

*Please read this manual carefully before setting-up and using your unit*

# SeaCorder

## Operator Manual

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## Operator Hazard Warning

	<b>RISK OF ELECTRIC SHOCK DO NOT OPEN</b>	
<p><b>CAUTION:</b> TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p> <p> This symbol warns the user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside of the unit.</p> <p> This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.</p>		

## Safety Statements

 <b>NOTE</b>	<i>Throughout the manual certain potential problems, or further information relating to the installation, maintenance, understanding or use of the apparatus will be highlighted to the operator by indications identified by the adjacent symbol and text.</i>
 <b>CAUTION!</b>	<i>Throughout the manual certain safety or operational related comments and requirements will be highlighted to the operator by indications identified by the adjacent symbol and text.</i>
 <b>DANGER!</b>	<i>Throughout the manual certain safety or operational related comments and requirements that could lead to injury or loss of life will be highlighted by the adjacent symbol and text.</i>

## Handling of Electrostatic-Sensitive Devices



### Attention

Observe Precautions for handling  
Electrostatic Devices

### Caution

## Handling of Electrostatic-Sensitive Devices

**Certain semiconductor devices used in the equipment are liable to damage due to static voltages.**

Observe the following precautions when handling these devices in their unterminated state, or sub-units containing these devices:

- Persons removing sub-units from any equipment using electrostatic sensitive devices must be earthed by a wrist strap via a 1M $\Omega$  resistor to a suitable discharge reference point within the equipment.
- Soldering irons used during any repairs must be low voltage types with earthed tips and isolated from the Mains voltage by a double insulated transformer. Care should be taken soldering any point that may have a charge stored.
- Outer clothing worn must be unable to generate static charges.
- Printed Circuit Boards (PCBs) fitted with electrostatic sensitive devices must be stored and transported in appropriate anti-static bags/containers.

F110.0

## Warranty Statement

**Tritech International Limited** herein after referred to as **TIL**

TIL warrants that at the time of shipment all products shall be free from defects in material and workmanship and suitable for the purpose specified in the product literature.

The unit/system warranty commences immediately from the date of customer acceptance and runs for a period of 365 days (excluding the battery which is warranted for 90 days). Customer acceptance will always be deemed to have occurred within 72 hours of delivery.

**Note:** Any customer acceptance testing (if applicable) must be performed at either TIL premises or at one of their approved distributors unless mutually agreed in writing prior to despatch.

### Conditions:

**These include, but are not limited to, the following:**

- 1 The warranty is only deemed to be valid if the equipment was sold through TIL or one of its approved distributors.
- 2 The equipment must have been installed and commissioned in strict accordance with approved technical standards and specifications and for the purpose that the system was designed.
- 3 The warranty is not transferable, except or as applies to Purchaser first then to client.
- 4 TIL must be notified immediately (in writing) of any suspected defect and if advised by TIL, the equipment subject to the defect shall be returned by the customer to TIL, via a suitable mode of transportation and shall be freight paid.
- 5 The warranty does not apply to defects that have been caused by failure to follow the recommended installation or maintenance procedures. Or defects resulting from normal wear & tear, incorrect operation, fire, water ingress, lightning damage or fluctuations in vehicle supply voltages, or from any other circumstances that may arise after delivery that is outwith the control of TIL.  
(**Note:** The warranty does not apply in the event where a defect has been caused by isolation incompatibilities.)
- 6 The warranty does not cover the transportation of personnel and per diem allowances relating to any repair or replacement.
- 7 The warranty does not cover any direct, indirect, punitive, special consequential damages or any damages whatsoever arising out of or connected with misuse of this product.
- 8 Any equipment or parts returned under warranty provisions will be returned to the customer freight prepaid by TIL
- 9 The warranty shall become invalid if the customer attempts to repair or modify the equipment without appropriate written authority being first received from TIL.
- 10 TIL retains the sole right to accept or reject any warranty claim.
- 11 Each product is carefully examined and checked before it is shipped. It should therefore be visually and operationally checked as soon as it is received. If it is damaged in anyway, a claim should be filed with the courier and TIL notified of the damage.

