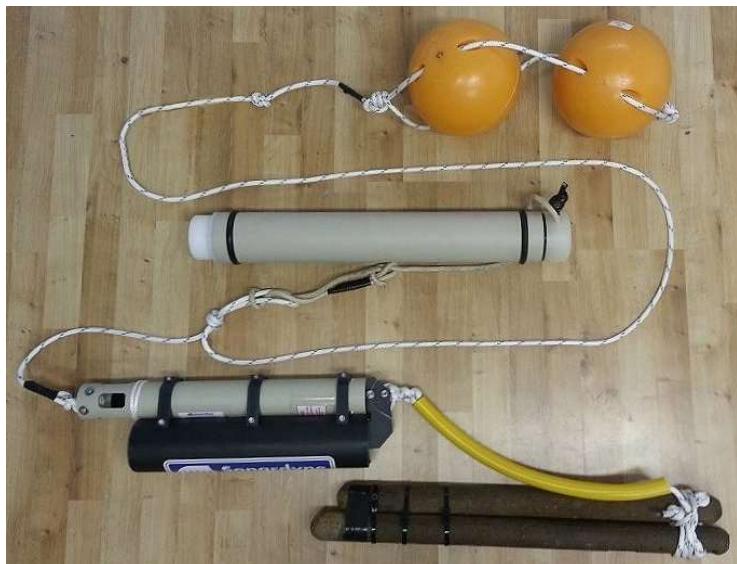
A few concrete blocks are not adequate on a sandy sea bed as these are dynamic and move with tidal currents. Massive concrete anchors, digging metal anchors or heavy metal anchors are needed. Manhole covers with a central attachment are effective but can be hard to lift.

Buoys

Try to use the smallest buoy that you will be able to find on retrieval. This helps to minimises drag in storms. However, some users have deployed large surface markers with radar reflectors and 4 tonne anchors.

You might prefer to use a short line that results in the buoy spending most of the time submerged due to the tide stream or tide height, appearing only briefly at the surface when the tide is slack or at low water. However, make sure the float will not be collapsed by the water pressure.

Another option is to use a remote release mechanism. This allows smaller anchor weights to be used as surface buoys are not required and therefore drag is greatly reduced.



Towing

Towing PODs is not recommended, for the following reasons:

- Animals are more or less undetectable unless they face the hydrophone.
- Porpoises tend to move away from moving boats and become undetectable over a width and distance that varies both with boat characteristics and with porpoise familiarity.
- Detection well beyond the range of responsive movement is unlikely with the POD so no undisturbed data set is available.
- Dolphins find towed PODs very interesting and will follow for long periods and get detected easily, but again the variables controlling this interaction are almost impossible to determine.

Towing a long way behind a yacht might give a usable way of filling weather-gaps in survey data for porpoises, and crude dolphin-encounter data.

5 Setting up F-PODs for deployment



It is strongly recommended that before you deploy your PODs, you practice setup, starting, closing, opening and downloading data, as described in this section and sections 6 and 7, so that you are confident with the operating procedures.

Setup options

The F-POD app allows you change the following setup options:

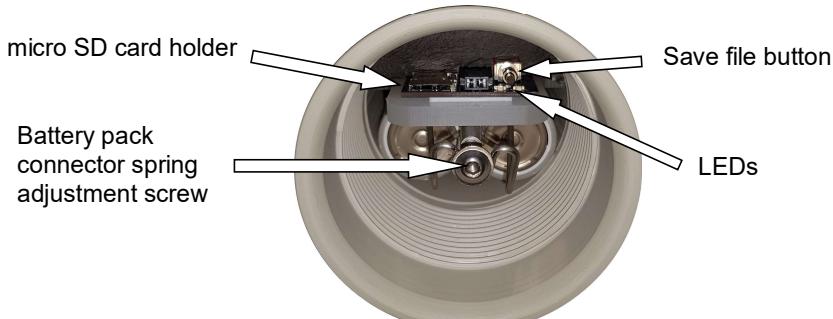
- using different types of battery
- continuous or intermittent logging
- filtering boat sonars
- automatic amplitude threshold control
- switch angle settings
- resetting the internal clock, for example, to use local time rather than UTC.

