



EstroScan™ II

Heat Detection System – Hand Held Tag
and Eartag Dual Frequency Reader

Operating Instructions

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IMPORTANT

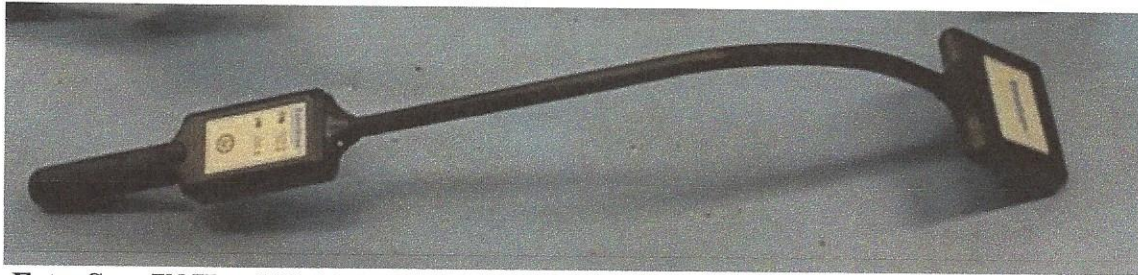
BEFORE YOU USE THE HAND HELD READER THE FIRST TIME:

The Hand Held Reader is equipped with a shipping lock to help prevent unintentional operation or draining of the battery while being transported. When locked, the power switch will have no apparent effect. *The shipping lock must be disabled by the following sequence:*

1. Press and *hold* the **Read** button.
2. While holding Read button, press and *hold* the **Power** button until the **Status** LED shows Red.
3. Release the **Power** button when the **Status** LED shows Red (but continue holding the **Read** button).
4. When the **Status** LED shows Green, release the **Read** button immediately.

The unit will then unlock and begin its normal power up sequence. Thereafter, the Power button should function normally (the lock is now disabled).

NOTE: The unit is shipped with the battery in a partially charged state. After disabling the shipping lock, charge the battery before use (see instructions below).



EstroScan™ Hand Held Reader

Status LED Indicator

- Red – Idle
- Yellow – Reading
- Green – Active Tag Detected
- Flashing Red – Power save
- Green/Red Flash - Low battery

