FELIXOR

BY Thylation

Standard Operating Procedure

QUICK START GUIDE

SAFETY INFORMATION

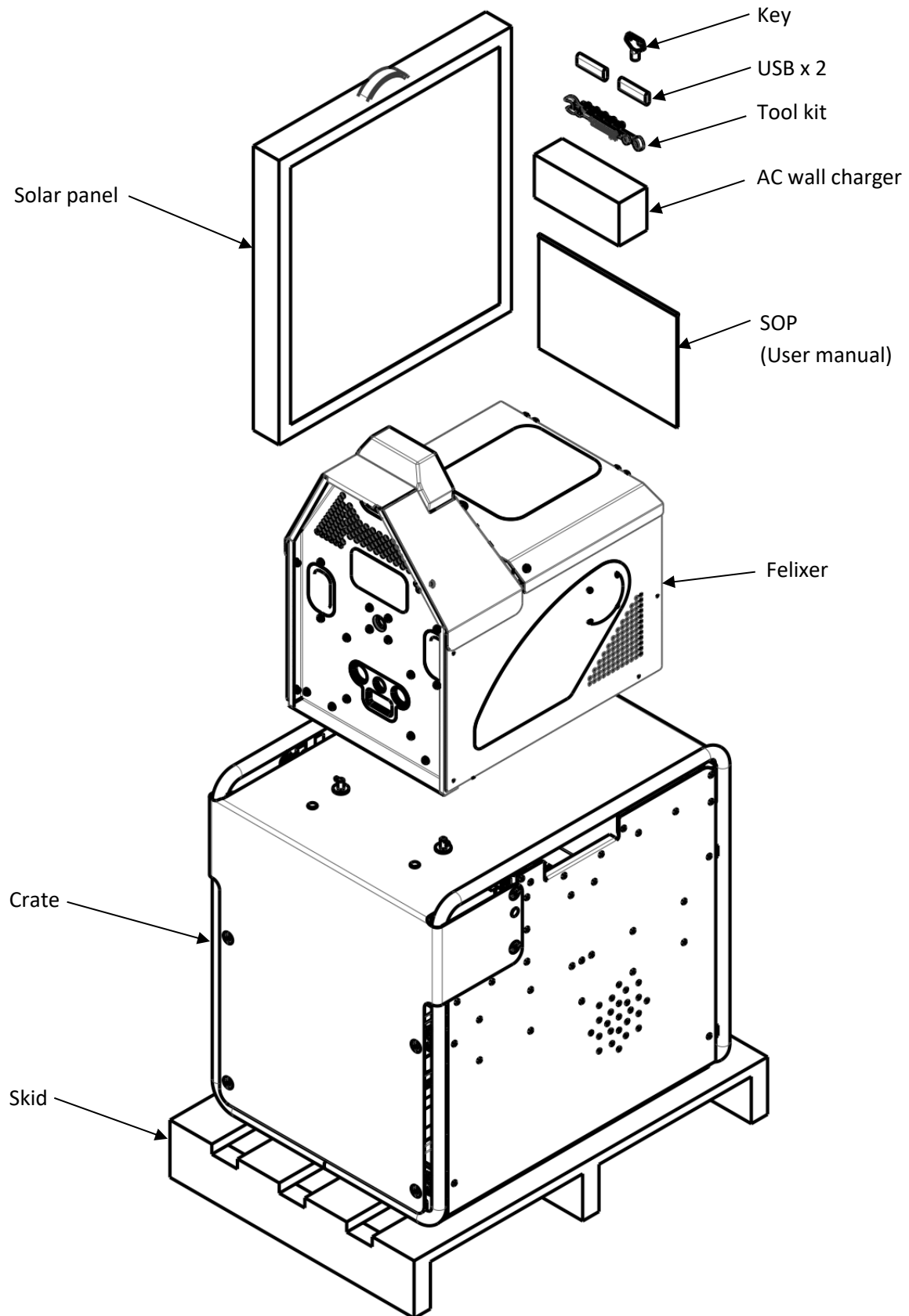**SETUP INSTRUCTIONS**

MAINTENANCE GUIDE
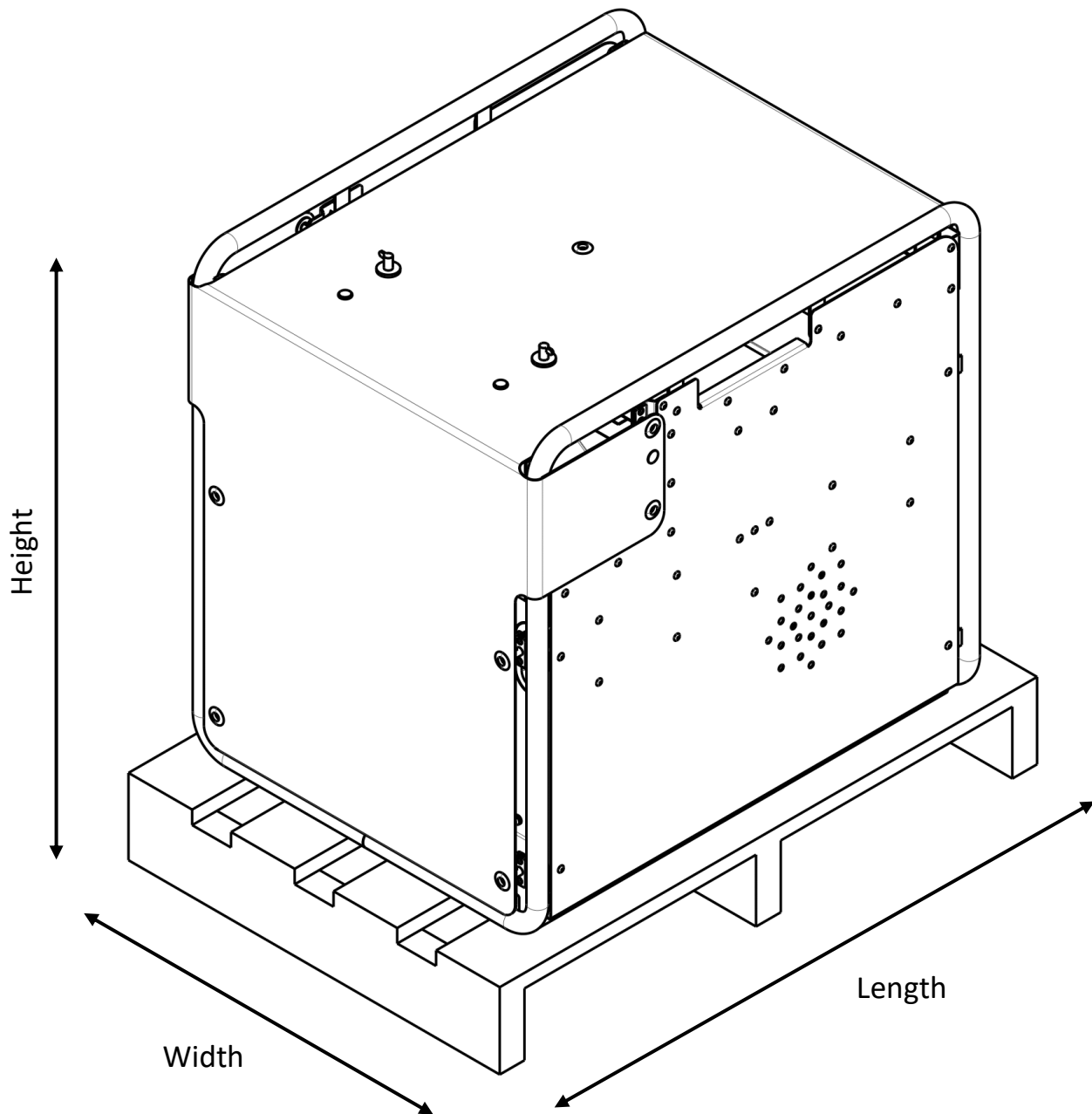
TROUBLESHOOTING

RCM COMPLIANT

Components

Solar panel

Key

USB x 2

Tool kit

AC wall charger

SOP
(User manual)

Felixer

Crate

Skid

Dimensions and weights

Item	Dimensions L x W x H (cm)	Weight (kg)
Felixer	54 x 35 x 55	27
Solar panel	55 x 6 x 52	7
Other a**ccessories** **(User Manual, wall charger, tool kit, USBs, key)**	N/A	1
Crate	64 x 50 x 62	12
Felixer and accessories **in crate**	64 x 50 x 62	47
Skid	76 x 53 x 11	4.5
Felixer and accessories **in crate on skid**	76 x 53 x 73	51.5

QUICK START

⚠️ **WARNING**

DANGEROUS POISON – The Felixer contains and emits potentially deadly 1080 poison. Do not touch or ingest. Ensure familiarisation with 1080 Felixer Cartridge APVMA Label and if poisoning is suspected, ring

Poisons Information Line on **13 11 26**.

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

Available on https://thylation.com/training/

This Standard Operating Procedure contains a quick start guide and detailed procedures and a troubleshooting guide, 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.

When the Felixer is in a crate:
1. Two people required to lift.
2. Grasp the tubes at the handle openings.
3. Lift using your legs.
4. Maintain a straight back and arms whilst carrying the crate over long distances.

Prepare site

- Ensure project area is compliant with APVMA permit/label and approved by 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 less than 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 Reloading

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.
   WARNING: Dangerous poison may be present on the magazine and in the cartridges. Handle with care.
4. Wearing gloves, grasp the circular white magazine with your left hand and pull the magazine firmly up and towards you.
5. Reload magazine as per *Loading and replacing gel cartridges*, page 40.
6. Align the slot in the replenished magazine with the retaining pin. Slide the magazine down and into the clips until you hear a solid clunk. The magazine is now secured.

Power on
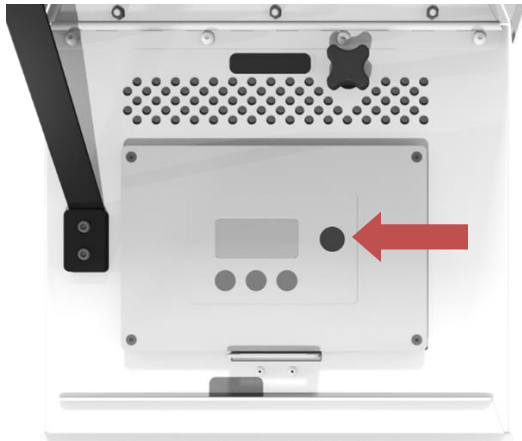
With the lid open, locate the control panel.

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

Self-checks will be performed on start-up.

Once the DISARMED status screen is showing, press ARM to start the setup procedure. Stand to the side of the Felixer to avoid blocking the lidars.

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. Turn the black knob to adjust the height such that the laser aligns with the marked line on the hood.
4. Press OK to continue.
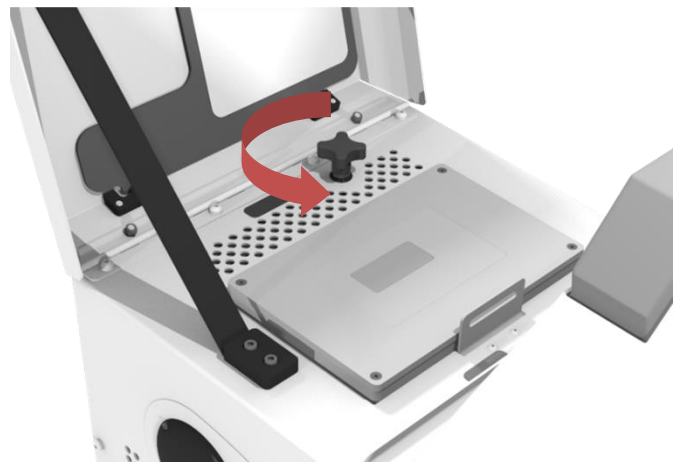
Setup site note

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. It is also used to avoid triggering by animals beyond the levelled ground and especially on the other side of fences.

If deployed within 5m of a fence line, the Felixer must be configured to be unable to be activated by targets through the fence and from firing through the fence, as per the APVMA label.

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 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 lidar sensor-activated camera, 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 cartridges in the magazine have been used, 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.
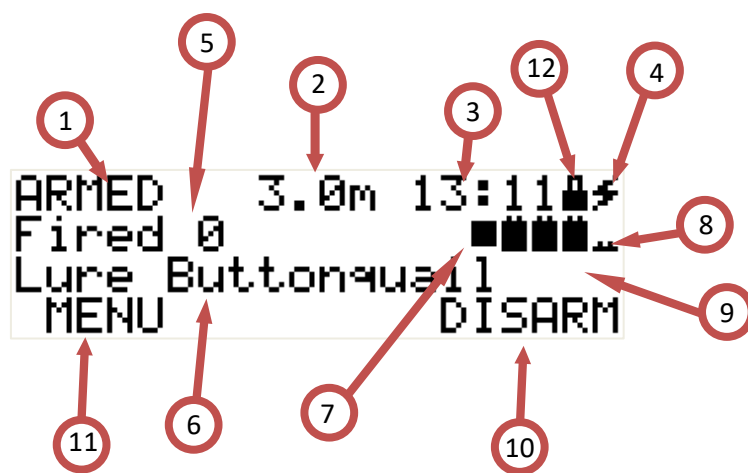
Reloading and checking

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 recorded log data. 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

Table of Contents

Introduction

The Felixer has been designed for the control of feral cats and foxes. Using a camera with artificial intelligence, combined with an innovative sensing method, the Felixer can distinguish between targets and non-targets in a fast and reliable manner. Note only V3.2 Felixer and retrofitted V3.1 Felixers have artificial intelligence enabled.

When a target is detected, the firing mechanism sprays as gel with 1080 dangerous poison onto the target, which the animal will instinctively lick from its coat.

The Felixer also photographs anyone or anything 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)
2. Carry handle
3. Magazine hood
4. User interface
5. Height adjust knob
6. Sensor detection slide-out card
7. Antenna
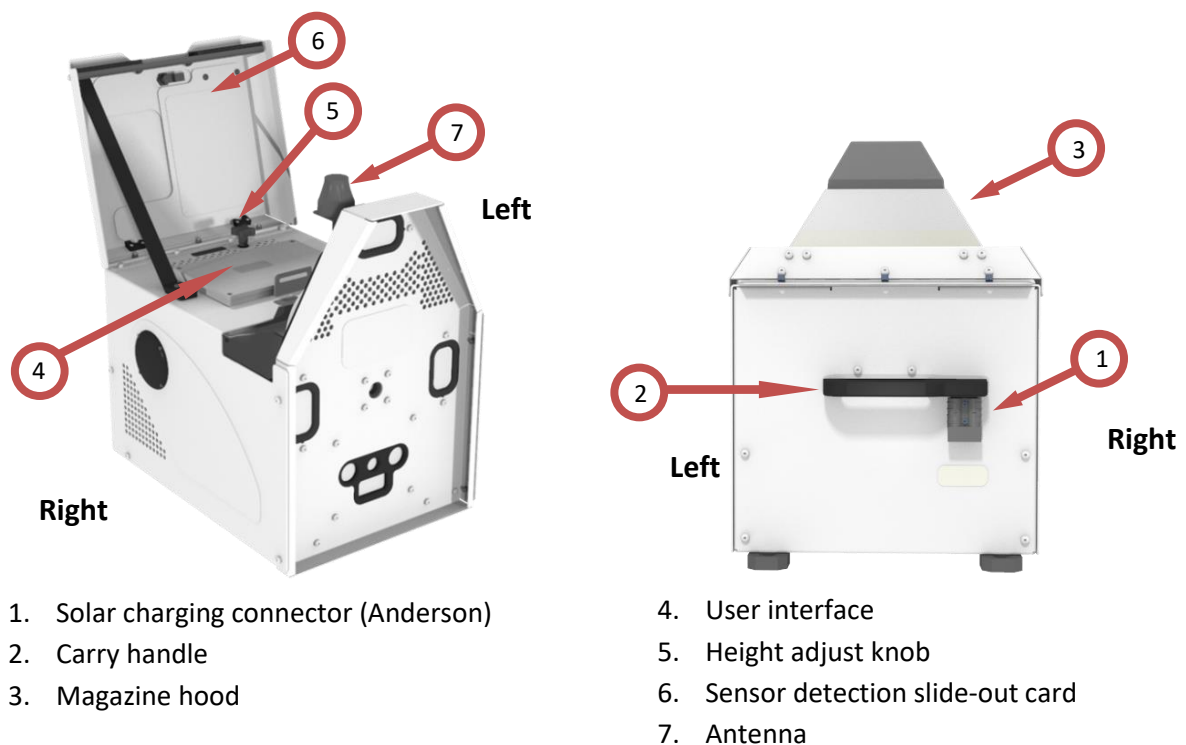
Left and right sides are referenced in log files and on the display from the forward-looking direction of the trap.

