eShepherd

Pushing the boundaries in livestock farming.

USER MANUAL v1.2 | 02/24

How does it work?

A virtual fence is created in the eShepherd Web Application and sent to the animal's neckbands via a base station on your farm. Animals wearing the eShepherd neckband are trained to understand and stay within virtual boundaries. When an animal approaches the fence, the neckband emits an audio cue (beep). If the animal ignores the cue and continues towards the fence, the neckband delivers an aversive, but harmless, pulse. eShepherd cues are automated, predictable and avoidable so animals quickly learn to respond to the audio cue alone.

Contents

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SECTION 1 Important Information

Please read all the instructions before using the eShepherd system. Save these Instructions.

- **WARNING** - The eShepherd system is not to be used by anyone (including children) with reduced physical, sensory or mental capabilities and/or persons with a lack of relevant experience and knowledge, unless they have been given adequate instruction or are appropriately supervised.
- **WARNING** - Do not connect to mains-operated equipment. 
- Young children should be supervised to ensure that they do not play with the eShepherd system.
- **WARNING** - Do not use eShepherd to create a boundary fence or to fence animals off from a roadway or other areas that contain moving vehicles. Always use physical fences at boundaries to roadways (and other areas that contain moving vehicles) and neighbouring property.
- **WARNING - Risk of electric shock!** When neckbands are handled, avoid touching or making physical contact with the electrodes (chains) – it is recommended to hold the neckband by the plastic housing or the top strap.
- Check with your local council and/or regulatory body for any regulations applying to use of virtual fencing systems.
- Neckbands should only be opened or repaired by a Gallagher Authorised Service Centre.
- Neckbands should only be used with animals that are greater than 200kg / 440 lbs in weight.
- The neckband contains batteries that are not replaceable. Do not attempt to open the neckband.
- Improper fitment can lead to injuries to the fitter. Refer to Neckband Fitment p. 9. Do not attempt to fit a neckband to an animal if you are not confident and have the necessary experience working with cattle.
- Improper fitment can lead to injuries to an animal and/or improper functioning of the eShepherd system resulting in poor pulse stimulus delivery. Neckbands that are fitted too tightly can lead to pressure necrosis. If neckbands are fitted too loosely, there is an increased risk that the neckband may fall off or lead to injury to the animal.
- Neckbands track cattle movements, but they DO NOT replace direct visual inspection and good animal husbandry or stock management.
- When neckbands are not in use, virtual paddocks that are associated with the neckband should be removed and the neckband should be placed into hibernation. This will preserve the internal battery and ensure that the neckband is unable to deliver a pulse when being handled.
- A neckband should not have an active virtual paddock at the time of fitment or removal.
- Do not fit neckbands on lame or injured animals without first seeking professional assessment from a vet.
- We recommend inspecting cattle at least every 30 days to ensure that there are no lesions or sores and to adjust the neckband such that it does not become too tight or too loose as an animal's weight changes.
- The eShepherd system does not provide information on the following:
  a. The extent of feed or water that is available in a virtual paddock.
  b. Whether animals have become caught on physical fences or other hazards.
  c. If the neckband is becoming too tight causing skin damage or too loose due to animal growth or change in body condition.
- Regularly inspect neckband housing and Base Stations for any damage. If damaged in any way, immediately cease use and contact your Gallagher Authorised Service Centre for repair in order to avoid a hazard.

Working with Cattle

- **WARNING** - Do not attempt to fit or remove a neckband unless you are trained and experienced in cattle yard operations and have the animal restrained in a fully operational cattle crush.
- Remove any obstructions around the crush that may result in pressure and crush injuries to personnel or the animal.
- Fitment of the neckbands to animals can create unpredictable behaviour. Ensure that there is a suitable fence or barrier between personnel fitting neckbands and the animals.
- Always ensure that a first aid kit is close at hand.
- Always refer to the relevant safe work procedures in your state or territory for farming, and cattle handling and movement.
- Do not fit neckbands to animals that are highly agitated. Neckband fitment will be safer if cattle are in a calm state. We recommend allowing plenty of time for fitment and that the fitment process is not rushed.

