BirdCam v4 - User Manual

Revision: March 2, 2017

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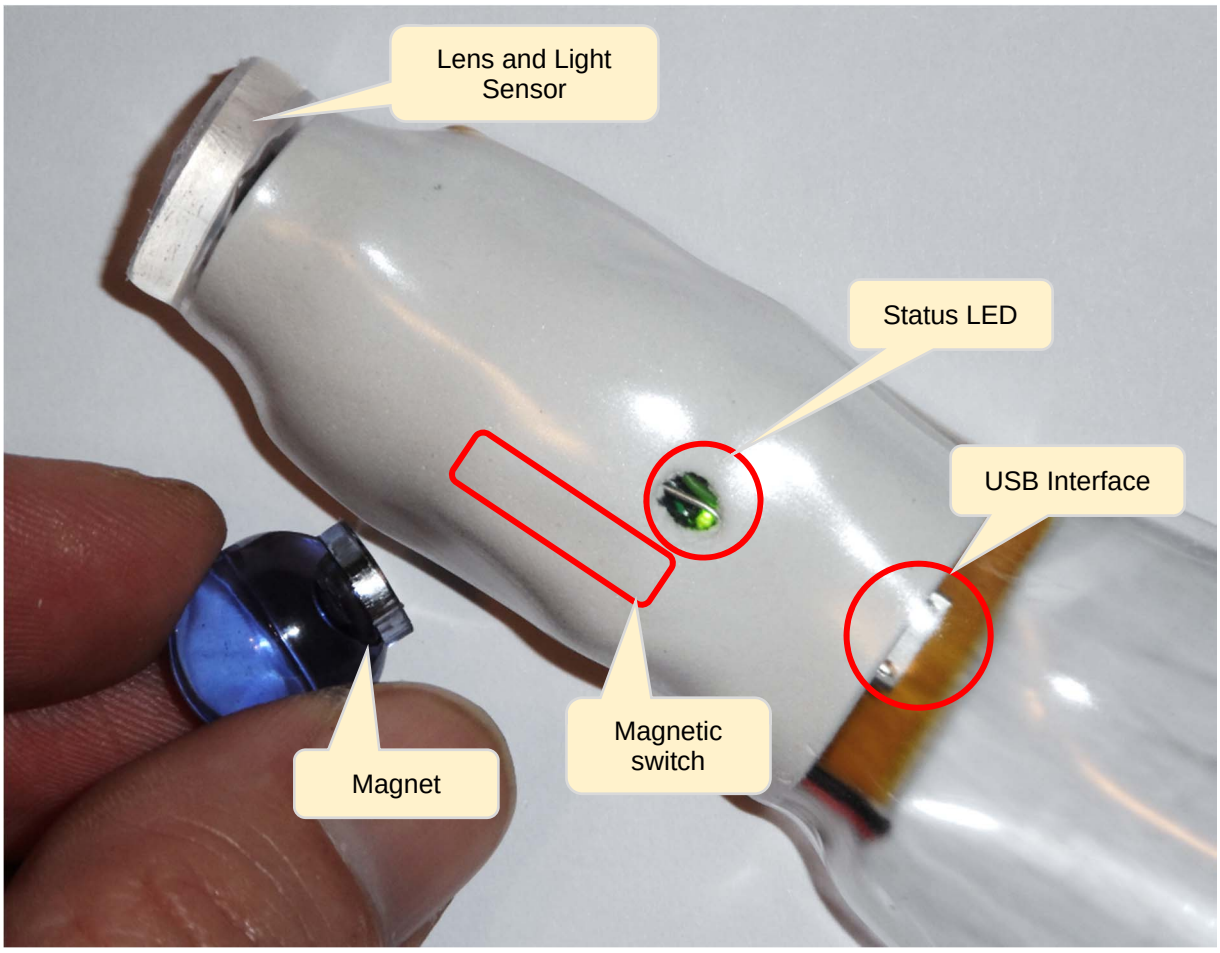
1. Overview

The BirdCam is a small digital camera that records videos in an adjustable time interval. It is intended to be attached to birds such as Gannets or other small animal for scientific projects and wildlife research.