All the above options and more advanced options are described in the *F-POD Software Guide*.

Opening the F-POD

1. Use a screwdriver or bar through any one of the three holes in the lid to remove it by rotating it anti-clockwise (as seen looking at the lid end).

Internal parts



Installing batteries

The POD battery pack consists of 2 stacks of 5 cells, side-by-side in the housing, with the positive end of all cells facing inwards.

For most purposes, alkaline D-cells are recommended. See *Calculating the maximum deployment time* on page 9 more information.

F-POD buoyancy varies with total cell weight. Positive buoyancy is approximately 0.7 kg with alkaline D-cells and 1.2 kg with lithium batteries.

The POD uses one stack of D-cells at a time. The electronics selects the stack that provides the lower voltage. When the voltage from this stack of cells falls too low, the POD software selects the other stack of cells automatically.

To install the batteries:

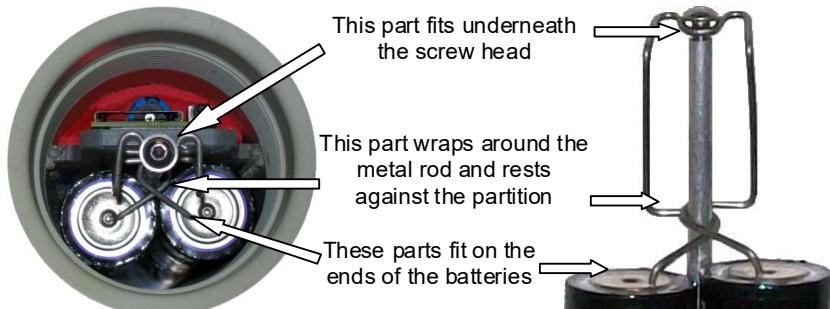
1. Inspect the batteries for damage. If the insulation around the outside casing of the battery is damaged, it can cause the battery pack to short-circuit. Either repair it with tape or use a new battery.
2. Place the POD on a horizontal surface.
3. Slide the cells into the POD one by one, filling first one stack and then the other.



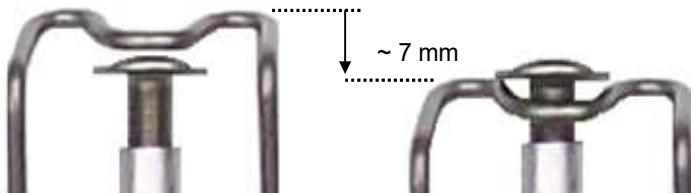
All the cells should face the same way – **positive end facing into the POD.**



4. Fit the battery pack connector spring as shown below by squeezing the spring gently and passing the loop in the bottom of the spring over the rod. Then slide the spring down the rod until it touches the batteries.



5. Adjust the screw in the top of the rod so that the dome of the screw is just below the top of the connector. This means you will only have to push the connector down approximately 7 mm to engage the head of the screw. This ensures that the battery pack is held securely, but not too tightly, as too much pressure could deform or damage the battery casings.



The F-POD uses no power in this mode. It will not use battery power until the POD is started.

Starting the F-POD

1. Fit the battery pack connector spring as shown above.
 2. Use one of the 32 GB micro SD cards provided by Chelonia. If one is not available, any *blank* micro SD card up 32 GB can be used.
 3. Check that the SD card is blank. This ensures that you have the maximum amount of space on the card.
-  If the SD card still has F-POD data on it, the POD will start, but there is less space available for new data (see *Multiple deployment data* on page 22).
4. Insert the SD card into the card holder in the POD. Push the card down gently until it clicks into place. This switches on the POD.



Both LEDs light red while the POD starts up, then blue to indicate that both battery stacks are OK (FPODs 6800 onwards will also light both LEDs white for a few seconds, then usually a single blue flash). Finally both LEDs flash green 5 times to indicate that the POD has started running.