Overview of the eShepherd Setup

A Gallagher eShepherd representative assists you through:

Customer Onboarding and eShepherd System Preparation

- ☐ Welcome to eShepherd and discuss eShepherd application at your property.
- ☐ Confirm cellular / mobile data coverage on the property.
- ☐ Estimate LoRa communication coverage.
- ☐ Determine suitable / accessible Base Station location(s).

Access to the Web and Mobile App

- ☐ Customer registration to the eShepherd Web App (all users).
- ☐ Mobile App installed and access confirmed.

Web App Introduction

- ☐ Brief introduction to the Web App completed.
- ☐ Introduction to the Resource Centre.
- ☐ Physical boundaries and physical fences defined or uploaded.
- ☐ Watering points defined.
- ☐ Animal training discussed.

Please follow to the instructions for:

Base Station Installation

- ☐ Base Station(s) installed and powered on.
- ☐ Base Station GPS co-ordinates documented.
- ☐ Confirm cellular connection using signal LEDs on router.

Neckband Preparation

- ☐ Unpack neckbands, charge and un-hibernate.
- ☐ Check Web App to confirm neckband communications.
- ☐ Confirm all neckbands are flashing green.

Neckband Fitment to Animals

- ☐ Watch neckband fitment training videos.
- ☐ Neckbands fitted to animals.

Neckband assignment to Animals

- ☐ Associate the neckband to the animal using an RFID/EID reader and the eShepherd Mobile App.

Introducing Animals to eShepherd

- ☐ Animals released to training paddock.
- ☐ Animals settled and calm.
- ☐ First virtual paddock activated.
- ☐ Animal training period completed successfully (7-10 days).

SECTION 2 eShepherd Base Station

The eShepherd Base Station is an internet connected device that is installed on your property and facilitates a communication link between the eShepherd Web App and the eShepherd neckbands. The required internet access is provided through a 3G/4G cellular connection.

The Base Station arrives boxed in pre-assembled components. Please refer to the Base Station Installation Guide for assembly instructions and final switch ON procedure.

IMPORTANT!

If the cellular communication has an outage for more than 24 hours, the neckbands will stop enforcing the virtual fence boundary. When communications are back online the neckbands will resume normal operation.

SECTION 3 eShepherd Neckband

The eShepherd Neckband is an intelligent IoT (Internet of Things) device that is fitted to the neck of animals on a property that is using the eShepherd system. The solar powered unit tracks the position of each animal using GPS. An integrated audio device delivers tones and, if required, a custom pulse circuit delivers an aversive but harmless pulse stimulus to the animal via the two chains.

Refer to Neckband Fitment p. 9 for details on how to fit eShepherd neckbands to animals.

Top Strap
Sits comfortably on the animal's neck and secures the chain.

Chain
Adjust the chain links for a correct fit. Delivers the harmless pulse stimulus.

Identifier
Every neckband has a unique code.

Status LED
The LED colour displays the neckband status.

RFID Tag
Use the Hand Held EID Reader to read the tag.

Locking Clip
Locks the chain into position.

Solar Panel
Keeps the long-life lithium battery charged for year-round operation.

Internal Speaker
Delivers the audio cue.

Animal Welfare

eShepherd is a virtual herding system that is based on sound animal training and welfare principles. As such, the system has been developed with predictability and control as core elements of the animal training mechanism. The sequence of an audio cue followed by a pulse is predictable and the animal can quickly learn to avoid the pulse by responding to the audio cue alone.

SECTION 4 eShepherd Web and Mobile Application

eShepherd Web App install

Gallagher eShepherd will send you emails containing links to create your access to the eShepherd Web App. The Web App is a powerful tool used to manage virtual paddocks and animal grazing.

If the emails do not appear in your inbox, please check your spam or junk mail folders. The email will come from no.reply@eshepherd.gallagher.com.

The email links direct you to a registration page where you set your password and complete the sign-up process.