**Note:** TIL reserve the right to change specifications at any time without notice and without any obligation to incorporate new features in instruments previously sold.

**Note:** If the instrument is not covered by warranty, or if it is determined that the fault is caused by misuse, repair will be billed to the customer, and an estimate submitted for customer approval before the commencement of repairs.

## Statutory Compliances

### Waste Electrical and Electronic Equipment Directive (2002/96/EC - WEEE)

Tritech International Limited is very aware of its responsibilities to the environment and to the sustainability of the resources of our planet. The European Commission has issued the above Directive in an effort to reduce the impact on the environment due to electronic appliances being committed to landfill after they have come to the end of their useful life.

When the appliance referred to in this manual is no longer serviceable, it **MUST NOT** be discarded by placing in landfill, dumping in the sea or incineration. **SEPARATE** collection is mandatory.

The owner of the appliance should either return it and its associated leads & accessories, if appropriate, to Tritech International Limited with a certificate of decontamination (we reserve the right to protect our staff from the effects of any contamination) or sent to an appropriate treatment or recycling agency.

Any goods manufactured after 08/2005 that fall within the scope of the WEEE Directive are marked as shown opposite and will have the date of manufacture and the manufacturer's identification marks.



## Technical Support

### Contact your local agent or Tritech International Ltd

	<b>Mail</b>	<b><i>Tritech International Ltd.</i></b> Peregrine Road, Westhill Business Park, Westhill, Aberdeen, AB32 6JL, UK
	<b>Telephone</b>	++44 (0)1224 744111
	<b>Fax</b>	++44 (0)1224 741771
	<b>Email</b>	support@tritech.co.uk
	<b>Web</b>	www.tritech.co.uk

**An out-of-hours emergency number is available by calling the above telephone number**

If you have cause to use our Technical Support service, please ensure that you have the following details at hand **prior** to calling:

- System Serial Number (if applicable)
- Fault Description
- Any remedial action implemented

Due to the expansion of equipment capabilities and the fact that new sub-modules are continually being introduced, this manual cannot detail every aspect of the operation.

## Introduction

<p><b>Features</b></p> <ul style="list-style-type: none"> <li>• Rugged anti-shock stainless steel frame</li> <li>• Battery pack - 8 hours duration</li> <li>• MD4000 high resolution colour video camera</li> <li>• MP4 video recorder - 30 hour duration</li> <li>• 30 Gb hard drive</li> <li>• Depth rating 2000 metres (4000M Optional)</li> <li>• SeaCorder can be fitted with other Tritech cameras depending on operational requirements.</li> </ul>	<p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Oceanographic research</li> <li>• Oil and gas</li> <li>• Military surveillance operations</li> <li>• Flow and structural monitoring</li> <li>• Fishery research</li> <li>• Deep sea fishing net monitoring</li> </ul>
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The all-new Tritech SeaCorder is an autonomous deep sea video recording system that has been specifically designed to provide a compact and robust unit for capturing subsea video data. A prime application of SeaCorder, is oceanographic research for academic, military and commercial markets. Incorporating an MP4 digital video recorder and 30 Gb hard drive, SeaCorder provides a versatile storage medium for up to 30 hours of high quality video data collection. The battery pack is able to power the system for up to ten hours.

SeaCorder is fitted with the Tritech MD4000 high resolution colour camera, which is an ideal camera for close-up inspection work. Integrated white LED's provide uniform illumination across the viewing area. A feedback loop automatically adjusts the lighting level, providing optimum picture quality regardless of the reflectivity of the work surface. The Dynamic Light Control (DLC) unit makes the system particularly suitable for autonomous Subsea operation as it automatically adjusts the lighting level to suit its environment. This ensures the best possible video images. SeaCorder's anti-shock stainless steel frame protects the camera, battery pack and recording unit in harsh environments, whilst ensuring that the system can be securely attached to its mounting. Depth rated to 2000 metres, SeaCorder has an important application in monitoring the behaviour of trawling nets as well as many other subsea tasks.