If one of the blue LEDs does not light, there is a problem with a battery stack. The left LED off means the left battery stack is faulty. The right LED off means the right battery stack is faulty. Stop the POD and check the batteries.



If, after startup, one LED flashes red every 4 seconds, there is a problem. Possibly, the SD card is full or there are already 10 deployment data files on the card. Remove the SD card, delete any files on it and try again.

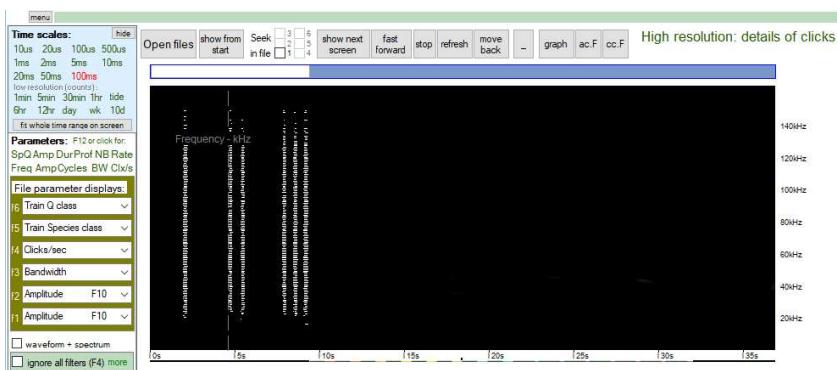
The F-POD has an accurate internal clock that has been set to UTC (Coordinated Universal Time) and the left LED will now briefly flash green every minute and continue to flash if there is data to be written to the SD card, e.g. from any local ultrasound noise from sources such as fluorescent lighting or laptops. If data is being recorded you will often see some amber flashes just before the green flash.

5. Wait until you see the LED briefly flash green on the minute rollover to confirm that the POD is running.

Checking the POD starts, runs and stops

If you want to check that the POD runs and records data before you start a deployment, you can do the following quick test:

1. Start the POD as above.
2. Invert the POD so the hydrophone is pointed upwards in case the angle sensor is set to only switch on when above horizontal.
3. Wait for 2 minutes to roll over.
4. Stroke the hydrophone housing a few times with your finger in a simple sequence such as 1 stroke, pause, 2 strokes, pause, 3 strokes.
5. Stop the POD (see *Stopping the POD* on page 20).
6. View the data in FPOD.exe (see the *F-POD Software Guide*). You should see your sequence if you view the data at 50 ms time resolution. For example:



Closing the POD

The lid is supplied with two O-rings. The O-rings have been lightly lubricated using a PTFE dry-lube oil to ensure that the lid tightens smoothly.

Tip: If you want to lubricate the O-rings before deployment, using a dry-lube lubricant minimises stickiness that might attract dust and grit.

PODs have a lid with 10 mm diameter holes for attaching mooring lines (see the figure below and *Mooring lines* on page 11). Use a bar or screwdriver located in one of the holes to open and close the lid.

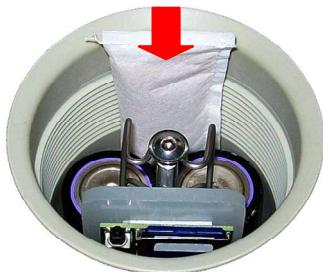
To close the POD:

1. Make sure there are two O-rings in place on the lid.



Check that the O-rings are clean. Check particularly that there are no hairs, grit or sand trapped beneath the O-rings as these could cause damaging leaks.

2. Take a silica gel packet out of its moisture-proof container and slide it down between the batteries and the POD housing.



There may be a risk of corrosion if there is no silica gel to keep the humidity low. Corrosion may cause power loss or failure of electronic components which may lead to data loss.



The silica gel pack can become saturated in only 30 minutes of exposure to warm damp air, so keep it in an airtight jar or bag until you are ready to close the POD.

When dry, silica gel is yellow/orange in colour. The crystals turn green when damp.

To restore the crystals, place the bag in an oven and heat at 120°C for two hours.