Once you have logged in to the Web App, please go to the 'Resource Centre' (Question Mark in the bottom right)and familiarise yourself with the basic operation of the Web App.

Hint: Bookmark this link for quick access: https://app.eshepherd.com/login

IMPORTANT!

Gallagher recommends watching the videos in the 'Web App Guides' section.

eShepherd Mobile App install

The eShepherd Mobile App can be installed on either an Android or Apple iOS device.

To install the app on an iPhone

Note: the mobile app is in Beta Release and cannot be accessed from the App Store directly.

Use the 'TestFlight' App to install the eShepherd App on an iPhone.

1. Open the App Store
2. Search for the app called TestFlight.
3. Install the TestFlight app. Once installed, you can close that app.
4. Scan the QR code below or click this link: https://testflight.apple.com/join/243eje1K

Scan the QR code

5. You will be taken to the TestFlight app and given the option to install the eShepherd Mobile App.
6. Follow the prompts to install the eShepherd Mobile App.
7. Use the same email and password as your Web App login.

To install the app on an Android Phone

1. Open the Google Play Store.
2. Search for the Gallagher eShepherd App.
3. Install the app.
4. Use the same email and password as your Web App login.

SECTION 5 eShepherd System Preparation

Once the eShepherd hardware has arrived on your property, the base station and the neckbands need to be installed and prepared for first use.

1. Base Station Installation

To install the base station, please follow the base station installation guide. When the base station is installed and operational, the neckbands can begin their system connection process.

The state of the base station can be checked by looking at the LED indicators on the cellular router.

Please contact your eShepherd representative to confirm that the base station is online.

2. Neckband Preparation

Neckbands arrive in lots of 4 in cardboard boxes and are in a state of 'hibernation' – which is equivalent to being turned off. At the earliest convenience, neckbands should be unboxed and placed in a sunny location near or in the yards where they will be fitted to the animals. The neckband battery will be solar charged any time it is exposed to sunlight, even when it is hibernated.

Once the base station is operational, neckbands can be un-hibernated so that they can commence the network connection process to the base station. *Make sure the neckbands are within range of the base station.*

3. Un-hibernate the Neckbands

To un-hibernate (or turn ON) a neckband:

Hold the supplied magnet near the LED indicator (as shown) for around 3 seconds.

1. Wait and listen for the neckband to play a rising tones tune.
   Note, these tones are very quiet and may be difficult to hear in a noisy environment.
2. Once the tune has finished, the LED indicator will start blinking.
   The colour of the LED will depend on the neckbands state. For more information on the LED colours and states please see Neckband Status LED p. 14.

For reference: to hibernate or turn off a neckband, follow a similar process.

1. Hold the magnet near the LED indicator and keep it there.
2. The neckband will emit 5 short beeps, one every second.
3. After the 5th beep, the neckband will play a descending tune, and the LED will stop blinking.

4. Automated Network Connection

Once the base station and the neckbands are operational, the system begins an automated network connection process. This process can take several hours while messages flow to and from the neckbands to establish a regular communication cadence.

5. System check via eShepherd Web App

Once the automated network connection process has completed, neckbands will appear on the eShepherd Web App. To verify that all neckbands are operational and communicating with the platform follow the steps below.

Login to the eShepherd Web App at https://app.eshepherd.com/

1. Navigate to the Neckband menu
2. Go to the 'Map Layers' and confirm that Neckbands are selected.
3. You should see triangular icons where your neckbands are located.
4. In the side-panel, sort the 'Last Updated' column.
5. All neckbands should have updated their status within the last 30 minutes.

If all neckbands are communicating, then they are ready to be fitted to animals. If some neckbands have not reported any status messages, check that the neckband has been un-hibernated properly.

SECTION 6 Neckband Fitment

Assess the animal

- An animal should be considered healthy before being fitted with a neckband;
- If an animal is "lame", we do not recommend fitting a neckband or continuing to use the using the eShepherd system;
- An animal's Body Condition Score (BCS) should not be lower than '2'. Refer to Body Condition Score p. 17.
- Neckbands should not be fitted to animals that have open wounds on the neck, including broken skin from rubbing due to irritation e.g. from buffalo fly.
- Neckbands are to be fitted to the neck of cattle only. Do not hang the neckband on any other part of the animal during the fitment process.