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.
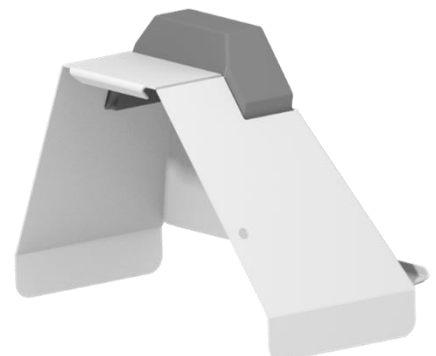
A hole is provided in the side to allow a padlock to be attached to the hood and front panel if desired. See *Security*, page 15.

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: DANGEROUS 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 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* on page 27.

Avoid removing the USB memory when the USB active symbol is showing on the display (see *Disarmed status* , page 26).

When checking the Felixer logs from the field, it is recommended to replace the USB with a second configured USB. Avoid collecting data from more than one Felixer on the same USB. The first USB can then be taken back to the office for analysis of the logs and photos by uploading data to the **Felixer Management System (FMS) (at least every 3 months). Once data are uploaded, please format and prepare the USB for its next Felixer use.**

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* , page 18).

Once armed, the magazine is locked in place and cannot be removed until disarmed.
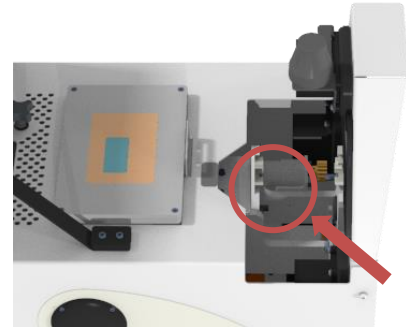
Speaker

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* , page 17.)

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).

Fully charge the battery immediately after the Felixer is returned from a deployment and before it is put into short-term storage. For extended storage, keep the charger connected to mains electricity to preserve battery health. The charger connects to a standard Australian 240V outlet and the Anderson connector on the back of the Felixer.

Serial number SP030xxx

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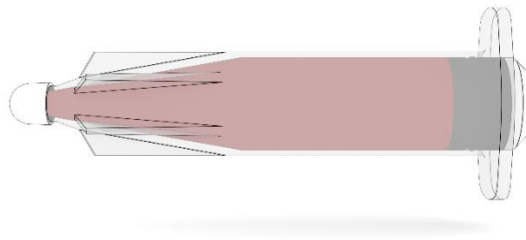
WARNING: DANGEROUS POISON. DO NOT INGEST CARTRIDGE OR CONTENTS OF CARTRIDGE.

Green-dyed gel is used for testing and evaluation and does not contain poison, only food-colouring.
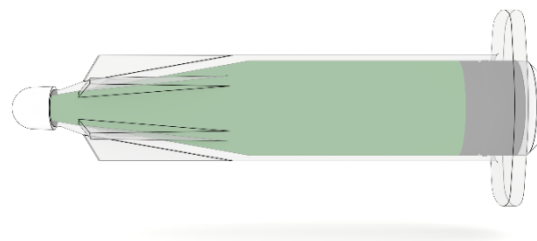
Safety

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

Dangerous poison hazard

The Felixer contains and emits poisonous gel. The dangerous poison used is 1080. 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: DANGEROUS POISON – DO NOT INGEST CARTRIDGE OR CONTENTS OF CARTRIDGE.

Refer to the attached APVMA Label 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: DANGEROUS POISON – REFER TO LABEL DOCUMENTATION
USE CAUTION, GLOVES AND GLASSES WHEN HANDLING.**

IF POSIONING SUSPECTED, RING POISON INFORMATION LINE 13 11 26

All Felixer users must have State/Territory authority for handling 1080 and must have passed the Felixer Accreditation Program before being issued with a 1080 Felixer Cartridges. The Felixer Accreditation Program is an online training and accreditation package available at https://thylation.com/training/ that outlines safety risks and precautions, necessary permissions and 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 and the APVMA Label.
- Use gloves when handling Felixer 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 contacts your skin, rinse immediately with water.
- Triple rinse used cartridges and bury rinsate, empty cartridges and packaging in a local authority 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 Label/Safety Data Sheet (SDS) on 1080 Felixer Cartridges is appended to this manual and is printed and shipped with the cartridges. See *Appendix C: APVMA Permit*, page 77.

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 from an impact. Always stay clear of the line of fire.

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 Felixer cartridge security and storage. If uncertain about the rules in your area, contact Thylation for advice. Some Felixers have a second provision for padlock on the hood which is a requirement for use in Western Australia.

Felixer setup

Site setup

Site preparation is crucial for maximising 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 of 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.
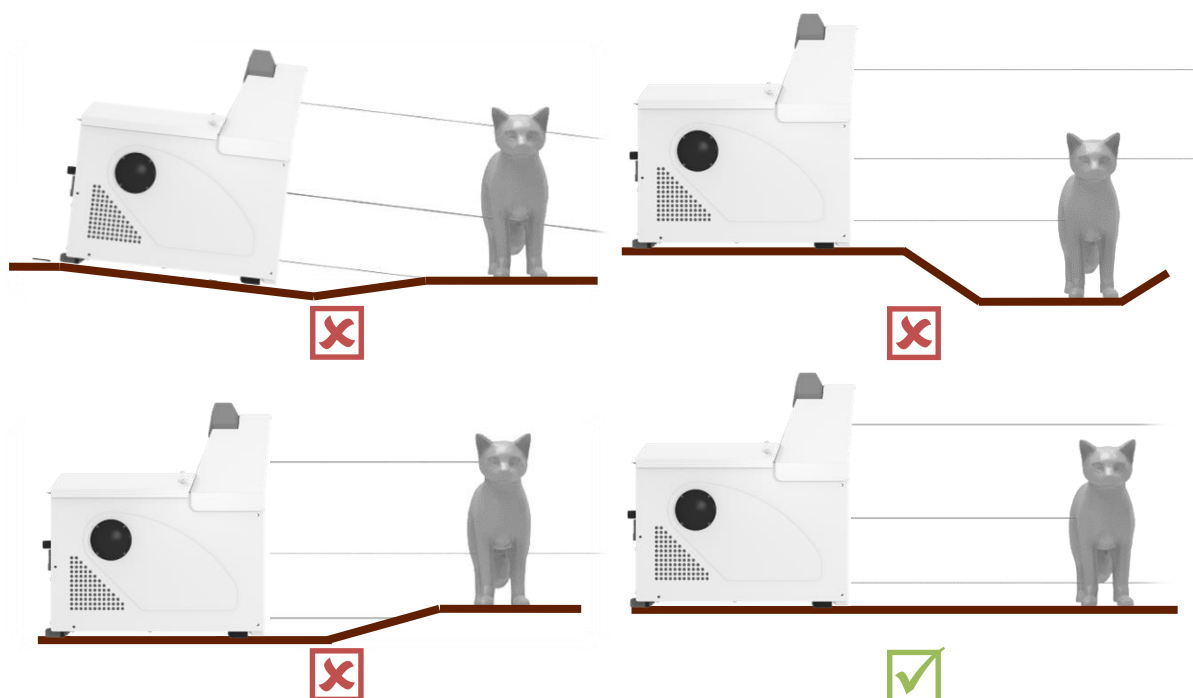
Solar panel setup

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 animals.
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 mm^2 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 20% (default), the software will enter a hibernation mode designed to draw minimal power until 6pm.

- 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 49). 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 at 6pm, 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 dangerous 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 magazine hood.

Inserting the magazine

As the Felixer is transported without a loaded magazine, cartridges need to be loaded.

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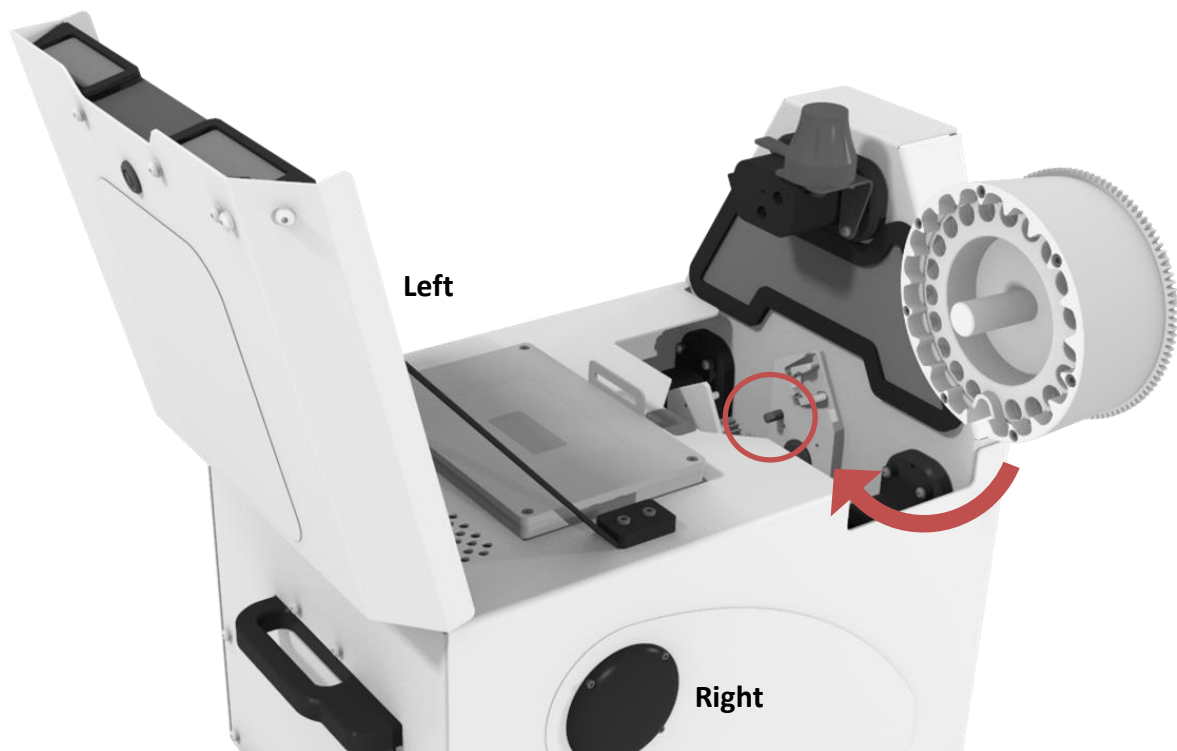
5. You will hear a solid clunk sound when successfully inserted.
6. The magazine has now been reloaded.
7. Replace the lid.
8. Proceed with arming as instructed.

Turning the Felixer on

1. Press any button. The Felixer will power on and start-up information will display 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* on page 30 for more detailed information.
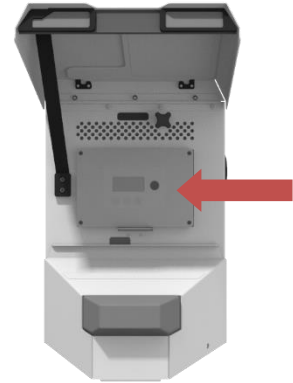
Solar panel check

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.

Sensors clear check

During setup, the Felixer will check that no obstructions are close to the sensors.

A prompt will appear if obstructions are detected.

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

Levelling the Felixer

This process is required so sensors detect the correct height of the target. This 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 and ensure a 2m levelled width.
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   Rgt 5.0m
BACK            DONE
```
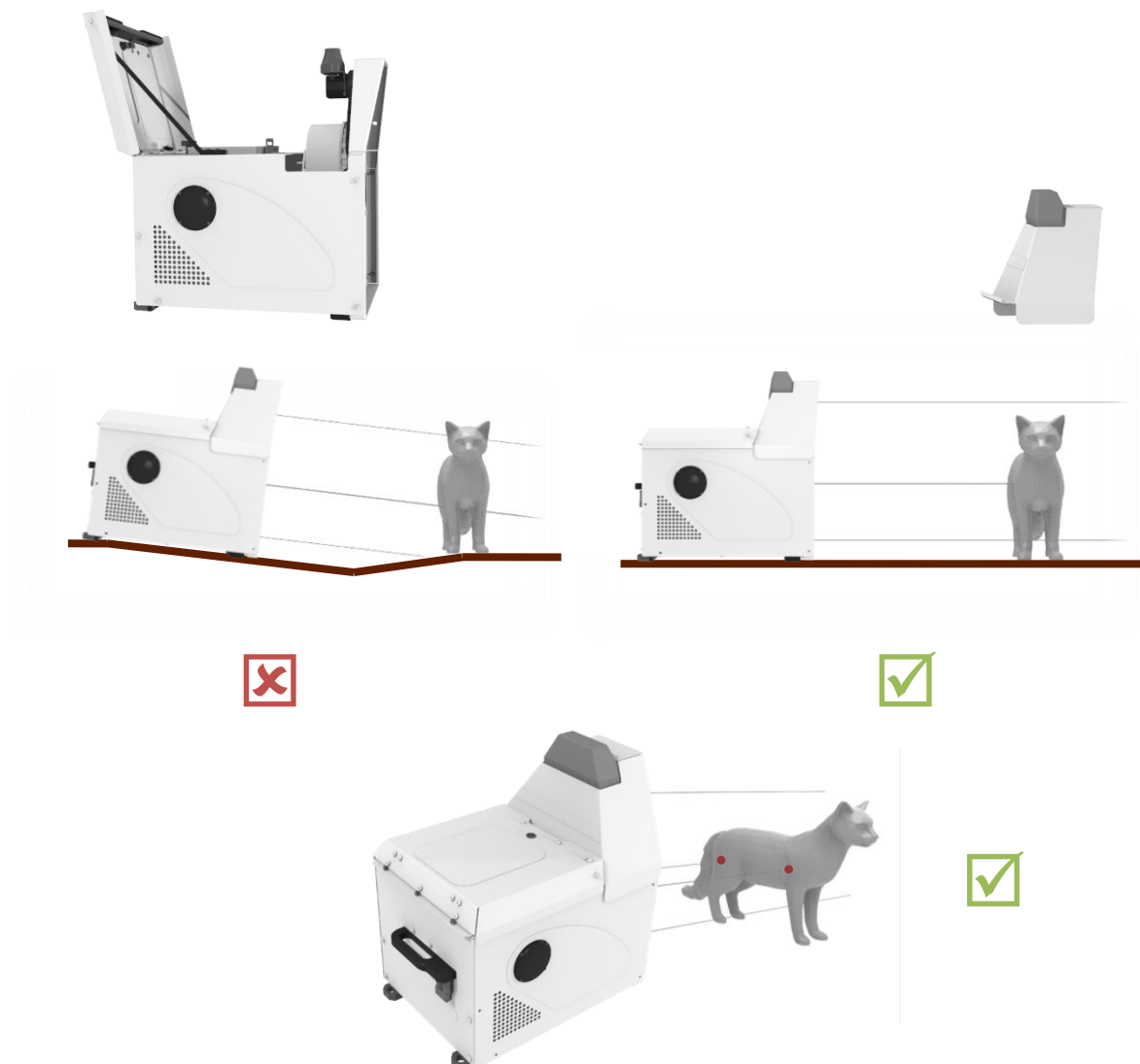
Setup site note

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,

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

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 (version 3 and earlier), the user will be prompted to place a marker on a map in the FMS to set the location.

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:

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

      >>>>
```

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
```

It is possible that over time the GPS coordinates will register as several metres apart and create various Sites in the FMS for the same location. These Sites can be merged, please contact Thylation to action and consolidate your data.

Range checks and max range

Remove the setup site note and replace the Felixer hood.

Irregular objects which move in the wind, like fencing, small shrubs, tree branches, or tall grass can affect the readings from the sensors and trigger the camera, creating lots of images of waving grass/trees that will need to be classified. An empty backdrop is also undesirable, as the sensors may have difficultly 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. Use of herbicide may be required to maintain a vegetation-free target zone.

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

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

bush, the maximum range should be reduced to avoid sensor detections of a moving backdrop. 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
```
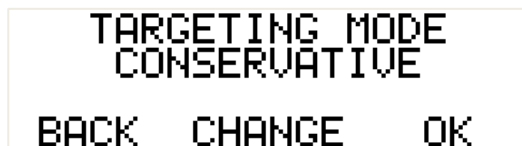
Use the slide-out test card in the lid to simulate a target. The display will show the range measured by the blocked sensor, and voice prompts will announce the distance.

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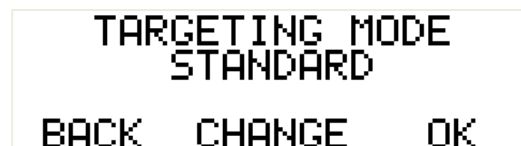
Once clear, press OK to proceed to the next step.