3. Align the lid and housing carefully and begin screwing them together until the visible O-ring is beginning to be compressed. You will feel an increase in resistance when the lid starts to press on the outer O-ring. From that point, a further quarter of a turn will complete the closure. The strap wrench shown here is not essential.



The POD is now ready for deployment.

6 Retrieving F-PODs

It is recommended that you take the following kit with you when you retrieve PODs at sea:

- the spare SD card
- a means of recording your observations
- a scrubber and scraper to remove bio-fouling
- a heavy screwdriver and POD wrench to open and close the POD
- a towel
- a pair of tweezers to remove the silica gel
- an airtight container to put the silica gel in
- paper towels to clean any sand or grit that may have lodged under the O-rings
- a spare set of O-rings in case of damage
- a spare battery pack connector spring
- new batteries for redeployment
- a voltmeter to check battery condition, if you want to re-use batteries
- a waterproof marker pen to write contact details on the POD housing
- any tools for your attachment method
- a splash-proof box for this kit

Opening the F-POD after deployment

When you retrieve an F-POD:

1. Use a plastic scraper to clean off any heavy fouling.
2. Scrub and wash the housing.
3. Dry the POD and lid, especially around the O-ring.
4. Open the POD in a dry, stable location.

Stopping the POD for serial numbers below 6800

If the POD is running correctly, the left LED will briefly flash green every minute.

To stop the POD:

1. Press and release the **Save File** button carefully.
 - If the POD has already shut down, nothing will happen and you can remove the SD card after a few seconds.

- If there is data to save, the right LED flashes yellow rapidly while the data is written to the SD card, and then both LEDs stay ON green for 3 seconds when writing has completed.
2. When the LEDs go out, remove the SD card by gently pressing and releasing it. This switches off the POD.
 3. Remove the SD card and put it in a safe place.
 4. If you want to redeploy the POD immediately, go to the section *Redeploying the F-POD immediately* below.
 5. Remove the battery pack connector spring.
 6. Remove the silica gel and put it in a moisture-proof container.
 7. Inspect the O-rings for damage and replace them if necessary.
 8. Remove the batteries and note which stack each one comes from.

Stopping the POD for serial numbers from 6800

If the POD is running correctly, the left LED will briefly flash green or amber every minute.

To stop the POD:

1. Press and release the **Save File** button carefully.
 - If the POD has already shut down, both LEDs will immediately flash multicolours and you can eject the SD card.
 - If there is data to save, the right LED flashes amber rapidly while the data is written to the SD card, then both flash multicolours. As soon as the multicolour flashing starts you can eject the SD card.
2. Remove the micro SD card and put it in its labelled SD card adapter.
3. If you want to redeploy the POD immediately, go to the section *Redeploying the F-POD immediately* below.
4. Remove the battery pack connector spring.
5. Remove the silica gel and put it in a moisture-proof container.
6. Inspect the O-rings for damage and replace them if necessary.
7. Remove the batteries and note which stack each one comes from.

Redeploying the F-POD immediately

If you want to redeploy the F-POD immediately:

1. Check that the spare SD card has no files on it.
2. Insert the spare SD card into the card holder.

Both LEDs light red as the POD start up, then blue to indicate that both battery stacks are connected (FPODs 6800 onwards will also light both LEDs white for a few seconds, then usually a single blue flash). Finally both LEDs flash green 4 or 5 times to indicate that the POD has started running.

The left LED will now briefly flash amber or green every minute and continues to flash if there is data to be written to the SD card, e.g. from any local ultrasound sources.

3. Close the POD.

7 Downloading your data

When you have retrieved your SD card from a deployed F-POD, you can copy the data from the card to your PC using the FPOD.exe app.

Files on the SD card for FPOD serial numbers below 6800

The filename format for F-POD data files is F_DATA*n*.CHE. For example: F_DATA0.CHE, F_DATA1.CHE, F_DATA2.CHE, etc.

Each file is approximately 4 GB in size and the number of files on a card depends on the size of the card and how much data has been recorded.