Note: Bos Taurus bulls, for example, can develop a very broad and muscular neck, that is larger than their head. This can result in the neckband sliding over their head and falling off the animal. Please consider this limitation when attempting to manage this class of animal.

Ensure the environment is safe

- Do not attempt to fit or remove a neckband unless the animal is restrained in a fully operational cattle crush.
- Fitment of the neckbands to animals can create unpredictable behaviour. Ensure that there is a suitable fence or barrier between personnel fitting neckbands and the animals.
- Do not attempt to fit eShepherd neckbands unless you have appropriate training and experience to safely work cattle yards and operate a cattle crush.

1 Restrain the animal in the crush using the backing bar.

Some animals pull back their head against the head bail (head gate). If the crush (chute) is fitted with a backing bar feature, then use this to push the animal forward to expose its neck.

2 Disconnect the top strap on the fitment side.

Disconnect the top strap on the same side where you intend to reattach the clip.

> Important: Use a Hand Held Reader (HHR) to scan the RFID chip located in the base of the neckband before fitment. Refer to Assigning Neckbands to animals p. 11

3 Fit the neckband on the animal.

Place the neckband around the head of the animal ensuring the LED indicator and cows head imprint are facing forward, and the audio speaker holes face backwards, towards the animal's brisket.

4 Clip the buckle together to secure the neckband.

5 Adjust the chains to obtain the correct fit.

The chain length can be adjusted by lifting it up through the slot in the buckle, adjusting the length and then re-engaging the chain in the slot by pulling down firmly. Ensure that both sides of the chain are the same length.

6 Check the space between the neckband and the animal's neck ridge.

Ensure the neckband's tightness by lifting the top strap above the neck ridge. There should be room to fit your fist between the neck and the strap comfortably.

7 Fit the locking clips.

Fit the two locking clips by pushing them in from the top (or the side of the buckle facing away from the animals neck).

8 Visually inspect the animal.

Take a step back and view the neckband and how it sits on the animal.

Note: Regular checking of the neckband is required when animals are undergoing rapid changes in physical size to ensure animal comfort.

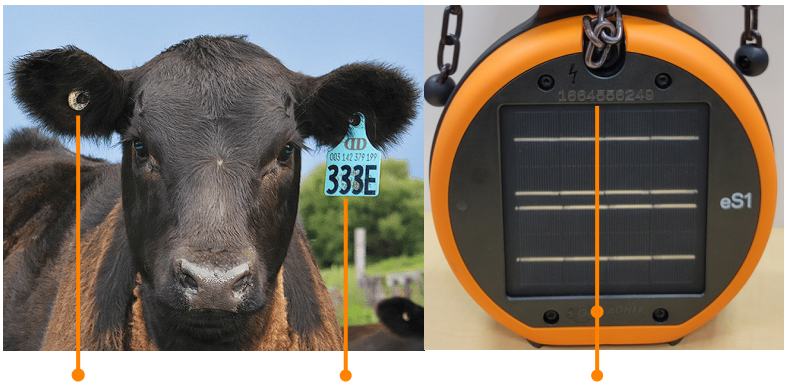
SECTION 7 Assigning Neckbands to animals

Associating neckbands to EIDs/VIDs

For traceability and data tracking, each neckband can be linked to an animal's existing electronic identification (EID) tag or visual (ear) tag (VID).

This association is made using the eShepherd Web App,where all three forms of identification can be interconnected.

Each neckband contains a unique RFID or EID tag which is printed on the neckband. The RFID or EID tag can be scanned or read using a handheld EID reader.



Animal EID	Animal VID	Neckband EID
932521764128106	333E	1664556249

1. Pair the Gallagher Hand Held Reader (HHR) to the eShepherd Mobile App

Compatible with Gallagher Hand Held Readers 4 and above as WiFi capability is required.