Charge LED Indicator

- Red – Charging
- Green – Done
- Yellow - Error

Power Button

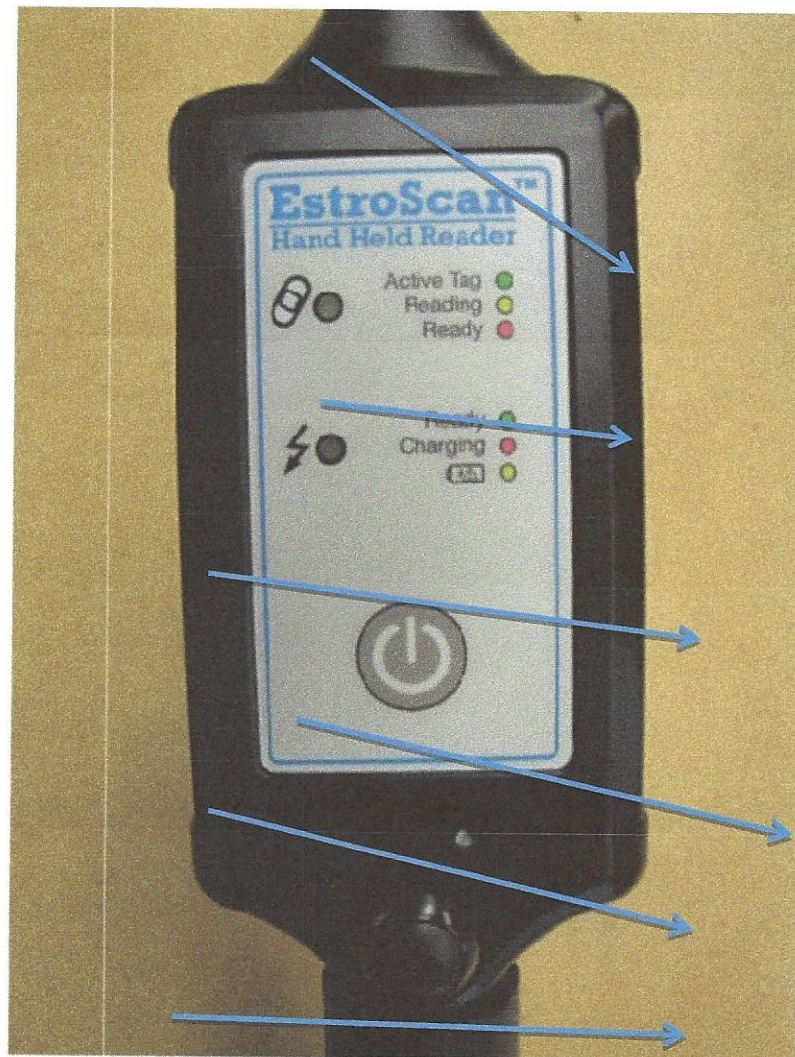
- Push ON
- Push OFF

Beeper and vibration motor (inside)

Read Button

- Hold to read
- Release for Idle
- Press to exit Power save mode

Hand Grip



Operating Controls and Indicators

1. General Information and Operation

1.1 EstroScan™ System and Hand Held Reader Overview

The EstroScan™ heat detection system uses RFID (radio frequency identification) technology to detect and qualify cattle mounting activity for heat detection. This is done by applying special EstroScan™ “tags” to the cattle which are activated by mounting activity and read by the EstroScan™ reader system as the cattle pass under the antenna. EstroScan™ is a dual frequency RFID reader since it will also read regular Low Frequency (LF) RFID eartags by pushing the same Read button when its antenna is positioned near an eartag.

The EstroScan™ Hand Held Reader is a lightweight easy to use device for determining whether tags are activated or not. The system uses HF (high frequency – 13.56MHz) RFID technology. This is different than the LF (low frequency) RFID technology typically used with ear tags. When positioned near a LF eartag the EstroScan™ reader will vibrate, read, store and transmit the LF tag read via its Bluetooth communication module to a cell phone or computer.

The patented EstroScan™ Tags each contain an RFID chip which will not respond until the tag is “activated” by cattle mounting activity. Once activated, the tags are readable by the Hand Held Reader which provides both visual and audio indicators, allowing the cow to be selected for breeding. When the EstroScan™ tag has been read the antenna on the reader may be repositioned to read the eartag on the same animal so the animal may be added to the list of animals selected to be bred that day. These IDs are then stored in the reader’s or computer’s memory.

The **Hand Held Reader** antenna is carefully designed to allow reliable discrimination between activated and inactivated tags. There is a push-to-read **Read** button near the handgrip. There is a beeper and small vibration motor inside the enclosure to help indicate active tags. By also reading the eartag on an animal with an activated EstroScan tag the animals may be bred at a later time or location in accord with the list saved on the cell phone or computer.

The **Hand Held Reader** is powered by a built-in Lithium-ion rechargeable battery. On the rear of the lower enclosure is an environmentally sealed USB connector designed for charging ONLY. There is no USB data connection. Use the provided **USB charger** and USB Cable to recharge the built-in battery. The battery is NOT user replaceable.

1.2 Operation Details

The **Hand Held Reader** operates by using 13.56 MHz RFID (Radio Frequency Identification) to constantly “poll” (look for) activated EstroScan™ Tags while the **Read** button is depressed. The RF field under the antenna extends about 10 to 15 cm from the antenna. The dual frequency EstroScan™ reader also operates on the standard 134.2 kHz Radio Frequency standard with all ISO 11784/85 eartags. So pressing the same **Read** button with the antenna within 15cm of the eartag will enable it to read, store and record the identifying eartag for the cow that EstroScan™ has just sensed is in heat.

To power up the unit: Press the power button on the front panel. The Red **Status** LED should light right away and then the unit performs a brief self-test. The LED turns Red, then Green, the beeper sounds once, the unit’s vibration motor activates briefly, and then the LED turns Red again, indicating that the unit is ready. *If the LED is flashing yellow, there was a problem detected during the self-test.*

To read a tag: Hold the **Read** button down. The **Status** LED should become yellow, indicating that the reader RF field is ON and that the unit is attempting to read any active tags. Bring the reader antenna close to an activated tag. When it reads, the beeper will beep, the vibration motor will activate briefly, and the **Status** LED will turn green. **The LED will stay Green as long as the tag is in range, but there will be a beep only when the tag enters the field.**



CAUTION: The RF Field is on (and near the antenna) when the **Status** LED is Yellow (or Green as a tag is being read) while the **Read** button is being pushed.