Targeting mode

The targeting mode is only applicable to v3.1 Felixers and earlier (non-AI-enabled Felixers). 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. Customised algorithms are also possible – consult Thylation for details.

```
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 false positive detection 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.

Bluetooth blocking

Bluetooth blocking functionality can be enabled. This prevents the Felixer from firing within 60 seconds of any Bluetooth beacon being detected. This is compatible with Bluetooth collar-borne tags, which can be fitted to pets to safeguard them from Felixers. Firing will also be blocked by a Bluetooth signal, such as wireless headphones, in the vicinity. An animal that would otherwise have been recognised as a target will register TARGET_FIRE_BLOCKED or TARGET_PHOTO_BLOCKED (in photo-only mode) if any Bluetooth beacon is detected. Because Bluetooth blocking uses extra power, it should be disabled during setup unless Bluetooth tags are in use.
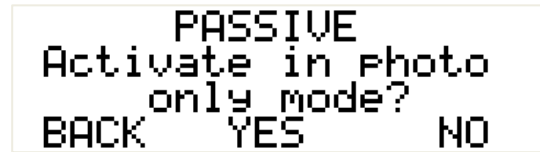
Arming

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 alongside the detailed log files.

```
       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.

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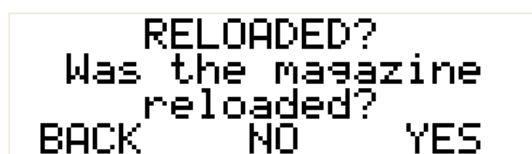- If you want to arm the Felixer with the **intent to fire** on targets, select **NO**.

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 (without inserting 1080 poison cartridges) to avoid the firing mechanisms seizing and becoming stuck.

Reload prompt before arming

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

```
     RELOADED?
Was the magazine
    reloaded?
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 60.

```
ACTIVATING TRAP
   Magazine  ▪
```

```
ACTIVATING TRAP
   Homing  ■
```

```
ACTIVATING TRAP
   Winding  ·
```

```
ACTIVATING TRAP
   Camera  ▪
```
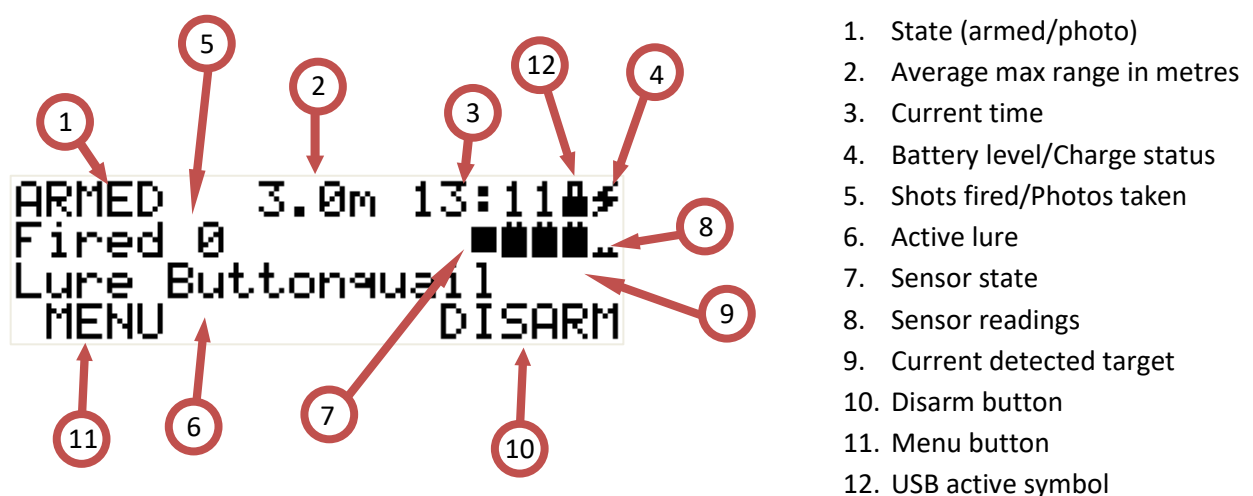
```
ACTIVATING TRAP
   Sensors  ▪
```

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* , page 30.

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* section on page 28 for full descriptions of states and symbols.

Quick arming

The Felixer can be armed quickly, skipping site setup, levelling checks, the setup photo and satellite fix. To quick arm the Felixer, press and hold **ARM**. To proceed with quick arming, select **YES**. This option should only be used if the Felixer has been set up at this site previously and it is being rearmed.

```
DISARMED      13:05▲■
Photos 4
Lure Buttonquail
 MENU         ARM
```

```
  QUICK REARM?
Skip normal setup?

        NO    YES
```

Disarming

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

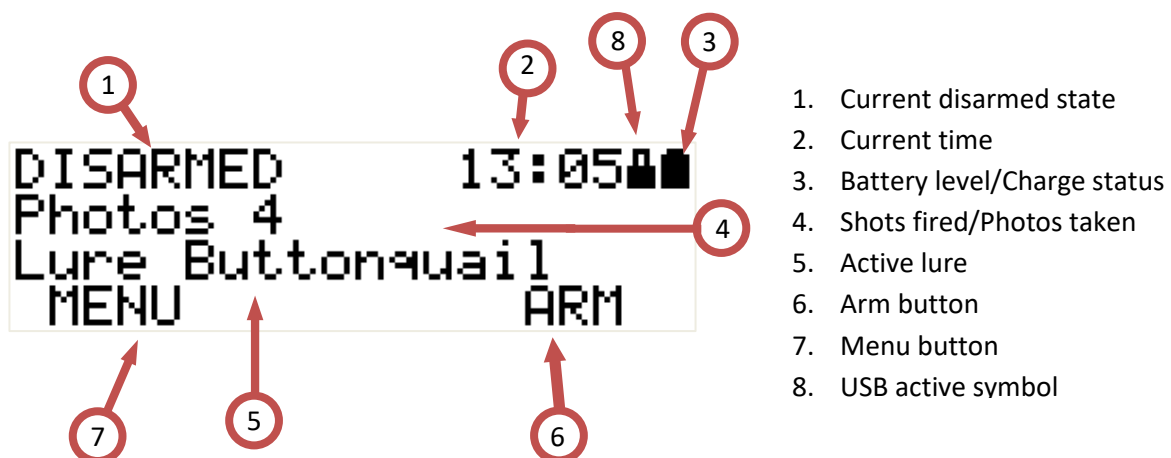The **DISARM** button is also used to exit Photo Only Mode.

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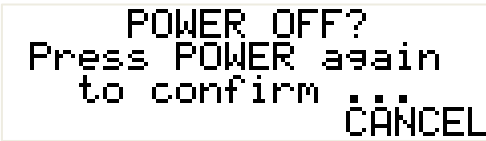
```
    Trap is safe
 to power off...
```

Disarmed status screen

1. Current disarmed state
2. Current time
3. Battery level/Charge status
4. Shots fired/Photos taken
5. Active lure
6. Arm button
7. Menu button
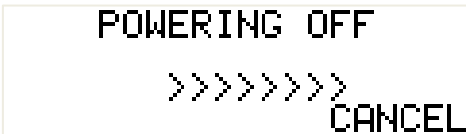8. USB active symbol

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 – swapping the USB

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 48. During inspection, provided the USB active symbol is not present, simply swap the new USB 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 can then safely be taken back to the office for examination of the photos and log files by uploading the data on to the FMS. USBs should **not** be shared between Felixers unless formatted and prepared with new software. Upload data from the USBs to the *Felixer Management System (FMS)* (see page 35) at least every 3 months as per Thylation's Terms & Conditions. 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. Thylation also must report on toxin use to authorities on a regular basis.

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 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▪□     ACTIVE  1.2m 10:06▪▪
Photos 0      ▪▪▪▪▪     OBJ DETECT     !▪▪_▪▪
Lure Combi#1            Lure OFF          RGT
   MENU  PHOTO    STOP     MENU  PHOTO  DISARM
```

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

TOP - Top sensor activated.
BOT - Bottom sensor activated.
LFT - Left sensor activated.
RGT - Right sensor activated.
MUL - Multiple targets. Left and right sensors detect objects at substantially different ranges.
LOW - Left and right sensors are activated, but bottom sensor is also activated at a closer range.
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.

```
DISARMED       13:05�
Photos 4
Lure Buttonquail
 MENU          ARM
```

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

```
ARMED   3.0m 13:12
Photos 0      ■■■■▪
Lure Buttonquail
 MENU          DISARM
```

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.

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

Navigation of the setting menu is expressed as follows:

[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.

```
        SENSORS
T2.9/2.9█ B3.0/3.0█
L2.9/2.9█ R2.9/2.9█
 BACK    NEXT
```

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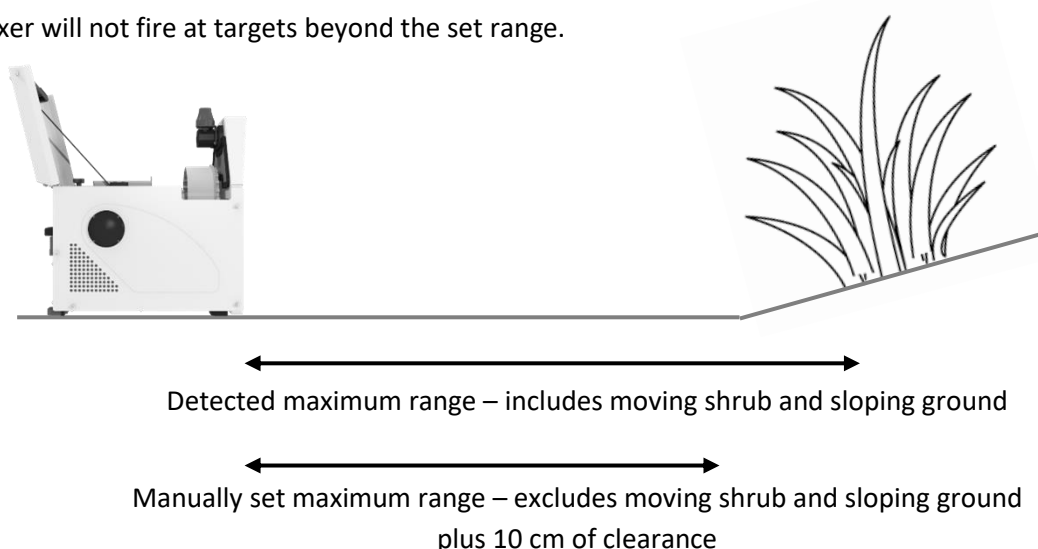
To adjust the setting, press **CHANGE** and use the **+** and **–** buttons to set the maximum range in steps of half a metre.

```
  SENSOR MAXIMUM
       4.0m

BACK    NEXT   CHANGE
```

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.

Detected maximum range – includes moving shrub and sloping ground

Manually set maximum range – excludes moving shrub and sloping ground plus 10 cm of clearance

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
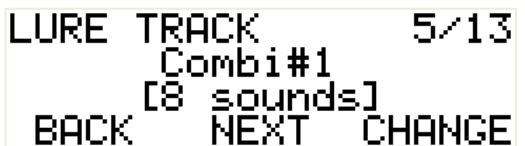
Enabling/disabling the lure

```
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.

Refer to *Configuring advanced software features before field use* on page 49 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                    LOCATION
Lat  -34.89730 Fix 1       Lat  ???        Fix 0
Long 138.57579 Sat 3       Long ???        Sat 0
  BACK    NEXT               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 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.

```
    Felixer 3.1
      3.0.0
    2020-06-17
 BACK    NEXT
```

The hardware serial number should match the engraved SP030xxx found inside the magazine cavity.

