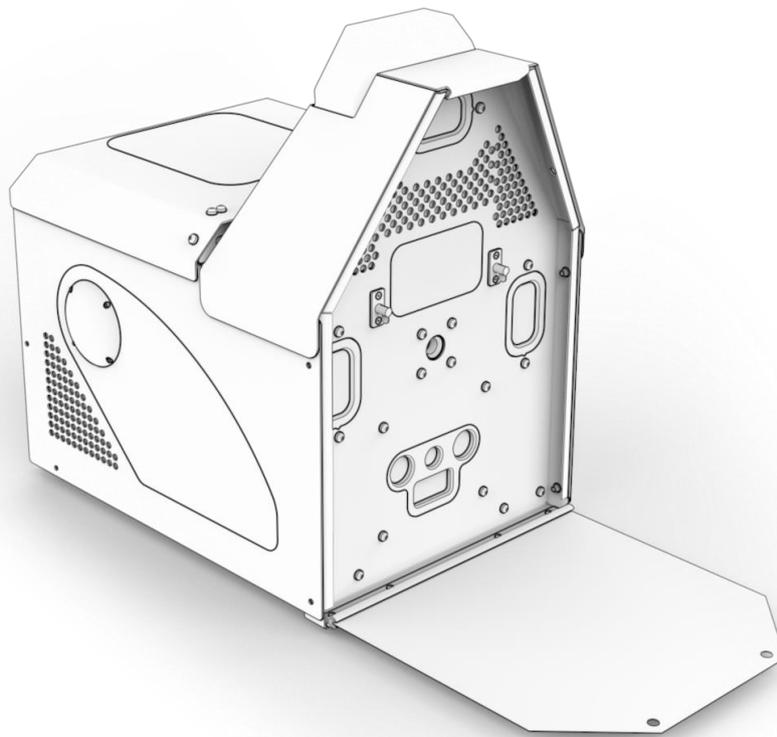


FELIXER

FELIXER 3.1 GROOMING TRAP



QUICK START GUIDE

SAFETY INFORMATION

SETUP INSTRUCTIONS

MAINTENANCE GUIDE

TROUBLESHOOTING



RCM COMPLIANT

QUICK START



WARNING

POISON – The Felixer contains and emits potentially deadly 1080 poison. Do not touch or ingest. Ensure familiarisation with 1080 Safety Data Sheet (SDS) and if poisoning is suspected ring **Poisons Information Line on 13 11 26.**

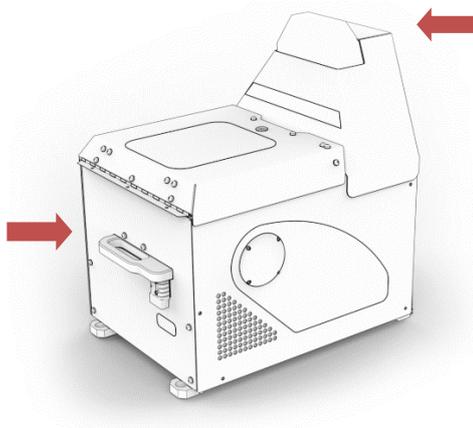
ACCREDITATION – Users must have completed Felixer training and accreditation course.

LASERS – Invisible and visible radiation that can damage eyes is emitted from front of Felixer.

STORED ENERGY – Hazards inside, gel emitted at high velocity from front of Felixer.

This User Manual contains a quick start guide and instructions for routine operation, supplemented by sections marked with a red strip to denote advanced user functions.

Transport



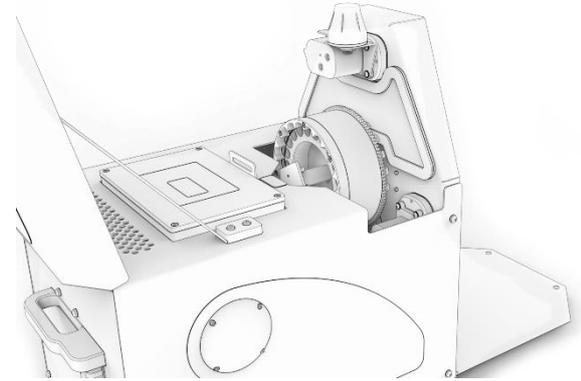
1. Grasp the black handle on the rear.
2. Hold the top with your other hand.
3. Lift using your legs. The Felixer is heavy and care must be used when lifting or moving it.

Prepare site

- Ensure project area has been approved by APVMA, authorised officers and landowners (including neighbours if on boundary fence).
- Select site with likely cat/fox activity such as a passageway along a fence, road, or track. Ideal locations are ~4m wide, on flat and even ground.
- Erect approved warning signage on likely approach routes to Felixer.
- Prepare flat, unobstructed area in front of the Felixer.
- Avoid flood zones, livestock pads and traffic to avoid damage.
- Face Felixer perpendicular to expected target walking direction, preferably with a solid backdrop.
- Locate solar panel nearby with North facing aspect (within 5m), ideally out of sight.
- Bury solar panel cable where possible.

Magazine Replacement

1. Unlock the lid lock with the key. Open the lid and allow the rubber strap to hold the lid open.
2. Remove the triangular hood from the top of the Felixer by sliding it up and out.
3. Standing on the right side shows magazine as pictured.
4. Wearing gloves, grasp the circular white magazine with your left hand and pull the magazine firmly up and towards you.
5. Align the slot in the new magazine with the retaining pin. Slide the fresh magazine down and into the clips until you hear a solid clunk. The magazine is now secured.



Power on



With the lid open, locate the control panel.

Press the **RED** button to turn the Felixer on.

Self-checks will be performed on start-up.

Ensure mud splash guard is lowered and a solar panel is connected when prompted.

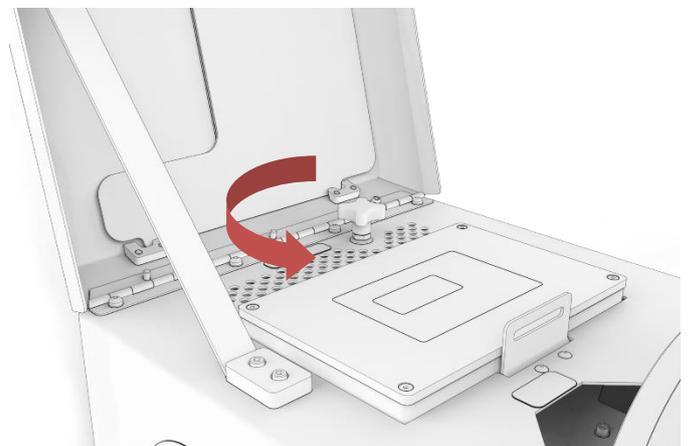
Once the DISARMED status screen is showing, press ARM to start the setup procedure.

The 3 green buttons are used for menu navigation as indicated on the display.

Levelling the Felixer

The first step in the setup procedure is levelling the Felixer. Align the Felixer parallel to the ground to correctly detect and hit targets.

1. Place the Felixer's magazine hood on the ground at up to 4m from the front face at the maximum range that targets are expected, with the marked alignment line facing the sensors.
2. Level an area for the Felixer.
3. Rotate the black knob to adjust the height such that the laser aligns with the marked line on the hood.
4. Press OK to continue.



Setup site note

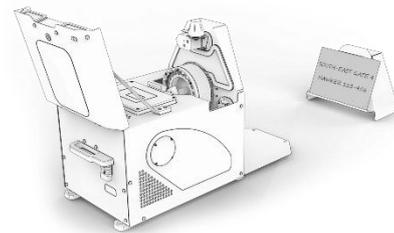
To keep track of the location and site details of each Felixer, a note should be placed on the hood before the setup photo is taken. When data have been uploaded to the *Felixer Management System (FMS)*, the user will be prompted to copy across the site information from the SETUP picture.

```

SETUP SITE NOTE
Place note on hood
for site picture
BACK  SKIP  READY
  
```

1. Write the site name, grid reference and any other relevant site information in the following format on an A4 piece of paper. For example:

South-east gate 4
Hawker 123-456



2. Move the hood to 1 metre in front of the Felixer. The correct distance is important for capturing the image clearly – too far away and the writing will be illegible.
3. With the hood still in front of the Felixer, place the note on the rear of the hood, facing the Felixer camera.
4. During this stage, the Felixer will also search in the background for a satellite fix.
5. When ready, select **READY** to take the setup photo. The following screen will appear.

```

SAVING SITE NOTE
>>>>
  
```

Sensor Setup

A custom range restriction can be specified in increments of 50cm to define the target zone that can be levelled without obstacles. This is particularly important to restrict detection of moving or 'semi-transparent' objects like wire fences or leafy bushes and to avoid triggering by animals beyond the levelled ground and especially on the other side of fences.

Use the centre **CHANGE** button to adjust the target distance setting. Once set, press OK to perform a range check.

You can check target detection is functional by using the cat-shaped slide-out card from the lid and moving it into view of the Felixer sensors at different distances from the Felixer. Ensure that the card cannot be detected beyond the desired and levelled target zone and particularly not within 10 cm of non-solid objects (such as fences and bushes). After a change in the distance or a target type is detected, the Felixer will read the detected target type and its distance. This information is visible on the display.

Arming

Follow the voice-prompts to arm in a passive photo-only mode, or the active firing mode.

“Photo Only Mode” turns the Felixer into a laser activated camera trap, useful as a wildlife survey tool or as a safe test mode. It is recommended that the trap is armed occasionally to avoid the firing mechanisms seizing.

If arming to a firing state and the magazine has been used before, the Felixer will prompt to check if the magazine has been replaced with fresh cartridges. If the Felixer has not been reloaded and you want to resume from the previous cartridge position, press **NO**.

The Felixer will perform system checks including a preview of the current audio lure before arming. The magazine will move and rotate back and forth as part of these checks.

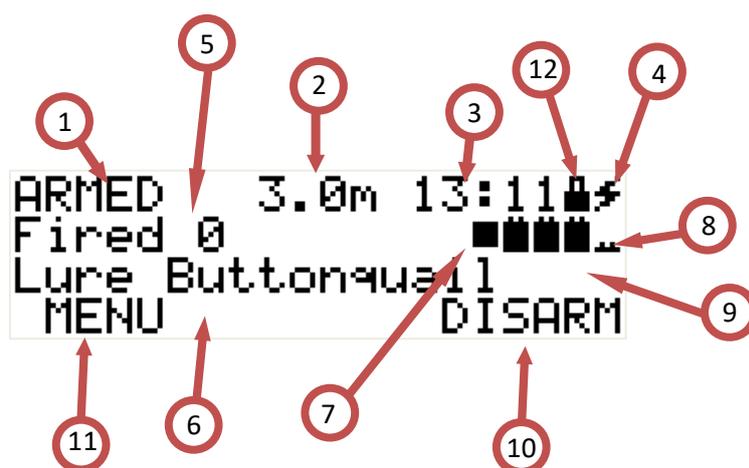
Reloading and checking

Check the battery voltage using the battery icon on the top right of the display. The amount of shaded area on the battery icon represents the battery’s level of charge. This symbol will become a lightning bolt when charging.

The number of cartridges fired and number of photos taken are displayed on the front menu screen in armed and disarmed states every two seconds.

The Felixer should be disarmed and shut down before the USB is removed to avoid corrupting the USB memory or losing any log data that are recorded. The USB contains a data log of all images and sensor activations, configuration settings, and enables software upgrades.

Main Screen Overview



1. State (disarmed/armed/photo)
2. Average max range in metres
3. Current time
4. Battery level/Charge status
5. Shots fired/Photos taken
6. Active lure
7. Sensor state
8. Sensor readings
9. Current detected target
10. Disarm button
11. Menu button
12. USB active symbol

See the *Modes Reference* section on page 27 for full descriptions of states and symbols.

See the *Felixer Options* section on page 29 for details on using the Menu options.

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Introduction

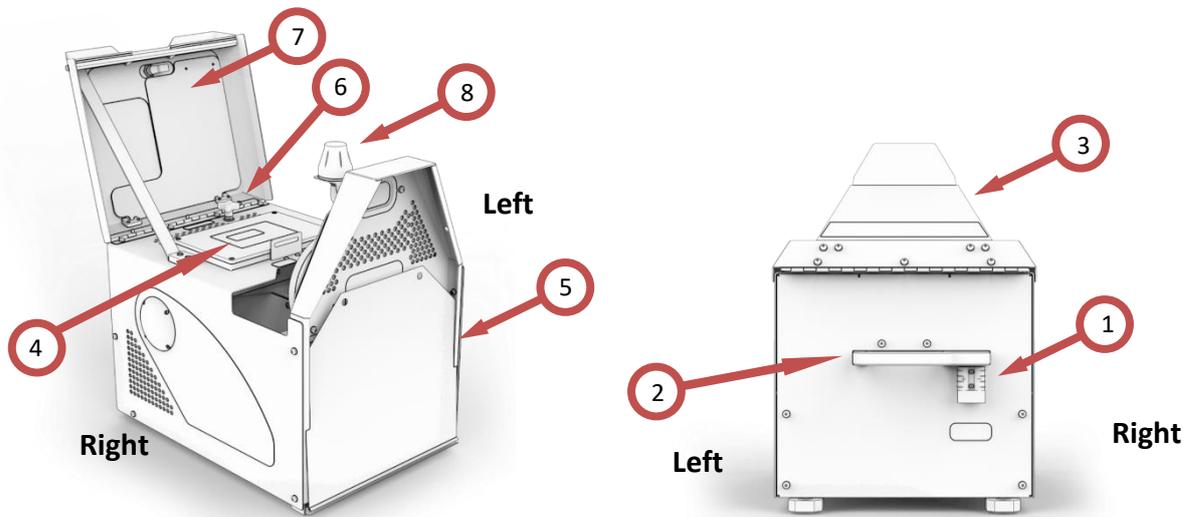
The Felixer has been designed for the control of feral cats and foxes. Using an innovative sensing method, the Felixer can distinguish between targets and non-targets in a fast and reliable manner.

When a target is detected, the firing mechanism sprays a poisonous gel onto the target, which the animal will instinctively lick from its coat.

The Felixer also photographs targets and other objects that break any of the sensor beams. The Felixer can be programmed to play audio lures at varying time intervals to attract target animals.

Anatomy of the Felixer

Assembly Overview



- | | |
|--|------------------------------------|
| 1. Solar charging connector (Anderson) | 5. Mud flap |
| 2. Carry Handle | 6. Height Adjust Knob |
| 3. Magazine Hood | 7. Sensor detection slide-out card |
| 4. User Interface | 8. Antenna |

Left and right sides are referenced in log files and on the display from the forward-looking direction of the trap.

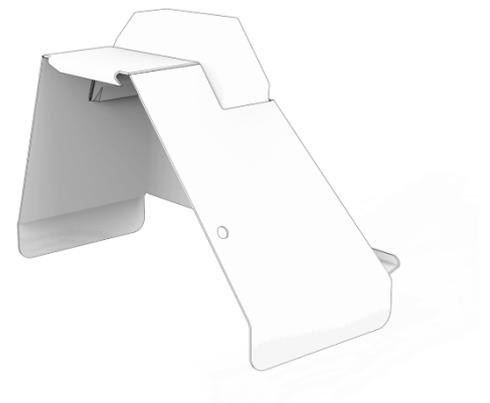
Magazine Hood

This metal cover is removed to allow access to the magazine.

The plastic section allows the antenna underneath to operate.

It also has a marked line to check the height of the Felixer during level adjustment. During levelling, ensure the hood sits on top of the ground and does not sink into soft sand.

A hole is provided in the side to allow a padlock to be attached to the hood and front panel if desired. See *Security*, page 14.



Magazine

The white cylindrical block is the magazine. Holding 20 cartridges of gel, this component is removed by the operator to add new gel cartridges to the Felixer. The 1 symbol indicates the first slot.

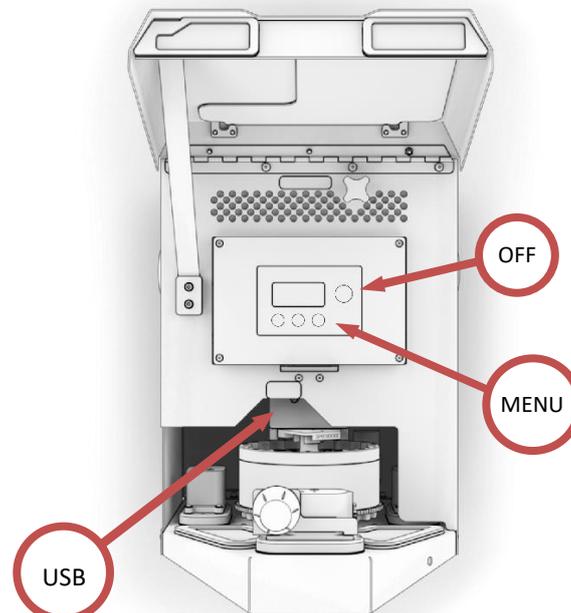


**WARNING: POISON MAY BE PRESENT ON THIS COMPONENT
USE CAUTION AND GLOVES WHEN HANDLING**

Control Panel

The Control Panel is used to set and adjust the Felixer.

The **GREEN** buttons allow for menu use, and **RED** for power on/off.



The USB flash memory drive stores configuration data, audio lures, captured photos and detailed log files to monitor the progress and status of the Felixer. It can also be used to update the Felixer firmware in the field.

There is an indication on the display next to the battery indicator that shows when the USB is actively being used by the Felixer. For more info, see *Field Inspections* on page 26.

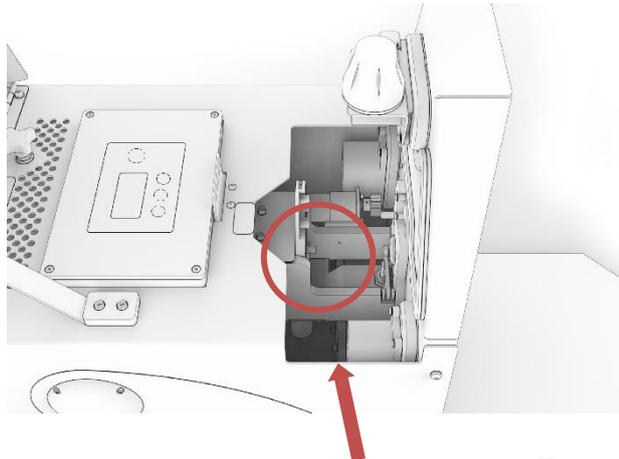
Avoid removing the USB memory when the USB active symbol (see *Disarmed Status Screen*, page 25) is showing on the display.

When checking the Felixer logs from the field, it is recommended to replace the USB stick with a second configured USB stick. Avoid collecting data from more than one Felixer on the same USB. The first USB stick can then be taken back to the office for analysis of the logs and photos. **Ensure USB data are regularly uploaded to the Felixer Management System (FMS) (at least every 3 months) and the USB is cleaned once the data have been uploaded.**

Piston

The visible section of the piston impacts the cartridge to fire gel at targets. When inserting a new magazine, it is important to align the slot in the magazine with the piston pin (see *Inserting the Magazine*, page 17).

Once armed, the piston locks the magazine in place. The magazine cannot be removed until disarmed.



Speaker

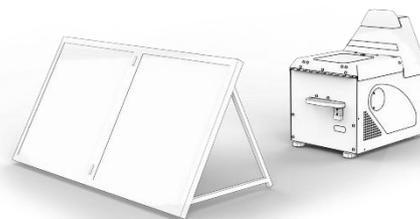
The speakers on the sides of the Felixer play audio lures to attract animals and voice files to assist in navigating the menu system.



Solar Panel

The solar panel comes with a travel case and 5m steel braided cable.

Connect to the grey Anderson connector on the rear face of the Felixer. (See *Solar Panel Setup*, page 16.)



240V Charger

The 240V charger is used to recharge or recondition the internal battery.

The battery is of a sealed lead acid type. These batteries may experience rapid lifetime deterioration when left in a low or uncharged state for any extended period (four weeks or more).

It is highly recommended to fully charge the battery immediately after it is returned from a deployment and before it is put into short-term storage. For extended storage, keeping the charger connected will help preserve battery health.

The charger connects to a standard Australian 240V outlet and the Anderson connector on the back of the Felixer.

Serial Number

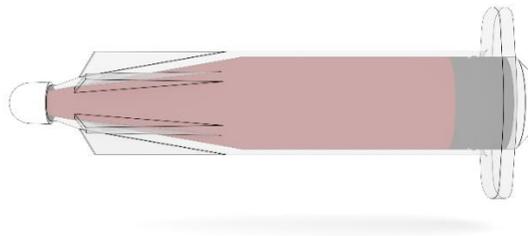
Each Felixer is stamped with a unique serial number. This can be found underneath the hood, behind the magazine. The serial number is also visible on the display during start up.



Cartridges

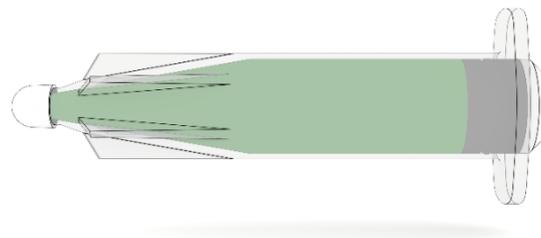
The Felixer magazine has capacity for 20 cartridges. A cartridge is a plastic vessel sealed with a plastic cap that contains gel to spray on targets. It consists of a body, a plunger, a nozzle cap, and gel. When a target is detected, the piston pushes the plunger towards the nozzle end of the cartridge body, ejecting gel from the cartridge.

Gel containing 1080 poison can be identified by its red colour, clearly visible through the transparent wall of the cartridge. Red gel is used for firing at targets.



WARNING: POISON. DO NOT INGEST CARTRIDGE OR CONTENTS OF CARTRIDGE.

Green gel is used for testing and evaluation and does not contain 1080 poison.



Safety

Felixers present hazards that could result in injury or death if improperly operated.

Poison hazard

The Felixer contains and emits poisonous gel. The poison used is 1080. A quantity of 8 mg of 1080 is contained in the 3 ml of gel in each cartridge. 1080 poison can cause death to humans if ingested.

WARNING: POISON – DO NOT INGEST CARTRIDGE OR CONTENTS OF CARTRIDGE.

Refer to the attached SDS for further information. Each cartridge contains 8 mg of 1080 poison. The lowest known lethal dose for humans (0.71 mg/kg bodyweight), suggest an 80 kg person would have to consume over 7 cartridges and a 15 kg child would need more than 1 full cartridge to receive a lethal dose using this conservative estimate. Do not ingest the cartridge contents.