Battery life and the Read button: The Hand Held Reader uses much more (10X) battery power while looking for and reading active tags than it does while idle. For this reason, it is recommended to hold the **Read** button down only when actually attempting to read tags. This will greatly extend the time the unit will operate on a charge.

To power the unit OFF: Press the **Power** button. The LED will turn off, indicating the unit has shut down. Note: The **Power** button will not respond to turn the unit off until about 5 seconds after it is first turned on. This is normal.

Automatic Power saving modes: The **Hand Held Reader** automatically goes into a reduced power mode after 30 seconds of inactivity (**Reader** button not pressed). At this point, the beeper will chirp and the **Status** LED changes from steady RED to flashing RED every 1.5 seconds. If the **Read** button is depressed, the unit immediately resumes reading and the timeout is reset. If **Read** button is not depressed within 5 minutes, the unit will power itself off to save battery power.

Low Battery Indication: If the battery gets very low, the unit will enter the power saving mode in 10 seconds rather than 30 seconds and the **Status** LED will show a quick

Green then Red flash rather than a Red flash (every 1.5 seconds). The unit may still be operated if the battery is low, but it is recommended to charge the unit soon.

Low Battery Shutdown: If the battery gets too low to operate, the unit will automatically power itself off. If this happens, you should charge the unit. It may be possible to get a few more reads after waiting a minute from shutdown, but charge the unit as soon as possible.

1.3 Charging the Unit

To Charge the Hand Held Reader: First make sure the USB jack on the back of the unit is clean and free of debris. If it is not, a gentle stream of water may be used to clean the connector. The connector is sealed to keep water out of the inside of the unit. Allow the connector to dry completely before charging if wet. Plug the charging cable into the connector and then into the USB charger. Plug the USB charger into AC power. The **Charge** LED should become Red. When fully charged, the **Charge** LED should become Green. If the **Charge** LED is yellow, it indicates a charge error (such as too hot, too cold, or a charger or battery problem).



WARNING: While the reader is water resistant, the charger is NOT. Do not allow the charger to become wet at any time or use in a wet location. Dry the Reader off before charging if it is wet.



WARNING: Charge the unit only when it is within the charging temperature range (10°C to 35°C). Permanent damage to the battery may result, reducing battery life or even leading to fire or explosion.

1.4 Battery Life

The battery is intended to provide a minimum of 6 hours operation in a typical dairy environment when using the “press to read” by pressing the **Read** button shortly before approaching a tag and releasing the button after attempting to read the tag.

Actual battery charge life (operational time between charges) will vary significantly depending on how it is used. The actual battery usage depends on the operating mode and the actual life is based on how much total time is spent in each operating mode.

Estimated operating time for each mode:

- Reading (button pressed) 3-4 hours
- Idle (button not pressed but not in power saving mode) 30-40 hours
- Power saving mode: about 50 hours

The unit will automatically go into power saving mode after about 1 minute of inactivity (about 15 seconds if the battery is low). To resume normal mode, just press the **Read** button.

Battery charge life is reduced significantly when the temperature is below about 10°C, so operating time will be less at lower temperatures.

2 Safety Information



THERE ARE INHERENT HAZARDS WITH THE OPERATION AND SERVICE OF DAIRY FARM EQUIPMENT. FOR YOUR PERSONAL SAFETY. READ THE ENTIRE MANUAL AND OBSERVE THE FOLLOWING SAFETY PRACTICES:

FAILURE TO OBSERVE THESE SAFETY PRACTICES CAN RESULT IN PERSONAL INJURY OR DEATH.