A special enclosure makes the camera water and dive proof which makes it ideal for diving seabirds. Power consumption and weight are optimized to provide longest operation and least possible stress to the animal.
Charging and data download is done by standard USB interface.
The camera is enabled and disabled with an integrated magnetic switch.



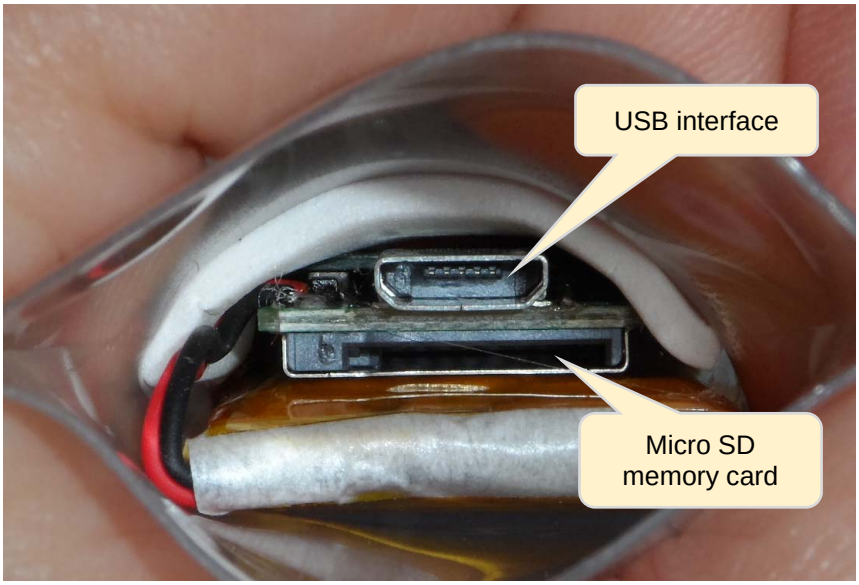
The camera can get modified for battery size, lens tilt angle, solar charging. These options need to get adjusted to your requirements and embedded during production. Please get in contact with our engineering department (engineering @ perthold. de).

2. Specification

Please see the latest data sheet for specification.

3. Charging the camera

The camera is charged via the USB cable. It can be connected to a computer or to an USB phone charger. A red light will blink as long as charging is not completed.



Make sure that the camera has been switched off before connecting to USB.

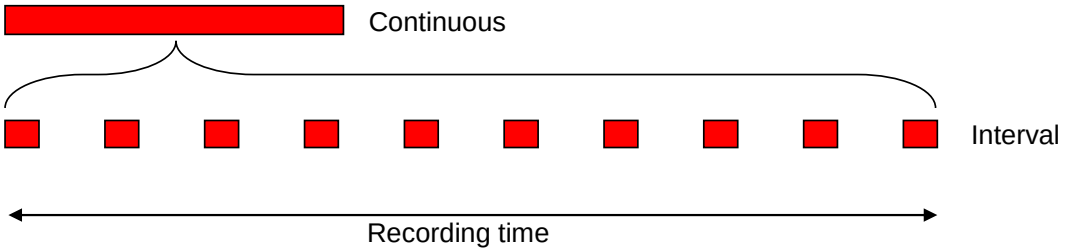
Under some circumstances the camera will start recording if a memory card is present and no USB communication can be established (usually when using USB phone chargers). In that case the camera will blink 3 times with the red LED and then turn its lights offIt is recommended to eject the memory card before charging, so that the camera is not going into this mode.

!	**Note:** Never charge the battery in freezing conditions. The battery will get damaged.

!	**Note:** Never let the camera sit with a discharged battery for a longer period. The battery will get damaged.

4. Programming the Camera

The camera supports two recording modes namely Continuous Recording and Interval Recording as well as a delayed start option which starts the actual operation at a later time.



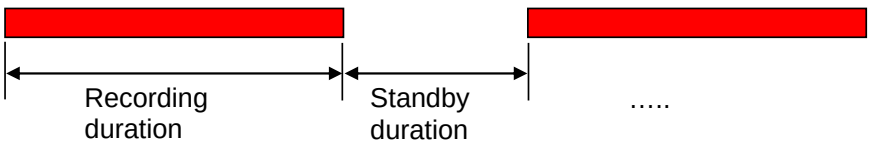
4.1 Continuous Recording

Once recording is started it will stop when the available memory is full or the battery energy is used up. Even though the camera records continuously you may get multiple files on the memory card.