Multiple deployment data

If you run an F-POD using an SD card that already has F-POD data on it, the POD saves the new data files using a different naming format. If the SD card is large enough, you can run an F-POD up to 10 times without deleting the previous data files. The files are named using the following format:

F_DATA0.CHE, F_DATA1.CHE, F_DATA2.CHE, etc.

0_DATA0.CHE, 0_DATA1.CHE, 0_DATA2.CHE, etc.

1_DATA0.CHE, 1_DATA1.CHE, 1_DATA2.CHE, etc.

...

8_DATA0.CHE, 8_DATA1.CHE, 8_DATA2.CHE, etc.

Tip: We recommend that after you have downloaded all the data from your SD card, you delete all files on it before you use it again.

If you try to run the POD an eleventh time, the red LED will flash and the POD will not start. You must delete the files on the SD card before the POD will start.

Files on the SD card for FPOD serial from 6800

The filename format for newer F-POD data files is 0FPOD*nnn*.CHE. In these newer F-PODs a new file is written for each day, this is to reduce the chance of data loss should the F-POD stop unexpectedly or if the card is ejected without pressing the stop button.

For example:

0FPOD000.CHE, 0FPOD001.CHE, 0FPOD002, etc.

Each file will be several MB in size and the number of files on a card depends on the number of days the F-POD has been running for.

Multiple deployment data

If the SD card is large enough, you can run an F-POD up to 36 times without deleting the previous data files. The files are named using the following format:

Deployment	Day 1	Day 2	Day 3	...
1	0FPOD000.CHE	0FPOD001.CHE	0FPOD002.CHE	...
2	1FPOD000.CHE	1FPOD001.CHE	1FPOD002.CHE	...
3	2FPOD000.CHE	2FPOD001.CHE	2FPOD002.CHE	...
...	...			
10	9FPOD000.CHE	9FPOD001.CHE	9FPOD002.CHE	...
11	AFPOD000.CHE	AFPOD001.CHE	AFPOD002.CHE	...
...	...			
36	ZFPOD000.CHE	ZFPOD001.CHE	ZFPOD002.CHE	...

If you try to run the POD a thirty-seventh time, both red LEDs will flash and the POD will not start. Remove the SD card to switch off the POD. Use a blank SD card instead.

Tip: We recommend that after you have downloaded all the data from your SD card, you reformat it before you use it again.

Error report

When the POD is started, it writes a text file called REPORT.TXT that contains information about the POD and any errors encountered in the *previous deployment*.

If you have problems with a POD, we may ask you to run and stop the POD and then send us the REPORT.TXT file.

Data files

When the CHE files are downloaded using the FPOD.exe app, they are saved on your PC as FP1 files.

In the FPOD app you should enter an accurate and consistent location name and the data will then be saved as an FP1 file with the name: *location date PODnumber filenumber*.

For example, 0FPOD000.CHE is saved as:

location date FPOD_nnnnn file0.FP1

Tip: Before re-using the SD card, you should reformat it. You can use the Microsoft Windows Format app although we recommend using the free SD Association formatter as it is optimized for SD/SDHC/SDXC cards, does not allow you to accidentally format a hard drive and can be found at: www.sdcard.org/downloads/formatter.

However, if you run multiple POD deployments without deleting the files on the SD card between deployments, when you download the files, FPOD.exe will offer to save the data files for each deployment in turn, using the format:

0FPOD000.CHE	→	<i>location date FPOD_nnnnn file0.FP1</i>	oldest
1FPOD000.CHE	→	<i>location date FPOD_nnnnn file1.FP1</i>	...
2FPOD000.CHE	→	<i>location date FPOD_nnnnn file2.FP1</i>	...
3FPOD000.CHE	→	<i>location date FPOD_nnnnn file3.FP1</i>	newest
etc			

Tip: Be aware that you may already have downloaded everything except the last deployment.