## Operating conditions

 <p><b>CAUTION!</b></p>	<p><i>The camera has been designed primarily for underwater operations and in air usage is not optimised due to the heat produced by the LED's. Water has a cooling effect on the camera which means that it will become hot when operated in air. Operation in air for extended periods will activate a safety device within the electronics which will reduce the light emission as a direct function of the internal temperature reached by the LED's. The light should not be used outwith the limit of conditions specified in this manual. For any special requirement please contact TRITECH INTERNATIONAL LTD.</i></p>
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## SAFETY OF USE



**DANGER!**

**THE LIGHT RADIATION EMITTED FROM THE CAMERAS LED LIGHTS & OPTIONAL IR LIGHTING IS EXTREMELY CONCENTRATED AND MAY DAMAGE THE EYE IF SHINED DIRECTLY ONTO IT.**

**DO NOT STARE DIRECTLY AT THE LIGHTS WHEN OPERATIONAL**

When powered on the camera lighting circuit will be in DLC mode (Dynamic Light Control) this means that in a darkened area or normal ambient light conditions (i.e. not pointing at a direct light source) the LED's will emit light– i.e. For this reason it is not advisable to be looking directly at the camera face where the LED's are located at switch on.

## Optional Features

Infra Red LED Lighting



# IMPORTANT SAFEGUARDS

## USE

### POWER SOURCE

This set should be operated only from the source indicated on the marking label. If you are working on a boat, it should be plugged in at the regulated mains and **on the same physical main line** as your computer. This precaution will avoid electronic damage generated by gradient voltage on the ground.

### CLEANING

After use the underwater unit must be properly rinsed with fresh water, then, the underwater unit must be dried, before plugging it in.

All the connectors must always be maintained dry and clean.

### MAINTENANCE

You should use a smear of grease on the Burton connectors/plugs.

To follow the self-discharge and restoration characteristic of the battery, for long-term storage, you should recharge the battery every 6 months.

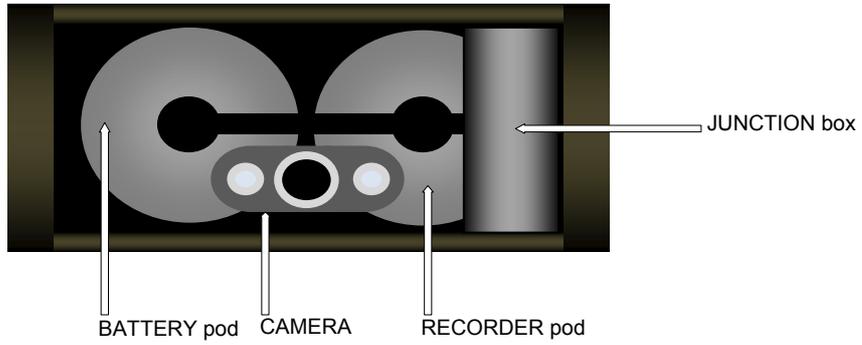
## DAMAGE REQUIRING QUALIFIED SERVICING

Do not plug in the system or operate under any of the following conditions:

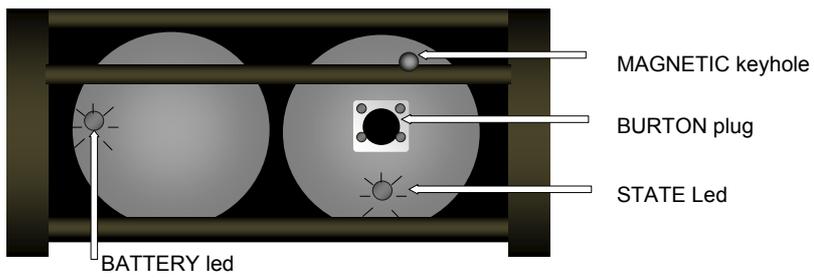
- When one of the cables is damaged or frayed.
- When one of the connectors is damaged or corroded.
- When one of the two safety valves has moved outwards. (The safety valves are the two acrylic ports used to view the state and battery led's located at the end of each pod.) **If one of these safety valves pops out, that will indicate a possible SAFETY HAZARD and under no circumstances should you try to open a pod or dismantle one of the connectors prior to contacting a qualified service engineer.**