```
   SERIAL NUMBER
     SP030009

 BACK    NEXT
```

Updates

If an update is detected on the USB, the Felixer will automatically complete the update upon start up. If the update is not applied automatically, the software, camera and detector update pages allow the operator to update the respective software to newer versions 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 for software and camera, but up to 30 minutes for the detector (AI model).

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

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

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 browsers.

Internet Explorer is not supported.

The data uploaded consist of photos, log files and sensor log files. If you cannot access the FMS, the data can be accessed directly on a computer, refer to *Appendix A: Reading data* on page 72.

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.

System ready for additional uploads. Drag the contents of a Felixer USB drive here or click to select a folder. The upload will automatically begin.
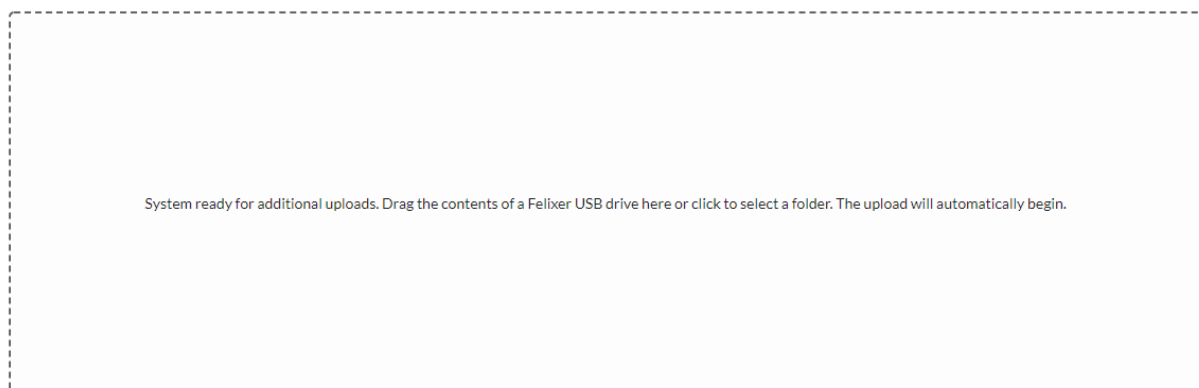
The upload was successful. The USB can now be cleaned for the next use.
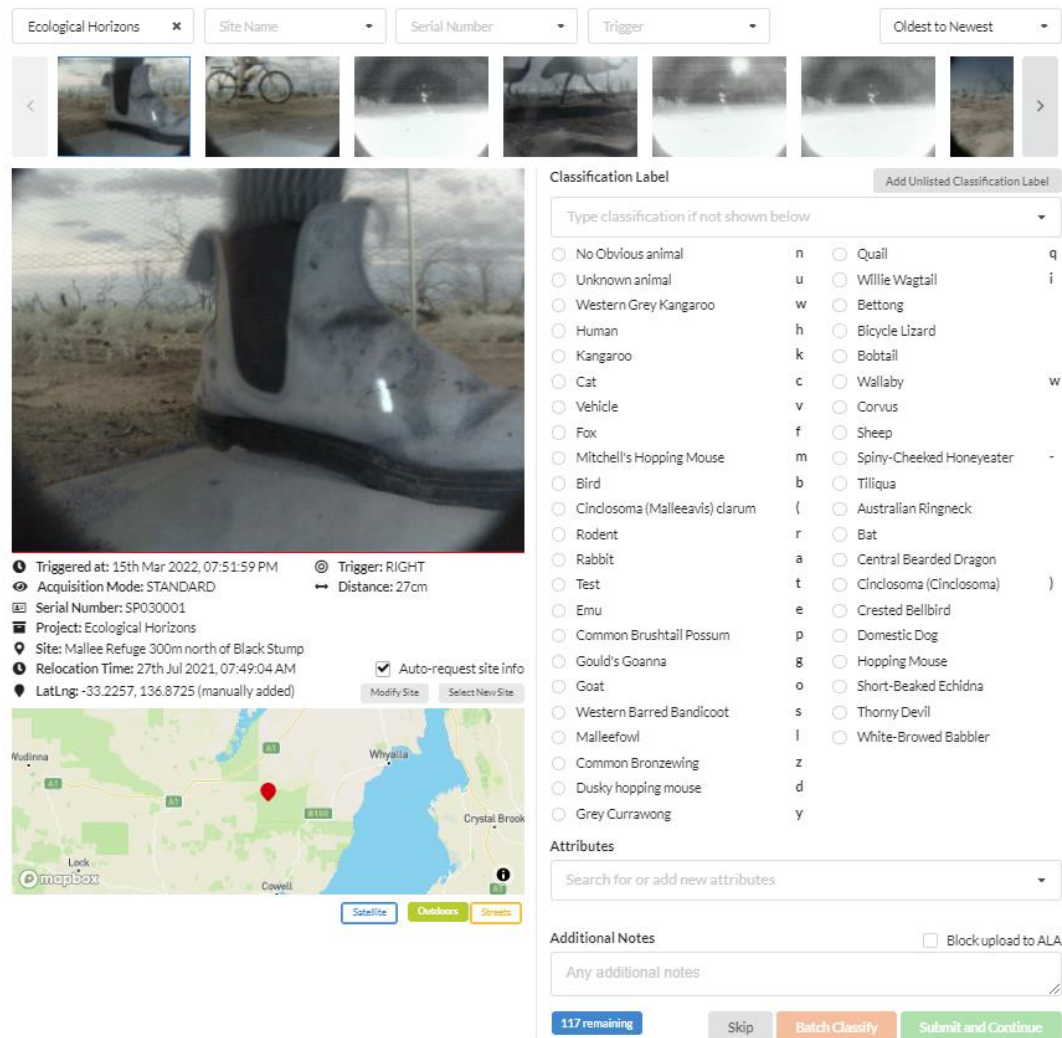
Please navigate to the drive in Windows and double click the 'ERASE-ALL.bat' file. You will be prompted for confirmation, confirm the operation.

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

Classify data

Photos that are uploaded to the FMS must 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.

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.

Sometimes multiple Sites are created when the GPS signal 'moves' a few metres from the original location. These Sites can be merged in the FMS to collate the data. Please contact Thylation to action.

Add a Site Change

SETUP Photo

[View larger SETUP photo]
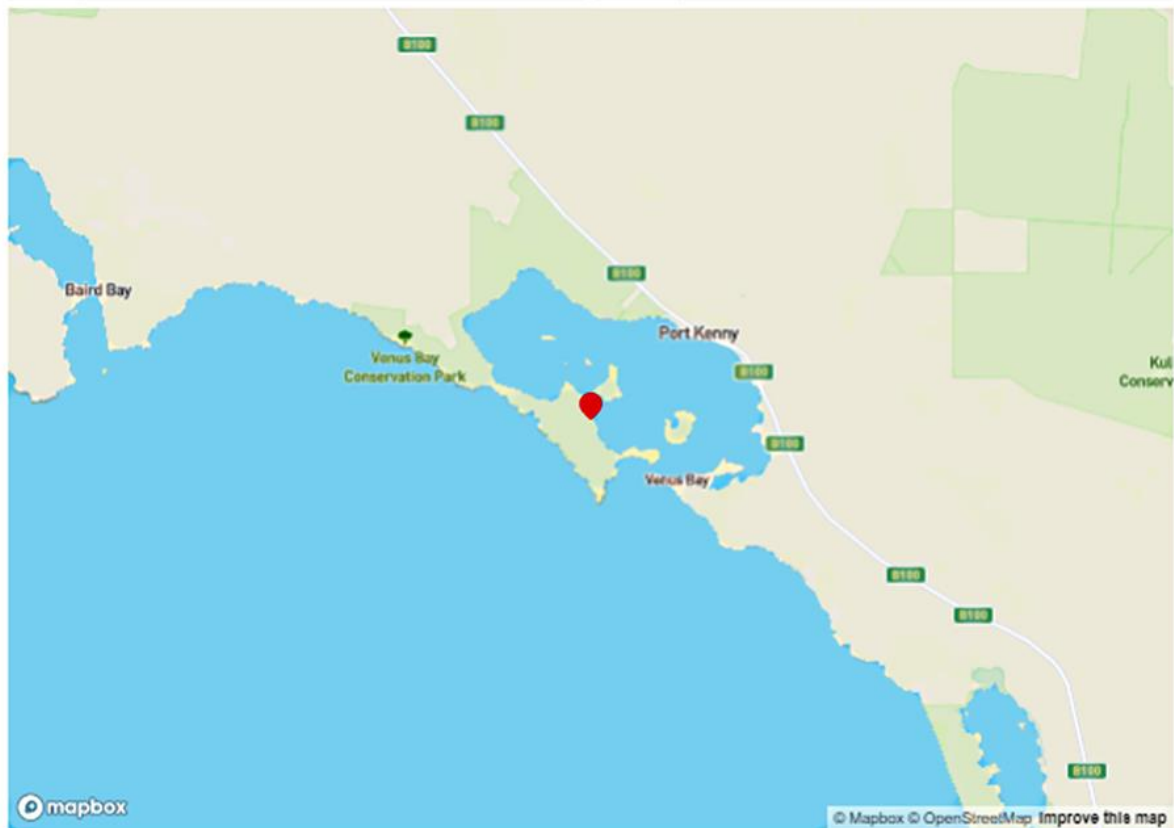
Site Name

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 | -22.206238 | | Longitude | 124.626785 |

[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.

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 an additional filter value.

Download latest firmware
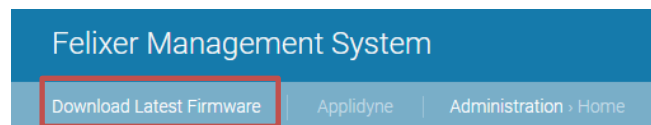
In the top left of the home screen, select **Download Latest Firmware**. This will start a download of the zipped software. When the download is complete, open the file and unzip the contents. Place the unzipped contents in the top/root directory of the USB. See *Updating* , page 54 for instructions on completing an update.
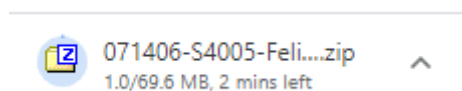
Maintenance instructions

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 47 for details.

Camera housing

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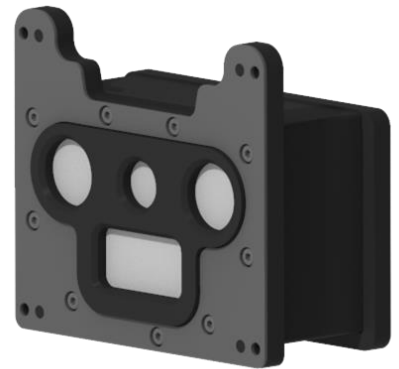
Battery

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.
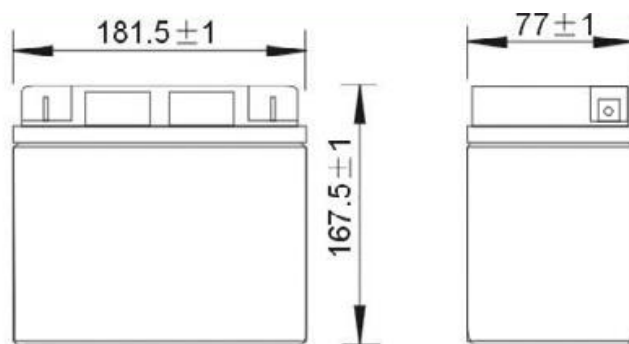
The battery mounts in the base of the Felixer can be relocated and a larger battery can be installed to provide greater capacity. This is a Century PS12260H, which is a 12V 26Ah Sealed Lead Acid type. For information on battery installation, see page 44.

Loading and replacing gel cartridges

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

<p style="color:red; font-weight:bold; text-align:center;">WARNING: DANGEROUS POISON MAY BE PRESENT ON THIS COMPONENT
USE CAUTION AND GLOVES WHEN HANDLING</p>

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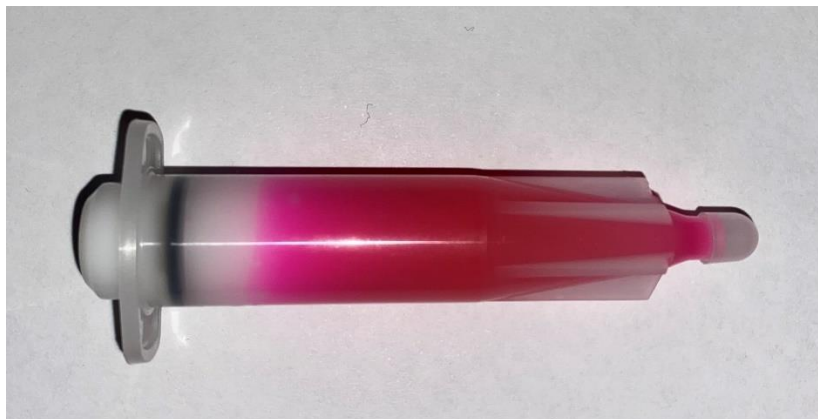
Secure the magazine assembly with one hand, use your free hand to slide the new cartridge nozzle-end first into the vacant slot until the cartridge cannot be inserted any further.

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.
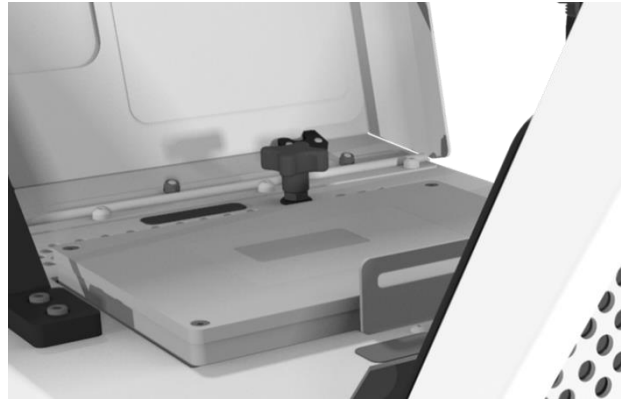
Use a 3.0mm hex driver to remove the **8** screws on the sides of the Felixer as shown below, and the **2 screws** on the top outer edges of the hinge as marked:
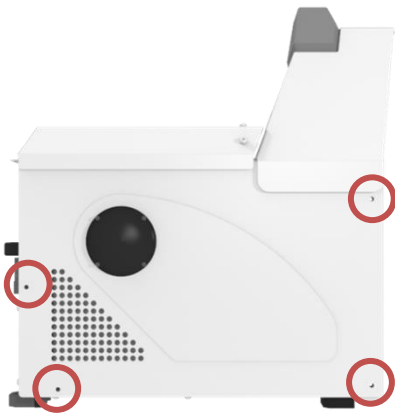
Once the screws are removed, gently lift the panel upwards and towards the back of the Felixer, ensuring the wires to the speakers are not caught or pulled tight. Remove the D connector connecting the speakers to the electronics enclosure.

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

ADVANCED USER

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* , page 64 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.
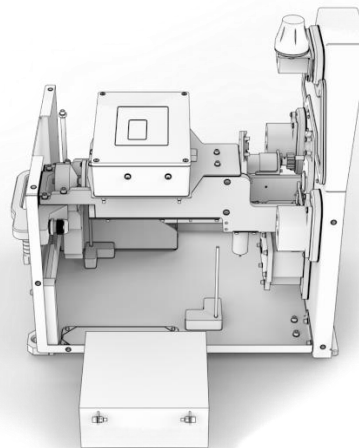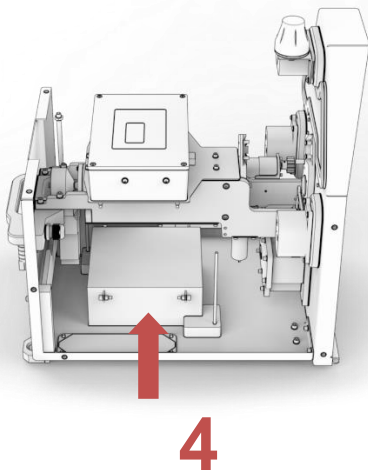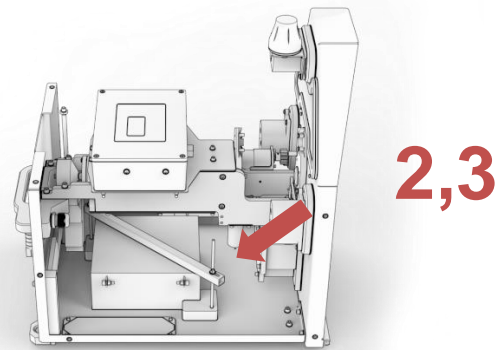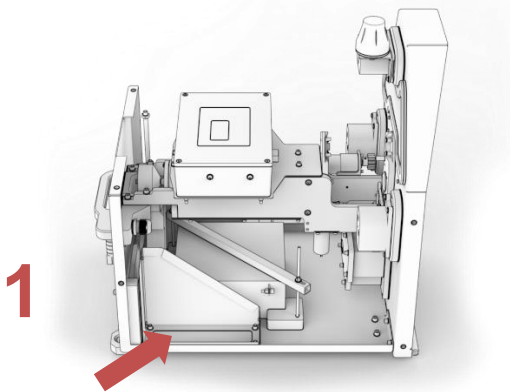
Replacing the battery with a larger capacity battery

A larger 12V 26Ah battery (Century PS12260H) can be sourced to replace the original 12V 18Ah battery (Century PS12180). Follow *Removing the battery* on page 44 to remove the existing battery.

1. With the battery removed, remove the two screws in the base of the battery mount as shown below.
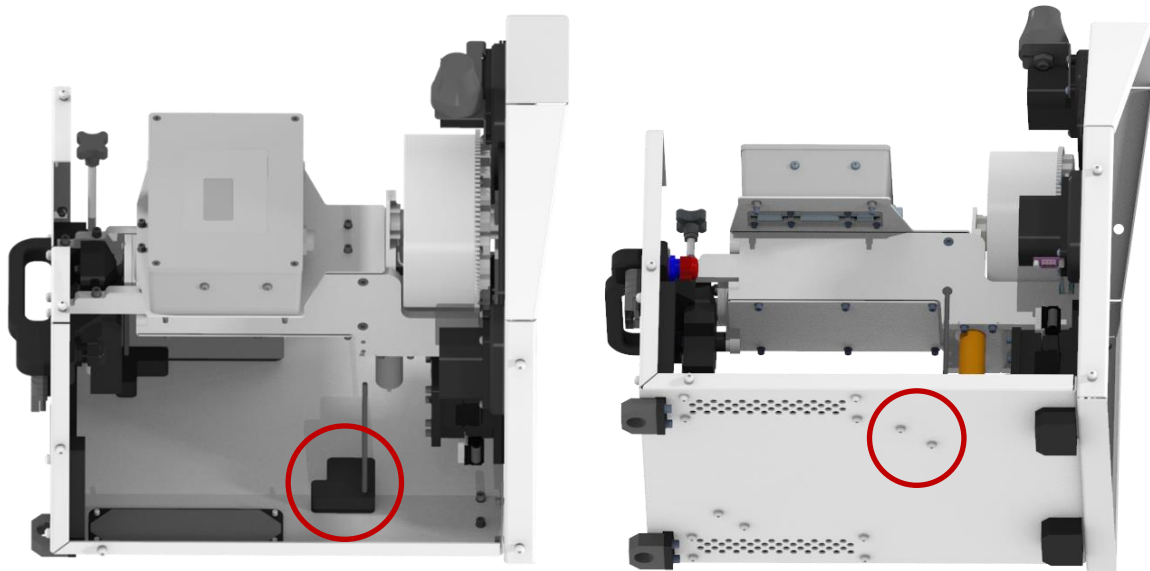
2. Relocate the two screws to the alternative holes in the battery mount.

Threaded rod hole

Screw into here for PS12260H battery

Screw into here for PS12180 battery
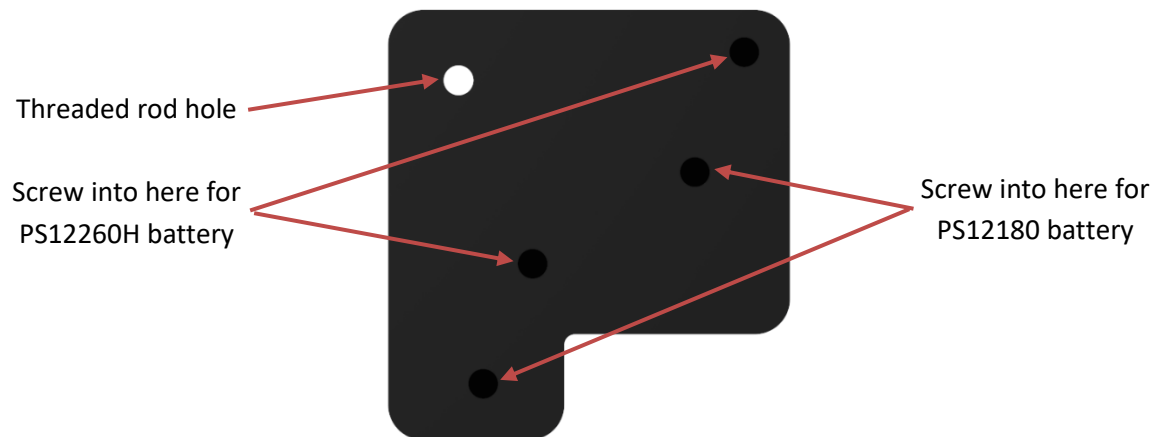
Continue installing the larger battery following the instructions in *Installing the battery* below.

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. Write the date on installation on the top surface of the battery in permanent marker.

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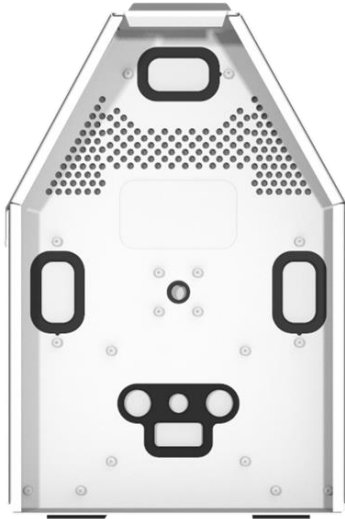
Most Felixer units will only require basic cleaning of dirt and cobwebs. This can be done with a wet cloth/paper towel.

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.

Before returning a Felixer at the end of a lease period, ensure all dirt, plant material, insects and other biosecurity hazards are removed from the Felixer, Crate and Solar Panel.

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.

ADVANCED USER
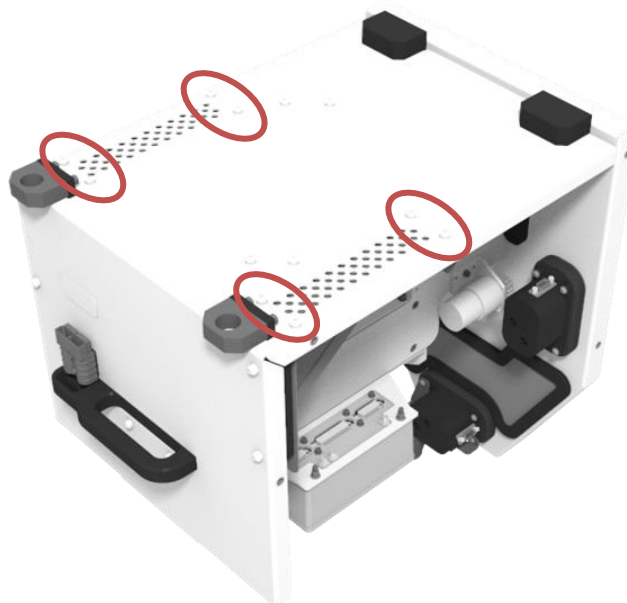
Preparing a USB drive

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* on page 38 for instructions.

Ideally, use one of the original 2 USBs that were included with the Felixer. If this is not possible, use a USB that is between 4 GB and 16 GB in capacity. Ensure the USB has a cover protecting the contacts.
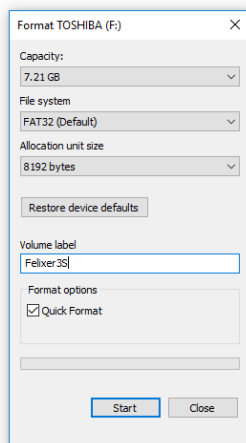
To prepare a USB flash drive, right click on the drive underneath the 'Computer' section on the left-hand side of the Windows file explorer window and select 'Format...' from the menu. Formatting will erase all USB contents.

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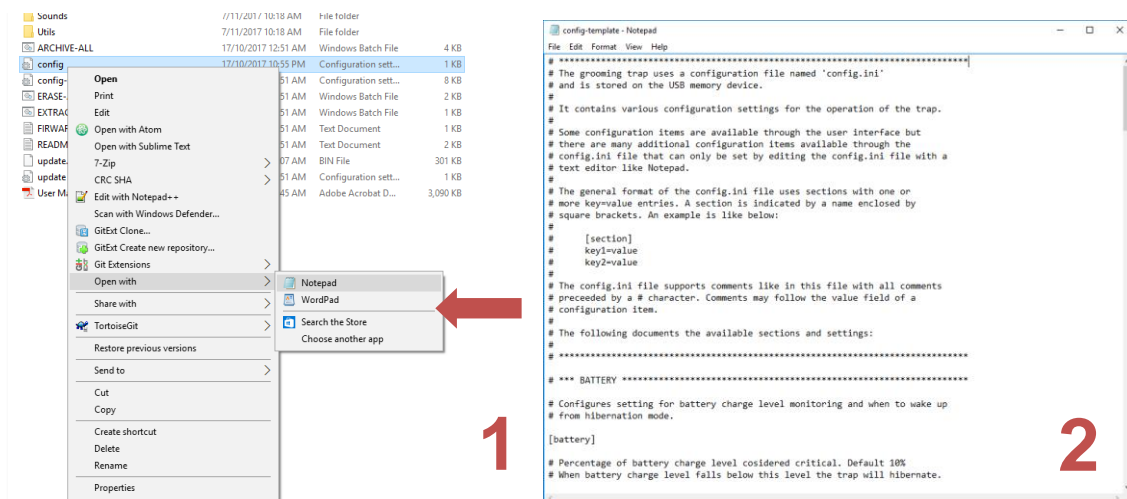
The configuration file provides an inline description of each setting. As such, no further detail on individual settings is given in this manual.

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.

ADVANCED USER
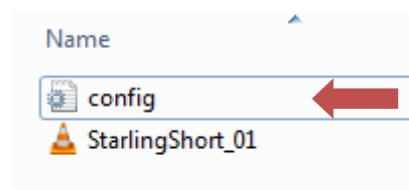
Archiving log files and photos

The USB contains a batch file 'ARCHIVE-ALL.bat' file. This batch file allows creation of a compressed archive of the Felixer logs and photos and is only required if you are unable to upload the data directly to the FMS.

To use it, insert the USB 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:

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.

Name	Date modified	Type	Size
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
FIRWARE 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

ADVANCED USER

Erasing log files and photos

The USB 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 drive*, page 48 for instructions on formatting a USB.

To use it, insert the USB 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:

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

ADVANCED USER

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* , page 38 and *Preparing a USB drive*, page 48).

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.
5. Advance to the next screen and select **UPDATE** to update the camera software. The system will update with update status on screen. This process typically takes 30 seconds or less.

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

6. Advance to the next screen and select **UPDATE** to update the detector (AI model). The system will update with update status on screen. This process can take up to 30 minutes.

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

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/.
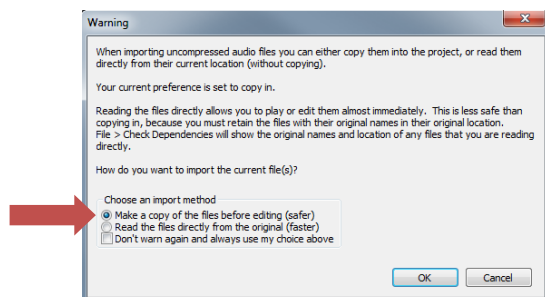
Open Audacity.

Drag the source audio file into Audacity.

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

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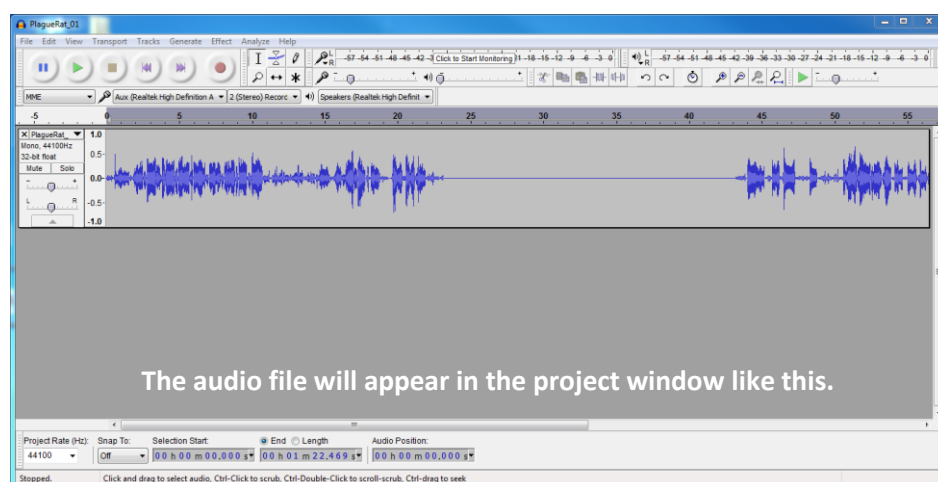
All files used for audio lures should have normalized volume. If the track is mono, like the above, it can be useful to convert the file to stereo for optimum playback. The following steps will describe these steps and how to export to the correct format.

Converting to stereo

Duplicate the track (or use Ctrl+D)

Set the original track to "Left Channel" by clicking on the dropdown arrow on the first track in the project window

Set the duplicated track to "Right Channel" in the same way as previously.

ADVANCED USER

Select the option to "Make Stereo Track" and the two tracks will combine to give a duplicated 'stereo' track.
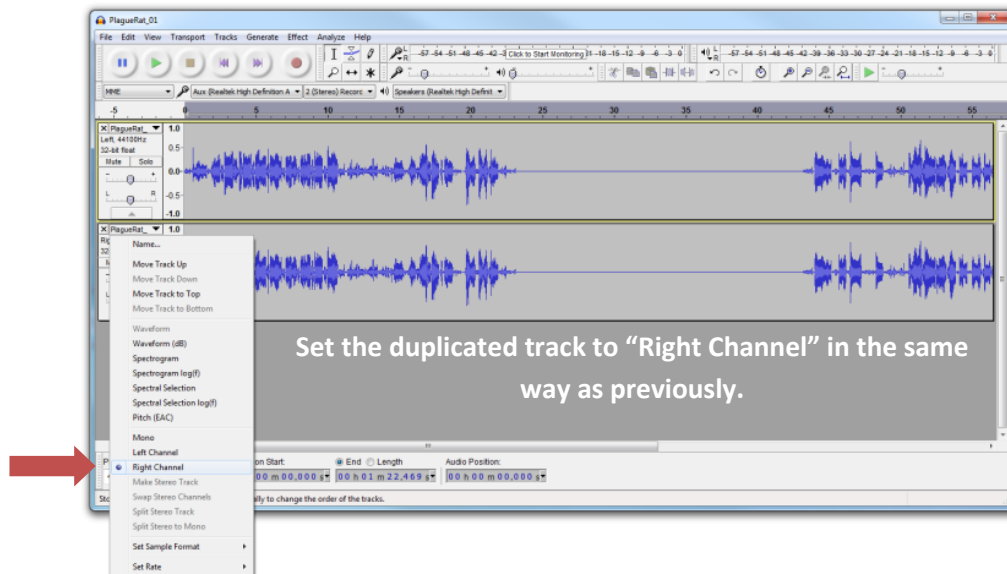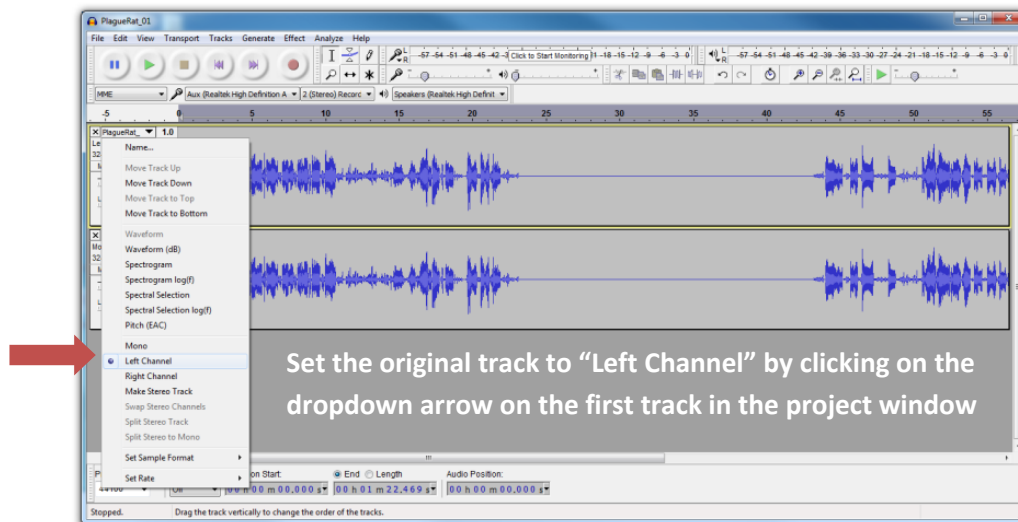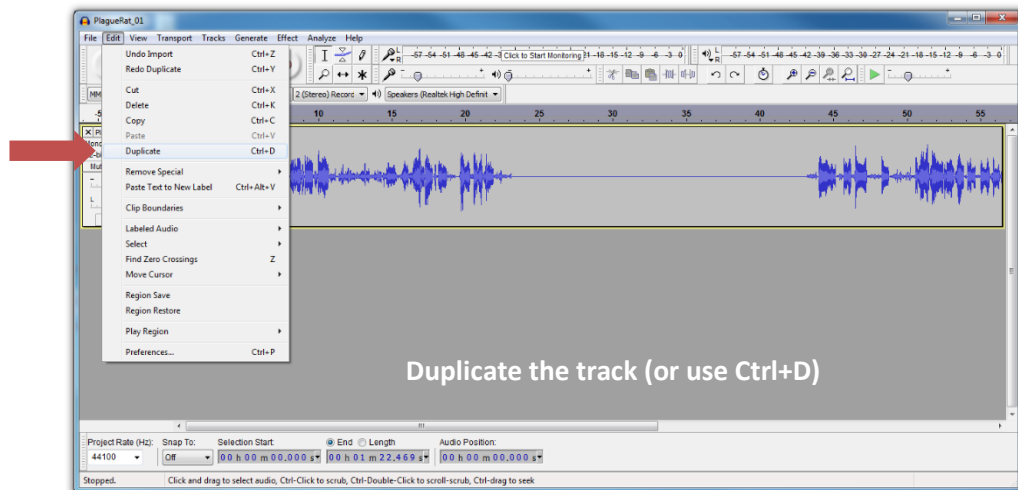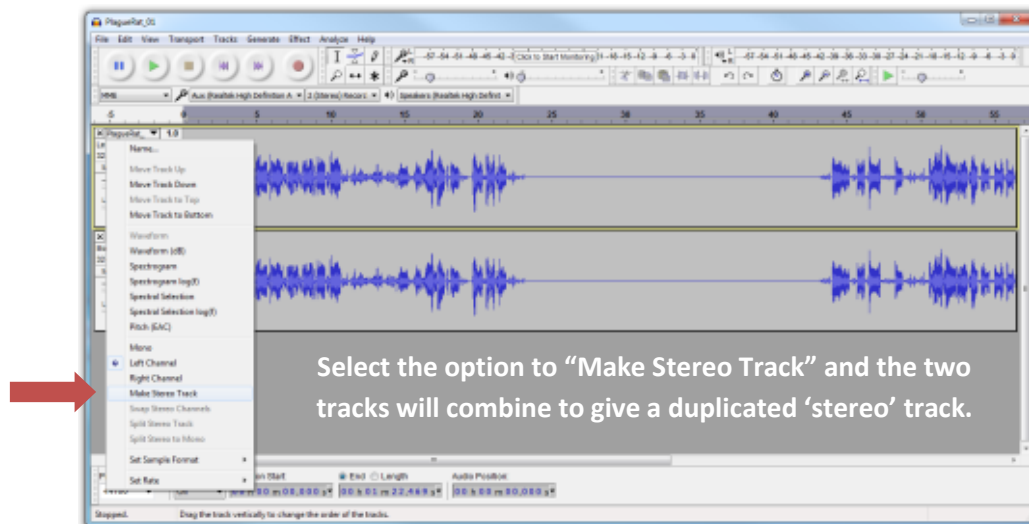
Normalising volume levels

Select "Normalize" from the Effect menu in the toolbar.
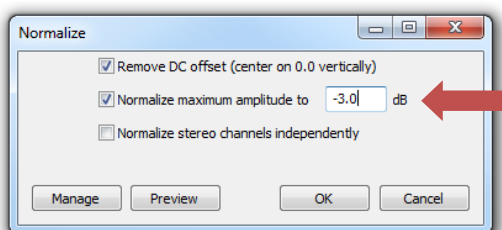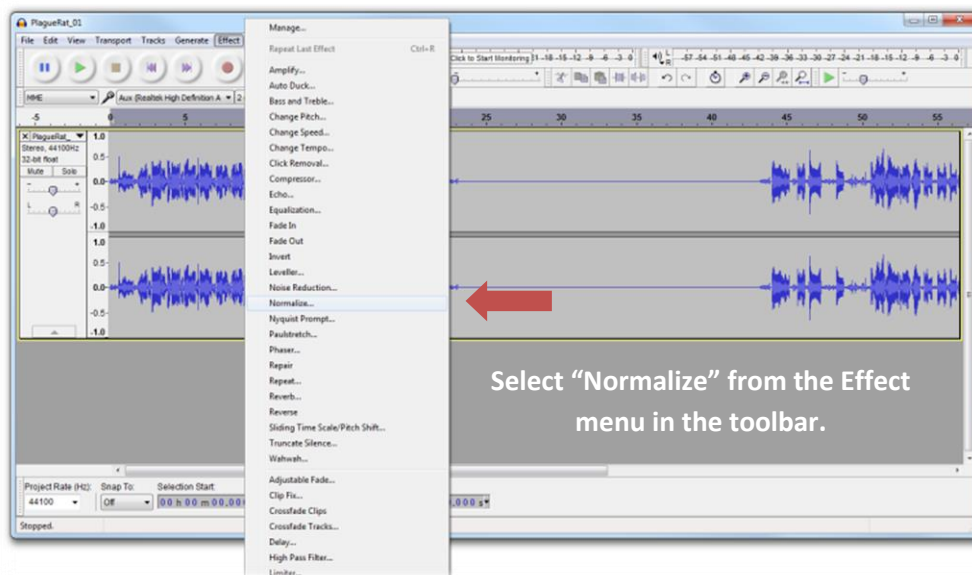
Leave the checkboxes as default.

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

Under the file menu, select "Export Audio"
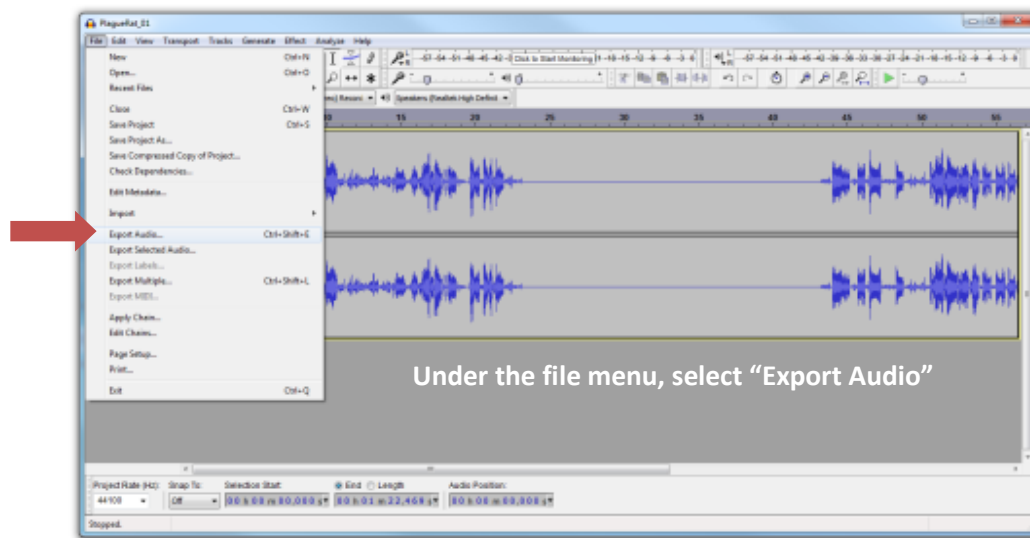
Name the file.

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.

ADVANCED USER

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.

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.

ADVANCED USER

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 20%. In this state, the Felixer waits until a scheduled wakeup time (default 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 20%) 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 20% and will normally wake up at 6pm 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 44).

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 D 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 46). 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.