**WARNING: POISON – REFER TO POISONS DOCUMENTATION
USE CAUTION, GLOVES AND GLASSES WHEN HANDLING.**

IF POSIONING SUSPECTED, RING POISON INFORMATION LINE 13 11 26

All Felixer users must have passed the Felixer Accreditation Program before being issued with a Felixer poisons licence or 1080 cartridges. The Felixer Accreditation Program is an online training and accreditation package available at www.thylation.com that outlines safety risks and precautions, necessary permissions and also demonstrates the optimal way to select sites, install Felixers, troubleshoot and retrieve data.

The following safety precautions should be taken:

- Felixer cartridges must be transported, stored, handled, and disposed of according to guidelines in this User Manual.
- Use gloves when handling gel cartridges or when reloading the magazine.
- Gel can occasionally be deposited on parts of the magazine, the barrel, and the front of the Felixer. Gloves should be worn, and caution should be exercised when handling these items.
- If red gel gets on your body, rinse it immediately with water.
- Triple rinse used cartridges and bury rinsate, empty cartridges and packaging in a local authority landfill.
- Used cartridges and packaging should be triple washed before being bagged for landfill.
- 1080 poison cannot be transported via regular freight and must be handled by a dangerous goods freight company. Contact Thylation for advice on shipping cartridges.

The SDS on 1080 poison is appended to this manual. See *Appendix C: Safety Data Sheet (SDS)*, page 74.

Laser hazards

- Do not look directly into the sensor windows on the front of the Felixer as eye damage may result. The sensors emit invisible laser (Class 1) radiation.
- Do not look directly into the red aiming laser (Class 1) as eye damage may result.
- Do not view the front of the Felixer with optical instruments such as binoculars as eye damage may result.

Mechanical hazards

- In the armed mode, the Felixer contains stored energy that may cause injury. Do not attempt to service or handle internal components of the Felixer whilst it is armed.
- Gel is ejected from the front of the Felixer at high speed. While unlikely, injury is possible in result of an impact. Stay clear of the line of fire at all times.

Security

The Felixer is provided with a lock on the lid and provision for a padlock to be attached to the hood and front panel. Consult with local poisons authorities for regulations regarding 1080 security and storage. If uncertain about the rules in your area, contact Thylation for advice.

Felixer Setup

Site Setup

Site preparation is crucial for maximizing the efficiency and performance. Site conditions, including levelness and new objects (e.g. plants) in firing range should be checked periodically and after storms.

Site Selection Criteria

Known or likely target animal activity nearby.

Select pathways through vegetation including along roads, fences, dune crests or dry creeks.

Away from flood prone areas or accumulation of water to depth greater than 2 cm.

In hot climates, position the Felixer pointing south or east, away from direct sun.

Felixer points **perpendicular** to the animal's likely walking direction.

Clear space for at least 2 m in front and to the sides of the Felixer.

Select flat ground in front of and to the sides of the Felixer to minimise site preparation.

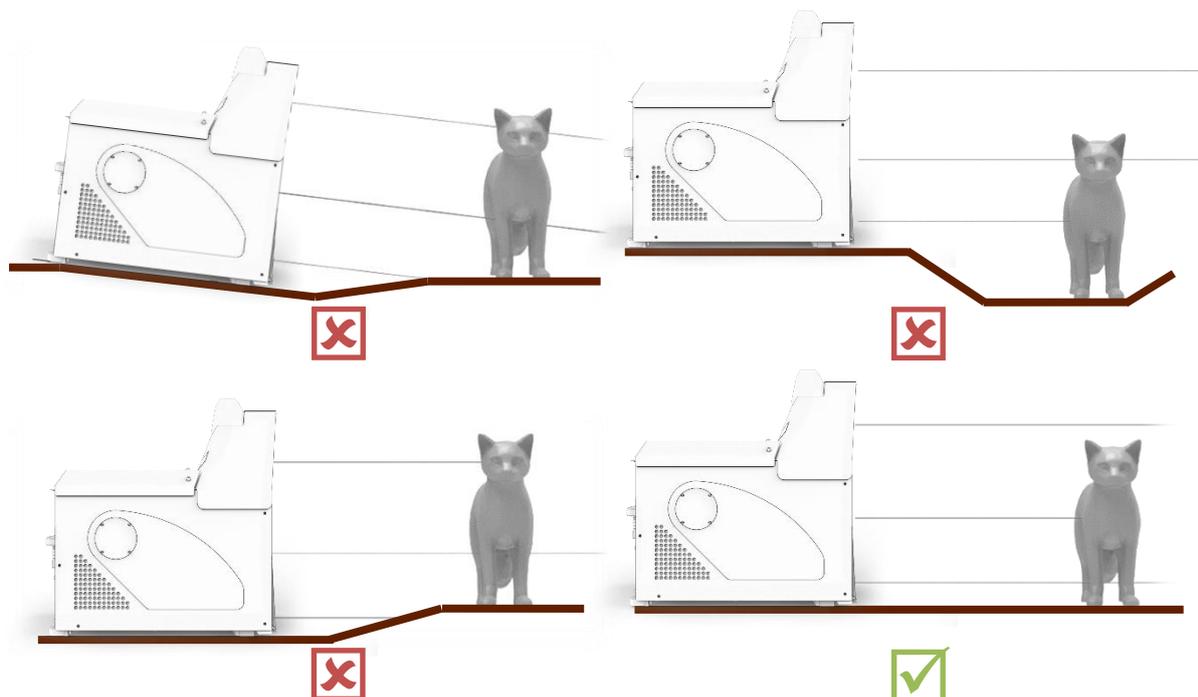
Set up in front of a solid backdrop, such as dense vegetation, a tree stump, rock, or earth wall.

Site Preparation

Use a shovel to prepare the ground where the Felixer will be placed. The ground should be flat and ideally level. If the soil is soft, consider effects of erosion and 'settling' into the dirt over time. For best performance, spray a weed killer in the area 1 metre by 4 metres in front of the trap to avoid weeds growing, which may block the sensors or cause false triggers when moving in the wind.

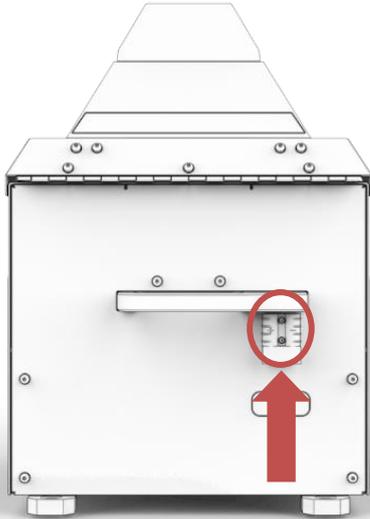
Place the Felixer on the prepared ground and aim the front in the desired firing direction, perpendicular to the predicted cat or fox travel direction. Prepare the area in front of the Felixer to reduce any height discrepancies which affect sensing and firing. Refer to the diagrams below.

Once the Felixer has been installed parallel to the ground, connect the solar panel.



Solar Panel Setup

To maintain battery charge over extended periods of time, the supplied solar panel needs to be set up in view of full sunlight and connected to the charging connector on the rear of the Felixer.



Rear view

1. Remove the solar panel from the travel case.
2. Slide the legs into an open position.
3. Place the panel on the ground, ideally hidden to minimise detection by target animal.
4. Aim the panel in a northerly direction.
5. Avoid vegetation cover and objects which block sunlight.
6. Anchor panel legs with rocks or logs.
7. Uncoil the cable from the solar panel.
8. Connect the solar panel to the Felixer's rear Anderson connector.
9. If a longer cable is desired, Anderson extension leads can be purchased from 4WD/camping stores.*
10. Where foxes, dingoes or Tasmanian devils are likely, consider burying the cable and protecting the connector from chewing.
11. The solar panel is now connected and set up.

**When using long cables, voltage drop will reduce the amount of energy transferred from the solar panel to the Felixer. It is recommended to keep extensions to a maximum of 10 metres. For a 10 metre cable, ensuring that the cable has at least 6 mm² of copper in each wire (AWG 10) will keep the voltage drop within acceptable limits.*

In extended periods of cloudy weather or in situations with trees obstructing light, the battery may reduce below an operational level.

- To ensure the battery is maintained in an operational state the volume and frequency of audio lures will automatically be reduced to save power.
- If the battery level falls below 10% (default), the software will enter a hibernation mode designed to draw minimal power.
- In hibernation mode, the Felixer can be 'off' (the display is completely blank) but relies on a scheduled wakeup to occur later in the day (6pm default, see *Configuring advanced software features before field use*, page 47). With hibernation mode and a full day's sun, the battery should have a higher level of charge by wakeup time.
- When waking up from hibernation, the software will reassess the charge level and either become operational or return to hibernation for another 24 hours.

Unlocking the lid

The lid has a lock to prevent unauthorised access and to comply with poisons regulations.

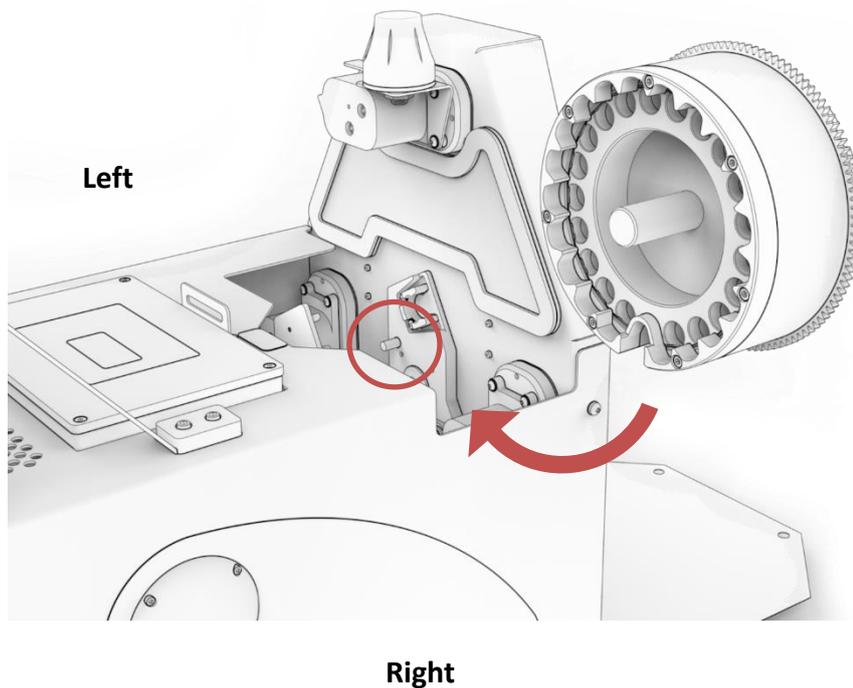
To lock or unlock, insert the key into the round keyhole on the lid, and turn 90°. The lid can be opened by grasping the cut-out section near the triangular magazine hood.



Inserting the Magazine

As the Felixer is transported without a loaded magazine, one needs to be inserted.

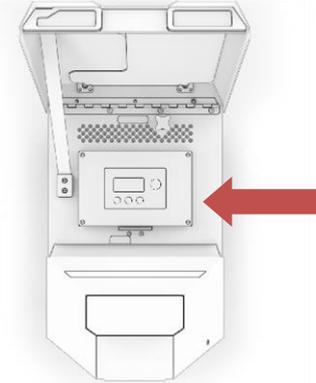
1. Remove the magazine hood from the raised section of the Felixer.
2. Stand on the right side of the Felixer as pictured, with the magazine held in your left hand.
3. Insert the magazine into the Felixer by aligning the slot on the front face of the magazine with the retaining pin in the Felixer's magazine cavity.
4. Slide the magazine into the clips.



5. You will hear a solid clunk sound when successfully inserted.
6. The magazine has now been reloaded.
7. Replace the lid.
8. Proceed with arming as instructed.

Turning the Felixer On

1. Press any button. The Felixer will power on and start-up information displayed on screen.
2. After performing system checks, a DISARMED status screen is displayed.
3. From the DISARMED status screen, the Felixer can be armed by pressing the **ARM** button.
4. Configuration settings can be adjusted through the MENU button. Refer to *Entering the Settings Menu* on page 29 for more detailed information.



Solar Panel Check

The menu will prompt for a solar panel if no active charging is detected. If charging is detected, this screen is skipped.

```
SOLAR PANEL
Is the solar
panel connected?
BACK YES
```

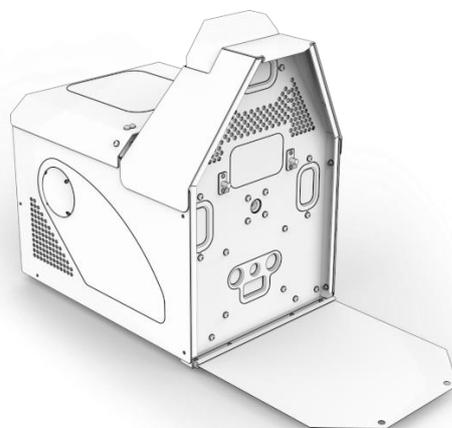
Ensure that the solar panel is placed facing the sun, free of obstructions, and use the Anderson fitting on the rear of the Felixer to connect it. If possible, bury the cable to prevent trip hazards or chewing damage from wildlife.

Mud Flap Check

During setup, the Felixer will check that the mud flap has been lowered and no obstructions are close to the sensors.

```
SENSORS BLOCKED?
Check sensors
are clear.
BACK CHECK
```

A prompt will appear if obstructions are detected.



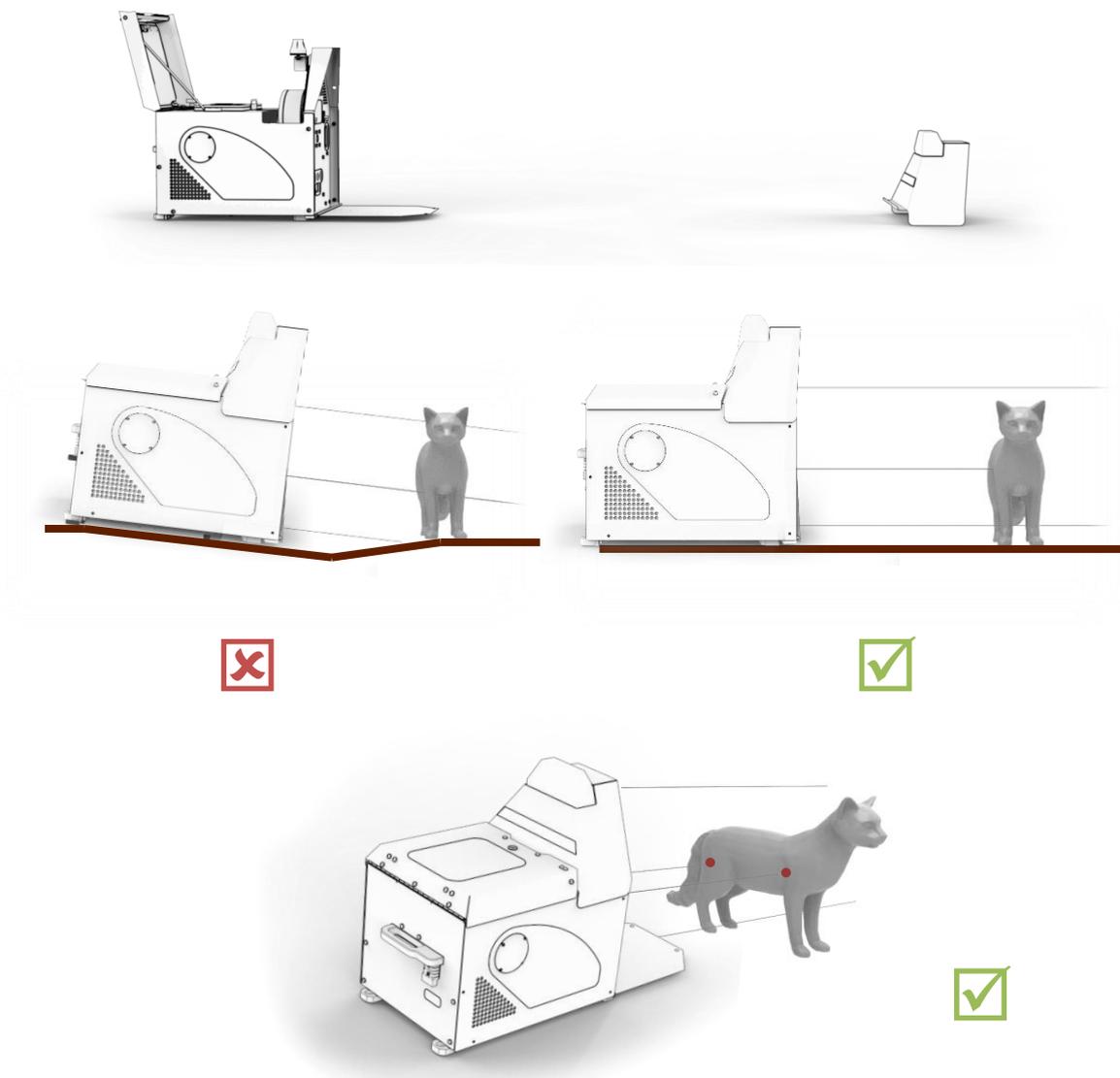
Levelling the Felixer

This process is required so sensors detect the correct height of the target and gives you the best chance of distinguishing cats from other animals in a safe and reliable manner.

1. The levelling menu is displayed after pressing **ARM** on the DISARMED status screen.
2. The laser on the front will turn on.
3. Use the magazine hood to act as a reference.
4. Place the hood at the desired maximum range in front of the Felixer with the laser alignment mark facing the sensors. Ensure the hood does not sink into soft sand. Check the alignment of the laser dot against the mark.
5. Digging in or raising the Felixer may be required to achieve optimal levelling.
6. Use the black knob on the top of the Felixer to fine-tune the angle of the Felixer to match the laser dot to the laser alignment mark.
7. Gradually move the hood with the laser alignment mark towards the Felixer, along the full distance of the firing range to check level ground.
8. If the ground is not level, move soil to keep the laser dot on the laser alignment mark.
9. Ensure all sensors can detect the required maximum range.
10. Once completed, press **DONE** to proceed to the next step.

```

LEVEL FELIXER
Top 5.1m  Bot 1.1m
Lft 5.1m  Ret 5.0m
BACK      DONE
  
```



Setup site note

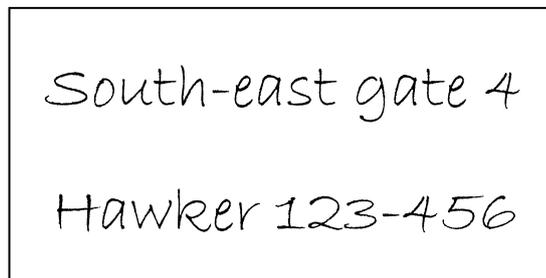
To keep track of the location and site details of each Felixer, a note should be placed on the hood before the setup photo is taken. When data have been uploaded the *Felixer Management System (FMS)* and the FMS encounters a SETUP picture, it will prompt the user to type in the note with site information as visible on the image. If the Felixer has GPS capability, this will also be automatically locked to GPS coordinates. For Felixers without GPS, the user will be prompted to place a marker on a map in the FMS to set the location.

```

SETUP SITE NOTE
Place note on hood
for site picture
BACK  SKIP  READY
  
```

When setting up a Felixer in a new location for the first time, using the setup site note feature ensures good data management and is highly recommended. If rearming the same Felixer in the same location, it is ok to skip the setup site note step.

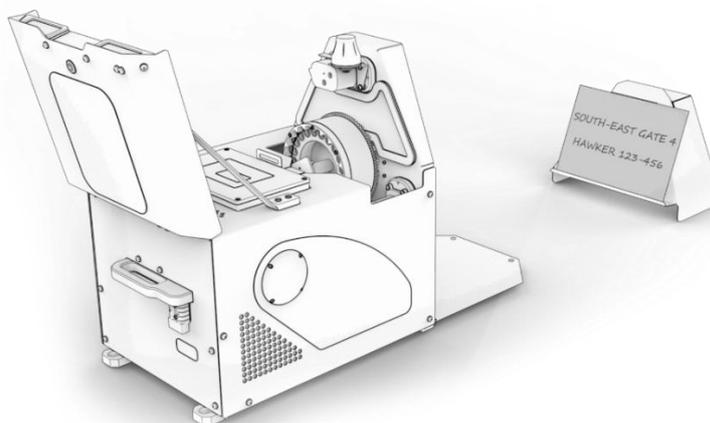
1. Write the site name grid reference and any other relevant site information in the following format on an A4 piece of paper. For example:



2. Move the hood to 1 metre in front of the Felixer. The correct distance is important for capturing the image clearly – too far away and the writing will be illegible.
3. With the hood still in front of the Felixer, place the note on the rear of the hood, facing the Felixer camera.
4. During this stage, the Felixer will also search in the background for a satellite fix.
5. When ready, select **READY** to take the setup photo. The following screen will appear.

```

SAVING SITE NOTE
      >>>>
  
```



Satellite Fix

A satellite search will commence in the setup site note stage. If a satellite fix has not yet been found after **READY** has been selected, the following message will appear.

```
SITE LOCATION
Please wait for
satellite fix...
BACK
```

Having a GPS location ensures ease of photo organisation and Felixer tracking. After a period of searching, an option to **SKIP** this stage will appear.

```
SITE LOCATION
Please wait for
satellite fix .
BACK                SKIP
```

If the Felixer cannot get a satellite fix, ensure there are no obstructions between the antenna and satellite signals (for example, the tin roof of a shed or a heavy tree canopy). Select **RETRY** to search for satellites again, or **SKIP** to proceed with no satellite fix.

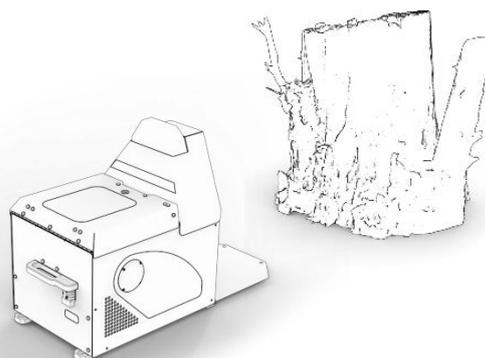
```
SITE LOCATION
Unable to get
satellite fix.
RETRY                SKIP
```

Range Checks and Max Range

Remove the setup site note and replace the hood on the Felixer.

Irregular objects which move in the wind, like fencing, small shrubs, tree branches, or tall grass can affect the readings from the sensors. An empty backdrop is also undesirable, as the sensors may have difficulty detecting distance accurately. Ideally, set up in front of a solid backdrop, such as dense vegetation, a tree stump, rock, or earth wall.