# Using the Seacorder

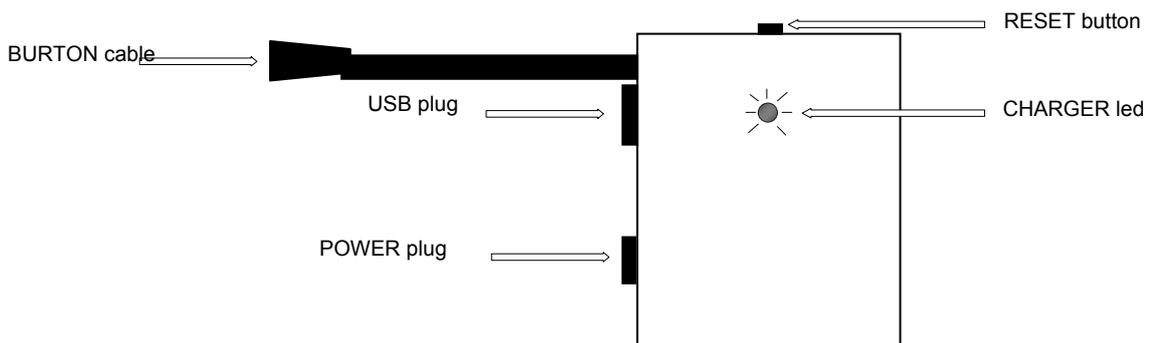
Underwater unit - Front view



Underwater unit - Rear view



Control box - Top



Getting Started

# **Step 1 : Checking supplied items**

Make sure that you have the following items supplied with the Seacorder :

Magnetic key (2)

Control box (1)

Burton blank plug (1)

Power cord (1)

USB cable (1)

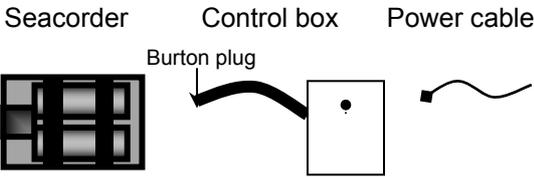
CD-ROM "for the Seacorder" (1)

Manual (1)

Quick start guide (1)

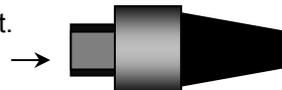
# Step 2 : Charging the battery

You could recharge the battery after every deployment, but you should avoid recharging it immediately after a full charge. The battery is free from memory effect.



## 1 With the Seacorder off, remove the Burton blanking plug from the Seacorder

Ensure that all the connectors are clean and dry. Take care of the polarizing slot.



## 2 Connect the Burton plug of the control box to the Seacorder



## 3 Connect the power cord to the wall outlet

Please refer to Power Source in “Important Safeguards” section.

The BATTERY led should come on when you switch on the mains power and stay on during the charge. The CHARGER led lights up and charging starts, according to the colour codes below:



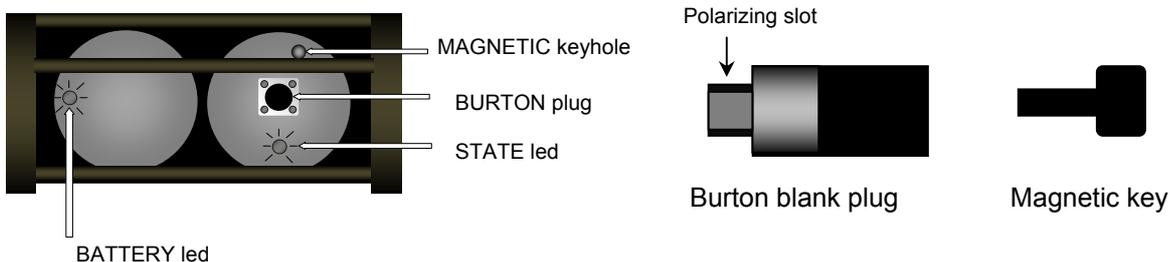
Color	Main battery charger state
Orange	Unplug or initialisation
Alternating red/green	Error
Red	Fast charge
Green flashing	Top-off charge
Green	Trickle charge (battery full)

### Charging time

The main battery requires around 6 hours to be fully charged. You could leave the unit charging longer, as the charger will enter into trickle charge mode at the end of the main charge.