Magazine is stuck and cannot be removed after disarming

- If the magazine latch is stuck, the magazine cannot rotate to the home position. The Felixer will detect an error and present the following screens.
    - Check Latch

        - TEST activates the magazine latch solenoid 5 times to try to free the latch
        - NEXT skips to next screen (Magazine stuck)
    - Magazine Stuck

        - BACK to Check Latch screen.
        - UNLOAD does three actions
            1. Activates magazine latch solenoid
            2. Winds piston back to firing position
            3. Rotates magazine to home using magazine motor. This will return the magazine to the home position if all 3 components are still working.
        - NEXT skips to next screen (Unload Magazine)
    - Unload Magazine

        - BACK to Magazine Stuck screen.
        - YES to confirm that the magazine is in the home slot. Firing piston will then unwind into the home slot.
        - NO to tell Felixer magazine is not home and prevent piston unwinding into a loaded cartridge.
- V3.2 Felixers (serial numbers SP030231 and higher) feature an extended magazine latch, which can be manually actuated to assist a magazine to the home position. If the magazine does not rotate home in the Unload Magazine phase, pull the lever up to release the latch.
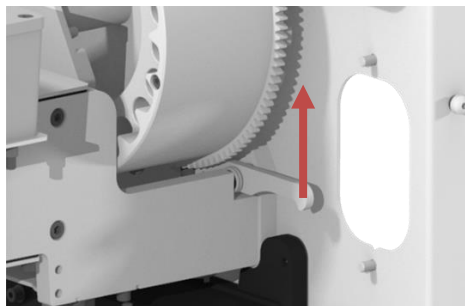
Assert Error

- 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 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 drive*, page 48.
- Contact Thylation for additional support.

Connector key

To simplify troubleshooting, the *Error code* on page 67 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.
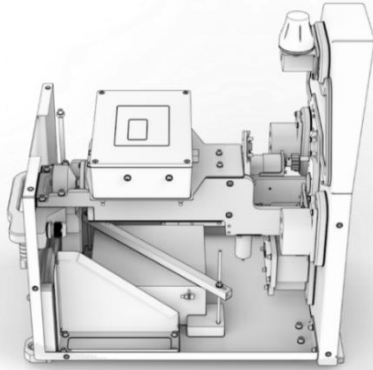
RIGHT SIDE

LEFT SIDE

USB connector

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
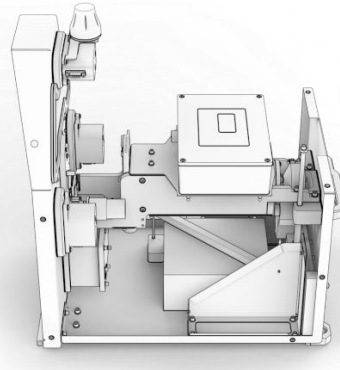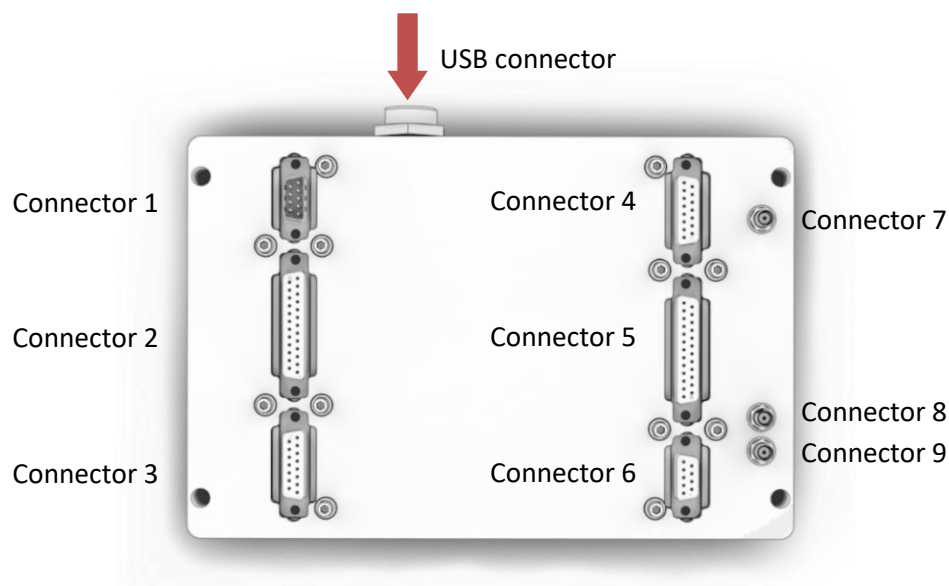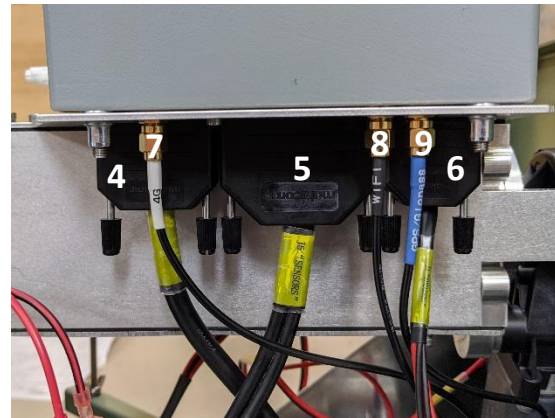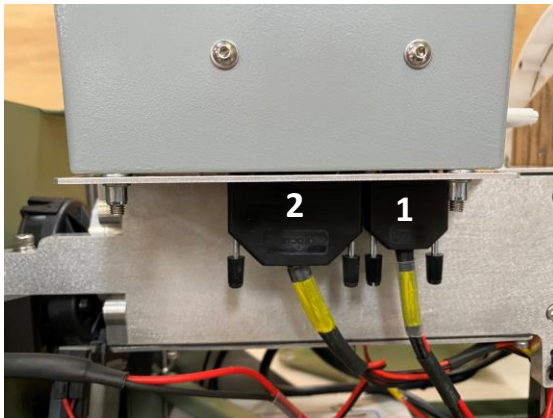
View from beneath the electronics box

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.
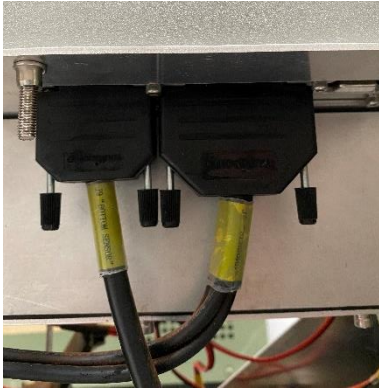
Screws tight	*Left screw loose*	*Both screws loose*
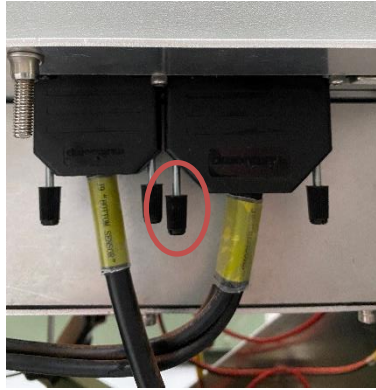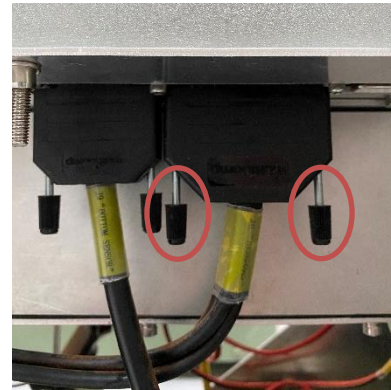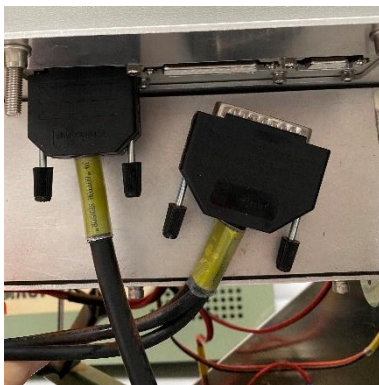
Connector loose	*Reconnecting*	*Tightening screws*
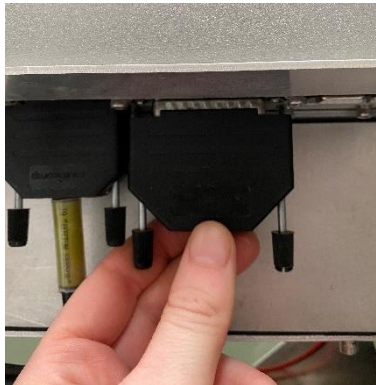
Coaxial cables

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.

Connectors tight	*Connector loose*
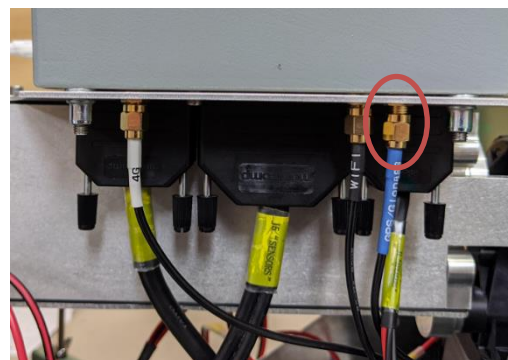
Blade connectors

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*
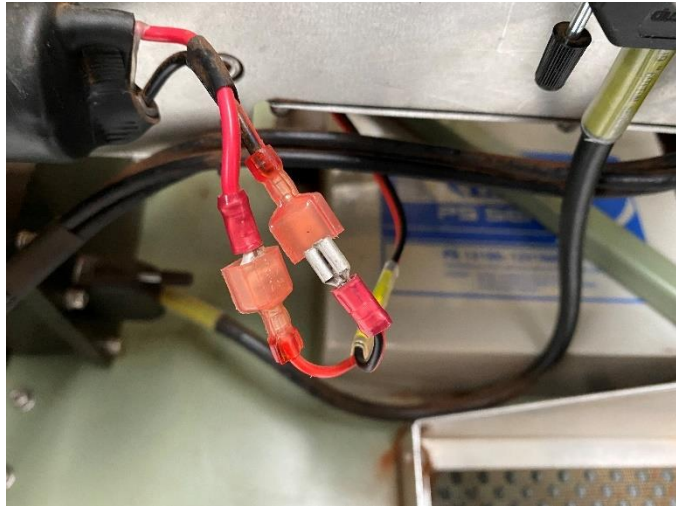
Eye terminals

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
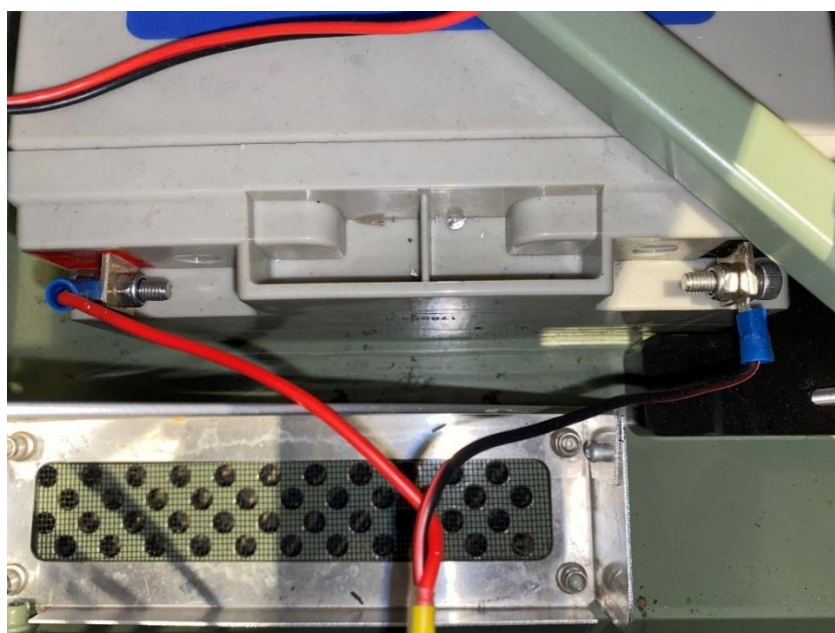
Error code reference

Error code	Label	Description	Remedy
5	CLOCK NOT DETECTED	Unable to communicate with clock or clock battery.	The internal CR2032 backup 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 backup 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 (attached to the latch) 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 new 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 new 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 *Removing the battery*, page 44.)
69	BACKUP_BATT NOT DETECTED	Unable to communicate with the backup battery.	The internal CR2032 backup 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 backup 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 SP030xxx*, page 13).

Where possible, it is best that USB contents are uploaded to the Felixer Management System (FMS) to help us diagnose issues. Refer to page 35 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 50 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 default 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* 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.

ADVANCED USER

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 image using artificial intelligence and sensor readings to result in a targeting decision.

Each 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.

ADVANCED USER

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	
Object Type	*Description*
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	ONLY BOTTOM sensor triggered.
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.
MULTI	Both LEFT and RIGHT are triggered but with the distance between them more than the default 30cm.
TARGET_FIRED	The AI algorithm recognises the object as a CAT or FOX and 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.
TARGET_PHOTO	The AI algorithm recognises the object as a CAT or FOX and 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.
SLOW	A target detection where the calculated speed of the object is slower than the safety threshold. This is typically to manage grazing kangaroos. This is not applicable for AI-enabled Felixers.
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.
NO_BOTTOM	The bottom sensor was not triggered at all. The algorithm expects to see motion across the bottom indicating that cat/fox legs have walked through it.

ADVANCED USER

LOW_CONF	The AI algorithm detects a possible CAT or FOX target, but the confidence is too low to conclude it is a target.
NON_TARG	The sensors have detected an object that is similar in shape and speed to a target but the AI camera has high confidence that it is a non-target species.
OUTSIDE_RANGE	The target has not crossed in front of the firing slot. It is outside the range of firing.
TARGET_BLOCKED	A firing or trigger event has been blocked due to sensor error or safety condition.
TARGET_FIRE_BLOCKED	The AI algorithm recognises the object as a CAT or FOX and both LEFT and RIGHT are triggered and the distance between them less or equal to the default 30cm, but a Bluetooth signal was detected during the event, so the target firing was blocked. Bluetooth blocking can be enabled/disabled in the configuration menu.
TARGET_PHOTO_BLOCKED	The AI algorithm recognises the object as a CAT or FOX and both LEFT and RIGHT are triggered and the distance between them less or equal to the default 30cm, but a Bluetooth signal was detected during the event, so the target identification was blocked. Bluetooth blocking can be enabled/disabled in the configuration menu.
TARGET_FIRE_ABORT	There is a miscommunication with the sensors just before the Felixer would have fired that causes the firing to abort.

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 serial number, time and date, along with the detection type and the range of the trigger.

Example 1: SP030280_2022-10-28_09-43-42_TARGET_FIRED_57cm

Appendix B: Felixer 3.2 hardware specifications

SENSING	4x LiDAR sensors using 935nm wavelength. Classified as safe CLASS 1 laser. Tuned for operation within 4 metres.
FIRING MECHANISM	Mechanically loaded spring. Exit Velocity up to 60ms^{-1}. 20 cartridge rotating magazine. 3ml gel per cartridge.
INTERNAL BATTERY	12V 18Ah Century PS12180 Lead Acid.
SOLAR PANEL	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.
AC WALL CHARGER	240V input Australian plug. 18V 4A output Anderson weather-proof connector.
REMOVABLE STORAGE	USB Flash Drive. Shipped with 16GB USB sticks.
INTERNAL STORAGE	Internal MicroSD card. Installed at factory.
CAMERA	AI-enabled: 320x240px CMOS sensor with automatic day/night filter. 3.6mm lens (Wide 64° FoV). High power 1.4W IR flash. Non-AI-enabled: 640x480px CMOS sensor with no IR-cut filter. 3.8mm lens (Wide 60° FoV). High power 1W IR flash.
AUDIO LURE	Programmable volume, runtimes, and scheduling. Capable of playing stereo WAV files from USB.
ANTENNA	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: APVMA Permit

PERMIT TO ALLOW RESEARCH USE AND SUPPLY OF AN UNREGISTERED AGVET CHEMICAL PRODUCT

PERMIT NUMBER - PER80926

This permit is issued to the Permit Holder in response to an application granted by the APVMA under section 112 of the Agvet Codes of the jurisdictions set out below. This permit allows a Supplier (as indicated) to possess the product for the purposes of supply and to supply the product to a person who can use the product under permit. This permit also allows a person, as stipulated below, to use the product in the manner specified in this permit in the designated jurisdictions. This permit also allows the Permit Holder, the Supplier (if not one and the same) and any person stipulated below to claim that the product can be used in the manner specified in this permit.

THIS PERMIT IS IN FORCE FROM 29 JUNE 2016 TO 31 DECEMBER 2022

Permit Holder:
ECOLOGICAL HORIZONS PTY LTD
SECRET ROCKS STATION
VIA KIMBA SA 5641

Suppliers:
ECOLOGICAL HORIZONS PTY LTD
SECRET ROCKS STATION
VIA KIMBA SA 5641

THYLATION OPERATIONS
LEVEL 1, 100 HUTT ST
ADELAIDE SA 5000

Persons who can use the product under this permit:
All persons acting as trial collaborators for the purposes of this trial and under the direction of the Permit Holder who are experienced in vertebrate pest management, vertebrate poison use and have the appropriate training/licence in the State/Territory that the trial is being undertaken.

CONDITIONS OF USE

Unregistered Product to be used:
Thylation Operations Cat Grooming Trap 1080 Cartridges
Containing: 4 g/L SODIUM FLUOROACETATE as the only active constituent.

RESTRAINTS:
DO NOT feed the product to non-target animals including birds.
DO NOT apply the product to, or in, crops which are in mid to late developmental stages.
DO NOT apply the product to, or in, crops if contamination of produce is likely to occur.
DO NOT contaminate dams, rivers, streams, waterways or drains with the product or used containers.
DO NOT deploy traps in toxic mode in Tasmanian devil habitat. Traps may only be deployed in photo-only mode in Tasmanian devil habitat.

Directions for Use:

Location	Purpose	Rate

Kangaroo Island South Australia:
- Recycling depot Kingscote and Kingscote airport
- Pelican Lagoon Conservation Park
- Seal Bay Conservation Park
- Lashmar Conservation Park
- Simpson Conservation Park
- Dudley Conservation Park
- Flinders Chase National park
- Ravine de Casoars Wilderness Protection Area
- Kelly Hill Conservation Park
- Dudley Peninsula
- Consenting private land blocks :
    CT5446/903
    CL1334/42
    CT5992/154
    CT5329/313
    CT5934/951
 	
Eyre Peninsula, South Australia:
- Secret Rocks Nature Reserve
- Venus Bay Conservation Park
 	
Anangu Pitjantjatjara Yankunytjatjara (APY) Lands, South Australia
-New Well, Musgrave Ranges, Everard Ranges, Tomkinson Ranges region.
 	
Flinders Ranges National Park, South Australia