Follow the steps in the exact order:

Use your mobile device:

a. Open the eShepherd App and login to the app
Your phone needs to be connected to the internet to login to the mobile app.

b. Only once logged in, go to Settings -> WiFi. **Leave this view open.**

Use the Hand Held Reader:

c. From the 'Main Menu' page, go to the 'Wireless' menu.

d. Choose Wi-Fi (not Bluetooth). The HHR will now be 'Discoverable'.

Use your mobile device:

e. **Android Device:** The HR5-xxxxxxxxxx device will now appear in device list. Select this.
Apple iOS: The HR5-xxxxxxxxxx device will now appear under MY NETWORKS. Select this.
The phone will now connect to the HHR reader.

f. Close the Settings App, and go back to the eShepherd App.

g. Navigate to the Devices menu. The HHR should be listed there.

h. Tap on the listed HHR device to connect it to the mobile app.
Once connected the device will be highlighted green.

2. Create a new session in the eShepherd Mobile App

a. Navigate to the Sessions and start a new session by pressing the '+' button.

b. Accept the default settings and press 'Create'.

3. Scan the neckband to create the association

a. Use the HHR to scan a neckband EID.

b. Scan the animals EID tag or manually enter a VID.

c. The 'association' will then be automatically added to the session list.

d. Repeat with the next neckband and animal.

4. Upload the session to the eShepherd Web App

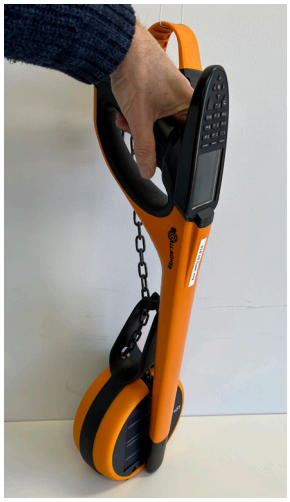
a. Once all Neckbands have been assigned, save the Session and upload to the eShepherd Web App.

Note: When using a combination of a panel reader and weigh scale to collect animal performance data, there's a possibility of the neckband's EID tag interfering with the animal's EID tag read. To prevent this, the neckband's EID tag has been 'shielded' to reduce the chance of simultaneous readings. This way, the panel reader only reads the animal's EID tag.

Using the HHR to scan a neckband EID

Reading the neckband's EID with an HHR is a one-time association task. Shielding the EID tag within the neckband prevents panel reader access, posing a challenge for HHR readings.

To successfully read the EID tag, the HHR needs to be positioned very closely to the EID tag location shown.



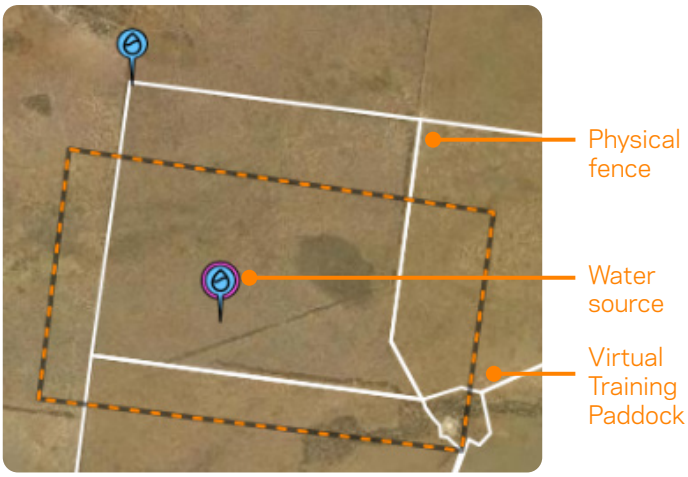
SECTION 8 Introducing Animals to eShepherd

The eShepherd neckbands produce a sequence of audio cues to warn the animal when it is close to a virtual fence. If the animal continues toward the fence and breaches the virtual boundary, a pulse will be delivered. Animals typically learn to avoid the pulse by responding to the audio cues alone within 7-10 days of training.

Ensure all animals have been correctly fitted with neckbands.