## 4 When charging is complete disconnect power cable and unplug burton from Seacorder.

# Step 3 : Prepare the unit for deployment



**1** Insert the Burton blank plug into the Seacorder Burton plug, with the polarizing slot on the proper side.

**2** Screw-down the Burton blank plug to the connector of the recorder pod, firmly, but *without the use of any tool*



**3** Install the Seacorder on your support (Trawl net )

**4** Insert the magnetic key inside the keyhole located on the recorder pod for 3Seconds duration

Please refer to the "Quick guide flow chart".

**5** Keep the magnetic key in a safe place

Take care not to lay it down near magnetic sensitive devices (hard drive, magnetic card ... )

 **BATTERY led**

This should be red when the unit is switched on. (When this red led is lit up, it means that the main battery is activated. The RECORDER pod controls the BATTERY pod, and tests the system prior to activation. )

 **STATE led**

Please refer to the "Quick start guide flow chart" .

# QUICK START GUIDE – RECORDING FLOW CHART

## Operational Summary

### CAPTIONS



Insert magnetic key

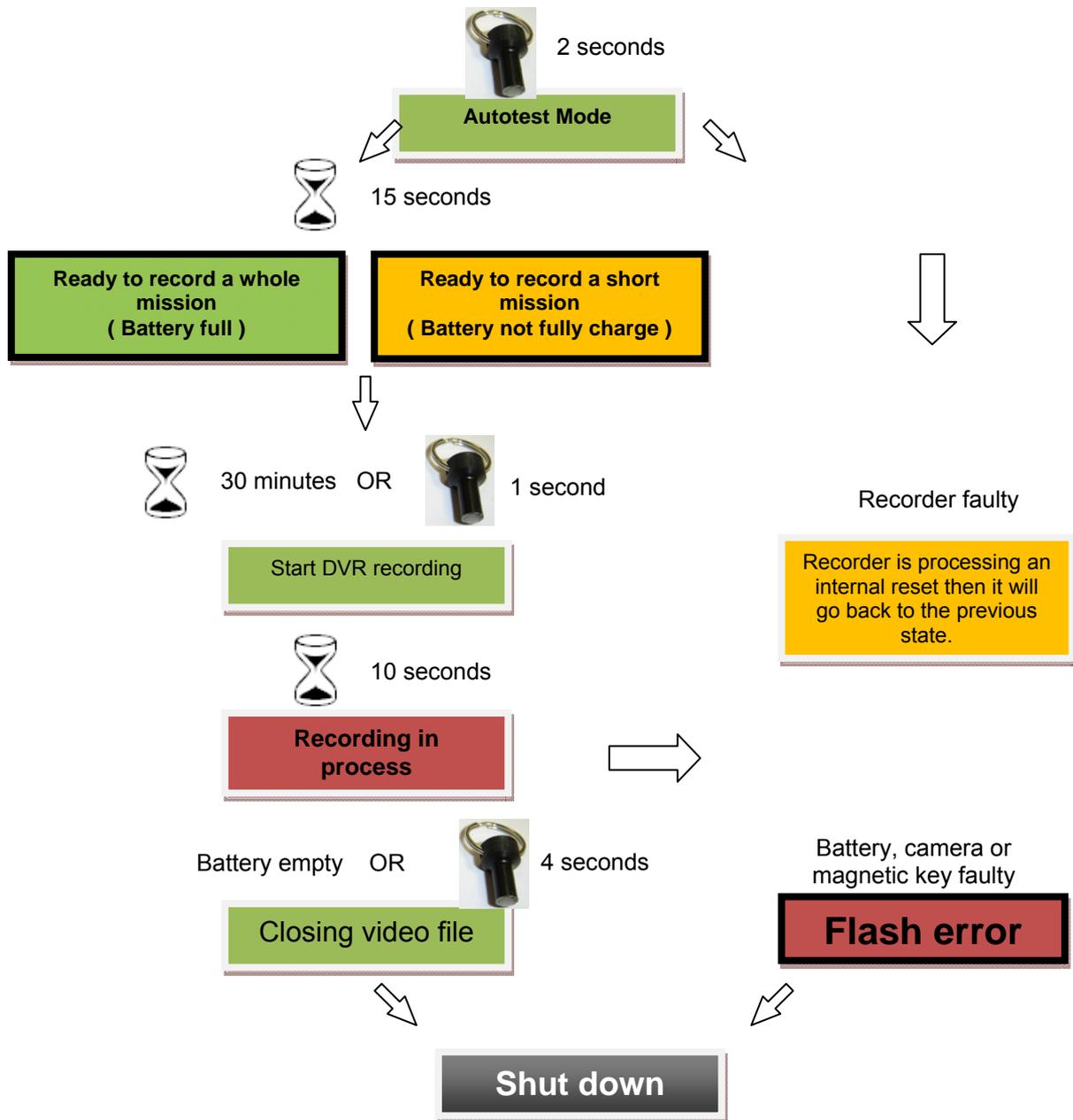
Recorder pod status led

**FLASHING**



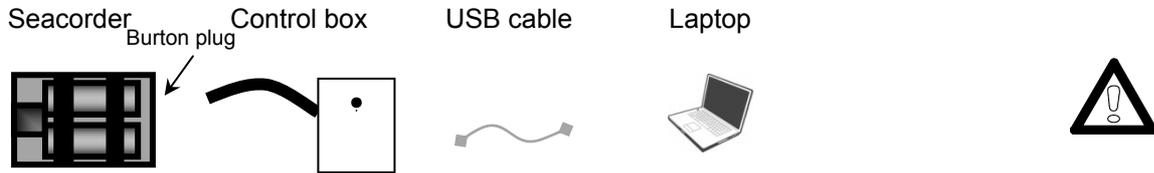
Wait

**LIGHT STEADY**



# Step 4 : Video download

You could play/save the video after every deployment, but you must be inside a dry area.



**1** Extract the Seacorder from your support (Trawl net ) and rinse it with fresh water.

**2** Dry the unit, especially the Burton connector.

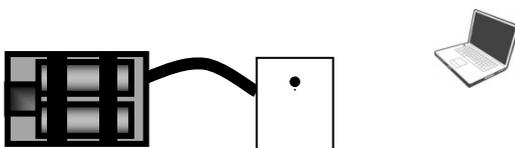
**3** Lay down safely the Seacorder, the control box and the laptop on a bench.

**4** Make sure that the Seacorder is off, if not insert the Magnetic key to switch it off

**5** Connect the Seacorder to the Control box

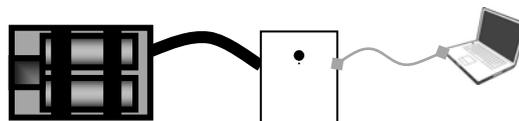


**6** The control box **MUST** not be connected to the mains supply to download the video files.

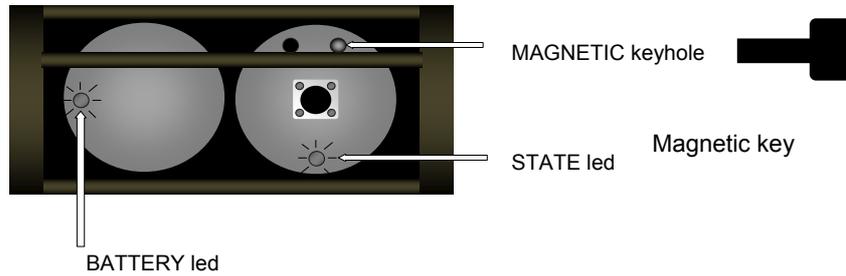


*If the control box is connected to the mains supply while attempting to download video files this is likely to result in serious component damage to the system. This can result in a major system failure requiring a 'return to factory repair'.*