	Conduct efficacy trials using sodium fluroacetate as a gel from Thylation Operations Cat Grooming Trap 1080 Cartridges, delivered via automatic application unit (Felixer Cat Grooming Trap) to control European red fox (*Vulpes vulpes*), Feral cat (*Felis catus*) and small-medium Wild dog (*Canis lupus familiaris* and *Canis lupus dingo*)	8 mg or 12 mg sodium fluroacetate per dose (approx 2 or 3 mL of gel) delivered from Thylation Operations Cat Grooming Trap 1080 Cartridges.
		
		Maximum trap sites 1 per 2 km^2

Monarto region, South Australia *Arid Recovery Reserve and Olympic Dam Mine lease, South Australia* *Western NSW National Parks (Sturt National Park)* *Mountain pygmy possum, potoroo and smoky mouse sites (NSW)* *South-Western Queensland Bilby and Night Parrot Habitat Qld (Currawinya National Park, Pullen Pullen Reserve, Ethabuka Reserve, Cravens Peak Reserve)* *Cape York parrot and Bridle nailtail wallaby sites (Qld)* *Gulf of Carpentaria Islands (West Island) (NT)* *Central Land Council desert sites (NT)* *Great Sandy Desert Bilby Site (Nifty minesite) (WA)* *Matuwa region (WA)* *Mitchell Plateau in the Kimberleys (WA)* *South-west forests (WA)* *Tasmania Lungtalanana, Bruny Island and Tasmanian Midlands (TAS)*		

Critical Use Comments:
- Use strictly in accordance with Thylation Operations Cat Grooming Trap 1080 Cartridge product label (Attachment 1) and trial protocol.

- Lethal dose delivered via an automatic application device, Felixer Cat Grooming Trap.

- The Felixer Cat Grooming Trap is triggered when an animal meeting the morphological specifications of a cat, fox, or small-medium sized wild dog is identified.

- All necessary precautions to avoid spraying face, body or inhaling or ingesting the product while loading the Thylation Operations Cat Grooming Trap 1080 Cartridges into the Felixer Cat Grooming Trap should be taken. Comply with safety directions listed at Attachment 1.

- DO NOT load Thylation Operations Cat Grooming Trap 1080 Cartridges until human and non-target animal safety is considered to be acceptable.

- Reload the Felixer Cat Grooming Trap magazine with Thylation Operations Cat Grooming Trap 1080 Cartridges when the trap has activated and where evidence suggests additional feral cats/foxes/wild dogs are present in the area. At the time of reloading, to the extent practicable, carcasses should be searched for and if found, disposed of in an appropriate manner according to the requirements of the State/Territory in which use has occurred.
- Approval must be gained from 1080 Authorised Officers in the State or Territory where trials are to be undertaken, prior to trials commencing.
- Any operation to be conducted in a national park must be approved by the relevant national parks authority in the State or Territory where trials are to be undertaken, prior to trials commencing.
- Any operation involving the use of this product to target wild dogs must be approved by the relevant state authority. All uses on NSW Parks Estate are subject to approval by the Director Conservation of the NSW National Parks and Wildlife Service.
- To minimise the risk to desirable non-target dingo populations this propduct should not be used in areas and periods of dingo whelping.

Jurisdiction:
NSW, QLD, ACT, TAS, SA, NT and WA only.

Additional Conditions:
- This permit provides for the use of an unregistered product. Unless otherwise stated in this permit, the use of the product must be in accordance with instructions on its label (Attachment 1).

- Persons who wish to prepare for use and/or use product for the purposes specified in this permit must read, or have read to them, the details and conditions of this permit.

- Any Felixer Cat Grooming Trap set in an area with likelihood of public access must be clearly cordoned off from unauthorised access from the public. The barrier must be robust enough to withstand the length of time for the operation of the trap. The minimum distance between the barrier and the trap must 3 times the maximum projectiles firing distance.

- Deployed Felixer Cat Grooming Traps must be sign-posted to warn members of the public of the danger. The sign will need to comply with the standard signage condition from the APVMA sodium fluoroacetate (1080) review, plus the safety directions and first aid instructions and provide directions for decontamination in the event of accidental discharge.

- A product label must also be attached to the Felixer Cat Grooming Trap.

- If members of the public interfere with a Felixer Cat Grooming Trap, the trap must be stopped immediately and redeployed elsewhere.

- Before the Felixer Cat Grooming Trap is made operational with the 1080 product, the trap must have a minimum 2 week trial where only photographs are taken. If in this period the trap has malfunctioned during the 'dry run' with any non-target animal, then the trap must be removed from use or repaired.

- The active trial is to be suspended at all sites where either humans or high risk wildlife (e.g. quoll species) incorrectly trigger Felixer Cat Grooming Traps at a rate of more than 1 in 200 detections until modifications are made to either the hardware (height of bottom sensor) or software (target-differentiating algorithm). The success of such modifications must be demonstrated by a minimum of 20 non-target delineations by the trap operating in photo-only mode, and demonstrated to the '1080 Authorised Officer' overseeing each trial (who also designate high risk wildlife), before the active trial can recommence.

- The APVMA should be notified immediately of any such trial suspensions and re-commencement of trial operations. Felixer Cat Grooming Traps should be set in conservative mode at any sites where false positive rates for any non-targets exceed 5%, and again, any such incidents should be reported to APVMA and the '1080 Authorised Officer' overseeing each trial.

- Animal ethics approval is required from each state before trials begin in each state (as required by individual state legislation).

- Felixer Cat Grooming Trap trial sites not already listed in this permit (or not previously authorised by a '1080 Authorised Officer') must be authorised in writing by the '1080 Authorised Officer' overseeing each trial, with details of each site forwarded to APVMA, prior to using Thylation Operations Cat Grooming Trap 1080 Cartridges at any site.

- SODIUM FLUROACETATE (1080) is a Restricted Chemical Product (RCP). A person must not supply, or cause or permit 1080 to be supplied, to a person who is not authorised to use 1080 under a law of the relevant jurisdiction. A person wishing to use 1080 must be authorised under a law of the relevant jurisdiction. This permit does not and cannot provide that authorisation – contact your state agricultural authority for information about who holds such authorisation and how to obtain it.

- Knowledge of the non-target species and their populations prior to deployment of the Felixer Cat Grooming Trap during the research permit period will allow a better understanding of the likely risk. During the "dry fire" stage of the program, the presence of quolls and other potentially susceptible species should be determined from remote sensing or other observations.

- If species likely to be susceptible that have not been tested and proven safe in pen or photo-only trials are found at this stage, or if direct poisoning is found to occur during the permit period, measures should be taken to reduce the risk to these species, for example:

  o Removing Felixer Cat Grooming Trap units from the area;

  o Using a more conservative algorithm to further reduce chance of off target firing;

  o Using a reduced dose of 8 mg 1080 (2 mL Thylation Operations Cat Grooming Trap 1080 Cartridgs gel). When using this dose, all instructions in this document and at Attachment 1 must still be complied with.

  o Capturing the species to the extent practicable and re-releasing once safe to do so.

- During the permit period, the response of susceptible non-target species should be monitored and recorded. Such reporting should include the success rate of finding carcasses in comparison with the number of times the Felixer Cat Grooming Trap is

triggered, the difficulty in locating them and evidence of scavenging. This report must be provided to the APVMA should a permit renewal or registration be sought.

- If deployed within 5 m of a fence line, the Felixer Cat Grooming Trap unit must be configured to be unable to be activated by targets through the fence and from firing through the fence. In cases where large animals (cattle, horses, etc) are likely to move along fencelines, traps set within 5 m of fences should be secured to ensure they will not be moved by animals.

Landholder Awareness:
- Users must ensure that the park, reserve, forest manager or other appropriate responsible persons for land use management, and landholders for private property, provide consent and are made aware of the Felixer Cat Grooming Trap deployment program. Permit users must comply with current State/Territory 1080 requirements for signage, notification and bait placement.

- Permission must be granted in writing by the neighbouring property owner to deploy the Felixer Cat Grooming Trap within 5 m of the fence.

Supply and record keeping:
- The supplier must supply the product in a container that complies with the requirements of section 18(1) of the Agricultural and Veterinary Chemicals Code Regulations. Attached to this container must be a label which is identical in content and format to the label in Attachment 1.

- The permit holder or supplier must not supply an amount of product that exceeds the quantity stated in this permit required to treat any nominated area. A receipt for each supply must include details of the person/s, quantity of product, area to be treated and date when supply occurred.

- The permit holder or supplier must at the time of the supply of the product provide to the person a copy of the permit in full setting out the conditions and/or instructions for use or schedule to the permit approved by the APVMA that sets out the conditions and/or instructions for use.

- This permit allows only the Supplier to possess the product for the purposes of supply and to supply the product to a person who can use the product under the conditions of this permit.

- The permit holder may only publish notices to call for persons to participate in research. Publishing a notice by any means offering to supply the product is an offence against the Agvet Code and not exempted by issue of this permit.