4.2 Interval Recording

The camera will be operated in a repetitive recording/standby cycle. This allows to expand the available resources (battery energy and memory) over a longer time range.

One cycle consists out of a recording phase and a standby phase in which the camera is switched OFF as shown in the following graphic. For both phases the duration can be set on the camera.



The smallest time increment for these durations is called a time unit. The length of a time unit is specified in the data sheet and can be factory set depending on customer needs. If nothing is specified the standard equivalent of 1 time unit is about 15 minutes.

4.3 Programming Procedure

The recording sequence is programmed with the magnetic switch of the camera. Please take a look at the functional flow at the end of this section.

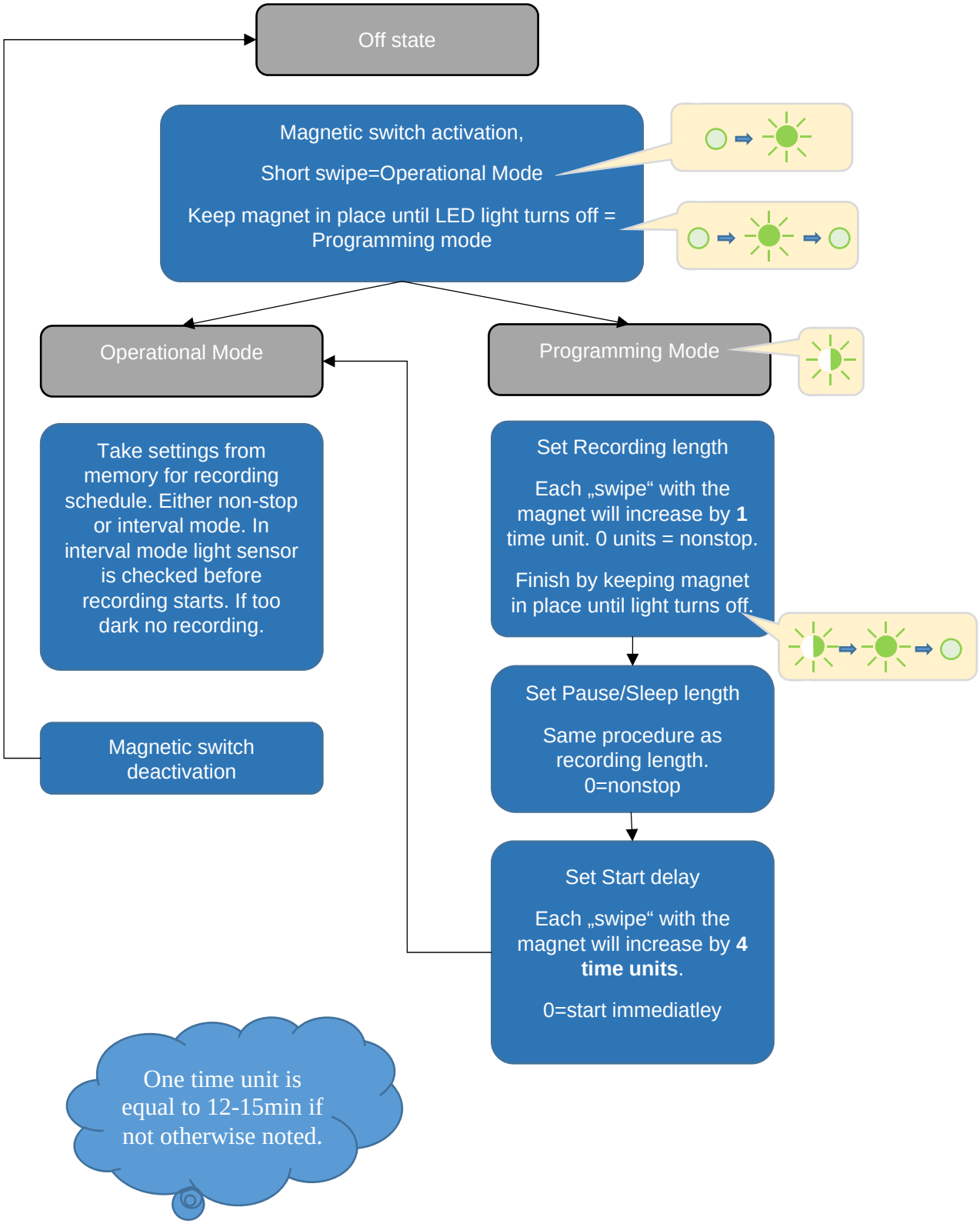
While a brief activation of the switch is turning the camera ON, a longer activation enables the programming mode.