Although the Felixer software tries to ignore environmental triggers as much as possible, reliability is improved when the surrounding areas are free of partial obstructions and moving objects.



Set Maximum Range Value

With a solid backdrop, the maximum range that the Felixer will operate on will be determined automatically and normally does not need to be adjusted. If there are moving objects in the background, such as a fence or bush, the maximum range should be reduced to avoid sensor detections of a moving backdrop.

```
RESTRICT MAXIMUM
Actual 2.9m
Restricted to 4.0m
BACK CHANGE OK
```

Leave a minimum 10 cm gap between maximum range and potential moving or semi-transparent obstructions.

If necessary, use logs/rocks just wide of the sensor line to direct cats into the specified target range.

On the Sensor Maximum page, press the **CHANGE** button to cycle through half metre steps.

Press **OK** to confirm and save the maximum range setting. No targets will be detected past this point.

Range Checks

The Felixer should have a clear view of the target area, with no loose obstacles or vegetation obstructing the zone. The range check feature allows validation of the sensing area.



```

DETECTION CHECK 2.8m
Sensors: ■■■■■
OK when done
BACK          OK
  
```

Use the slide-out test card in the lid to simulate a target. The display will show the range measured by the blocked sensor, and voice prompts will announce the distance.

1. Observe the area directly in front of the Felixer.
2. The perceived range from the sensors is displayed on screen as bar graphs (short bar is sensor obstructed in front of specified range).
3. Clear any debris from the view of the sensors and remove any loose branches or foliage in the direct path of the firing line.
4. Check that the Felixer recognises the card as a target throughout the specified firing range, but not beyond.

Once clear, press OK to proceed to the next step.

Targeting mode

The Felixer operates using a sensing algorithm that considers the height, speed, and leg motions of the animal to discriminate between different species. It can operate in two distinct modes: Standard and Conservative.



```

TARGETING MODE
CONSERVATIVE
BACK CHANGE OK
  
```



```

TARGETING MODE
STANDARD
BACK CHANGE OK
  
```

In Standard mode, the emphasis is on maximising detections of target species like feral cats and foxes. In this mode there is also a small chance of accidental targeting of non-target species.

Conservative mode introduces extra safeguards to further minimise the risk that non-target species are targeted but also has a lower chance of successfully detecting target species. It should be used in areas where non-target species are prevalent or of particularly high value, or readily mistaken for a target species. Wallabies are one such species that are prone (when grazing) to being wrongly identified as a target species.

Arming

Arm in Passive Photo Only Mode

The Felixer can operate in a completely safe “Photo Only Mode”.

In this mode, the Felixer will not arm the firing mechanism, but will otherwise function in the same manner with respect to sensing and logging of data.

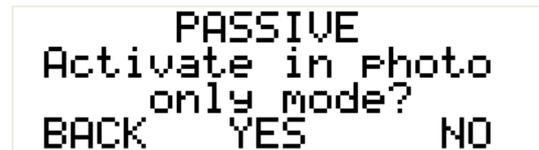
Photos will be saved to the USB stick alongside the detailed log files.

- You can activate this mode instead of a live firing mode by selecting **YES** on the **PASSIVE** menu screen.
- If you want to arm the Felixer with the **intent to fire** on targets, select **NO**.

Once an option has been selected, the Felixer will operate in a passive mode, or prompt the user about the magazine status in the following step.

The status screen in Photo Only Mode is laid out in the same format as the armed screen. Refer to the armed screen layout for more detailed information.

Felixers kept in Photo Only Mode should be regularly armed to avoid the firing mechanisms seizing and becoming stuck.



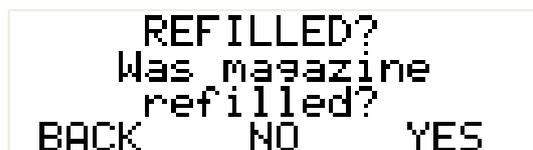
```

PASSIVE
Activate in Photo
only mode?
BACK    YES    NO
  
```

This mode is best used in situations with unknown environmental factors, to scout out an area or to test the target detection modes without firing gel.

Reload prompt before Arming

The Felixer will prompt the user to specify if the magazine has been refilled when a used magazine is detected. If the magazine has been reloaded previously and has not fired, this prompt is skipped.



```

REFILLED?
Was magazine
refilled?
BACK    NO    YES
  
```

If the magazine is full of cartridges starting from the first position, press **YES**.

If the Felixer is being re-armed without any reloading or replaced cartridges, and the cartridges start from a non-zero position, then answer **NO** and the Felixer will arm to the previously remembered shot count.

Arming in a Firing Mode

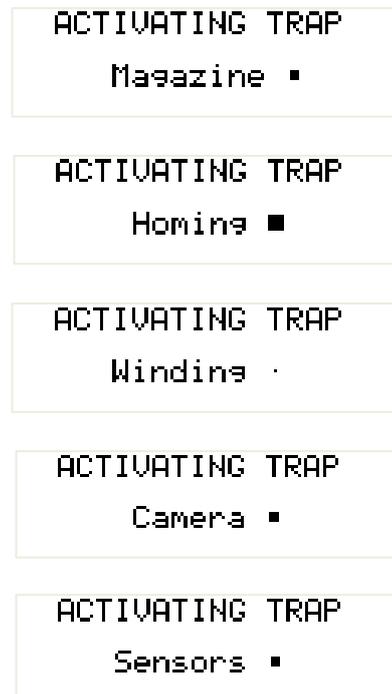
Once the reload prompt has been satisfied, the Felixer will begin arming. This process includes self-checks of internal systems to ensure correct operation before entering an armed state.

The following screens show self-checks for:

- Configuration Settings and Lure
- Camera and Sensors
- Magazine and Piston

When these checks pass, the magazine will be rotated, and the firing piston moved into an energised state.

If tests fail, consult the *Troubleshooting* section of this manual on page 58.

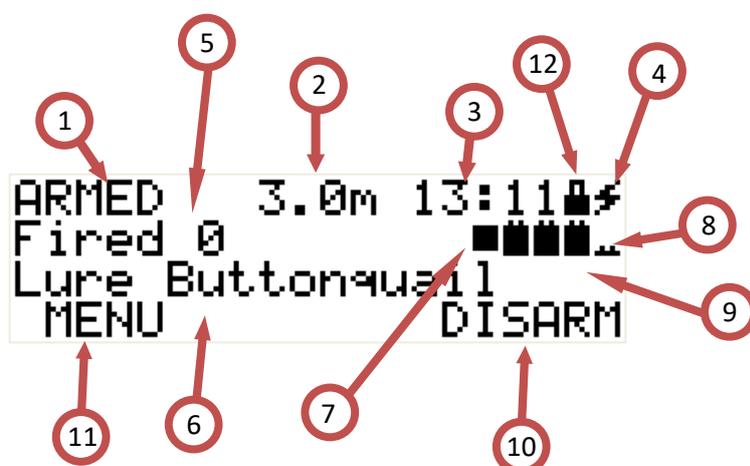


WARNING – THE PISTON HOLDS A LARGE AMOUNT OF MECHANICAL POTENTIAL ENERGY AND CAN CAUSE INJURY. DO NOT MOVE OR TRANSPORT WHILE ARMED.

At this point, the Felixer is considered armed, and will verbally prompt the user to close the lid and walk away. After a short period of cooldown time (120 seconds by default), the Felixer will become fully active and will fire at valid targets.

When armed, sensor data, audio lure and configuration settings remain accessible via the MENU button. The MENU functionalities are detailed below in *Felixer Options*, page 29.

Armed Status Screen



1. State (armed/photo)
2. Average max range in metres
3. Current time
4. Battery level/Charge status
5. Shots fired/Photos taken
6. Active lure
7. Sensor state
8. Sensor readings
9. Current detected target
10. Disarm button
11. Menu button
12. USB active symbol

See the *Modes Reference* section on page 27 for full descriptions of states and symbols.

Disarming

At any time in Active mode the Felixer can be immediately disarmed by pressing the **DISARM** button, far right **GREEN** button.

The **DISARM** button is also used to exit Photo Only Mode.

The Felixer will slowly release the spring tension and return the magazine to the home position so it can be removed.

At this point, you can turn the Felixer off or configure settings as required.

```
STOPPING TRAP
Unwinding ■
```

```
STOPPING TRAP
Homing ■
```

```
Trap is safe
to power off...
```

Disarmed Status Screen

The diagram shows a monochrome LCD screen with the following text: "DISARMED", "Photos 4", "Lure Buttonquail", "MENU", "13:05", and "ARM". A battery level indicator is shown next to the time. Eight numbered callouts (1-8) point to specific elements on the screen:

- 1. Current disarmed state (points to "DISARMED")
- 2. Current time (points to "13:05")
- 3. Battery level/Charge status (points to the battery indicator)
- 4. Shots fired/Photos taken (points to "Photos 4")
- 5. Active lure (points to "Lure Buttonquail")
- 6. Arm button (points to "ARM")
- 7. Menu button (points to "MENU")
- 8. USB active symbol (points to a small square symbol next to the time)

Turning the Felixer Off

1. Press the **RED** button once.
2. The menu will prompt if you are sure you want to turn the system off.
3. Press the **RED** button again to confirm.



POWER OFF?
Press POWER again
to confirm CANCEL

4. A countdown will play out for 10 seconds. You can cancel this prompt at any time with the **CANCEL** button.



POWERING OFF
>>>>>>>>
CANCEL

The Felixer will then shut down and the screen should go dark.

Field Inspections

When inspecting a Felixer in the field that has been in operation for a while, it is highly recommended to have a **second USB** memory stick prepared beforehand as described in *Preparing a USB flash drive* on page 46. During inspection, provided the USB active symbol is not present, simply swap the new USB stick device with the one present in the Felixer. If the USB active symbol is present on the screen, power the Felixer off before swapping USBs.

The previous USB stick can then safely be taken back to the office for examination of the photos and log files. USBs should **not** be shared between Felixers. Upload data from the USBs to the *Felixer Management System (FMS)* (see page 34) at least every 3 months. This is to prevent issues arising with the FMS, as it can only process data from one serial number at a time and may time out if too much data are uploaded at once.

Check that the USB active icon on the screen is not visible when removing the USB memory from the Felixer. When the USB active icon is visible, it means the Felixer is using the USB memory (e.g. to update the log file information) and removing the USB memory while this icon is showing is likely to result in corrupting the USB memory, thus losing valuable photos or log information.

When in doubt, disarm and power down the Felixer before removing or replacing the USB memory.

Removing the magazine

1. Remove the hood from the Felixer.
2. From the right side of the Felixer, brace your right hand on top of the Felixer.
3. Grasp the white magazine with your left hand and pull the magazine towards yourself.
4. With sufficient force, the magazine will release from the clips and become loose.
5. Use both hands to gently remove the magazine from the Felixer.

Modes Reference

The top left section of the status screen will show the state of the Felixer.

- DISARMED** - The Felixer is considered idle and will turn off after 10 minutes of inactivity.
The MENU button and ARM button allow you to change settings or begin the arming procedure.
- PHOTO** - The Felixer is in "SAFE" mode where no shots are fired, it only takes photos.
If the Felixer runs out of cartridges, it will drop down into this state to continue monitoring wildlife until reloaded by the user.
- ARMED** - The Felixer is in the normal mode, ready to fire at a target when detected.
- ACTIVE** - The sensors have detected something that has moved in front of them.
This state represents a higher level of sensing complexity, sensors are run at full speed to best find targets and make firing decisions. This is accompanied with an ! next to the sensor bar graphs.
- RELOADING** - The mechanism has recently fired and is moving to the next firing position.
- COOLDOWN** - The sensors have recently detected a target (or fired) and the Felixer waits.
This period is user defined as the 'sleep' parameter in the config.ini file, defaulting to 120 seconds. Hardware remains in Cooldown until sensors have not detected an object for 120 seconds.
No firing actions or sensing takes place during this period.

Sensor Activity Reference

Found below the time in passive or active mode, a series of bar graphs show the current sensed range. The dotted horizontal line shows the average maximum distance. The bar shows the distance to the object obstructing the respective sensor(s). The two images below show all sensors clear from obstruction (left) and an activated right sensor (right). The bars correspond to the Top, Right, Left and Bottom sensors when read in a left to right direction.

```

PHOTO  2.8m 09:35 0
Photos 0      ■■■■■
Lure Combi#1
MENU PHOTO STOP
  
```

```

COOLDWN 1.8m 15:14 0
Photos 2      *■■■■
Lure Combi#1      RGT
MENU PHOTO STOP
  
```

Below these, the current detected object is shown as a three-letter abbreviation as follows:

- TOP** - Top Sensor Activation.
- BOT** - Bottom Sensor Activation.
- LFT** - Left Sensor Activation.
- RGT** - Right Sensor Activation.
- MUL** - Multiple targets. Left and right sensors detect objects at substantially different ranges.
- TGT** - Detected a target. Requires left and right only to be activated at same time. The Felixer will fire on this detection trigger.

To the left of the bar graphs, the sensing state is shown as a character:

- *** - Cooldown - Felixer is waiting after a trigger event.
- !** - Active mode - Sensors are in full speed mode pending a trigger event.
- - Idle mode - Growing/shrinking square shows Felixer waiting for target.

Felixer Options

Entering the Settings Menu

Operators may require the ability to change Felixer settings in the field based on location specific requirements. The menu system allows for common settings changes and diagnostic information.

To access the menu from a freshly booted Felixer, press the **MENU** button on the **DISARMED** or **ARMED** screens.

All default settings are acceptable, but sensor and lure overrides are available.

The configuration tab allows the user to check the battery and charging status, view the GPS location and set the time and date if needed.

Navigation of the setting menu is expressed as follows:

```
DISARMED      13:05
Photos 4
Lure Button  quail
MENU          ARM
```

```
ARMED 3.0m 13:12
Photos 0
Lure Button  quail
MENU          DISARM
```

```
> Sensors
  Audio Lure
  Configuration
BACK  NEXT  ENTER
```

[STATUS SCREEN] → **MENU** BUTTON → SCROLL TO **CONFIGURATION** → **ENTER** BUTTON

Sensor Settings

Raw Values Page

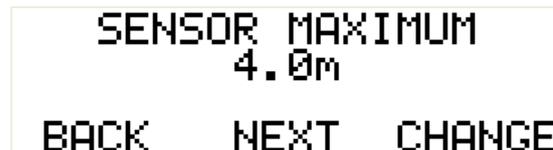
As a diagnostic feature, this page allows the operator to view the raw sensor values from the distance sensors on the front panel. Additionally, the long-term average for that sensor is displayed alongside with a bar graph indicator.



Sensor Maximum

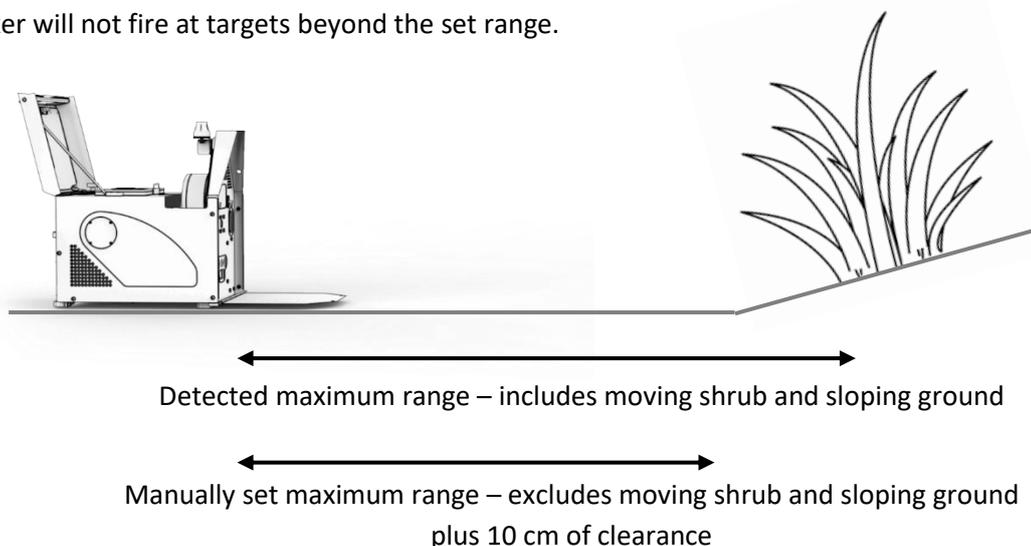
Setting the maximum range is important for two reasons. When deploying the Felixer pointed towards nearby permanent objects that can move, such as shrubs or a wire fence moving in the wind, manually setting the maximum range can reduce the number of triggers due to movement. This is also useful if the sensors face through a fence towards livestock which should not be detected. Setting the maximum range is also important to ensure that animals are only detected where the ground has been levelled. Sloping ground will make it difficult to correctly identify targets.

To adjust the setting, press **CHANGE** and use the + and – buttons to set the maximum range in steps of half a metre.



This setting is prompted during each arming setup procedure. Setting this accurately is not imperative, as the software will sense solid obstructions and gradually learn to adjust itself accordingly, however, this can take several hours. If there are moving objects or unlevel ground within the detected maximum range, reduce the maximum range to allow at least 10 cm clearance between the maximum range and interfering objects/uneven ground.

The Felixer will not fire at targets beyond the set range.



Configuring the Audio Lure Settings

Settings for the audio lure can be changed on Felixer with menu options, or it will read the configuration file on the USB. To edit lure settings, go to the lure settings page

[STATUS SCREEN] → **MENU** BUTTON → SCROLL TO **AUDIO LURE** → **ENTER** BUTTON

Enabling/Disabling the Lure

```
LURE STATUS
Lure playing
is DISABLED
BACK  NEXT  CHANGE
```

You can manually set if audio lures are enabled or disabled on the LURE STATUS Screen.

Press the **CHANGE** button to toggle the mode.

Selecting different lures

```
LURE TRACK    5/13
  Combi#1
  [8 sounds]
BACK  NEXT  CHANGE
```

The selected lure can be modified by pressing the **CHANGE** button to select the next sound folder.

The sound will play to preview the selection.

Lure sound files, order, play intervals and volume adjustments can be configured with the config.ini file on the USB stick.

Refer to *Configuring advanced software features before field use* on page 47 for more details.

Configuration Settings

Setting the Date and Time

The Felixer includes a clock which keeps time even when the Felixer is off.

This is used for scheduling audio lures and allows the Felixer to wake from hibernation modes at the correct time in the evening.

If GPS is enabled and a satellite fix has been obtained, the date, time and time zone will be set automatically. Time zones included in the Felixer are: Central Western, South Australia, Victoria, New South Wales, Queensland, Northern Territory, Lord Howe Island, Tasmania, Western Australia and Christmas Island. The time will be automatically adjusted for daylight savings.

To set the date and time manually, navigate to the configuration menu:

[STATUS SCREEN] → **MENU** BUTTON → SCROLL TO **CONFIGURATION** → **ENTER** BUTTON

```
CLOCK SETTING
Sun 09-Feb-2020
11:46:20 ACST
BACK  NEXT  CHANGE
```

Set the date and time by pressing **CHANGE** to begin editing it. Year, month, day, time zone, hour and minute are set sequentially.

```
CLOCK YEAR
Sun >2020<-Feb-09
-      +      SET
```

Use the + and – buttons to change values, and **SET** button to confirm selection.

Once all have been set, the date and time will be saved.

```
CLOCK MONTH
Sun 2020->Feb<-09
-      +      SET
```

```
CLOCK DAY
Sun 2020-Feb->09<
-      +      SET
```

```
CLOCK TIMEZONE
>South Australia<
ACST
-      +      SET
```

```
CLOCK HOUR
>11< : 46
-      +      SET
```

```
CLOCK MINUTE
11 : >46<
-      +      SET
```

Viewing Location

This screen displays the latitudinal and longitudinal GPS coordinates obtained during satellite fixing. If no satellite fix was obtained, the coordinates will be displayed as unknown.

```

LOCATION
Lat  -34.89730  Fix  1
Long 138.57579  Sat  3
BACK  NEXT

```

```

LOCATION
Lat  ???       Fix  0
Long ???      Sat  0
BACK  NEXT

```

Viewing Battery Level and Temperature

This screen shows the actual measured voltage, and estimated battery percentage.

A lightning bolt symbol indicates that battery charging is detected.

```

BATTERY STATUS
Batt: 12.4V 75% ⚡
Temp: 19.4 C
BACK  NEXT

```

Viewing Firmware Version and Hardware Serial Number

These pages provide information about the software currently running on the Felixer control electronics.

Firmware files are given a number for each major release, along with the date of release.

The hardware serial number should match the engraved SN found inside the magazine cavity.

```

Felixer 3.1
      3.0.0
      2020-06-17
BACK  NEXT

```

```

SERIAL NUMBER
SP030009
BACK  NEXT

```

Firmware Update

If a firmware update is detected on the USB, the Felixer will automatically complete the update upon start up. If the update is not applied automatically, the firmware update page allows the operator to update the Felixer software to a newer version kept on the USB. This can only be done in DISARMED mode.

```

SOFTWARE UPDATE
Press UPDATE to
upgrade software
BACK  NEXT  UPDATE

```

Once **UPDATE** has been pressed, the entire update procedure is automatic and will reboot into the Felixer firmware once complete. This typically takes 30 seconds.

Felixer Management System (FMS)

The Felixer Management System is a website dedicated to storing all data collected from Felixers and can be accessed at <https://felixerlogs.thylation.com>. It is a valuable management tool for users to store and analyse their Felixer data. The FMS allows you to upload your Felixer data from the USB.

The three main features of the FMS are uploading data, classifying the data, and viewing photos.



Users can also download the latest Felixer software (firmware).

Ideally the FMS should be accessed on a Windows computer with a reliable, fast internet connection. Use Chrome or Firefox. Internet Explorer is not supported.