- The permit holder must maintain records of the research performed under this permit. Specifically the records must include the date and location where the trials were conducted, rates and frequency of application, total amount of product used and the names and addresses of the persons conducting the research and confirmation that at the time of supply of the product a copy of the permit was provided to them in full setting out the conditions and/or instructions for use or schedule to the permit approved by the APVMA that sets out the conditions and/or instructions for use. The records must be progressively maintained whilst the permit is in force and for a minimum period of two years from the date of expiry of this permit and must be made available to the APVMA upon request.

- Upon a request being made, the records are to be provided:

  - immediately if the request is verbally from an APVMA Inspector who has attended the premises

  - in the time specified in the written correspondence containing the request.

- The records regarding persons, amount of product supplied, hectares to be treated and confirmation that at the time of supply of the product a copy of the permit in full setting out the conditions and/or instructions for use or schedule to the permit approved by the APVMA that sets out the conditions and/or instructions for use was provided to them must be made at the time of supply of the chemical product. Details of the amount of product used, rates and frequency of application must be made within 7 days of the permit holder becoming aware.

- Upon a request being made, all records relating to the original research protocol/s and/or research planning prepared by the Permit Holder to conduct scientific research under this permit must be made available to an APVMA Inspector within 24 hours.

Maximum Area to be Treated:
Kangaroo Island: Total area combined not exceeding 200 km^2
South Australian Rangelands: Total area combined not exceeding 100 km^2
Anangu Pitjantjatjara Yankunytjatjara (APY) Lands, South Australia: Total area combined not exceeding 100 km^2
Great Sandy Desert, Western Australia: Total area combined not exceeding 100 km^2
Flinders Ranges National Park: Total area combined not exceeding 100 km^2
Western NSW National Parks: Total area combined not exceeding 100 km^2
South-Western Queensland Bilby and Night Parrot Habitat: Total area combined not exceeding 100 km^2
*Gulf of Carpentaria Islands (NT)***:** Total area combined not exceeding 100 km^2
*Great Sandy Desert Bilby Site (Nifty minesite)(WA)***:** Total area combined not exceeding 100 km^2
*Mitchell Plateau in the Kimberleys (WA)***:** Total area combined not exceeding100 km^2
*South-west forests (WA)***:** Total area combined not exceeding 100 km^2
*Tasmania Lungtalanana, Bruny Island and Tasmanian Midlands (TAS)***:** Total area combined not exceeding 100 km^2
*All other sites approved in this permit or subsequently by '1080 Authorised Officers'***:** Total area each combined not exceeding 100 km^2

Maximum quantity of product to be supplied and used under this permit:
Total not exceeding 4000 doses of the unregistered product.

Issued by Australian Pesticides and Veterinary Medicines Authority
Note: 03/09/2019 – Permit updated to cover all States and Territories and to refer to '1080 Authorised Officers'. Non-technical edits made to improve clarity. Extended to December 2020. Issued as Version 4.
Note: 16/05/2020 – Permit amended to specify wild dogs and foxes as a target species, to clarify conditions allowing product deployment within 5m of fence lines, add condition requiring NPWS approval for use in NSW, and to add an additional supplier. Permit expiry extended to 31/12/2021. Issued as version 5.
Note: 16/12/2021 – Permit expiry date extended to 30/06/2022. Issued as version 6.
Note: 18/02/2022 – Permit updated to remove Vic as an approved jurisdiction, and to remove Victorian locations from the list of approved use areas. Issued as version 7.
Note: 30/06/2022 – Permit updated to include restraint against toxic deployment in Tasmanian devil habitat. Expiry date extended to 31/12/2022.

ATTACHMENT 1

DANGEROUS POISON
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS BEFORE OPENING

Thylation Operations
Cat Grooming Trap
1080 CARTRIDGES

ACTIVE CONSTITUENT: 4 g/L SODIUM FLUROACETATE (1080)
Each cartridge contains 8 mg or 12 mg SODIUM FLUROACETATE (1080)

This product is not registered. For experimental use only. Must only be used in accordance with PER80926.

For the control of feral cats, foxes and small-medium sized wild dogs when used with the Felixer Cat Grooming Trap only as per the directions for use

RESTRICTED CHEMICAL PRODUCT ONLY TO BE SUPPLIED TO OR USED BY AN AUTHORISED PERSON.

THIS PRODUCT MUST BE USED IN ACCORDANCE WITH THE LABEL INSTRUCTIONS AND ANY RELEVANT DOCUMENTATION ISSUED WITH STATE/TERRITORY AUTHORISATION TO USE 1080 PRODUCTS.

Important: Read this leaflet before use.

Thylation Operations
Address: Level 1 100 Hutt St, Adelaide SA 5000, Australia
Telephone number: 08 86481878 (Monday to Friday. 8:00a.m. - 5:00p.m.CST)
Emergency telephone number: 0409 534852 (24 hours)

AUTHORISED PERSONS:
Only authorised persons may possess, store, transport, handle or use Thylation Operations Cat Grooming Trap 1080 Cartridges.

STORAGE ANO DISPOSAL:
Do not store Thylation Operations Cat Grooming Trap 1080 Cartridges in a position accessible to children, livestock or domestic pets. At the completion of a control program, return unused capsules to authorised supplier or dispose of as per instructions below. This pesticide is only to be kept, stored or transported in a container bearing the label, as supplied by the manufacturer. Store in a secure locked facility. Store in the closed, original container in a dry, cool, and well-ventilated area out of direct sunlight. DO NOT allow capsules to contaminate foodstuffs, or feed, for human or non-target animal consumption. DO NOT reuse containers for any other purpose.

Thylation Operations Cat Grooming Trap 1080 Cartridges collected from non-activated ejectors must be disposed of if damaged or showing signs of wear. Retrieved used, damaged or worn capsules should be delivered with empty packaging for appropriate disposal to an approved waste management facility. If an approved waste management facility is not available, bury the cartidges, any 1080 contaminated rinsate and empty packaging 500 mm below the surface in a disposal pit at the site of use specifically marked and set up for this purpose, clear of waterways, desirable vegetation and tree roots in compliance with relevant Local, State or Territory government regulations. DO NOT burn empty cartridges or product unless authorised by relevant Local, State or Territory Government Authority and as per the relevant Local, State or Territory Government Authority instructions.

SAFETY DIRECTIONS
Very dangerous. Poisonous if swallowed. Harmful if absorbed by skin contact. When opening the container and using the product wear cotton overalls button to the neck and wrist and a washable hat, elbow-length rubber gloves and face shield. If product on skin, immediately wash area with soap and water. If product in eyes, wash it out immediately with water. If clothing becomes contaminated with product remove clothing immediately. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water. After each day's use, wash gloves, face shield and contaminated clothing.

FIRST AID
If poisoning occurs, contact a doctor or Poisons Infomation Centre. Phone Australia 131126. If skin contact occurs, remove contaminated clothing and wash skin thoroughly. Remove from contaminated area. Apply artificial respiration if not breathing. If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.

MATERIAL SAFETY DATA SHEET
Additional information is listed in the Material Safety Data Sheet (MSDS) and the enclosed leaflet that forms part of this label.

Batch: Date of Manufacture:

DANGEROUS POISON
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS BEFORE OPENING

Thylation Operations
Cat Grooming Trap
1080 CARTRIDGES

ACTIVE CONSTITUENT: 4 g/L SODIUM FLUROACETATE (1080)
Each cartridge contains 8 mg or 12 mg SODIUM FLUROACETATE (1080)

This product is not registered. For experimental use only. Must only be used in accordance with PER80926.

For the control of feral cats, foxes and small-medium sized wild dogs when used with the Felixer Cat Grooming Trap only as per the directions for use

RESTRICTED CHEMICAL PRODUCT ONLY TO BE SUPPLIED TO OR USED BY AN AUTHORISED PERSON.

THIS PRODUCT MUST BE USED IN ACCORDANCE WITH THE LABEL INSTRUCTIONS ANO ANY RELEVANT DOCUMENTATION ISSUED WITH STATE/TERRITORY AUTHORISATION TO USE 1080 PRODUCTS.

Important: Read this leaflet before use.

Thylation Operations
Address: Level 1 100 Hutt St, Adelaide SA 5000, Australia
Telephone number: 08 86481878 (Monday to Friday. 8:00a.m. - 5:00p.m.CST)
Emergency telephone number: 0409 534852 (24 hours)

DIRECTIONS FOR USE
Only for use by persons authorised by the relevant government authority.

Note: Relevant Government Authority means the State or Territory Government Authority responsible for authorising people to possess and use products containing sodium fluoroacetate ("1080") Thylation Operations Cat Grooming Trap 1080 Cartridges

Refer to www.ecologicalhorizons.com for reference to the relevant State or Territory Government Authority and related use documents

Critical Use Comments:
- Place Felixer Cat Grooming Traps along the sides of trails and in other areas where feral cat activity has been observed and where the grooming traps are unlikely to be activated accidentally. Mark the location of the grooming trap as appropriate (e.g. using flagging tape, spray marker or a GPS coordinate) to ensure they can be relocated for checking. Care should be taken when marking grooming trap sites so that detection by unauthorised persons is minimised.
- All Felixer Cat Grooming Traps must be set up in accordance with the instructions accompanying the trap to ensure activation when the trap detects a cat.
- Lures may be used in conjunction with Felixer Cat Grooming Traps to increase efficiency where appropriate.
- Note that the Felixer Cat Grooming Traps may be activated by small dogs present in a control area.