**7** Connect the Control box to the laptop with the USB cable

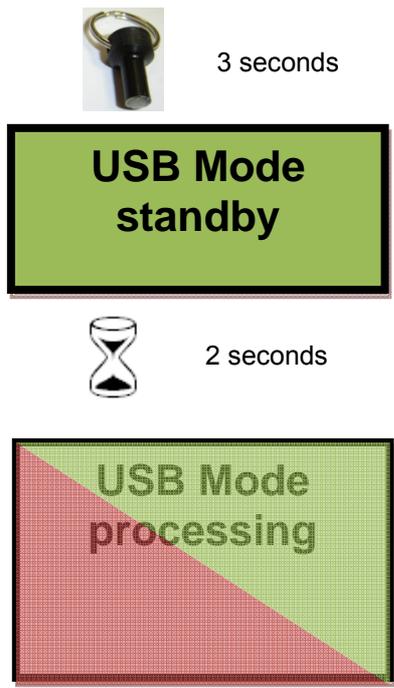


# Step 4 : Video download ( continued )



## 8 Insert the magnetic key inside the keyhole for 3 seconds

The Seacorder will start up in USB mode. The BATTERY led will light up. The STATE should then be flashing alternatively green and red.



## 9 Once the laptop recognises the external USB2 hard drive, open the folder “DVR\MyRecord”

The video files are called: V<Incremental number>.AVI

When you have recorded for 10 hours, you should get about 10 files.

The video format is DivX compatible, if Windows cannot open it, or if the video file is with mosaic, please install the codec provided on the Seacorder CDRROM.

**10** Copy & paste or cut & paste the video files from the Seacorder to the laptop, and make a backup with another external hard drive.

**11** Remove the USB device through the Windows safety procedure

(Damage could occur if this procedure is not applied.)  
Please see appendix 4 for details on how to do this.



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**12** Disconnect the USB cable from the laptop

The Seacorder will switch off by it-self, after 4 seconds standby.



**NOTE**

**If you disconnect the Burton plug from the Seacorder, when the charger and USB are on, it could damage the USB devices**



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**13** Disconnect the power cord from the wall outlet or leave the Seacorder on charge

---

# TROUBLE SHOOTING

If you have any problems using the Seacorder, use the following table to troubleshoot the problem. If the problem persists, disconnect the power source and contact technical support.

## **Power sources**

---

### **The BATTERY led doesn't light up.**

- Check the connections between the Seacorder and the Control box.
- Check the connection between the control box and the mains
- Check the mains voltage

---

### **The CHARGER led doesn't light up.**

- Check the connection between the control box and the mains

---

### **The CHARGER led lights up alternatively red/green.**

- Check all the connections.
- Check the safety valve on the battery pod. If the problem persists, disconnect the Control box from the wall outlet. The unit may be damaged.

---

### **The CHARGER led stays orange.**

- Check the connections between the Seacorder and the Control box. If the problem persists, disconnect the Control box from the wall outlet. The BATTERY pod or the Burton connector may be damaged.

---

### **The battery discharges too quickly.**

- Ambient temperature is too high or low or the battery has not been charged enough.
- Fully charge the battery again.
  - o If the problem persists, try to use the Seacorder in a dry and dark area.
    - If the problem persists, the battery may be worn-out. It will have to be replaced with a new one.
    - If the problem disappears, the underwater connector/cable may be damaged. The junction box may have to be replaced.