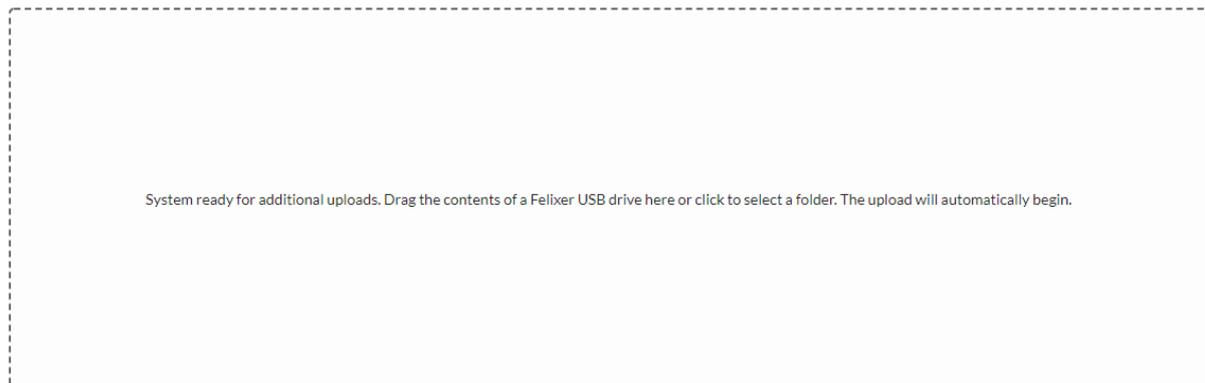
The data uploaded consist of photos, log files and sensor log files. In the event that you cannot access the FMS, the data can be accessed directly on a computer, refer to

Appendix A: Reading Data Files on page 69.

If you are experiencing an issue with a Felixer, upload the USB files to the FMS and notify Thylation.

Upload USB

To upload a USB to the FMS, select **Upload USB**. Click inside the box to navigate to the USB. Select all files on the USB. Alternatively, USB files can be dragged and dropped into the box.



The upload was successful. The USB can now be cleaned for the next use.

Please navigate to the drive in Windows and double click the 'ERASE-ALL.bat' file. You will be prompted for confirmation, confirm the operation.

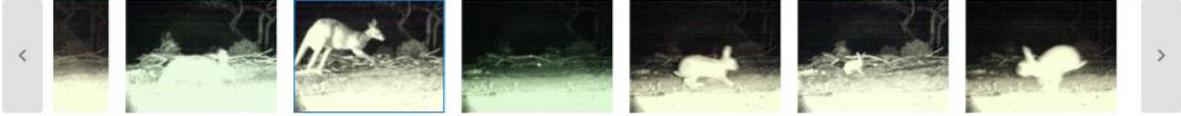
Once you have completed this process, click the button below to reset the upload interface.

 Upload Another

Classify Data

Photos that are uploaded to the FMS can then be classified. Select **Classify Data**. Additional classification labels can be added if desired. Selecting a particular Serial Number in the top left drop-down menu will display the GPS coordinates and the map location of the Felixer.

SP030105 ✕
Oldest to Newest ▼
Site Name ▼

<

>



Triggered at: 17th September 2020, 05:56:27 AM

Distance: 209cm

Serial Number: SP030105

Trigger: TOP

Site: Venus Bay Secret Track

LatLng: -33.2062, 134.6268 (from GPS)



mapbox
Modify Site Name

Satellite
Outdoors
Streets

Classification Label

<input type="radio"/> Bird	b	<input type="radio"/> Cat	c
<input type="radio"/> Dingo	d	<input type="radio"/> Fox	f
<input type="radio"/> Goanna		<input type="radio"/> Human	h
<input type="radio"/> Kangaroo	k	<input type="radio"/> Lizard	
<input type="radio"/> Rodent	r	<input type="radio"/> Test	t
<input type="radio"/> Unsure	u	<input type="radio"/> Vehicle	v
<input type="radio"/> Wallaby	w		

Attributes

Additional Notes

55 remaining
Skip
Submit and Continue

Site changes

If the FMS detects a new set of GPS coordinates, the user will be prompted to Add a Site Change. In this screen, the Site Name and Notes about the site can be entered. Allocating meaningful Site Names ensures Felixer photos and logs for that location can be accessed easily by filtering for it when searching.

Add a Site Change

SETUP Photo



[View larger SETUP photo](#)

Site Name

Venus Bay Secret Track

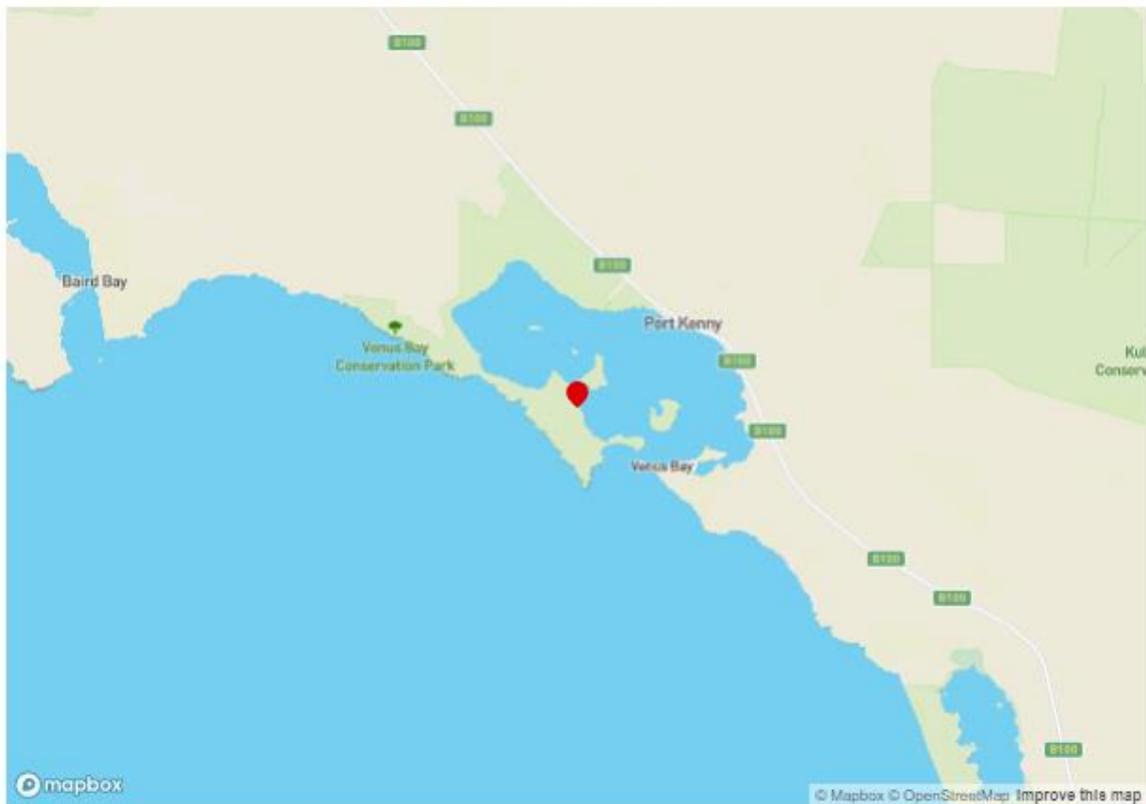
Site names cannot contain commas. If included they will be replaced with a hyphen. Site names should be globally unique and recognisable.

Notes

GPS Position (Not editable due to being from inbuilt GPS)

Latitude -33.2061238

Longitude 154.0257235



[Satellite](#) [Outdoors](#) [Streets](#)

Cancel

Add and Continue

View photos

To view the photos from your Felixer, select **View Photos**. Filters can be set on the right-hand side to show certain date ranges, trigger sensors, serial numbers and more.

Photos

Action: 0 of 10 selected

THUMBNAI LINK	CAPTURED	TRIGGER	DISTANCE	SERIAL NUMBER	FIRED	CLASSIFIED	TIME OF LAST LURE	LOCATION NAME	RECLASSIFY
	July 3, 2019, 11:06 a.m.	LEFT	174cm	MkII		Unsure	-	-	Reclassify
	July 3, 2019, 11:12 a.m.	LEFT	181cm	MkII		Unsure	-	-	Reclassify
	July 3, 2019, 11:31 a.m.	LEFT	190cm	MkII		Unsure	-	-	Reclassify

FILTER

By captured

Date: From date

Time: 00:00:00

Date: To date

Time: 00:00:00

By trigger

By distance

All

0-50cm

50-100cm

1-2m

2-3m

3-4m

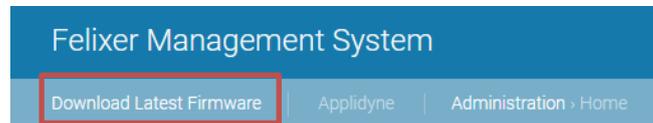
By serial number

By classification status

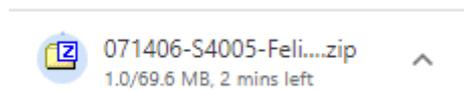
All

Filters may be set using the fields on the right side of the screen. Each filter setting must be confirmed by selecting 'Filter' before setting additional filter values.

Download Latest Firmware



In the top left of the home screen, select **Download Latest Firmware**. This will start a download of the zipped software. When the download is complete, open the file and unzip the contents. Place the unzipped contents in the top/root directory of the USB. See *Updating Software*, page 52 for instructions on completing an update.



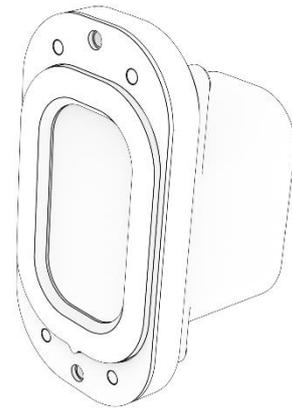
Maintenance Instructions

Sensor Housing

The sensor housings contain the LiDAR laser sensors used to detect targets.

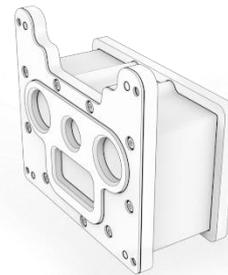
These sensors can accurately measure distances from the Felixer in a straight line.

For optimum performance, ensure the sensors are clear of obstructions and clean. See *Cleaning the external faces*, page 45 for details.



Camera Housing

The camera housing holds the IR sensitive camera, IR flash, the levelling laser used for alignment and the bottom sensor.

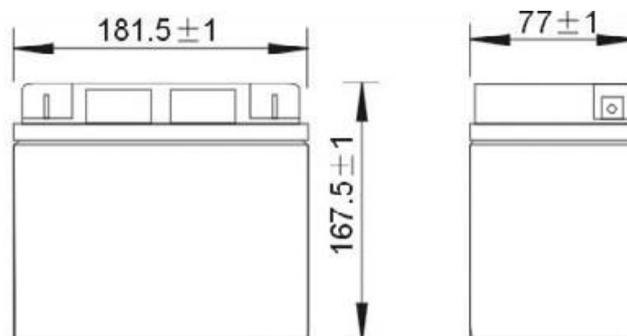


Battery

The included battery is a 12V 18Ah Sealed Lead Acid. It can provide several days of operation without charging.

Depending on the supplier and region, the battery installed in each Felixer may differ from the picture.

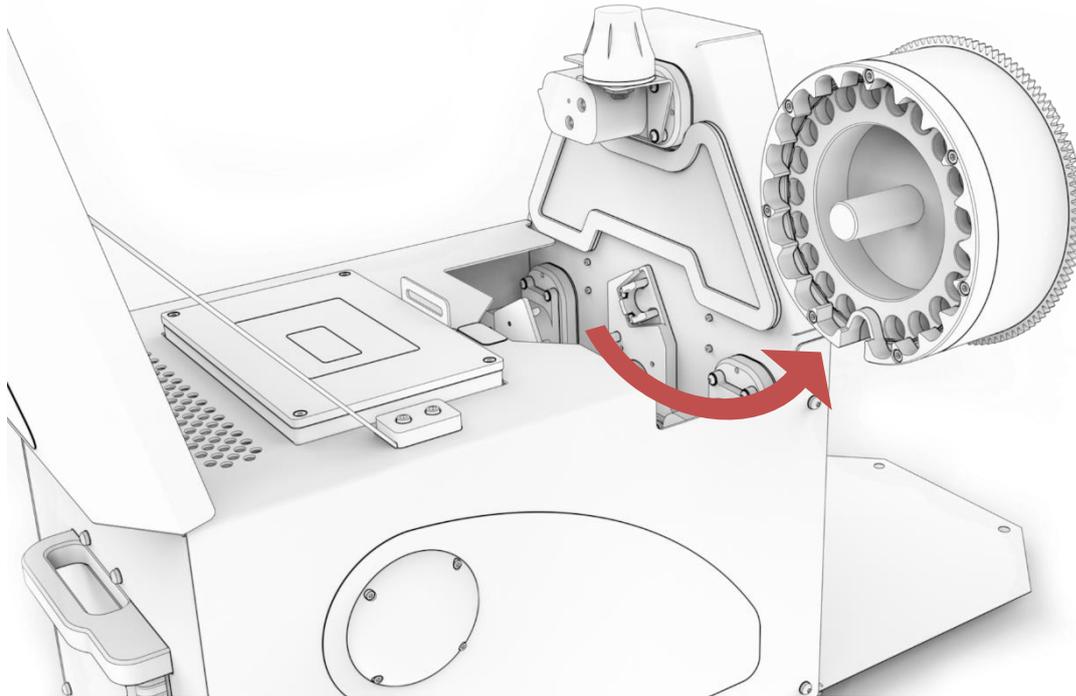
The standard battery used is the Century PS12180 as pictured and weighs approximately 6 kg.



Replacing gel cartridges

Remove the magazine assembly from the Felixer. The Felixer must be disarmed to allow magazine removal.

**WARNING: POISON MAY BE PRESENT ON THIS COMPONENT
USE CAUTION AND GLOVES WHEN HANDLING**



Place the magazine assembly with the firing (nozzle) ends face down on a clean surface.



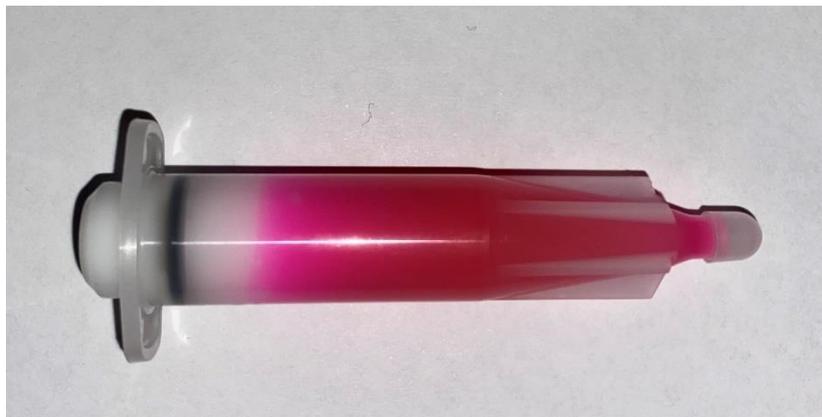
Remove the used cartridges by securing the magazine assembly with one hand and placing the fingers of your free hand under the tabs on the empty cartridge. A flat object may be used as a lever.

Using the tabs on the cartridge to hold the cartridge, pull the cartridge up away from the magazine assembly.



Repeat this process until all empty cartridges have been removed.

To install new cartridges, complete a visual check of the new cartridge to ensure it is the desired colour (green is for testing, red contains poison) filled with gel to a minimum of 3 ml, has no leaks and has a cap over the end of the nozzle. **Do not remove the cap.** The cap prevents gel leaking out and will be forced off when a target is fired at.

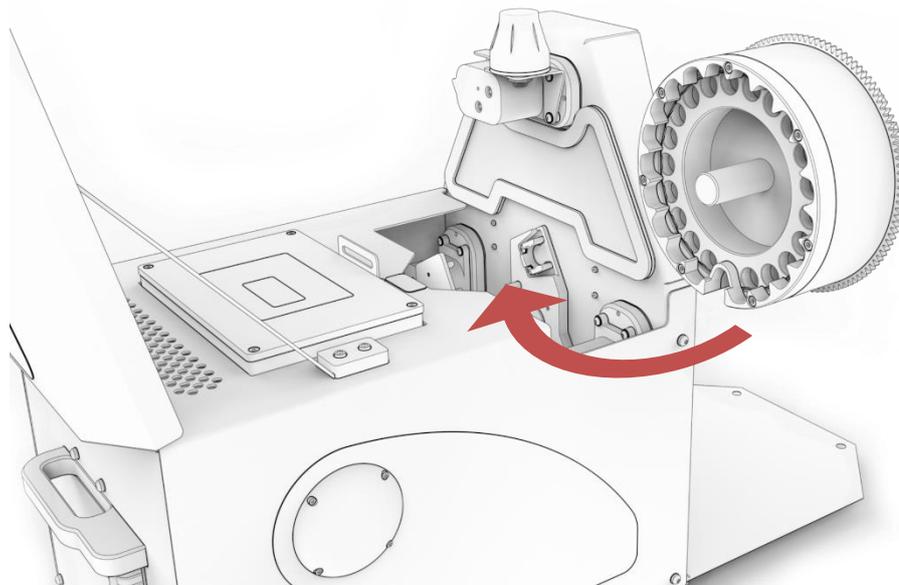


Secure the magazine assembly with one hand, use your free hand to slide the new cartridge nozzle-end first into the vacant slot until the cartridge cannot be inserted any further.

Ensure that you do not press the plunger with your finger when inserting cartridges into the magazine. Only press on tabs on either side.



Repeat this process until all empty cartridge slots have been filled. The magazine assembly can now be inserted back into Felixer ready for use.

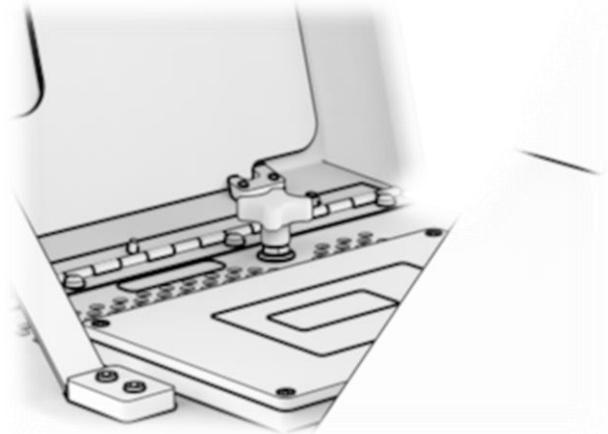


Used cartridges should be **stored in a sealed container** and then triple rinsed. Bury the rinsate and empty capsules in a local authority landfill.

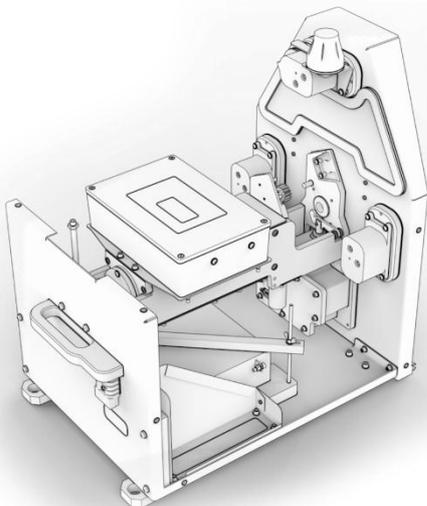
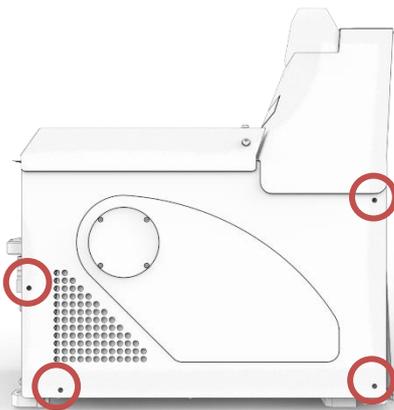
Removing the main cover panel

To access the battery, and to clean the internals of the Felixer, the main cover piece must be removed. First, remove the hood.

Remove the height adjust knob by unscrewing the knob while holding the nut with provided 13mm spanner. Then remove the nut. This allows the main U-shaped panel to slide off the top.



Use a 3.0mm hex driver to remove the **8** screws on the sides of the Felixer as shown below, and the **2** screws on the top outer edges of the hinge as marked:



Once the screws are removed, gently lift the panel upwards and towards the back of the Felixer, ensuring the wires to the speakers are not caught or pulled tight.

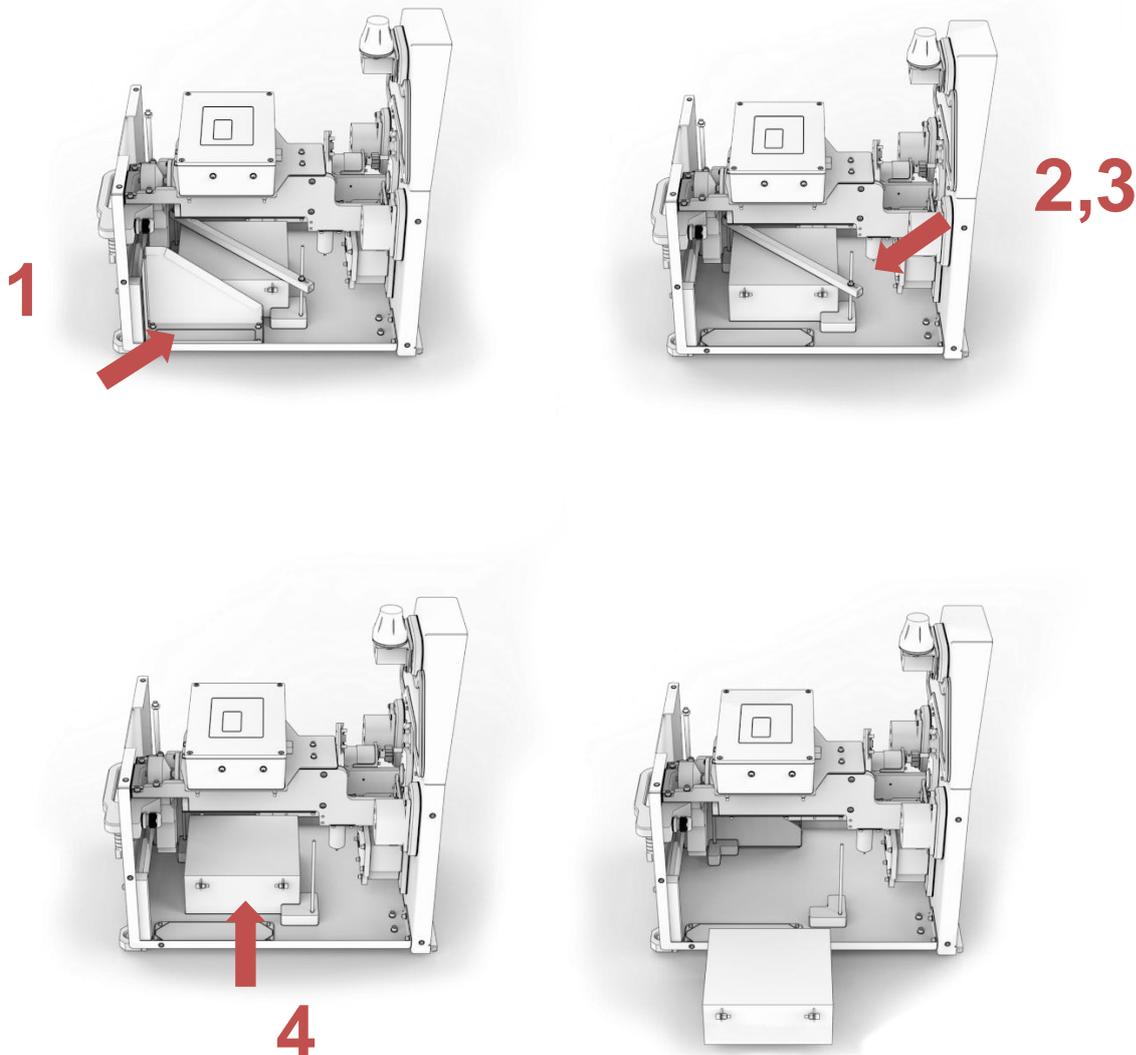
You can now access the internal components for further maintenance tasks.