- Additional integrated control programs to reduce feral cat populations will improve cat control program success. Sand pads and/or remote cameras may be used to identify the species responsible for activating the Felixer Cat Grooming Trap. Programs should be reviewed and modified regularly to maximise feral cat control efficiency.
- Ensure all safety precautions and directions (see below) are followed when loading Thylation Operations Cat Grooming Trap 1080 Cartridges into the Felixer Cat Grooming Trap and when setting the trap. IMPORTANT: Persons loading and setting cat grooming traps must follow safety directions including wearing eye protection and always keeping their head and body to the side of the trap to minimise exposure from accidental activation.
- Use audio lure on the Felixer Cat Grooming Trap to attract feral cats and encourage them to approach the trap within 4 metres range so that it activates and fires 1080 onto the cat.
- Reload the Felixer Cat Grooming Trap magazine with Thylation Operations Cat Grooming Trap 1080 Cartridges when trap has activated and where evidence suggests additional feral cats are present in the area. Continue to replace cartridges until repeat checks show the trap has not been activated or for the period of the control program.
- Loaded Felixer Cat Grooming Traps must be checked at least every 2 months where vehicle access is available and at least every 4 months in remote areas where vehicle access is limited unless otherwise specified by relevant government authority officer.
- Loaded Felixer Cat Grooming Traps should be checked more often where feral cat populations are high.
- Remove all Thylation Operations Cat Grooming Trap 1080 Cartridges at the end of the control program, (there may be value in leaving unarmed traps in place to habituate cats between trapping programs). Felixer Cat Grooming Trap magazines and cartridges must be cleaned by washing in soapy water and rinsing in clean water between control programs to remove 1080 product residue.
- Between control programs, traps should be maintained and serviced according to the device manufacturer's instructions to ensure they function property.

NOT TO BE USED FOR ANY PURPOSE OR IN ANY MANNER, CONTRARY TO THIS LABEL UNLESS AUTHORISED BY APPROPRIATE LEGISLATION

NEIGHBOURHOOD NOTIFICATION
Neighbours must be notified to allow them to take appropriate action. The notification must advise steps (e.g. restraint, muzzling) needed to be taken to ensure small domestic dogs and cats do not gain access to Felixer Cat Grooming Traps or Thylation Operations Cat Grooming Trap 1080 Cartridges or poisoned animals.

The notification must specify the dates between which the Felixer Cat Grooming Traps are deployed. This notification should be in writing and should be given to all adjoining landholders at least 72 hours in advance unless alternative communications have been made that meet State/Territory requirements and overall safety criteria. A record of the notifications must be kept. Use of Thylation Operations Cat Grooming Trap 1080 Cartridges must commence within 10 days of notification or else another 3 days notice of intent to deploy the traps with product is required advising the revised particulars.

SIGNAGE: Signage is compulsory for all lands where Thylation Operations Cat Grooming Trap 1080 Cartridges are deployed. Do not use the product until signage is in place. Signage must include – date Felixer Cat Grooming Trap and product are deployed, contact numbers, toxin name, target animal and a warning that domestic animals and pets can be affected. Users must ensure signs are put up immediately before 1080 poisoning operations commence on the property and are placed according to requirements by the relevant State/Territory authority. These signs must remain up until all of the traps and the product have been collected.

Signs may be available from your supplier and relevant Government Authority Officers. Check with the relevant Government Authority for any additional public notification obligations.

DISTANCE RESTRICTIONS
Felixer Cat Grooming Traps must be placed at least 150 m from a dwelling; 20 m from permanent or flowing water bodies; 5 m from the edge of formed public roadways; or as specified by State/Territory. Traps must be placed at least 5 m from boundary fences, unless the use is in compliance with PER80926.

PRECAUTIONS
DO NOT transport Thylation Operations Cat Grooming Trap 1080 Cartridges in such a way that unauthorised persons can access the product. The product must be kept in a secure section of the vehicle when transporting.

DO NOT place Felixer Cat Grooming Traps or Thylation Operations Cat Grooming Trap 1080 Cartridges in a position accessible to children, livestock, or domestic animals or pets.

Thylation Operations Cat Grooming Trap 1080 Cartridges must be stored as per label instructions if not being loaded or are loaded in a Felixer Cat Grooming Trap as per instructions for that device.

Collect all untaken Thylation Operations Cat Grooming Trap 1080 Cartridges following completion of the cat control campaign. Dispose of damaged and unusable product as per the Storage and Disposal instructions below.

PROTECTION OF DOMESTIC/WORKING DOGS
The person using the Felixer Cat Grooming Trap and Thylation Operations Cat Grooming Trap 1080 Cartridges should advise neighbours to restrain working or pet dogs and cats and ensure they do not enter the control area during feral cat control operations. Traps may be temporarily deactivated or removed if working dogs are required to muster livestock in paddocks where traps are deployed. Alternatively working dogs can be muzzled prior to entering paddocks to safeguard against accidental poisoning. In the event of accidental poisoning, wear Personal Protective Equipment listed in the Safety Directions and wash the pet in warm soapy water if it has been sprayed by the trap and dispose of wash-down water into covered or buried pit and seek immediate veterinary assistance.

DO NOT place the Felixer Cat Grooming Traps or Thylation Operations Cat Grooming Trap 1080 Cartridges in a position accessible to domestic dogs.

DO NOT allow domestic dogs or cats in areas with Felixer Cat Grooming Traps set unless appropriately restrained or muzzled.

PROTECTION OF WILDLIFE, FISH, CRUSTACEA AND ENVIRONMENT
Few animals other than small-medium sized dogs, foxes and cats will activate Felixer Cat Grooming Traps, but species which can activate the device and are susceptible to 1080 may be harmed. Therefore, to the extent possible, conduct control programs with Thylation Operations Cat Grooming Trap 1080 Cartridges when non-target species are least active or least susceptible.

Poisoned carcasses should retain less than a lethal dose of 1080 but to the extent possible, carcasses of animals poisoned by Thylation Operations Cat Grooming Trap 1080 Cartridges should be recovered and buried in accordance with the disposal instructions for residual product.

Report any incidents of non-target poisoning to the relevant Government Authority where there are reasonable grounds to suspect exposure to Thylation Operations Cat Grooming Trap 1080 Cartridges.

DO NOT allow non-target species to access the Thylation Operations Cat Grooming Trap 1080 Cartridges.
DO NOT contaminate dams, waterways or drains with the chemical or used containers

STORAGE AND DISPOSAL
Do not store Thylation Operations Cat Grooming Trap 1080 Cartridges in a position accessible to children, livestock or domestic pets. At the completion of a control program, return unused product to authorised supplier or dispose of as per instructions below. This pesticide is only to be kept, stored or transported in a container bearing the label, as supplied by the manufacturer.
Store in a secure locked facility. Store in the closed, original container in a dry, cool, and well-ventilated area out of direct sunlight. DO NOT allow Thylation Operations Cat Grooming Trap 1080 Cartridges to contaminate foodstuffs, or feed, for human or non-target animal consumption. DO NOT reuse cartridges for any other purpose.

Thylation Operations Cat Grooming Trap 1080 Cartridges collected from non-activated Felixer Cat Grooming Traps must be disposed of if damaged or showing signs of wear. Retrieved used, damaged or worn cartridges should be delivered with empty packaging for appropriate disposal to an approved waste management facility. If an approved waste management facility is not available, bury the cartridges, any 1080 contaminated rinsate and empty packaging 500 mm below the surface in a disposal pit at the site of use specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots in compliance with relevant Local, State or Territory government regulations. DO NOT bum empty containers or product unless authorised by relevant Local, State or Territory Government Authority and as per the relevant Local, State or Territory Government Authority instructions.

SAFETY DIRECTIONS
Very dangerous. Poisonous if swallowed. Harmful if absorbed by skin contact. When opening the container and using the product wear cotton overalls button to the neck and wrist and a washable hat, elbow-length rubber gloves and face shield. If product on skin, immediately wash area with soap and water. If product in eyes, wash it out immediately with water. If clothing becomes contaminated with product remove clothing immediately. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water. After each day's use, wash gloves, face shield and contaminated clothing.

FIRST AID
If poisoning occurs, contact a doctor or Poisons Information Centre. Phone Australia 13 11 26.
If skin contact occurs, remove contaminated clothing and wash skin thoroughly. Remove from contaminated area. Apply artificial respiration if not breathing. If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.

MATERIAL SAFETY DAT A SHEET
Additional information is listed in the Material Safety Data Sheet (MSDS).

CONDITIONS OF SALE and **DISCLAIMER**
Thylation Operations will not accept responsibility for losses or damage arising for the supply or use of these goods other than the responsibility for the merchantable quality of the goods. To the extent allowed by the relevant laws in each State/Territory, the liability of Thylation Operations is limited for the replacement of goods in the event that a valid claim of deficiencies in merchantable is proven.

Contact Information

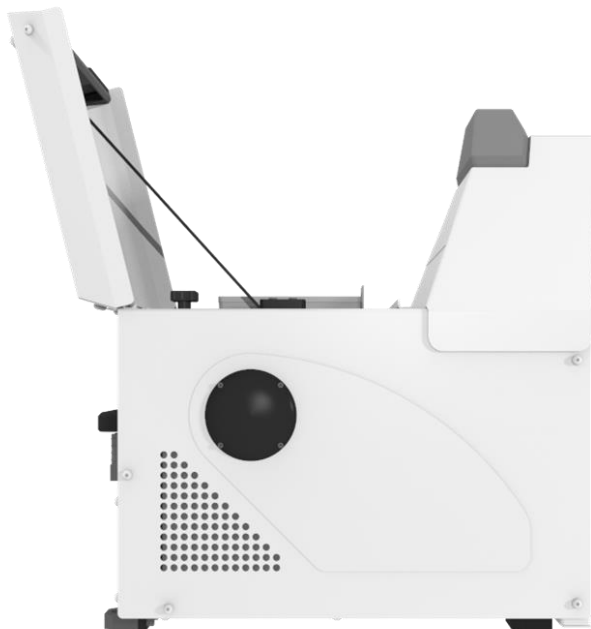### Thylation Operations Pty Ltd

1300 234 816

Email Address: felixer@thylation.com

www.thylation.com

ISSUE: 4 NOVEMBER 2022