Connecting the SD card to a PC

To set up your SD card:

1. Insert the micro SD card into the card reader.
2. Insert the card reader into a USB port on your computer.
Your PC will detect the SD card automatically and identify it as a removable drive.
3. If Windows displays AutoPlay or Scan and Fix options, close the windows without selecting any options.

Running the FPOD.EXE app

In the FPOD folder:

1. Run **FPOD.exe**. The main window is displayed.
2. To display and hide menu options, press F2, or move the mouse cursor into the blue bar at the top of the FPOD.exe window or click in the toolbar to the right of the buttons.
3. Display the menu options.
4. Click on the **Read SD** tab.

Copying data from the SD card

To copy data from an F-POD SD card:

1. On the **Read SD** page, enter location information that the app will use to append to the data file name.
2. Enter any deployment notes that you want added to the data file header.
3. Click the **F-POD: read SD card** button.
4. Locate the SD card, select a data file e.g. F_DATA0.CHE for older FPODs or any of the daily files from newer FPODs and click **Open**.

5. FPOD.exe suggests a name for the data file based on the parameters you entered above. You can simply accept the default name or change it.
6. Locate the **FPOD data** folder where you should store your F-POD data files and click **Save**.

Tip: If you save all your F-POD data files in the same folder, it's easier to batch process files using the app.

FPOD.exe extracts any data in the .CHE file(s) and creates corresponding data files:

F_DATA0.CHE → *filename_file0.FP1*

F_DATA1.CHE → *filename_file1.FP1*

etc.

For newer FPODs (serial numbers 6800 onwards) many daily files will correspond to a single FP1 file.

7. The file open file dialog box is displayed, select the FP1 file you just created and click **Open**.

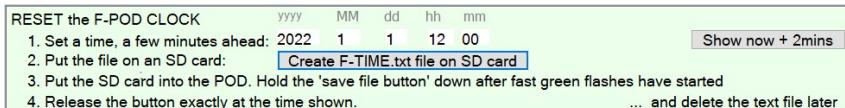
For information about how to use FPOD.exe, refer to the *F-POD Software Guide*.

Resetting the internal clock

The F-POD has a real-time internal clock. The correct UTC time is set during manufacture, but you can also set the clock time very simply, to local time for example, by using an SD card and the FPOD.exe app.

To reset the clock:

1. Open the POD, insert the batteries and fit the battery pack connector spring.
2. Run the **FPOD.exe** app and click on the **Settings** tab. The clock controls are displayed:



3. Using one of the micro SD cards, delete any files on the card.
4. Make sure that you are near an accurate clock.
5. Enter a time value a minute or two ahead of the current time in the **yyyyMMddhhmm** boxes or click the **Show now + 2mins** button assuming your Windows computer clock is accurate.
6. Click **Create F_TIME file on SD card**.

7. Navigate to the micro SD card and click **Save**.
8. Remove the SD card and insert it into the POD.
9. The POD begins its startup sequence and then one LED flashes green rapidly.
10. Press and hold the **Save file** button and when the clock time matches the time you set in the F_TIME file, release the button. After a brief pause, the POD LEDs flash green 4 times.
11. Remove the SD card and delete the files on it.

To check the clock:

1. Run the POD for at least 3 minutes.
2. Stop the POD and note the stop time.
3. Download the data and check that the data stop time matches your clock time.

8 Analysing your data

The F-POD app allows you to view, analyze and export your data. It includes automatic click train detection using the KERNO-F classifier and encounter classifiers that we will continue to develop as more data becomes available (see the *F-POD Software Guide*).

This path of developing an app which can be used on all collected data, has been successfully followed in the F-POD's predecessor, the C-POD.

The provision of a single method for use in a wide range of projects has been a key aim in the development of the C-POD and F-POD.

We would like to use customer F-POD data to help us improve the accuracy and sensitivity of the F-POD PC app train filter and species identification. Any app improvements we make will always be retrospectively applicable to all data sets and new versions of the F-POD app will be available free of charge, so that you can re-analyse your data. If you send us a copy of your F-POD data, we will, in return, provide brief feedback on the quality of your datasets free of charge. Any data you send us will be kept in complete confidence.