Battery care

Removing the battery

To remove the battery from the Felixer, remove the hood and U-shaped panel. **Remove the D connector attached to the battery from the electronics enclosure to prevent damage to the Felixer electronics (see *Connector Key*, page 61 for more detail).** The battery is mounted to the floor of the Felixer with a painted cross strap. The water trap may need to be removed to provide easy access to the battery as shown in photo **1** below.

1. Rotate the Felixer to rest on its side. Remove the 4 screws and remove the water trap.
2. Remove the battery strap by removing the 2 wingnuts and their washers.
3. Unscrew the ring terminals by loosening the nyloc with an 8mm spanner and 4mm Allen key.
4. The battery can now be lifted out easily.



Installing the battery

In some situations (air freight) the battery must be removed prior to shipment. As a result, the battery is required to be installed at the destination.

Remove the cover and water traps as described above. Insert the battery with the positive (+) terminal facing closest to the rear.

Once inserted, fit the battery clamp bar with 2 wingnuts as shown in photo **2** on the previous page.

Attach the positive **RED** ring terminal to the positive (+) terminal of the battery and the **BLACK** ground ring terminal to the negative (-) terminal and tighten the nuts (photo **3** on previous page). Check that the cable terminals are securely connected to the battery before connecting the D connector on the other end of the cable to the electronics box.

The battery has now been installed and the Felixer can be powered on for test.

If the Felixer starts properly, reinstall the water traps and U-shaped panel as necessary.

Charging the battery

To charge the battery whilst still installed, use the 240V Battery Charger included with the Solar panel and Felixer.

The battery is of a sealed lead acid type. These batteries can experience rapid lifetime deterioration when left in a low or uncharged state for any extended period.

It is highly recommended to fully charge the battery immediately after it is returned from a deployment and before it is put into storage.

1. Connect the charger to an Australian 240V mains power point.
2. Connect the Anderson plug to the rear Anderson connector on the Felixer.
3. Wait until the Felixer is 100% charged before redeploying into the field.

For long-term Felixer storage, it is recommended to leave the battery charger permanently connected and powered to maintain battery health.

Cleaning

Cleaning the external faces



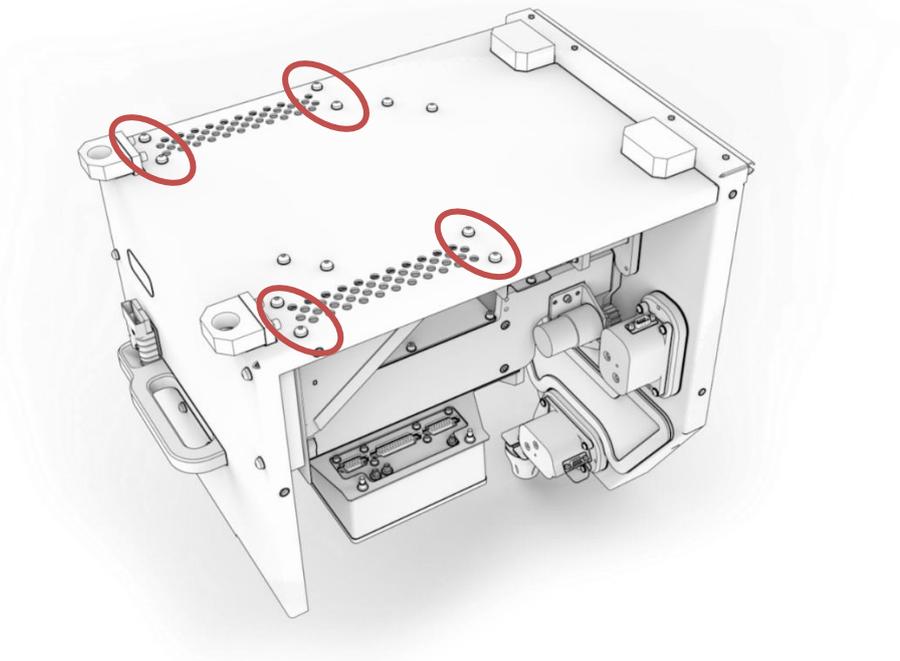
Most Felixer units will only require basic cleaning of dirt and cobwebs. This can be done with a wet cloth/paper towel.

Windows of the sensor housings and camera housing are most important to be kept clean, as they require transparency to be effective. Take care not to scratch the sensor windows.

Washing with a high-pressure washer or direct stream of water is not advised. Cleaning chemicals or abrasive cleaners also should NOT be used.

Cleaning out accumulated internal debris

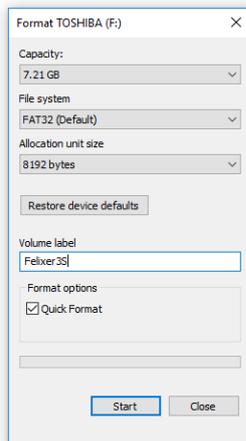
With the side panels removed, the water traps are prominent on the rear section of the sides. The water traps can be removed with the 8 bolts shown below using a 3mm Allen key, or washed in dirt can be removed by hand in situ.



Preparing a USB flash drive

For the Felixer to function properly, the USB requires a specific structure with special files for configuration and to play audio lures.

Download the latest USB file structure as a .zip file from the Felixer Management System website. See *Download Latest Firmware* on page 37 for instructions.



To prepare a USB flash drive, right click on the drive underneath the 'Computer' section on the left-hand side of the Windows file explorer window and select 'Format...' from the menu. Formatting will erase all USB contents.

In the Format dialog, enter an appropriate name in the 'Volume label' field as shown on the left, to help identify for which Felixer this USB flash drive is prepared.

Unzip the files from the software archive download and copy them to the formatted blank USB. An example is shown below:

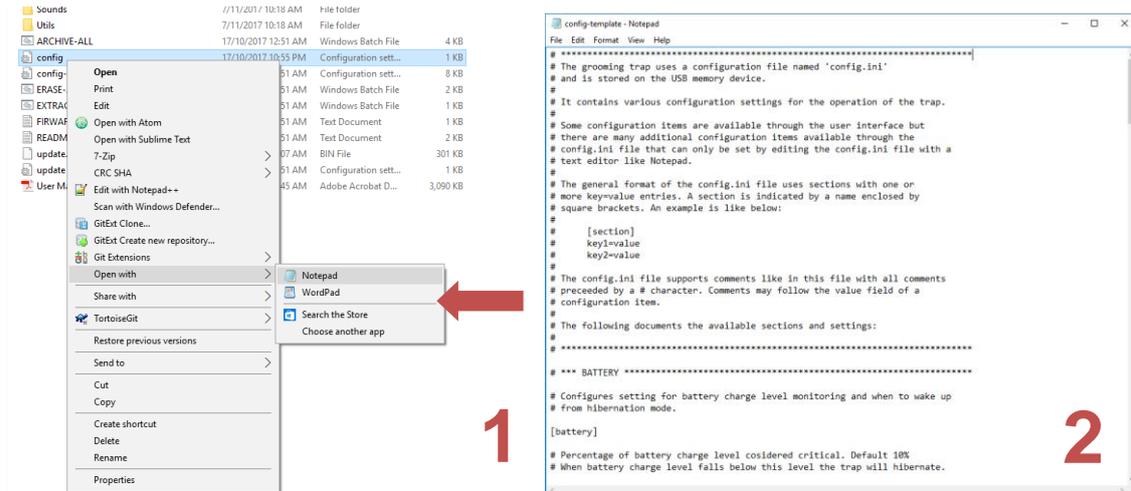
Name	Date modified	Type	Size
Logs	09/07/20 2:35 PM	File folder	
Lures	09/07/20 2:35 PM	File folder	
Photos	09/07/20 2:35 PM	File folder	
SensorLogs	09/07/20 2:35 PM	File folder	
Sounds	09/07/20 2:35 PM	File folder	
Utils	09/07/20 2:35 PM	File folder	
ARCHIVE-ALL.bat	09/07/20 2:35 PM	Windows Batch File	5 KB
config-template.ini	09/07/20 2:35 PM	Configuration sett...	8 KB
ERASE-ALL.bat	09/07/20 2:35 PM	Windows Batch File	4 KB
EXTRACT-ALL.bat	09/07/20 2:35 PM	Windows Batch File	1 KB
Felixer ARCHIVE-ALL.bat Manual.pdf	09/07/20 2:35 PM	Adobe Acrobat D...	248 KB
Felixer Fault Codes.txt	09/07/20 2:35 PM	Text Document	2 KB
Felixer User Manual.pdf	09/07/20 2:35 PM	Adobe Acrobat D...	3,509 KB
felixer.module	09/07/20 2:35 PM	MODULE File	455 KB
felixer.update	09/07/20 2:35 PM	UPDATE File	455 KB
FIRMWARE RELEASE NOTES.txt	09/07/20 2:35 PM	Text Document	9 KB
Quick Reference Felixer USB Managemen...	09/07/20 2:35 PM	Adobe Acrobat D...	200 KB
README.txt	09/07/20 2:35 PM	Text Document	3 KB
update.bin	09/07/20 2:35 PM	BIN File	443 KB
update.ini	09/07/20 2:35 PM	Configuration sett...	1 KB

Once copied, the advanced configuration settings can be changed as explained in the following advanced configuration topics.

Configuring advanced software features before field use

In the root of the USB flash drive, an advanced configuration file can be defined to provide control over the Felixer's functionality. You might want to do this to modify lure settings or power saving strategies.

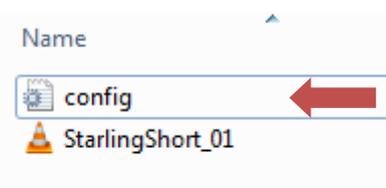
Locate the template file called config-template.ini. It is recommended that you duplicate this file and name the new copy config.ini before opening it with notepad. Text editors such as Microsoft Word or Apple Pages should not be used. Once open, the file should appear as shown in Step 2 below:



The configuration file provides an inline description of each setting. As such, no further detail on individual settings is given in this manual.

Additional control over the audio lure is possible with audio lure configuration files. In the *Lures* folder, the lure-config-template.ini file can be copied into any lure track folder and renamed to config.ini to apply the changes.

These lure configuration settings can fine tune the volume, randomization of time and volume, and modify the schedule for silent days and time between sounds.

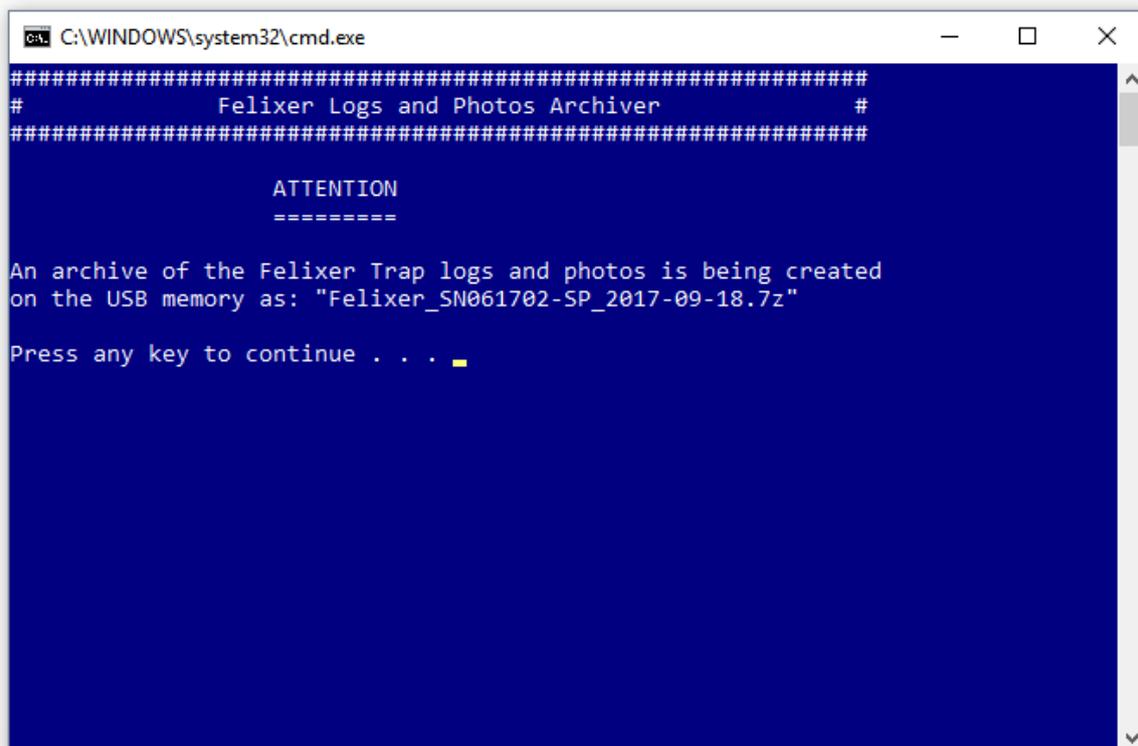


Archiving Log Files and Photos

The USB flash memory contains a batch file 'ARCHIVE-ALL.bat' file. This batch file allows creation of a compressed archive of the Felixer logs and photos.

Name	Date modified	Type	Size
Logs	7/11/2017 10:18 AM	File folder	
Lures	7/11/2017 10:18 AM	File folder	
Photos	7/11/2017 10:18 AM	File folder	
SensorLogs	7/11/2017 10:18 AM	File folder	
Sounds	7/11/2017 10:18 AM	File folder	
Utils	7/11/2017 10:18 AM	File folder	
ARCHIVE-ALL	17/10/2017 12:51 AM	Windows Batch File	4 KB
config	17/10/2017 10:55 PM	Configuration sett...	1 KB
config-template	17/10/2017 12:51 AM	Configuration sett...	8 KB
ERASE-ALL	17/10/2017 12:51 AM	Windows Batch File	2 KB
EXTRACT-ALL	17/10/2017 12:51 AM	Windows Batch File	1 KB
FIRMWARE RELEASE NOTES	17/10/2017 12:51 AM	Text Document	1 KB
README	17/10/2017 12:51 AM	Text Document	2 KB
update.bin	19/10/2017 10:07 AM	BIN File	301 KB
update	17/10/2017 12:51 AM	Configuration sett...	1 KB
User Manual	17/10/2017 12:45 AM	Adobe Acrobat D...	3,090 KB

To use it, insert the USB stick in a Windows computer and open the USB folder to view files. Then double click on the **ARCHIVE-ALL.bat** file. A window will pop up as pictured below:



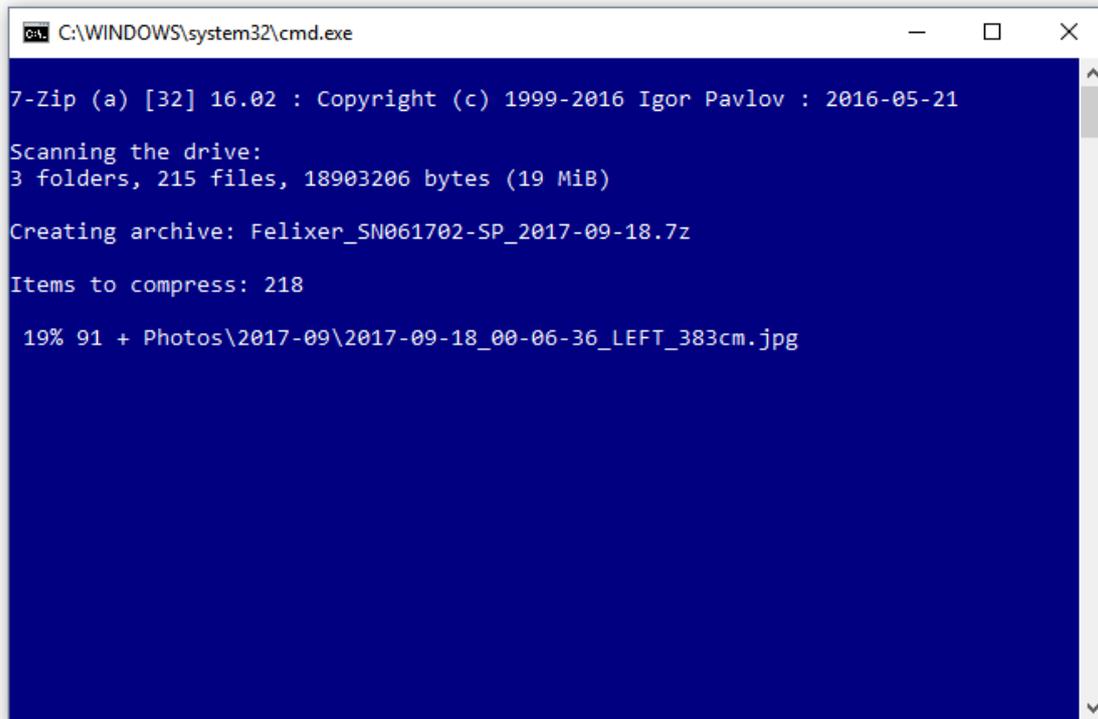
```
C:\WINDOWS\system32\cmd.exe
#####
# Felixer Logs and Photos Archiver #
#####

ATTENTION
=====

An archive of the Felixer Trap logs and photos is being created
on the USB memory as: "Felixer_SN061702-SP_2017-09-18.7z"

Press any key to continue . . .
```

Press any key to continue and an archive file with the name indicated will be created on the USB memory. The window will show the following:



```

C:\WINDOWS\system32\cmd.exe

7-Zip (a) [32] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21

Scanning the drive:
3 folders, 215 files, 18903206 bytes (19 MiB)

Creating archive: Felixer_SN061702-SP_2017-09-18.7z

Items to compress: 218

19% 91 + Photos\2017-09\2017-09-18_00-06-36_LEFT_383cm.jpg
  
```

The archive file is now on the USB memory and can be copied or emailed as required.

ARCHIVE-ALL	17/10/2017 12:51 AM	Windows Batch File	4 KB
config	17/10/2017 10:55 PM	Configuration sett...	1 KB
config-template	17/10/2017 12:51 AM	Configuration sett...	8 KB
ERASE-ALL	17/10/2017 12:51 AM	Windows Batch File	2 KB
EXTRACT-ALL	17/10/2017 12:51 AM	Windows Batch File	1 KB
Felixer_SN061702-SP_2017-08-17	17/08/2017 5:51 PM	7z Archive	1,569 KB
FIRMWARE RELEASE NOTES	17/10/2017 12:51 AM	Text Document	1 KB
README	17/10/2017 12:51 AM	Text Document	2 KB
update.bin	19/10/2017 10:07 AM	BIN File	301 KB
update	17/10/2017 12:51 AM	Configuration sett...	1 KB
User Manual	17/10/2017 12:45 AM	Adobe Acrobat D...	3,090 KB

Erasing Log Files and Photos

The USB flash memory also contains a batch file 'ERASE-ALL.bat' file. This batch file is used to erase all data stored on a Felixer USB. This process is only compatible with Windows systems. For other operating systems, such as Mac, the USB can be formatted to erase all data. Refer to *Preparing a USB flash drive*, page 46 for instructions on formatting a USB.

Name	Date modified	Type	Size
Logs	24/01/20 5:39 PM	File folder	
Lures	24/01/20 5:39 PM	File folder	
Photos	24/01/20 5:39 PM	File folder	
SensorLogs	24/01/20 5:39 PM	File folder	
Sounds	24/01/20 5:39 PM	File folder	
Utils	24/01/20 5:39 PM	File folder	
ARCHIVE-ALL.bat	24/01/20 5:39 PM	Windows Batch File	5 KB
config-template.ini	24/01/20 5:39 PM	Configuration sett...	8 KB
ERASE-ALL.bat	24/01/20 5:39 PM	Windows Batch File	4 KB
EXTRACT-ALL.bat	24/01/20 5:39 PM	Windows Batch File	1 KB
Felixer ARCHIVE-ALL.bat Manual.pdf	24/01/20 5:39 PM	Adobe Acrobat D...	248 KB
Felixer Fault Codes.txt	24/01/20 5:39 PM	Text Document	2 KB
Felixer User Manual.pdf	24/01/20 5:39 PM	Adobe Acrobat D...	3,509 KB
FIRMWARE RELEASE NOTES.txt	24/01/20 5:39 PM	Text Document	9 KB
Quick Reference Felixer USB Managemen...	24/01/20 5:39 PM	Adobe Acrobat D...	200 KB
README.txt	24/01/20 5:39 PM	Text Document	3 KB
update.bin	24/01/20 5:39 PM	BIN File	419 KB
update.ini	24/01/20 5:39 PM	Configuration sett...	1 KB

To use it, insert the USB stick in a Windows computer and open the USB folder to view files. Then double click on the **ERASE-ALL.bat** file. A window will pop up as pictured below:

```

C:\WINDOWS\system32\cmd.exe
#####
#           Felixer Logs and Photos Eraser           #
#####
You are about to wipe clean this USB device.
A backup archive will be created and then all Photos,
Logs and SensorLogs will be erased!
Are you absolutely sure [Y,N]?

```

Press N to cancel the erase action. **Press Y to continue.** All logs files and photos will be erased from the working folders and transferred to an archive file in the home directory. The window will show the following:

```

C:\WINDOWS\system32\cmd.exe
# Felixer Logs and Photos Archiving #
#####
7-Zip (a) [32] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
Scanning the drive:
12 folders, 324 files, 44803053 bytes (43 MiB)
Creating archive: Felixer_SP030048_2020-07-30.felixer_archive
Items to compress: 336
Files read from disk: 324
Archive size: 8802482 bytes (8597 KiB)
Everything is Ok
#####
# Felixer Logs and Photos Erasing #
#####
Erasing Photos...
Erasing SensorLogs...
Erasing Logs...
Erasing extracted detections...
Press any key to continue . . .