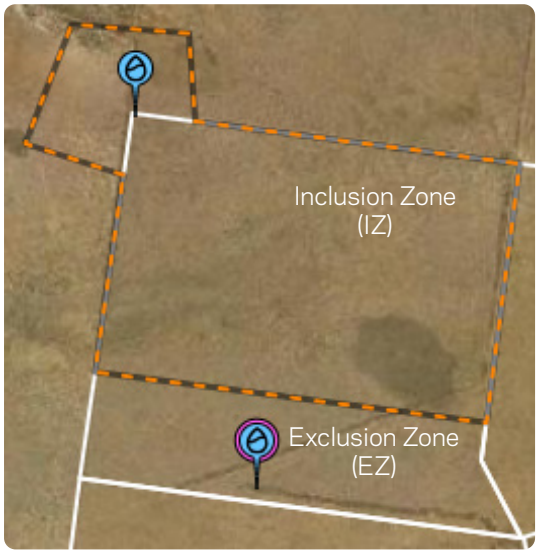
Creating the Virtual Training Paddock (VTP)

- Familiarize yourself with the Important Information p. 3 before setting up the Virtual Training Paddock (VTP).
- Ensure the VTP is situated within a well-maintained physical fenced area with ample pasture and water for the 7-10 day training period.
- Set up the virtual paddock line as straight as possible across the physical paddock to maintain low complexity and high predictability for the animals.
- Provide accessible watering points and easily recognizable shelter within the VTP for the animals.
- Ideally, choose a relatively flat terrain with minimal obstructions, such as dense scrub.
- Ensure that watering points, feeding points, and shelter are positioned at least 15 meters away from any virtual boundary fence.



Example 1

- The VTP is designed to encourage animal interaction within a **single** segment.
- The VTP has a central watering source.
- Additional feed is available allowing the VTP to be moved forward to allow for more feed.
- After 2-3 days of training, edit the VTP so that the virtual fence sits on top of the physical fence line.



Example 2

- This VTP can be used after the initial training period. The virtual fence starts outside the physical fence and after 2-3 days edit the virtual fence to sit on top of the physical fence.
- The water source is in the corner of the paddock. Ensure the VTP boundary allows access to the water source without the animals receiving an audio cue.

Activating the Virtual Training Paddock (VTP)

- Animals must be calmly grazing, walking or resting in the Inclusion Zone (IZ) before activating the VTP, as some may take up to 48 hours to acclimate.
- Allow animals to approach the VTP naturally, without applying pressure or force.
- It may take 7 days for all animals to interact with the VTP and demonstrate understanding.

SECTION 9 Tips and Troubleshooting

- If the solar panels are covered in dirt, they can be cleaned with water and a soft (dish) brush or soft cloth. Do not use strong cleaning agents, petroleum-based solvents or abrasive cleaning aids
- When neckbands are not in use, virtual paddocks that are associated with the neckband should be removed and the neckband should be placed into hibernation. You can find detailed instructions on the Support Portal on how to do this.
- If the Neckband Status LED indicator is flashing RED twice, then the battery capacity is very low and the neckband is not ready for virtual fencing operations. As the battery can only be solar charged, the best way to recover from this state is to leave the neckband exposed to full sunlight for 1 – 2 days.

SECTION 10 Neckband Status LED

The eShepherd neckband status LED indicator can show a number of different conditions of the device.

LED	Condition
	Battery charge is OK GPS/GNSS ready Network Connection OK
	Neckband initialising Attempting to connect to network
	When flashing **TWO** times: Battery is low **Do not fit to an animal**
	When flashing **ONE** time: Neckband is not ready GPS/GNSS not ready Has not connected to the network **Do not fit to an animal**
	The neckband has detected the presence of the magnet. When the magnet is in position, the neckband will emit a series of five beeps at one-second intervals and then hibernate the neckband.

SECTION 11 Important Battery Information

The eShepherd Neckband is powered by a long-life lithium based battery which is not user replaceable. A Gallagher Authorised Service Centre must be used for battery replacement or disposal. **Do not attempt to open or dispose of a neckband.**

This battery is charged by the integrated solar panels and does not need to be, nor can it be charged in any other way. Place in the sunlight for 3 days to charge the battery.