The procedure is as follows:

- In the default state the camera is OFF
- Move magnet slowly towards the switch until green light turns ON
- Hold magnet in place until green light turns OFF
- Remove magnet, the green light will blink a few times and when starts flickering
- Programming of Recording duration is now enabled
- Move magnet briefly towards the switch, the green light will shine bright, then continuous with flickering. The time setting incremented by 1 time unit. Repeat this until the desired time has been set.
- To complete and move on to the next stage, move the magnet towards the switch and hold it in place until the green light changes from flickering to ON and then transitions to OFF.
- Remove the magnet, the green light will blink a few times and when start flickering
- Programming of Standby duration is now enabled
- Repeat the procedure described before. Each input pulse will increment the Standby Length by 1 time unit.
- Remove the magnet, the green light will blink a few times and when start flickering
- Programming of Delayed Start duration is now enabled
- Repeat the procedure described before. Each input pulse will increment the Standby Length by 4 time units.
- Remove the magnet, the green light will blink a few times and then start the camera into Operation mode. The settings are stored, so you can turn OFF the camera and switch it ON later without the need to go through programming again.

!	**Note:** To enter 0 as the time unit you immediately move the magnet towards the switch and hold it in place until the green light changes from flickering to ON and then transitions to OFF. “0” for either Recording or Standby duration will switch the camera into continuous mode. “0” for Delayed Start duration will disable this option and start the operation immediately.

4.4 BirdCam Functional Flowchart



5. Activate Camera

After the battery is charged the camera can be activated.
Move magnet towards the switch until green light turns ON. Remove the magnet. The green light will blink several times, then goes OFF and blink every couple of seconds.

To turn the camera off, move magnet towards the switch until green light turns ON. Remove the magnet. The camera will stop recording and switch OFF.

6. Set Timestamp

The video footage is overlaid with a time stamp. This time can be adjusted.

Procedure:

- Connect the camera or the SD card to the computer.
- Open the drive with file explorer. You will find a file called time.txt
- Open with a simple Text editor, e.g. Notepad.
- Edit the date and time.
- Save file.

7. Important Care Notes

There are some important things to consider that may damage the camera:

- Do not clean the lens cover with alcohol, isopropanol, acetone or similar solvents. The result will either be a matte surface or a tampered water seal.

- Do not overheat the camera while sealing the ThermoSeal enclosure. You need to use a regulated heat gun and a small nozzle to just heat the sealing area.

- Do not charge the battery when the camera is cold (below 4 deg C).

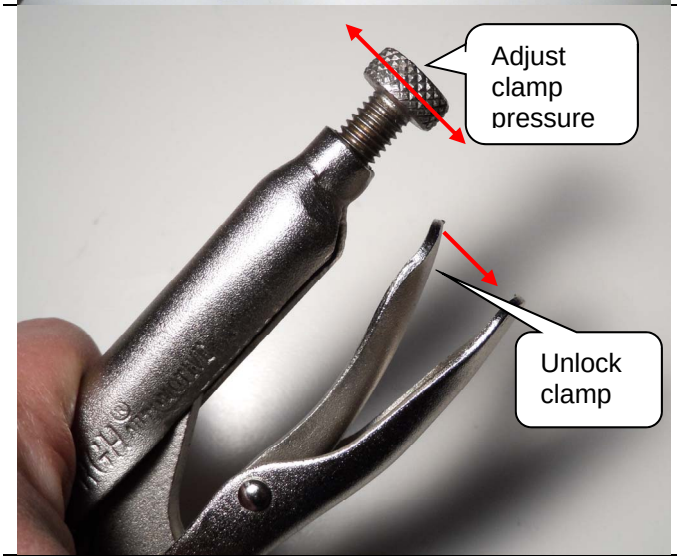
- Do not store the camera for a longer period with a discharged battery.