```

The Logs, SensorLogs and Photos folders are now empty. The archive file is now on the USB memory and can be stored on a computer as a backup.

Name	Date modified	Type	Size
Logs	24/01/20 5:39 PM	File folder	
Lures	24/01/20 5:39 PM	File folder	
Photos	24/01/20 5:39 PM	File folder	
SensorLogs	24/01/20 5:39 PM	File folder	
Sounds	24/01/20 5:39 PM	File folder	
Utils	24/01/20 5:39 PM	File folder	
ARCHIVE-ALL.bat	24/01/20 5:39 PM	Windows Batch File	5 KB
config-template.ini	24/01/20 5:39 PM	Configuration sett...	8 KB
ERASE-ALL.bat	24/01/20 5:39 PM	Windows Batch File	4 KB
EXTRACT-ALL.bat	24/01/20 5:39 PM	Windows Batch File	1 KB
Felixer ARCHIVE-ALL.bat Manual.pdf	24/01/20 5:39 PM	Adobe Acrobat D...	248 KB
Felixer Fault Codes.txt	24/01/20 5:39 PM	Text Document	2 KB
Felixer User Manual.pdf	24/01/20 5:39 PM	Adobe Acrobat D...	3,509 KB
Felixer_SP030001_2020-07-30.felixer_archive	30/07/20 3:29 PM	FELIXER_ARCHIVE ...	8,597 KB
FIRMWARE RELEASE NOTES.txt	24/01/20 5:39 PM	Text Document	9 KB
Quick Reference Felixer USB Management.pdf	24/01/20 5:39 PM	Adobe Acrobat D...	200 KB
README.txt	24/01/20 5:39 PM	Text Document	3 KB
update.bin	24/01/20 5:39 PM	BIN File	419 KB
update.ini	24/01/20 5:39 PM	Configuration sett...	1 KB

Updating Software

Occasionally, software updates are released to improve the performance of Felixers.

First, prepare a new USB with the latest software from the FMS website (see *Download Latest Firmware*, page 37 and *Preparing a USB flash drive*, page 46).

Remove the existing USB from the Felixer.

Insert the new USB into the Felixer. The update will occur shortly after the Felixer is turned on. Do not remove the USB. The new USB replaces the existing USB, which can be taken back to the office for examination of the photos and log files.

If the update does not happen automatically, it can be run manually.

1. Turn the Felixer on.
2. Once self-checks have completed exit to the disarmed screen using the back button.
3. Navigate to the SOFTWARE UPDATE page as shown



```
SOFTWARE UPDATE
Press UPDATE to
upgrade software
BACK  NEXT  UPDATE
```

[DISARMED STATUS SCREEN] → **MENU** BUTTON → SCROLL TO **CONFIGURATION** → **ENTER** BUTTON
→ SCROLL TO **SOFTWARE UPDATE**

4. Press **UPDATE**. The system will update with update status on screen. This process typically takes 30 seconds or less.

DO NOT REMOVE THE USB

**DO NOT DISCONNECT THE
BATTERY**

Adding New Lure Sounds

The audio lure is user configurable and adding new audio lures is straightforward. Caution should be taken to ensure lures are not too loud, frequent, or long which may deter cats approaching the Felixer.

1. Open the USB flash drive on your computer and open the *Lures* directory. You will see the existing lures in folders.
2. Create a new folder with an appropriate name. For best viewing results on the Felixer's screen, the file name should be no more than 10 characters long, and only contain alphanumeric characters. Longer names will be truncated.
3. Inside the new folder, place your audio files with correct formatting as shown below.

Files should be in the .wav format, with 16bit PCM format.

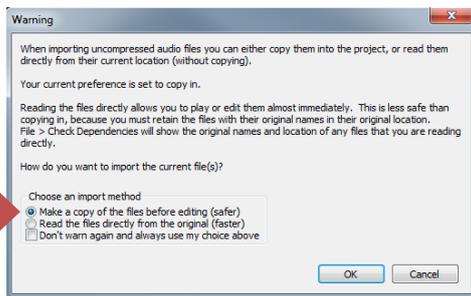
Stereo is preferred, and the volume levels should be normalized to -3db from maximum.

If the file is not already suitable, the following steps describe how to prepare the audio files.



Preparing Sound files

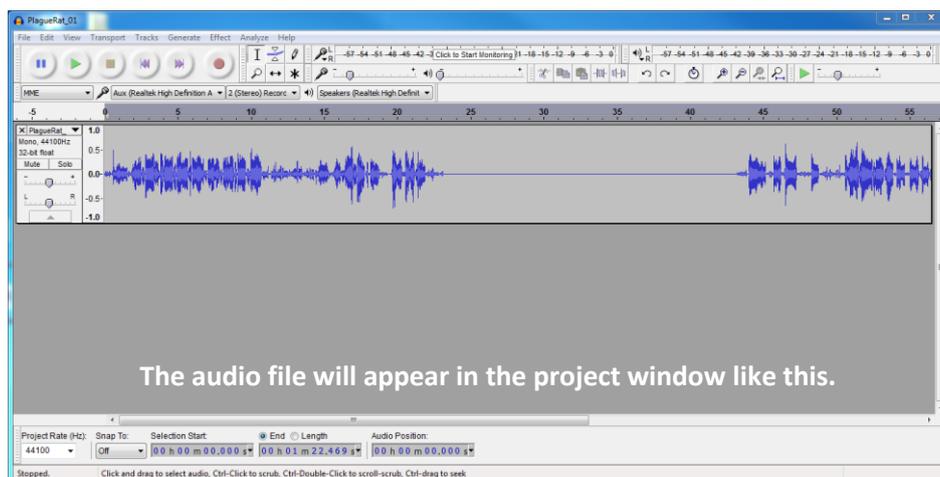
To prepare a sound file for use, use the free Audacity audio editing tool available from <http://audacityteam.org/>.



Open Audacity.

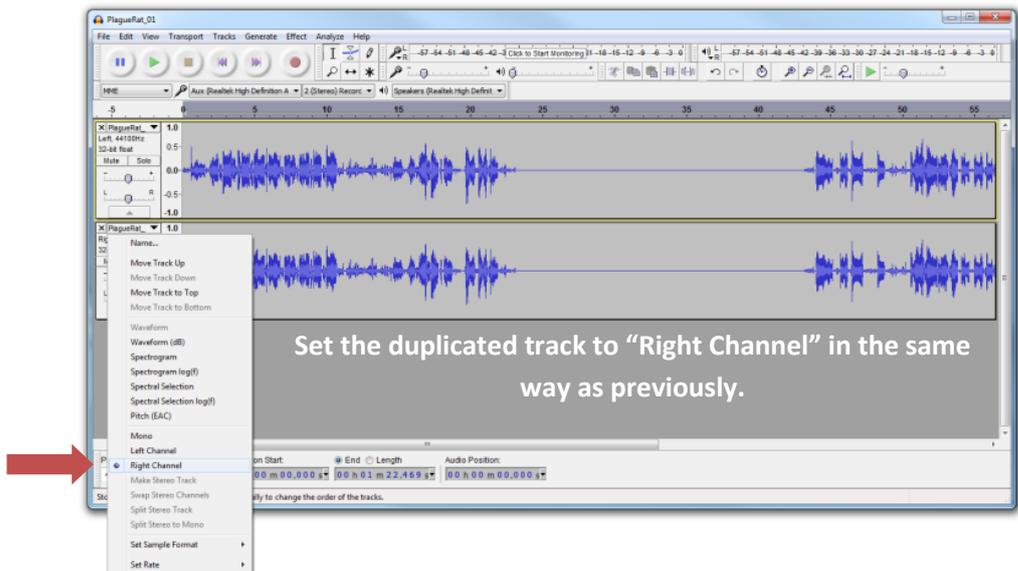
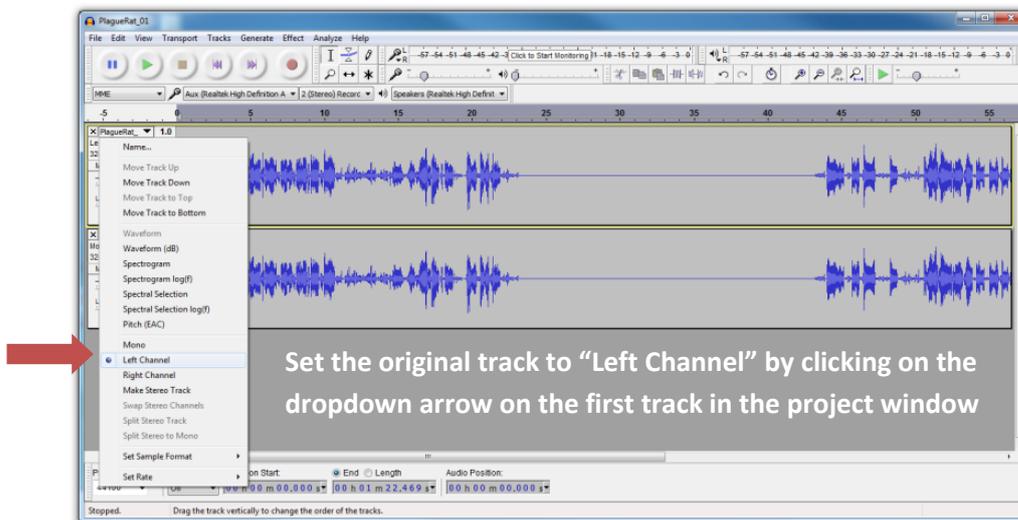
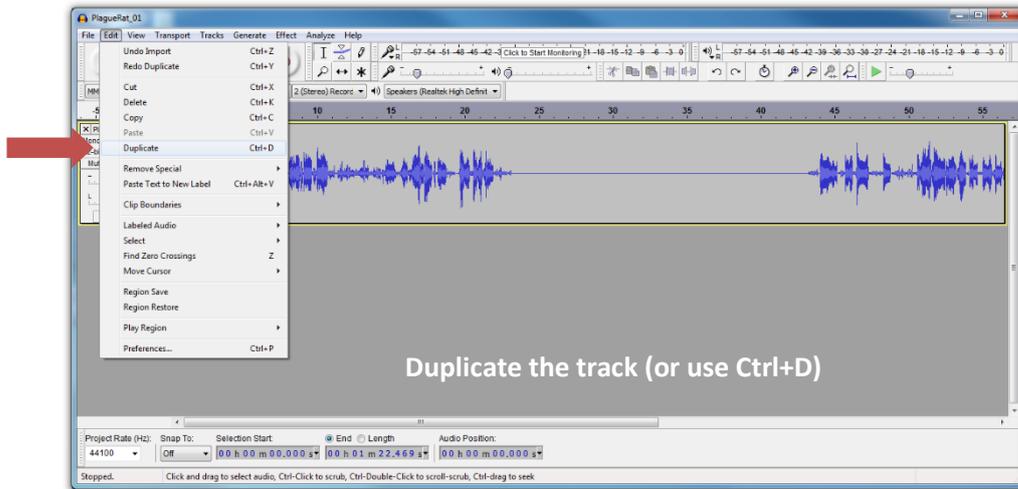
Drag the source audio file into Audacity.

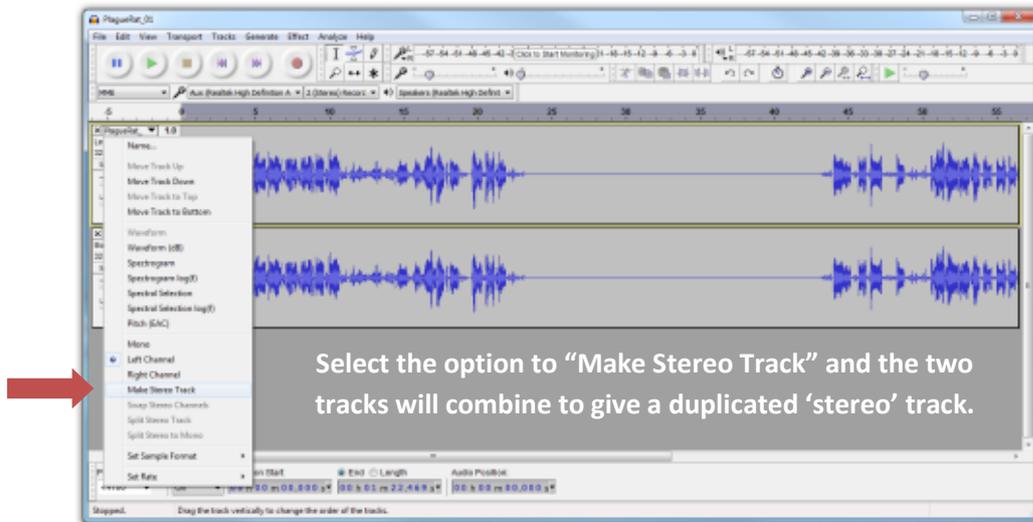
When prompted, make a copy of the file and proceed.



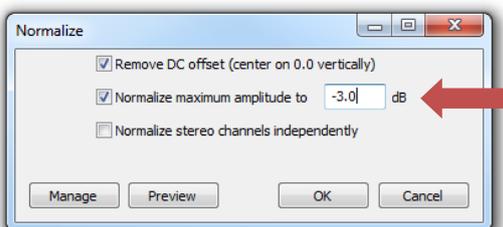
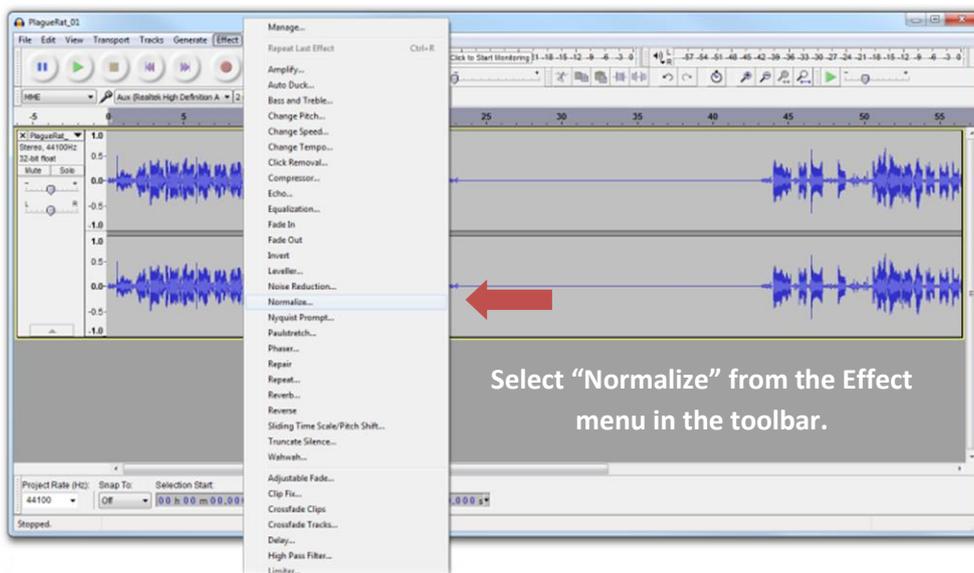
All files used for audio lures should have normalized volume. If the track is mono, like the above, it can be useful to convert the file to stereo for optimum playback. The following steps will describe these steps and how to export to the correct format.

Converting to Stereo





Normalising Volume Levels

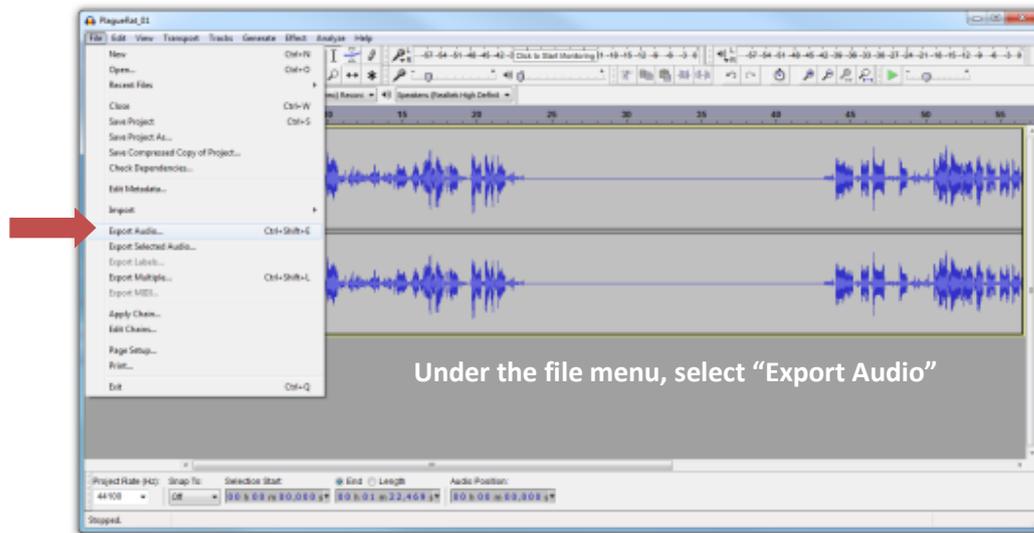


Leave the checkboxes as default.

Set the "Normalize maximum amplitude" to -3.0dB. This helps all sounds have similar volumes when played by the Felixer's speakers.

Click OK to complete this stage.

Exporting to the correct format



File name:

Save as type:

Name the file.

Ensure save format type is WAV (Microsoft) with the signed 16-bit PCM format as shown.

Save the file. When prompted to enter metadata, simply select OK to complete this process.

Move the file into the allocated Lure folder to make it available on the Felixer. Test your new file to ensure it plays correctly through the preview from the lure settings menu on the Felixer.

Fine Tuning Lure Settings

As described earlier, the **config.ini** file can be used to set lure properties with more control than available with the on-screen menu. To further improve control over a sound bank of matching lures, additional settings are available.

Name	Date modified	Type	Size
Bisbse	16/11/2015 9:05 AM	File folder	
Buttonquail	3/12/2015 7:02 PM	File folder	
Cat Yowl	30/11/2015 9:03 AM	File folder	
Combi Lure	3/12/2015 7:02 PM	File folder	
Fairy Wren	16/11/2015 9:05 AM	File folder	
Plague Rat	16/11/2015 9:05 AM	File folder	
Sparrow	30/11/2015 5:46 PM	File folder	
Starling	3/12/2015 7:02 PM	File folder	
Starling Short	18/01/2016 2:10 PM	File folder	
Thornbill	23/11/2015 3:36 PM	File folder	
lure-config-template.ini	22/01/2016 11:08 ...	Configuration sett...	2 KB

In the *Lures* folder, the `lure-config-template.ini` file can be copied into any lure track folder and renamed to `config.ini` to apply the changes.



Once copied and renamed, the file will be sitting alongside the lure sound files as pictured on the left.

Edit the file in a text editor to fine tune the volume, randomization of time and volume, and modify the schedule for silent days and time between sounds. The configuration file has comments explaining the available settings and their effect.

```

config.ini - Notepad
File Edit Format View Help
# This is a custom lure cycle configuration for the 'startling short' lure.
# It is read after the global 'config.ini' and as such overrides any 'global'
# settings.
#
# It is intended to keep the cat 'puzzled' as to where the sound comes from
# as it is (possibly) too short localise it.
#
# It plays very short burst of a starling shriek at a randomised
# time interval and with a randomised volume level.

[lure cycle]
# Master volume to play this lure at
volume=100
# The range in dB by which to vary the volume in a random way
reduction=10
# Loud cycle is enabled with 4 minutes
loud=4
# Soft cycle is disabled, this triggers the continuous random mode.
soft=0
# Random period to subtract from the loud cycle. so actual play cycle can
# vary between 2 and 4 minutes.
rand=2
# Number of days in the cycle. 1 day means we play every day.
# 2 days would mean we play one day and be silent for the next.
days=1

```

Troubleshooting

WARNING

**Only connect cables to the electronics box after all terminals are secured on the battery.
Failure to do so may result in damage to the main PCB.**

Felixer doesn't turn on

- Ensure the battery is installed and charged.
- Press and hold the power button until the screen backlight turns on and the software starts.
- If further issues persist, please contact Thylation.

Felixer doesn't turn off

The electronics features soft starting and soft power off to facilitate safe disarming of the mechanism.

- Normal power off requires a confirmation with second press on the power button.
- If this does not work, press and hold the **RED** power button for 3 seconds to skip the confirmation.
- **If** the above fail to shut down the Felixer, **AND** there is no indication of a change in system state after 2 minutes, press and hold all **3 GREEN** buttons simultaneously to force the controller off. Start normally after this point with a single button press.

Felixer turns itself off

As part of power saving features, the software will automatically enter a hibernation mode that appears as if the Felixer is off when the battery is below 10%. In this state, the Felixer waits until a scheduled wakeup time (typically 6pm) with the intention that the battery charges during the day.

To prevent this, ensure the battery level is above the critical threshold percentage (default 10%) by ensuring the solar panel can see full sun throughout the day. Check the solar panel cable connection and that the battery indicator shows the lightning bolt with the solar panel in the full sun. If necessary, use the 240V charger to top up the battery.

When I check the Felixer during the day, the display is completely blank

This is mostly likely because the Felixer is hibernating. The Felixer automatically enters a hibernation mode when the battery level gets down to 10% and will normally wakeup at to check battery levels.

Pressing any of the buttons will cause the Felixer to power up and become active immediately.

Battery is not charging

Ensure the solar panel is in full sunlight and is clear of accumulated dust and dirt.

When in full sunlight, if the battery is not fully charged, the charge indicator will appear on the Felixer display to confirm that the cable connection from the solar panel to the Felixer is OK. Check

the solar panel cable. Validate with a multi meter that a voltage can be detected from the panel at the Anderson plug.

If the Felixer has been in service for several years or stored without charging, the battery may exhibit reduced capacity and may require replacement (see *Battery care*, page 43).

Regularly charging the battery using the 240V charger will assist in maximising battery life.

Exit menus automatically

The software is designed to automatically exit to a main status screen after a timeout period of 2 minutes. If a different issue persists, please contact Thylation.

Button does not work

- When the Felixer menu is left inactive, the backlight is turned off to save power.
- To operate the menus in this power saving mode, a button needs to be pressed once to 'wake' the menu and the backlight will turn on.
- Press the button again and the action will be processed.

The USB could not be detected

- Please check the USB is connected and inserted properly.
- If issue persists, turn Felixer off and restart.
- Try a replacement USB.
- If problem persists, please contact Thylation.