When storing the neckband, put the neckband into hibernation mode and store in cool, dry, dark ventilated area to minimize battery current. The battery can be solar charged when in hibernation. Recharge the battery using sunlight on the solar panels when planning to un-hibernate a neckband.

If battery fluid comes in contact with:

Eyes - Flush the affected area with water for at least 15 minutes. Ensure adequate flushing by separating the eyelids with fingers. Call a physician.

Skin - Immediately flush with water and/or soap.

SECTION 12 Transportation and Storage

The eShepherd Neckband is classed as a dangerous goods item under UN regulations (UN3481) as it contains a lithium ion battery. As such, it requires special packaging labelled for transportation that includes the label shown below. We have taken care in packaging the neckbands to ensure that they comply with the IATA (International Air Transport Association) regulations, which will allow for their movement via air, sea, rail, and road.

It is recommended that the neckbands remain in this packaging and are stored in a dry location until fitting to animals. When the neckbands are not in use, virtual paddocks should be removed and the neckband should be placed into hibernation and returned to the supplied packaging, making them compliant for movement around the property or movement to another property. This will preserve the internal battery and ensure the neckband is unable to deliver a pulse. For full guidelines on compliance requirements, please consult your local code for the transport of dangerous goods by road and rail.

WARNING!

When neckbands are handled, care must be taken to avoid touching or making physical contact with the chain electrodes.

SECTION 13 Approvals and Compliance Standards

This product is categorized as eWaste and so cannot be disposed of with other waste or placed in landfill. Do not dispose of the neckband in a fire. Please refer to your local council, state or distributor for disposal advice.

This symbol on the product indicates that this product and with special care, the battery, must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city recycling office or the dealer from whom you purchased the product.

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected, where applicable.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by Gallagher Group Limited could void the user's authority to operate the equipment.

Contains FCC ID: 2AC7Z-ESPC3MINI1, ISED ID: 21098-ESPC3MINI1.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Responsible party (contact for FCC matters only):
Gallagher Group Limited
181 Kahikatea Drive,
Melville, Hamilton, 3204
New Zealand
Contact Us | Gallagher New Zealand

Industry Canada

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

L' appareil est conforme aux normes RSS (Règlements sur le spectre radio) sans licence émise par Industrie Canada. L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

L' équipement est conforme aux limites d'exposition aux radiations établies par ISED pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