You can send your data to us in any of the following ways:

- email
- via www.chelonia.wetransfer.com
- via another file transfer service.

You should examine the major features of each data file, including number of clicks logged per day and detection rates, and compare these with earlier data sets to verify that the instrument is still working normally.

9 Maintenance

Cleaning

Use a scrubbing brush to remove all marine growth and dirt completely. Wash and dry the POD.

O-rings



O-rings must be clean of all contamination – especially hairs and grit – before you close the POD. Any dirt on the O-rings may cause water to leak into the POD housing, causing damage to the electronics and loss of data.

Whenever you open the POD, follow the guidelines below:

- Place the POD housing on a clean hard surface.
- Look to see if there is any water between the outer and inner O-rings when the POD is opened.
- If an O-ring has picked up particles, remove it using a blunt tool like the end of a small spoon.
- Carefully clean all surfaces.
- If you are in any doubt about the state of the O-rings, replace them with new ones. A spare set of O-rings is supplied with new PODs. Replacements are available from Chelonia Limited.

Transducer housing

Bio-fouling or contamination with grease or paint can be removed using the kind of abrasive pads and preparations used for cleaning cooking utensils.

Mooring lines

Inspect the mooring lines after every deployment for signs of wear – mainly abrasion against rough surfaces.

Silica Gel

Silica gel packs should be inserted into the POD to absorb any water vapour and keep the electronics dry.

When you remove a silica gel pack after opening a POD, put it immediately into an airtight container.

When dry, silica gel is yellow/orange in colour. The crystals turn green when damp.

To restore the crystals, place the bag in an oven and heat at 120°C for two hours.



There may be a risk of corrosion if there is no silica gel to keep the humidity low. Corrosion may cause power loss or failure of electronic components which may lead to data loss.

Storage

Before you store your PODs:

- Remove all batteries.
- Clean off all barnacles and other marine encrustations.
- Wash the outside of the POD housing and any mooring lines using fresh water.

Protect the PODs from direct sunlight, which causes slow deterioration of the housing, O-rings and any mooring lines.

If you are storing PODs in a dry place, leave them open.

If you are storing PODs in a damp place, store them closed, with active silica gel packs inside.

10 Troubleshooting

Can I use any SD card in an F-POD?

The F-POD is designed to run using any *blank* micro SD card up to 32 GB capacity. We recommend that you format the SD card before use.

When I start the POD, only one blue LED lights brightly

There is a problem with a battery stack. The left LED off means the left battery stack is faulty. The right LED off means the right battery stack is faulty. Stop the POD, remove the SD card, remove and check that the batteries were inserted correctly (*all* batteries positive facing into the POD), they are not corroded and show good voltage values.

When I try to start the POD, the red LED flashes

Red flashes signify various issues including:

- The SD card is full.
- The SD card is damaged.
- You have run the POD more than 36 times with the same SD card without deleting the files on the card. Remove the SD card and delete the files on it or format it (see *Multiple deployment data* on page 22).
- The batteries are exhausted or faulty
 - Remove the batteries and check that they have been inserted correctly. See *Installing batteries* on page 14.

When I try to start the POD, 1 or 2 yellow/amber LEDs stay on

- The time has not been set or has been erased following a software update. See *Resetting the internal clock* on page 25.

When I download my data, the app offers to save a second file in format filename series 1 file 0.FP1

You did not delete all the files on the SD card before you ran the POD. This means that there is more than one deployment session on the card. Simply save each FP1 file, but be aware that the *last file you save* is the latest deployment. See *Data files* on page 23 for more information.

I tried to use the Delay Start option, but it did not work

F-PODs up to number 6312 need a software update for this feature to work. Contact us and we will supply a file that will allow you to upgrade your POD. Only F-PODs from serial number 6800 will save significant power when in sleep mode as this required an upgrade to the electronics.

Compatibility with FPOD.exe software generated settings

F-PODs up to number 6312 will need a software update before new settings can be applied as they use an older format, contact Chelonia if you need to update the firmware on your F-POD.



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