Camera not responding

- Ensure the internal camera connector is seated firmly and the locking screws are tightened.
- Shutdown the Felixer and reboot to verify functionality.
- Contact Thylation if the problem persists.

The magazine could not be detected

- Open the lid, remove the hood and verify that the white cylindrical magazine is firmly seated in the clips and has not been rotated.
- Ensure that the battery is sufficiently charged and retry (see *Charging the battery*, page 44). Lower voltages can make it more difficult to drive motors.

Magazine cannot be removed by hand

- If the Felixer is in an armed state, or entered hibernation mode in an armed state, the mechanism prevents users from tampering with the magazine until disarmed.
- Wake the Felixer if necessary, by pushing a button. Wait for an armed screen to be visible then press the disarm button.
- After successfully disarming, the magazine is removable.

Assert Error

- Errors will be shown on screen when the software experiences an unrecoverable crash.
- Verify that you are running the most recent software.

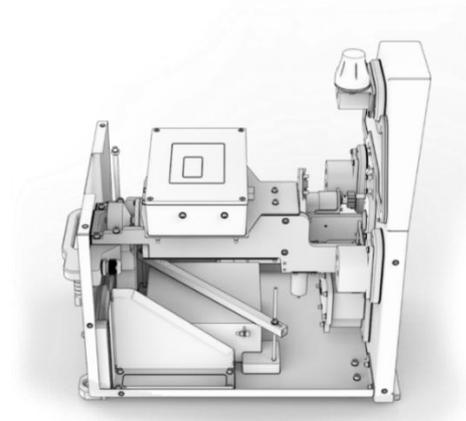
Make a note of the task you were attempting to perform, along with the description of the assert failure and contact Thylation. Photos or video documenting the error can be helpful for troubleshooting.

Cannot reach the firmware update screen

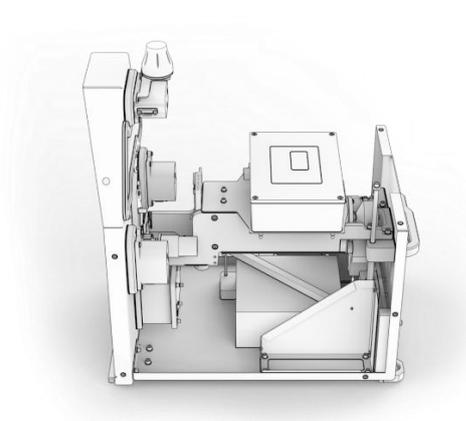
- Ensure the USB flash drive has a valid firmware update, and the USB is inserted.
- Turn the Felixer off.
- Start the Felixer in update mode by holding the two outer green buttons (not the centre one) until the firmware update page shows on screen.
- The update tool will read the USB, flashing a valid file if found. For more detailed instructions, refer to *Preparing a USB flash drive*, page 46.
- Contact Thylation for additional support.

Connector Key

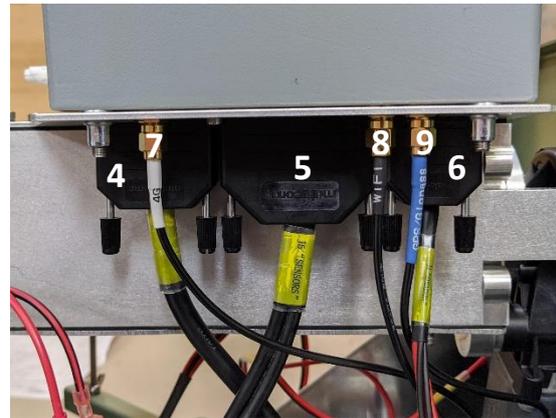
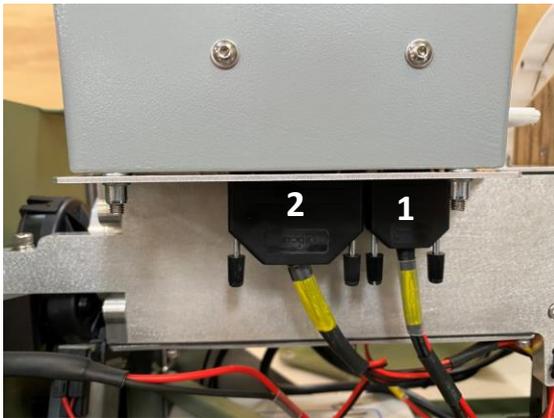
To simplify troubleshooting, the *Error Code Reference* on page 64 refers to numbered connectors. The key is detailed in the images below. When checking connectivity, start at the electronics enclosure and follow the cables to their termination points, ensuring no loose connections.



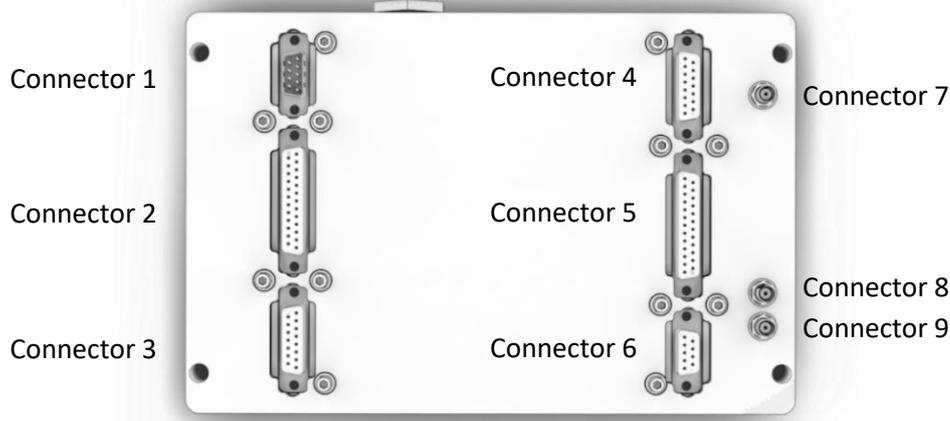
RIGHT SIDE



LEFT SIDE



↓ USB connector



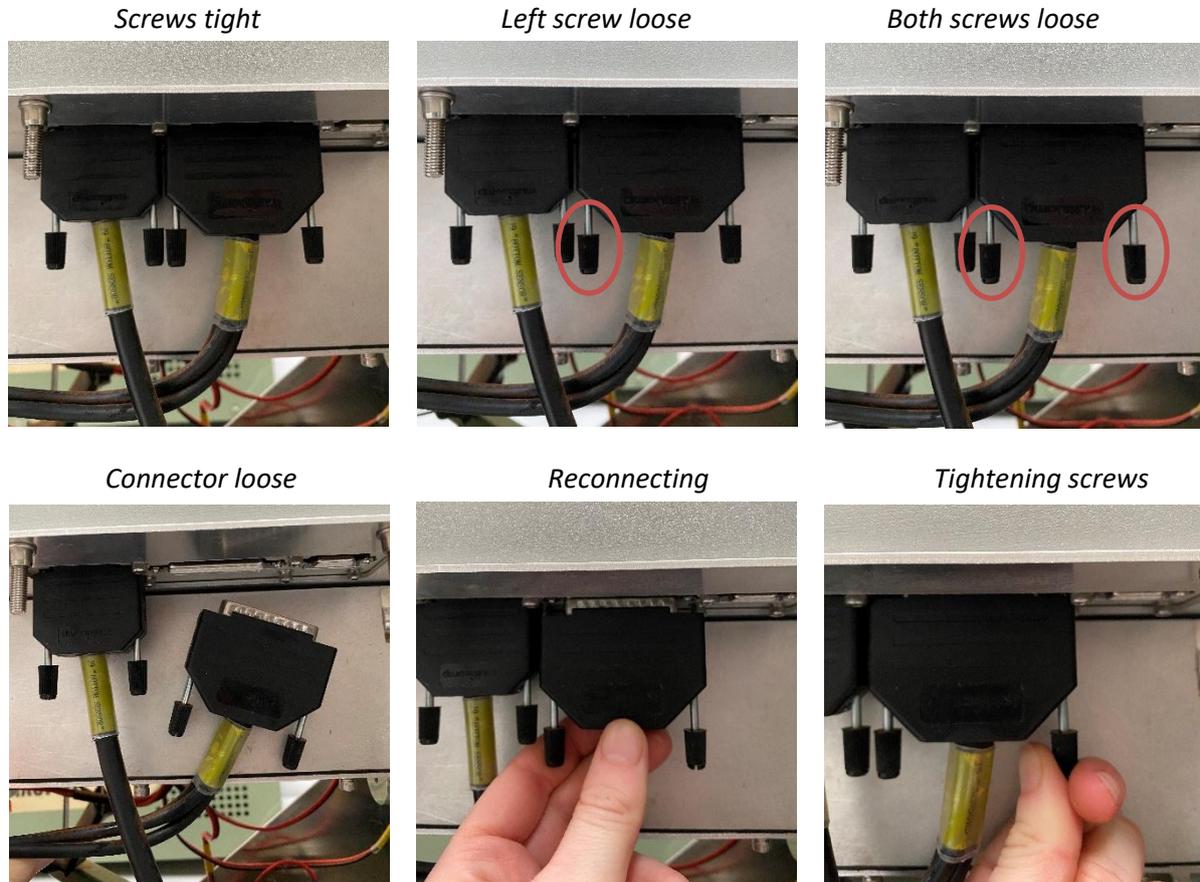
View from beneath the electronics box

Connector	Description
1	Battery & solar power
2	Solenoids & motors
3	-
4	Camera
5	Sensors
6	Audio
7	4G antenna
8	Wi-Fi antenna
9	GPS antenna

D connectors

The D connectors are black and have a connection terminal shaped like a “D”. When checking these, ensure the male and female parts are securely mated and the screws on either side are tight.

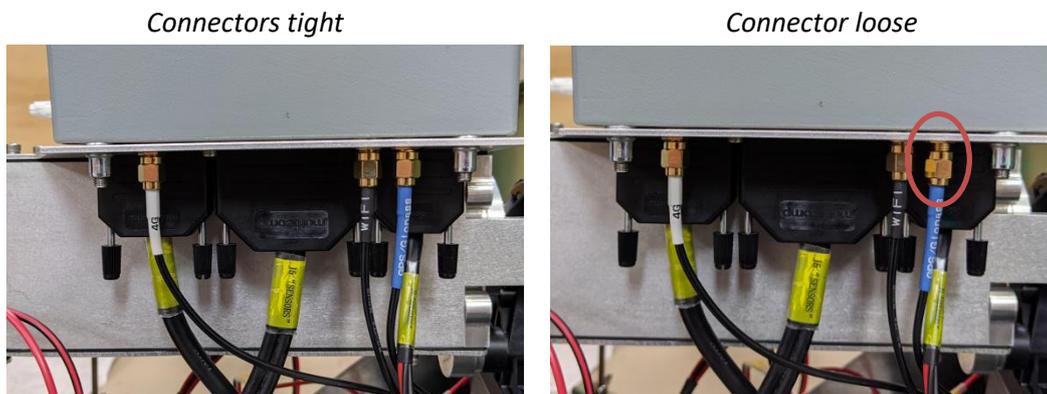
D connectors are used on the electronics enclosure and sensors.



Coaxial cables

The coaxial cables are round and brass coloured. When checking these, ensure the male and female parts are securely mated and the screw around the cable is tight. Do not overtighten the screw.

Coaxial cables are used on the electronics enclosure and are attached to the antenna.



Blade connectors

The blade connectors are small and red. When checking these, ensure the male and female parts are securely mated.

Blade connectors are used on the magazine motor, magazine latch solenoid and piston trigger solenoid.

Securely connected



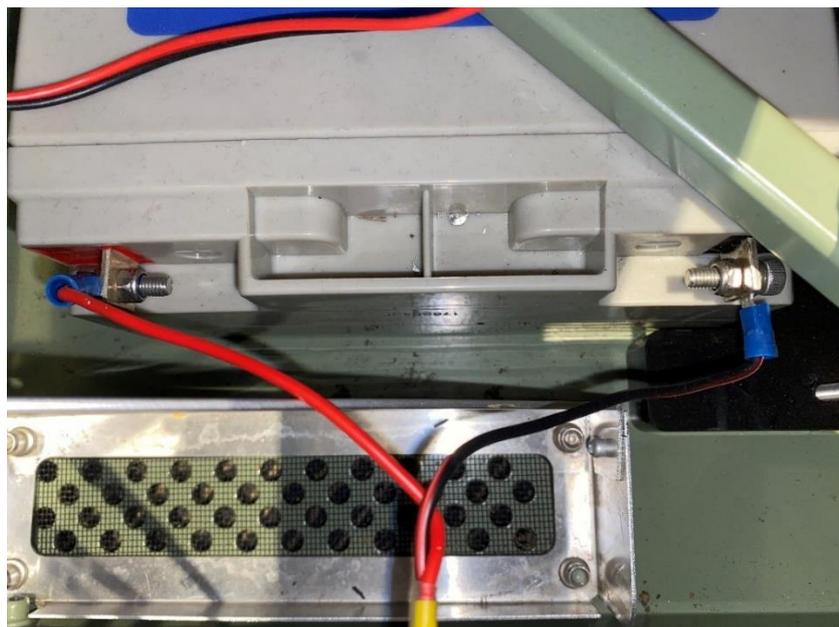
Disconnected



Eye terminals

The eye terminals are located on the main battery and held in place with screws and a nyloc nut. When checking these, ensure the nyloc nuts are tight on the screws and there is contact between the battery terminals and eye terminals.

Securely connected



Error Code Reference

Error Code	Label	Description	Remedy
5	CLOCK NOT DETECTED	Unable to communicate with clock or clock battery.	The internal CR2032 battery on the PCB inside the electronics box may need replacing. Contact Thylation.
6	CLOCK FAULT	Clock battery is faulty or flat.	The internal CR2032 battery on the PCB inside the electronics box may need replacing. Contact Thylation.
9	MAGAZINE_MOTOR NOT DETECTED	Magazine motor cable disconnected. Magazine latch may be stuck.	Check cable looms and connections attached to connector 2. Remove magazine. Depress the latch attached to the spring that resides beneath the magazine. If it is sticky or gritty, the spring may need lubricating, or the solenoid may be jammed with dust. Add a wicking lubricant such as WD40 to the interface between the spring and latch. If in a dusty area, use graphite or molybdenum disulphide spray. Depress the latch several times to move the lubricant around. Jiggle the solenoid plunger to encourage dirt to fall through. Contact Thylation if persists.
10	MAGAZINE_MOTOR FAULT	Motor driver fault/overheat. Possible stalled motor.	Check motor is turning without magazine inserted by attempting to arm with no magazine. Check cable looms and connections attached to connector 2.

13	MAGAZINE_LATCH NOT DETECTED	Magazine latch solenoid cable disconnected.	Check cable looms and connections attached to connector 2. Contact Thylation if persists.
14	MAGAZINE_LATCH FAULT	Unable to communicate with magazine latch solenoid.	Check cable looms and connections attached to connector 2. Contact Thylation if persists.
17	PISTON_MOTOR NOT DETECTED	Piston motor cable disconnected.	Check cable looms and connections attached to connector 2. Contact Thylation if persists.
18	PISTON_MOTOR FAULT	Motor driver fault/overheat. Possible stalled motor.	Check motor at rear of trap is turning (look through air holes). Check cable looms and connections attached to connector 2. Contact Thylation if persists.
21	PISTON_TRIGGER NOT DETECTED	Piston solenoid cable disconnected.	Check cable looms and connections attached to connector 2. Contact Thylation if persists.
22	PISTON_TRIGGER FAULT	Unable to communicate with piston solenoid.	Check cable looms and connections attached to connector 2. Contact Thylation if persists.
25	CAMERA NOT DETECTED	Unable to communicate with camera.	Check cable loom attached to connector 4. Contact Thylation if persists.
26	CAMERA FAULT	Camera is not functioning.	Check cable loom attached to connector 4. Contact Thylation if persists.
29	FLASH NOT DETECTED	Unable to communicate with flash on camera PCB.	Check cable loom attached to connector 4. Contact Thylation if persists

30	FLASH FAULT	Flash is not functioning.	Check cable loom attached to connector 4. Bottom sensor back cover may be removed to check physical status of the camera PCB. Contact Thylation if persists.
33	SENSOR_TOP NOT DETECTED	Top sensor is disconnected.	Check cable looms attached to connector 5. Contact Thylation if persists.
34	SENSOR_TOP FAULT	Unable to communicate with top sensor.	Check cable looms attached to connector 5. Contact Thylation if persists.
37	SENSOR_BOTTOM NOT DETECTED	Bottom sensor is disconnected.	Check cable loom attached to connector 4. Contact Thylation if persists.
38	SENSOR_BOTTOM FAULT	Unable to communicate with bottom sensor.	Check cable loom attached to connector 4. Contact Thylation if persists.
41	SENSOR_LEFT NOT DETECTED	Left sensor is disconnected.	Check cable looms attached to connector 5. Contact Thylation if persists.
42	SENSOR_LEFT FAULT	Unable to communicate with left sensor.	Check cable looms attached to connector 5. Contact Thylation if persists.
45	SENSOR_RIGHT NOT DETECTED	Right sensor is disconnected.	Check cable looms attached to connector 5. Contact Thylation if persists.
46	SENSOR_RIGHT FAULT	Unable to communicate with right sensor.	Check cable looms attached to connector 5. Contact Thylation if persists.
49	SPEAKERS NOT DETECTED	Speakers are disconnected.	Check cable loom attached to connector 6. Contact Thylation if persists.

50	SPEAKERS FAULT	Unable to communicate with speakers.	Check cable loom attached to connector 6. Contact Thylation if persists.
53	LASER NOT DETECTED	Laser in bottom sensor is disconnected.	Check cable loom attached to connector 4. Bottom sensor back cover may be removed to check laser wires are connected to the camera PCB. Contact Thylation if persists.
54	LASER FAULT	Unable to communicate with laser.	Check cable loom attached to connector 4. Contact Thylation if persists.
57	USB NOT DETECTED	USB is not connected.	Remove and replace the USB. Test the USB in a computer. If the computer cannot detect the USB, the USB may be faulty. Use a clean USB. Contact Thylation if persists.
58	USB FAULT	Unable to communicate with USB.	Remove and replace the USB. Test the USB in a computer. If the computer cannot detect the USB, the USB may be faulty. Use a clean USB. Contact Thylation if persists.
61	SD_CARD NOT DETECTED	SD card is not connected.	The SD card may not be secure on the PCB inside the electronics box. Contact Thylation.
62	SD_CARD FAULT	Unable to communicate with SD card.	The SD card may not be secure on the PCB inside the electronics box. Contact Thylation.
66	MAIN_BATT FAULT	System battery less than 10.5V	AC Wall charger may be used to charge flat batteries.

			Replace battery if issue persists. (See <i>Removing the battery</i> , page 43.)
69	BACKUP_BATT NOT DETECTED	Unable to communicate with the backup battery.	The internal CR2032 battery on the PCB inside the electronics box may need replacing. Contact Thylation.
70	BACKUP_BATT FAULT	Backup battery is less than 2.5V.	The internal CR2032 battery on the PCB inside the electronics box may need replacing. Contact Thylation.
73	MODULE_A NOT DETECTED	Module A is not connected on the main PCB.	Restart the Felixer. Contact Thylation.
74	MODULE_A FAULT	Unable to communicate with Module A on the main PCB.	Restart the Felixer. Contact Thylation.
77	MODULE_B NOT DETECTED	Module B is not connected on the main PCB.	Restart the Felixer. Contact Thylation.
78	MODULE_B FAULT	Unable to communicate with Module B on the main PCB.	Restart the Felixer. Contact Thylation.

Asking for Help

Got a problem that we haven't mentioned here? Is something performing in an unusual or dangerous manner? Feedback to felixer@thylation.com is appreciated, and we strive to improve the software and documentation based on external feedback. Include a detailed description of what task you were trying to perform, and any steps to reproduce the error if possible. Also include the Felixer's serial number which is located on the chassis to the rear of the magazine and on the display during start up (see *Serial Number*, page 12).

Where possible, it is best that USB contents are uploaded to the Felixer Management System (FMS) to help us diagnose issues. Refer to page 34 for details on uploading data to the FMS.

If you are having issues with the FMS, email all log files, sensor logs and all images to engineering support. The USB contains a convenient 'ARCHIVE-ALL.bat' file. Refer to page 48 for details on creating compressed files. This can be sent as an email attachment or uploaded to a shared storage service like Google Drive or DropBox.

Appendix A: Reading Data Files

Each Felixer detection event has an accompanying photo in the *Photos* folder and log file in each of the *SensorLogs* and *Logs* folders on the USB, grouped in subdirectories by month (format YYYY-MM). The photo and logs have a matching date/time information as part of their file name. The logs provide information about the Felixer operation, whilst the sensor logs provide detailed information about the sensor detection.

Archiving and Emailing Logs

The FMS is the preferred platform for sharing logs and photos with Thylation for diagnosis, but emailing is a helpful second option. The USB memory contains a convenient batch file that can be used to archive all photos and log files in one archive file for easier sharing. See section *Archiving Log Files and Photos* on page 48 for details on using this batch file.

System Logs

The Logs folder contains detailed system logs for each day (grouped in subdirectories by month). These logs provide the operator with a detailed view of the Felixer operation like sensor detections, lure playing, battery charge levels, temperatures, etc.

Log file names are in the format *SP03XXXX_YYYY-MM-DD.csv* to allow sorting in chronological order.

XXXX = Serial number ending **YYYY** = Year **MM** = Month **DD** = Day

Each log entry has 5 or more columns:

Date	Time	Sub System	Log Level	Message
-------------	-------------	-------------------	------------------	----------------

The **Time** column uses a time stamp in the format of **HH:MM:SS.000** and has millisecond resolution.

Beware when importing into Microsoft Excel that you need to create a custom number format like "hh:mm:ss.000" to ensure Microsoft Excel imports the time stamp data correctly.

As an alternative, the freely available LibreOffice software (<https://www.libreoffice.org/download>) is recommended.

The spreadsheet application of that office suite 'Calc' (compatible with Excel) successfully imports the log files timestamps with the millisecond resolution.

Log files can also be opened with a text editor like Notepad.

The sub system column indicates where in the Felixer firmware the log message was generated and is one of the following:

Sub System Type	Description
FILE	Manipulating file system data, USB related tasks.
CONFIG	Reading or writing to the configuration file.
MODULE	Plug in expansion modules on the PCB that do the Bluetooth/Wi-Fi/GNSS/Telemetry/etc.
MENU	Menu System.
GNSS	GPS position information.
BACKLIGHT	Screen backlight and button handling tasks.
LURE	Audio lure state (Files used, Playing, Stopped, Scheduled etc).
RFID	Receives RFID information.
AUXILIARY	Status of the expansion port.
SYSTEM	System check information.
SENSOR	Sensor information for debug information, errors, and events.
CAMERA	Camera related tasks and image handling.
DELIVERY	Status and events for the mechanism responsible for firing.
AUDIO	Reading, playing and status of audio file handling.
BATTERY	Battery voltage and percentage.
TEMPERATURE	Temperature from internal sensor. Should be used as a rough approximate only.