SECTION 14 Product Specifications

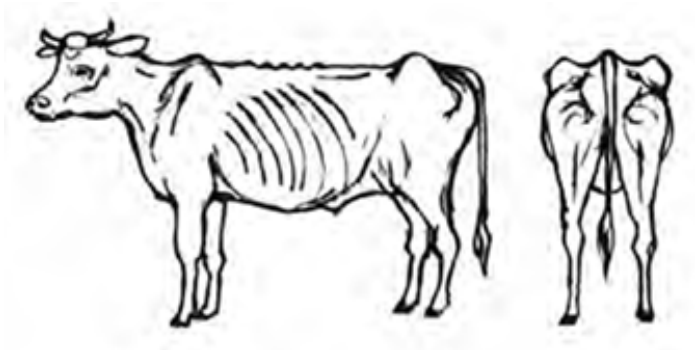
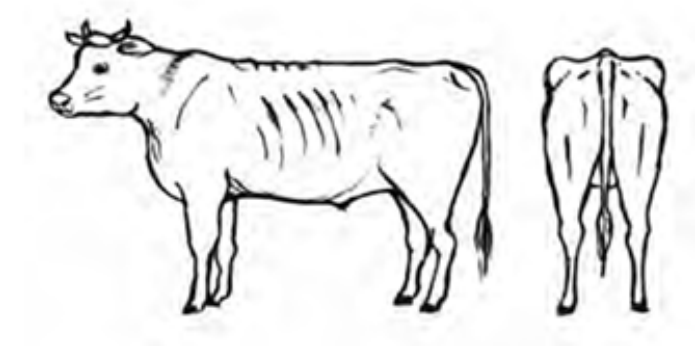
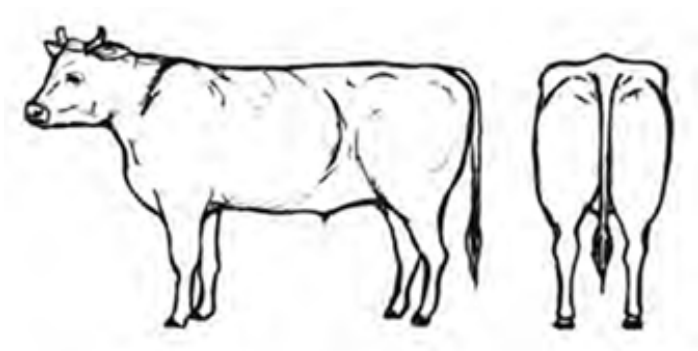
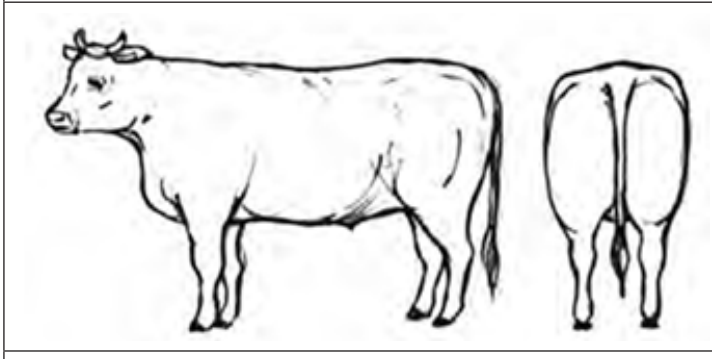
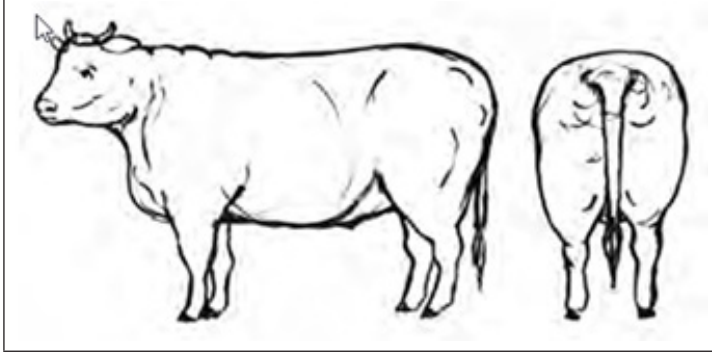
Electrical Specifications	
Current consumption:	30mA
Battery type:	Lithium 3.2V 12Ah
Output energy (500 Ohm load):	0.22J
Output voltage (open circuit):	6kV

Communications	
LoRa Communication (USA/Canada):	902 - 904 MHz
LoRa Communication (AU/NZ):	902 - 928 MHz
GNSS:	Receiver only
WiFi	2.4GHz

Environmental	
Ingress protection:	IPX7
Operating temperature range:	-10 to +70 °C / 14 to 158 °F

Physical	
Dimensions:	210mm (L) x 90mm (W) x 350mm (H)
Weight:	2.7 kg / 5.9lbs (including chains)

SECTION 15 Body Condition Score

	Condition score 1 Backbone prominent Hips and shoulder bones prominent Ribs clearly visible Tail-head area recessed Skeletal body outline
	Condition score 2 Backbone visible Hips and shoulder bones visible Ribs visible faintly Tail-head area slightly recessed Body outline bony
	Condition score 3 Hip bones visible faintly Ribs generally not visible Tail-head area not recessed Body outline almost smooth
	Condition score 4 Hip bones not visible Ribs well covered Tail-head area slightly lumpy Body outline rounded
	Condition score 5 Hip bones showing fat deposit Ribs very well covered Tail-head area very lumpy Body outline bulging due to fat