---

### **The Seacorder STATE led doesn't light up even when the magnetic key is inserted.**

- Insert completely the magnetic key for at least 3 seconds, If the problem persists :
- Charge the battery again. If the problem persists :
  - o Connect the Control box to the Seacorder and the main supply.
  - o Press the RESET button for 2 seconds

---

**Recording**

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**The Seacorder STATE led alternatively lights up in red and green, even without the Control box.**

- Connect the Control box to the Seacorder and the mains supply.
  - Press the RESET button for 2 seconds  
The RECORDER pod may be damaged.
- 

**The Seacorder state led is always flashing red.**

- Connect the Control box to the Seacorder and the wall outlet.
  - Press the RESET button for 2 seconds
- 

**The Seacorder STATE led lights up red for one or several times, then switches off.**

- The Seacorder has detected an error during its Auto test mode.
    - o Please refer to the "Error table"
- 

**The camera lights are switched off.**

- When the STATE led stays red, cover the light sensor of the camera with your hand.  
The camera may be damaged.
- 

**The Seacorder STATE led always stays red even when the magnetic key is inserted**

- Insert completely the magnetic key for at least 3 seconds, If the problem persists :
    - o Connect the Control box to the Seacorder and main supply.
    - o Press the RESET button for 2 seconds
- 

**The Seacorder video files are small ( only several Kilo bytes ) and black**

- o Format the hard drive (Use FAT32, Do not use quick format), the Control Box **must not** be plugged into the mains during this operation, and during formatting the system **must not** be interrupted for any reason.

## Download

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### **The Seacorder STATE doesn't flash alternatively in red/green.**

- Check all the connections.
  - If the problem persists, use another laptop and restart the download procedure.
  - If the problem persists, the Burton connector may be damaged.
- 

### **The Seacorder STATE led flashes green permanently, during USB mode.**

- The Seacorder video module has not started properly.
  - **Disconnect everything insert the key for 3 seconds and try to make a small video record test**
  - Start again.
- 

### **The laptop doesn't recognise the Seacorder hard-drive.**

- Restart the laptop, and the download procedure.
  - If the trouble persists, use another laptop, or another USB port.
- 

### **Windows warns that one file is corrupted**

- Before disconnecting the USB cable, the Windows safety procedure hasn't been done. The hard drive may be damaged.
  - It may be possible to use specialized software to recover the video file, and then the hard drive should be formatted.
- 

### **The download time is very long.**

- Use the provided USB cable to connect the Control box and the laptop. (USB2.0 compatible)
  - Use a laptop compatible with USB2.0 devices
  - Always connect the charger power cord to the wall outlet, on the same mains supply as the laptop, so as to avoid any electrical trouble between the laptop and the charger.
  - If the problem persists, the internal USB device may be damaged.
-

## **Video**

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### **The colour palette is occasionally not correct.**

- The automatic colour balance may be slightly shifted under certain light conditions and if a large colourful object appears.  
This is not a malfunction.
- 

### **The video is out of focus**

- Clean the camera lenses  
. The camera focus may have to be adjusted.
- 

### **The video is not recognised or like a mosaic, on the video player.**

- Install the codec provides with the CD-ROM. Windows XP media player needs codec to be able to read the video files properly.
-

# Seacorder STATE led - ERROR TABLE

The recorder pod includes an electronic board which permanently monitors the system.

If an error occurs the STATE lamp on the recorder pod will flash red before shutdown, the number of flashes should be counted and used to refer to the table below:

The STAE LED will flash at the following frequency: 3 seconds ON, 1 second OFF

Number of flash	Fault	Required Action
1	Not enough power to start recording The main battery voltage is too low	Recharge
2	No video signal from camera	Check connections
3	Internal DVR is failing to switch ON	Recharge
4	The main battery voltage is not seen or Out of order	Check connections
<b>Always flashing RED</b>	The magnetic key has been left in situ on recorder pod	Do not insert the key more than 15 seconds
<b>Always ORANGE</b>	The internal DVR is frozen	Wait 60 seconds. If nothing happened : Press the RESET button on the charger BOX. <b>Charger must be powered from the mains for this operation</b>

# **APPENDIX 1: Product Specification**

## **APPENDIX 2: SeaCorder Configuration (Option A)**

## **APPENDIX 3: Inline Seacorder Configuration (Option B)**

## **APPENDIX 4: Safely Remove Hardware**