The Log Level column indicates the severity of the log message and is one of the following in increasing level of urgency:

DEBUG, INFO, NOTICE, WARNING, ERROR, CRITICAL, ALERT, EMERGENCY

The log level can be modified in the configuration file stored on the USB to include more detailed logging information.

In some log entries, the *Message* field is subdivided in additional columns to allow easy access to some data fields (e.g. battery voltages or temperature).

Sensor Log Files

In addition to the main log file, the *SensorLogs* folder has logs with detailed records of the different sensor values and how the Felixer processed the sensor readings to result in a targeting decision.

Every line in the sensor log file is a single sensor reading. Each sensor reading is stamped with the date and time, with the time column using millisecond resolution.

For each row, there are several columns that give information regarding the state, detection logic and measurements.

Time – The time in milliseconds (*ms*) before the trigger event.

[SensorName] is used as the preface for the column values below.

This will be Top, Bottom, Left and Right.

[SensorName] Distance – Range in cm being returned by the sensor

[SensorName] Signal – Distance signal strength, ~200 is a ‘solid’ reading, lower is worse.

[SensorName] Velocity – Velocity of the sensed reading returned from the sensor (unitless).

[SensorName] Update – Toggle flag which changes on each new sample.

[SensorName] Status – Status register value used for engineering analysis.

Target – The resultant target determined by the sensing algorithms in the Felixer. The table below describes the different states:

Logged Detection	
<i>Object Type</i>	<i>Description</i>
NONE	None of the sensors are triggered.
LEFT	ONLY left sensor triggered.
RIGHT	ONLY right sensor triggered.
TOP	Top blocking sensor triggered. This ignores all other sensor readings.
BOTTOM	Bottom sensor triggered but with LEFT and RIGHT not triggered at all.
UNKNOWN	Some sensors are triggered, but evaluation has not completed fully. Should not normally appear in the logs.
LOW	A strong bottom sensor trigger with LEFT or RIGHT active. This is typically for wombats.
MULTIPLE	Both LEFT and RIGHT are triggered but with the distance between them more than the default 30cm.
TARGET_FIRED	Both LEFT and RIGHT are triggered and the distance between them less or equal to the default 30cm so this is a potential CAT or FOX type target which has been fired on.
SLOW	A target detection where the calculated speed of the object is slower than the safety threshold. This is typically to manage grazing kangaroos.
FAST	A target detection where the calculated speed of the object is faster than the maximum expected cat/fox speed. Firing on fast targets is not recommended due to low chance of a solid hit.
TARGET_PHOTO	Both LEFT and RIGHT are triggered and the distance between them less or equal to the default 30cm so this is a potential CAT or FOX type target on which a photo has been captured.
TARGET_BLOCKED	A firing or trigger event has been blocked due to sensor error or safety condition.

Distance - The current distance which the target detection is measured at.

Photos

Photos can be viewed on any computer's default photo viewer. The filename of the photo gives the time and date, along with the detection type and the range of the trigger.



Example 1: 2018-02-12_00-58-12_TARGET_FIRED_206cm

Appendix B: Felixer 3.1 Hardware Specifications

<i>SENSING</i>	4x LiDAR sensors using 935nm wavelength. Classified as safe CLASS 1 laser. Tuned for operation within 4 metres.
<i>FIRING MECHANISM</i>	Mechanically loaded spring. Exit Velocity up to 60ms ⁻¹ . 20 cartridge rotating magazine. 3ml gel per cartridge.
<i>INTERNAL BATTERY</i>	12V 18Ah Century PS12180 Lead Acid.
<i>MUD FLAP</i>	Foldable mud splash guard to reduce dirt splatter in rain.
<i>SOLAR PANEL</i>	80W foldable solar panel. Voltage 8 to 50V. Overvoltage and reverse polarity protected. 7A max current. 4.1A typical charge current. Stainless steel braided cable. Anderson weather-proof connector.
<i>AC WALL CHARGER</i>	240V input Australian plug. 18V 4A output Anderson weather-proof connector.
<i>REMOVABLE STORAGE</i>	USB Flash Drive. Shipped with Toshiba 16GB sticks.
<i>INTERNAL STORAGE</i>	Internal MicroSD card. Installed at factory.
<i>CAMERA</i>	640x480px CMOS sensor with no IR-cut filter. 3.8mm lens (Wide 60° FoV). High power 1W IR flash.
<i>AUDIO LURE</i>	Programmable volume, runtimes, and scheduling. Capable of playing stereo WAV files from USB.
<i>ANTENNA</i>	GPS, GLONASS, 4G, Wi-Fi, Bluetooth antenna. GNSS capability that allows GPS positioning for 3.1 Felixers with real time clock and automatic GPS time zone setting.

Appendix C: Safety Data Sheet (SDS)

Safety Data Sheet: ACTA 1080 Concentrate
Date of Issue: 21 Dec 2016

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	ACTA 1080 Concentrate
Recommended use of the chemical and restrictions on use:	For the preparation of 1080 baits to control feral pigs, foxes, rabbits and wild dogs Distance restrictions apply as per Distance restrictions apply as per state/territory government legislation. Only to be used in accordance with the label and any state/territory instructions for 1080 products This product is only made available to approved purchasers and is not for general use by unqualified persons and must not be made available to unapproved users. This is a restricted chemical substance and must be stored securely.
Supplier:	Animal Control Technologies (Australia) Pty Ltd
ABN:	25 137 868 449
Street Address:	46-50 Freight Drive Somerton Vic 3062, Australia
Telephone No:	+61 3 9308 9688 (Monday to Friday, 8:00a.m. – 5:00p.m. EST)
Fax:	+ 61 3 9308 9622
Email:	enquiries@animalcontrol.com.au
Emergency Telephone:	Poisons Information Centre 13 11 26 (24 hours)

2. HAZARDS IDENTIFICATION

Classification of the substance mixture:	This material is hazardous according to Safe Work Australia; HAZARDOUS SUBSTANCE. Classification of the substance or mixture: Acute Oral Toxicity - Category 2 Acute Dermal Toxicity - Category 2 Acute Inhalation Toxicity – Category 4
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SIGNAL WORD: DANGER**Hazard Statement(s):**H300 Fatal if swallowed.
H310 Fatal in contact with skin.
H332 Harmful if inhaled.**Precautionary Statement(s):****Prevention:**P264 Wash hands, arms and face thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/face protection.
P261 Avoid breathing mist/ vapours.
P271 Use only outdoors or in a well-ventilated area.

**Safety Data Sheet: ACTA 1080 Concentrate**

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Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

P302 + P352 IF ON SKIN: Gently wash with plenty of soap and water.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312 Call a POISON CENTER or doctor/ physician if you feel unwell.

P321/P322 Specific treatment refer to section 4 first aid measures.

P330 Rinse mouth.

P361 Remove/take off immediately all contaminated clothing.

P363 Wash contaminated clothing before reuse.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/container in accordance with Federal, State and Local Government regulations, refer to section 13 disposal considerations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion (w/w)
Sodium fluoroacetate ("1080")	62-74-8	3%
Other components are not considered hazardous in this formulation and therefore are not required to be disclosed according to the WHS Regulations.		

4. FIRST AID MEASURES

Speed in treatment is essential. If poisoning occurs, contact a Poisons Information Centre. Phone Australia 131126; New Zealand 0800 764 766 or a doctor. Have this SDS or the label with you.

Inhalation: Inhalation risk is minimal with the product which is an aqueous concentrate. However if required, bring affected person to fresh air.

Skin Contact: Absorption via intact skin is minimal but if skin contact occurs, remove contaminated footwear and clothing and wash skin thoroughly. Take care to thoroughly cleanse area including fingernails and scalp (if applicable). Remove from contaminated area. The product contains dye as a marker to indicate contaminated areas. The dye may persist after the sodium fluoroacetate has been washed away and is not of concern.

Eye Contact: If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor. Sodium Fluoroacetate is water soluble and is readily dispersed with water.

Ingestion: A primary source of poisoning with sodium fluoroacetate is the oral route. Seek immediate medical assistance. Apply artificial respiration if not breathing.

First Aid Facilities: Eyewash and normal washroom facilities.

Medical attention and special treatment:

The 1080 bait manufacturing concentrate contains 3% w/w (30g/kg) sodium fluoroacetate ('1080') and is used as a concentrate for the manufacture of baits for control of pest animals in accordance with APVMA approved product label.

Mode of action:

Sodium fluoroacetate is readily absorbed by the oral route and substitutes for normal acetate once it enters mitochondria, where it is initially converted to fluoroacetyl Coenzyme A. This process may take several hours during which clinical signs are absent. Fluoroacetyl CoA substitutes for normal Acetyl Co-A and is readily combined with oxaloacetate to form fluorocitrate, for downstream processing by the enzymes of the Tri Carboxylic Acid cycle (TCA cycle). However, Fluorocitrate, unlike normal citrate, blocks the aconitase enzyme and this prevents further processing of the fluoridated citrate. This blockade of aconitase also prevents processing of

**Safety Data Sheet: ACTA 1080 Concentrate**

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normal citrate in mitochondria, so the production of energy (ATP, NADH) is prevented at all subsequent stages of the TCA cycle. Normal citrate accumulates upstream of the metabolic blockade while the pyruvate pathway continues to function temporarily. Organs with high energy requirements such as the heart, diaphragm and brain are most affected by acute reductions in metabolic energy. Accumulation of citrate can cause chelation of extra cellular calcium ions. Disturbances in calcium ion levels can lead to clinical symptoms as nervous function is impeded. Early symptoms may include nausea, vomiting, stomach pains, tingling of the nose, numbness of the face, nervousness. More severe symptoms include tetanic convulsions, laboured breathing, excitability, hallucinations and heart attack. Treat symptomatically and supportively. Monitor for electrolyte abnormalities and metabolic acidosis. While prompt removal of any unabsorbed poison from the gut will reduce risks and minimise further absorption, it is important to seek medical advice as to the risks of causing vomiting. Consult poisons control for most up to date information. There is no proven antidote for fluoroacetate. Sub-lethal exposures will not block all aconitase enzymes and so may result in no symptoms and in this circumstance the fluoroacetate will be defluorinated to harmless excretion products in a short time, so long as biochemical energy supplies are available. Thus, minor exposures in less susceptible species may require no intervention. Sodium fluoroacetate is not readily absorbed through skin and is very water soluble prompt washing in soapy water will minimise risk after accidental skin exposure.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:	The product is non-combustible however in case of fire, use fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).
Hazchem Code:	2X
Specific hazards arising from the substance or mixture:	The aqueous formulation is not flammable and will not auto-ignite.
Special protective equipment and precautions for fire-fighters:	Fire fighters should wear a respirator with an A/P filter (organic vapour + particulate) and suitable protective clothing to prevent risk of exposure to products of decomposition.

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/ Environmental precautions:	Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.
Personal precautions/ Protective equipment:	Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contact. Work up wind or increase ventilation.
Methods and materials for containment and cleaning up:	Sodium fluoroacetate is water soluble. Contain - prevent run off into drains and waterways. While wearing protective equipment, mop-up excess liquid using absorbent sponge or towel and collect in containers. Wash any contaminated areas with soapy water and collect in containers. Triple rinse and bury rinsate and empty containers in a local authority landfill. If no landfill is available, bury the containers below 0.5m in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers should not be burnt. Do NOT re-use containers for any other purpose.

7. HANDLING AND STORAGE

Precautions for safe handling:	Keep containers closed at all times - check regularly for leaks or spills. Transport and store upright. To avoid risks to people and environment the instructions for use are to be followed. Avoid all contact with the product and wear protective clothing and elbow-length PVC gloves while opening the container and handling bait. Keep out of reach of children. Do not eat, drink or smoke in contaminated areas. Always remove contaminated clothing and wash hands after use and before eating, drinking, smoking or using the toilet. Wash contaminated clothing
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Conditions for safe storage, including any incompatibilities:

and other protective equipment before storage or re-use. Do not inhale vapour. Do not open containers indoors or in confined spaces and allow good ventilation in working areas.

Store in the closed, original container in a dry, cool, well ventilated area out of direct sunlight. Store in a locked room or place away from children, animals, food, feedstuffs, seed and fertilisers at all times, except when required for use. Keep working dogs and pets away from the capsules as they are highly susceptible to the poison.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control Parameters:**

No value assigned for this specific material by Safe Work Australia. However, the exposure standard for the active constituent, Sodium Fluoroacetate (powder):

TWA = 0.05 mg/m³STEL = 0.15 mg/ m³

As published by Safe Work Australia Workplace Exposure Standards for Airborne Contaminants.

No biological limit allocated.

Appropriate engineering controls:

The product formulation dilutes the concentration of sodium fluoroacetate and reduces the risk of handling sodium fluoroacetate powder. However this product remains extremely poisonous.

Individual protection measures, such as Personal Protective Equipment (PPE):

The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Observe good standards of hygiene and cleanliness. Always wash hands, arms and face thoroughly with soap and water before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment with detergent and warm water before storage or re-use.

Respiratory Protection:

Respiratory protective equipment is not needed under normal and intended conditions of product use. However if protection is required, consult AS/NZS 1715 and AS/NZS 1716 for further information.

Eye and Face protection:

Eye and face protection is not needed under normal and intended conditions of product use. However if protection is required, consult AS/NZS 1336 and AS/NZS 1337 for further information.

Skin Protection:

When opening the container and using the product wear cotton overalls buttoned to the neck and wrists, a washable hat and elbow-length rubber gloves. Always check with the glove manufacturer or your personal protective equipment supplier regarding the correct type of glove to use. Consult AS/NZS 2161 for further information.

Closed in shoes or safety footwear should also be worn when opening the container and using the product. Consult AS/NZS 2210 and AS/NZS 2919 for further information.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Dark blue/red/green liquid
Colour:	Blue/red/green
Odour:	No information available
pH:	No information available
Specific Gravity:	1.05g/mL
Melting Point/Freezing Point:	No information available
Boiling Point/range:	100°C
Flash Point:	No information available
Evaporation Point:	No information available
Vapour Pressure:	No information available

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Vapour Density:	No information available
Solubility:	100% soluble in water
Partition coefficient: n- octanol/water	No information available
Auto-ignition Temperature:	Not relevant
Decomposition Temperature:	No information available
Viscosity:	Not relevant

10. STABILITY AND REACTIVITY

Reactivity:	Non-reactive under normal conditions of use.
Chemical stability:	Stable for extended periods (indefinite) under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Possibility of hazardous reactions:	No information available
Conditions to avoid:	No information available
Incompatible materials:	None known.
Hazardous decomposition products:	No information available

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	Based on the lowest known lethal dose for humans (0.71 mg/kg bw), an 80 kg person would have to consume approximately 56mg of fluoroacetic acid, to receive a potential lethal dose. Lower doses may still cause toxic effects and there is a wide range of susceptibility in species compared to the highly vulnerable canid species which succumb at around 0.1mg/kg dose. There is usually period of latency between poisoning and onset of symptoms of between 30 minutes and 3 hours. Neurological effects include convulsion, respiratory depression, tremulousness, hallucinations and coma. Cardiac effects include hypertension then hypotension, arrhythmias, ventricular fibrillation and cardiac failure.
Ingestion:	Very poisonous if swallowed. Lethal doses can cause cardiac arrest.
Inhalation:	Not applicable to this formulation. There is no inhalation or vapour risk with the liquid product under normal circumstances.
Skin:	Avoid contact with skin. Studies with rabbits have shown that 1080 is poorly absorbed through the skin.
Eye:	Avoid contact with eyes. Effects not known.
Respiratory or skin sensitisation:	Not a skin sensitiser and not expected to be a respiratory sensitiser.
Germ cell mutagenicity:	Not suspected to cause genetic defects.
Carcinogenicity:	Not considered to be a carcinogenic.
Reproductive toxicity:	Not considered to be toxic to reproduction.
STOT-single exposure:	Not expected to cause toxicity to a specific target organ.
STOT-repeated exposure:	Not expected to cause toxicity to a specific target organ.
Aspiration hazard:	Not expected to be an aspiration hazard.
Chronic health effects:	Long term exposure at high doses may lead to cardiac and or testicular damage. Studies into the effects of chronic (90 day) exposure in rats have found damage to the heart and in males the testis, at a dose of 0.25mg/kg/day. Though some of this damage may be reversible over time when exposure is removed.

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12. ECOLOGICAL INFORMATION

Ecotoxicity:	Sodium fluoroacetate is toxic to fish but is rapidly diluted in water. Sodium fluoroacetate is readily degraded by common soil bacteria and moulds once baits become wet in soil. Do not contaminate streams, rivers or waterways with the chemical or used containers.
Persistence/degradability:	The product is biologically degradable. The contents remain stable while contained within the plastic capsule.
Bioaccumulative potential:	Will not accumulate in soil or water.
Mobility in Soil:	Not relevant.

13. DISPOSAL CONSIDERATIONS

Disposal methods:	Refer to Waste Management Authority. Dispose of contents/container in accordance with local/regional/national/international regulations. Break, crush or puncture and dispose of empty containers in a local authority landfill. Triple rinse and bury rinsate and empty capsules in a local authority landfill. If no landfill is available, bury the containers below 0.5m in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product must not be burnt. Do NOT re-use containers for any other purpose.
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14. TRANSPORT INFORMATION

Road and Rail Transport:	Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; DANGEROUS GOODS
UN Number:	2902
Proper Shipping Name or Technical Name:	PESTICIDE, LIQUID, TOXIC, N.O.S. (CONTAINS SODIUM FLUOROACETATE)
Transport Hazard Class:	6.1
Packaging Group:	II
Hazchem Code:	2X
Marine Transport:	Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.
UN Number:	2902
Proper Shipping Name or Technical Name:	PESTICIDE, LIQUID, TOXIC, N.O.S. (CONTAINS SODIUM FLUOROACETATE)
Transport Hazard Class:	6.1
Packaging Group:	II
IMDG EMS Fire:	F-A
IMDG EMS Spill:	S-A
Air Transport:	Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.
UN Number:	2902
Proper Shipping Name or Technical Name:	PESTICIDE, LIQUID, TOXIC, N.O.S. (CONTAINS SODIUM FLUOROACETATE)
Transport Hazard Class:	6.1
Packaging Group:	II

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15. REGULATORY INFORMATION

Poison Schedule (SUSMP):	7
APVMA Approval No.:	57956
AICS:	All the constituents of this material are either listed on the Australian Inventory of Chemical Substances (AICS), not required due to the nature of the chemical, or have been assessed under the National Industrial Chemicals (Notification and Assessment) Act 1989 as amended.

16. OTHER INFORMATION

GENERAL INFORMATION:	Sodium fluoroacetate is water soluble and readily degraded by common soil bacteria and moulds which do not have metabolic pathways inhibited by fluoroacetate but do have defluorination mechanisms.
	Do not contaminate streams, rivers or waterways with the chemical or used containers. Information on non-target animal distribution, conservation status, habitat preference, diet, tolerance to 1080, body weight and size of home range can be used to reduce poisoning risks posed by baiting programs. Time baiting programs when non-target species are least active or least susceptible. Follow approved label directions to minimise risks to non-target animals.
ISSUE NUMBER:	002
ISSUE DATE:	21 Dec 2016
	In any event, the review and, if necessary, the re-issue of an SDS shall be no longer than 5 years after the last date of issue.
Reason(s) for Issue:	Second issue Revised Primary SDS and updated to GHS requirements.
LITERARY REFERENCE:	ADG Code - Australian Code for the Transport of Dangerous Goods by Road and Rail (7th edition) AICS - Australian Inventory of Chemical Substances APVMA – Agricultural Pesticides and Veterinary Medicines Australia GHS - Globally Harmonised System of Classification and Labelling of Chemicals (3 rd revised edition) 2009 IARC - International Agency for Research on Cancer Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice (Feb 2016) STEL - Short term exposure limit means the average airborne concentration of a substance calculated over a 15 minute period. The STEL should not be exceeded at any time during a normal eight hour working day. SUSMP - Standard for the Uniform Scheduling of Medicines & Poisons SWA - Safe Work Australia, formerly ASCC and NOHSC TGA – Therapeutic Goods Australia TWA - Time-weighted average means the average airborne concentration of a particular substance when calculated over an eight-hour working day, for a five-day working week. WHS – Workplace Health and Safety

The physical values and properties described in this SDS are typical values based on scientific literature and material produced to date, and are believed to be reliable. Animal Control Technologies provides no warranties, either expressed or implied and assumes no responsibility for the accuracy or completeness of the data contained herein. The information is supplied upon the condition that the persons receiving information will make their own determination as to the suitability for their purposes prior to use of this product. Due care should be taken to ensure that the use of this product and its disposal is in compliance with all relevant Federal, State and Local Government regulations.

End of SDS

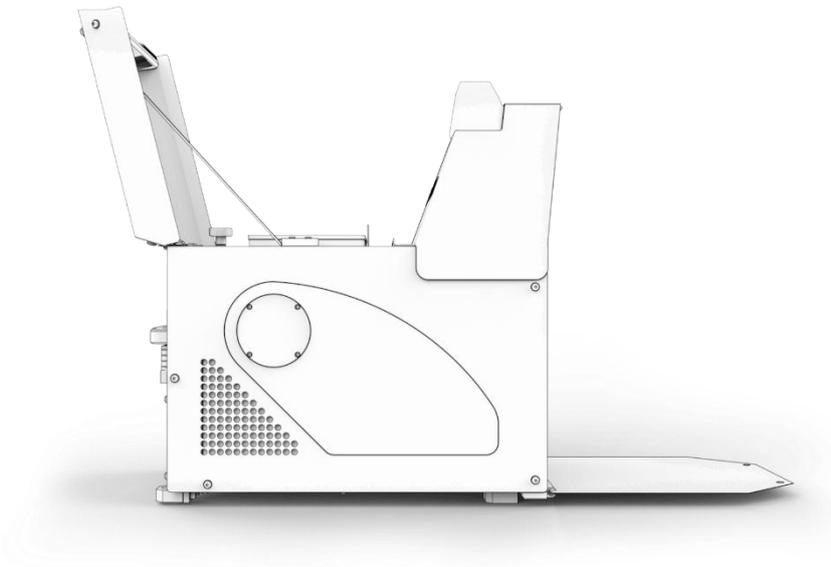
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