8. Enclosure Sealing

Below follows the description of the sealing process. We have also a video available to show the workflow and details.

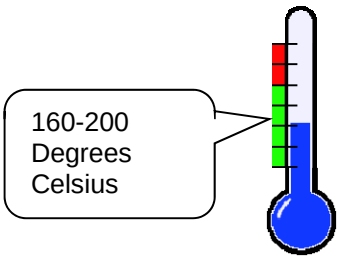
The ThermoSeal material is handled like regular shrink tubing. You will need the following tools: Heat gun, seal clamp and scissors.

All CatLog-S devices are pre-sealed and just need to be sealed on the interface prior to use.
We sell the sealing tool as well as the ThermoSeal material.
Please note that regular shrink tubing will not have the ability to open and close the seal again without compromising the seal tightness.



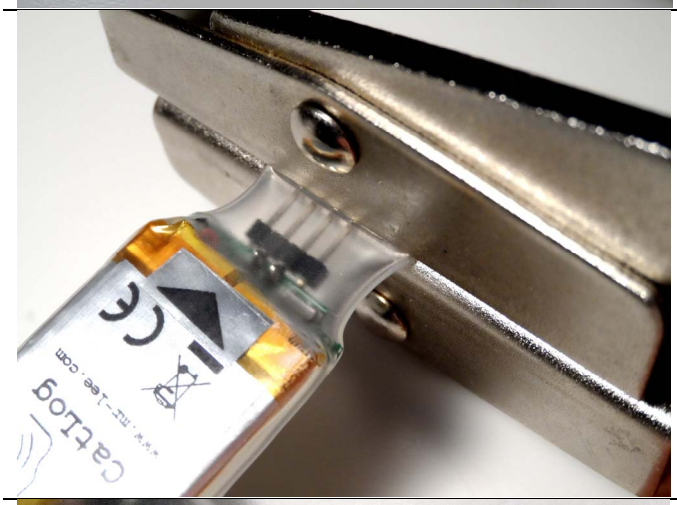
Before you start adjust the sealing clamp. With the adjustment wheel you set the clamp force. Make the adjustments while the clamp is open, when close the clamp to see the resulting gap size/pressure. The clamp will lock itself in closed position making it very convenient for the later sealing operation. To unlock press the handle lever as indicated in the picture below.

The right adjustment for ThermoSeal is that in closed empty position the jaws still touch each other but the closing pressure is very low.



Next step is to adjust the heatgun. The optimal temperature range is 160-200 degrees Celsius (320 – 390 Fahrenheit). If you have an unregulated heatgun you will need to vary the distance between air outlet and device to not overheat the material. You may also want to shield the battery. The battery may get damaged by too high temperatures.

Now heat the material at the sealing location (see red circle in image) from **all sides** until it gets soft and sticky.
If you are opening a seal apply heat until the material gets back to the tubular shape. Do not overheat or apply heat for a long period of time. Usually it takes 30s to 1 minute to properly heat the material.



Now quickly take the device, place the seal area between the jaws (center area) and close the clamp. It is important to note to **not clamp parts of the device**.

After about 30-60s you can unlock the clamp and remove the device. In batch operation you will heat the next device while the seal of the previous device cools down. Please remember to let the clamp cool down itself from time to time.

If the seal is closed for the first time you may need the scissors to cut off excess material. The ideal seal width is 5-8mm.

9. Support and Help

You can get in contact with the technical support or check for updates of this manual by visiting our website: http://www.mr-lee.com , select Scientific Product Line.

10. Frequently Asked Questions

Q: Can the memory card get exchanged ?
A: Yes, the card is located below the USB interface. Press on it to eject it. The camera will accept up to 32GB cards.