- The Dual Frequency **Hand Held Reader** must be operated in accordance with these instructions. Become familiar with the controls. All persons who operate or otherwise handle this **Hand Held Reader** must read and understand and follow the safe operating practices, precautions, and warning messages in this documentation.
- **Do Not Open.** There are no user-serviceable parts inside including the battery. Refer to authorized qualified personnel only for service.
- Do not leave the Dual Frequency **Hand Held Reader** in a hot car or truck or where it may exceed the operating temperature range. The Internal Lithium Ion battery can be permanently damaged leading to potential battery failure, fire or explosion.
- Do not use the Dual Frequency **Hand Held reader** if it is damaged, overheats or shows any signs of water incursion. Refer to authorized service personnel.
- The Dual Frequency **Hand Held Reader** emits 13.56 MHz and 134.2 kHz RF energy from the antenna when operating (while the **Read** button is pressed). Do not hold the antenna near (within 20 cm of) your body or another person while the **Read** button is depressed. Turn off the Dual Frequency **Hand Held Reader** when not in use. **Persons with cardiac pacemakers should exercise additional care.**
- Do not use tools (such as a pointer or screwdriver) to press the **Power** or **Read** buttons.
- This Dual Frequency Hand Held Reader is designed to be water resistant but is not intended for direct wash down. It may be cleaned with a gentle stream of water. **DO NOT IMMERSE OR POWER WASH.**

- Only charge the unit within the specified charging temperature range of 10°C to 35°C. Failure to observe this temperature range can greatly reduce the operating life of the battery and could cause permanent damage leading to battery failure, fire or explosion.
- Do not use the charger if it is damaged or wet. The charger is intended for use in dry locations ONLY. **WARNING: DO NOT** attempt to open the **USB Charger**. Refer to authorized service personnel.
- Charge ONLY with the supplied **USB charger** or other chargers authorized by the manufacturer. The Readers' USB port is for charging only and has no data connection.
- Do not leave the unit plugged into the charger for extended periods.
- Do not use the **USB charger** for other uses than charging the **Hand Held Reader**.
- Do not put anything other than the USB cable into the USB connector. Keep it covered with the attached USB cover when not charging. If it has become contaminated with debris, it may be gently cleared with clean water and then air-dried.
- Do not attempt to use this system for any purpose other than as intended by the manufacturer.
- Keep children away from this device.
- Do not make any modifications to the equipment. The internal battery is NOT user replaceable and attempting to do so is not safe due to its polarized connections. Contact service if the battery requires replacement.
- Do not mount or hang anything on the Dual Frequency **Hand Held Reader**.

3 Reading Tags with the Dual Frequency Hand Held Reader

3.1 Tag Activation and Reading Issues

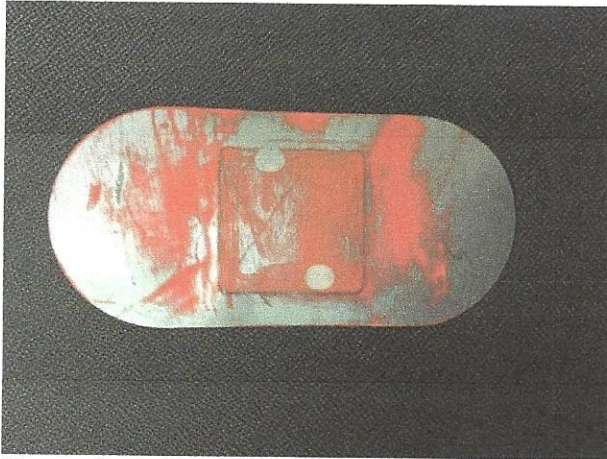
3.1.1 Tag Activation

Tags are inactive when first applied to cows. They will not normally read even when in contact with the bottom of the Hand Held Reader antenna. This is due to an RF “blocking” ring located in the tag center area. As long as this ring is intact, the tag will not read.

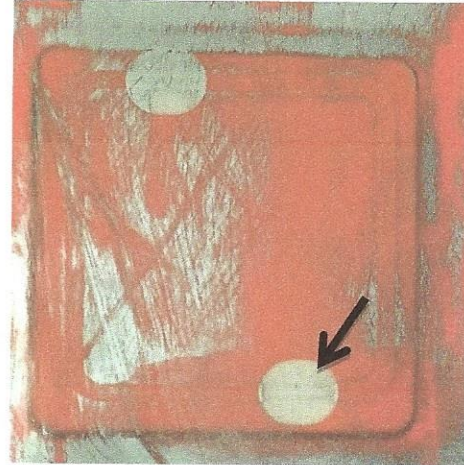
When a cow is mounted, the scratch-off coating on the tag begins to be removed. There are two break-away zones on each tag where the blocking ring can be broken. If the ring in one of the two break-away zones is broken fully, the tag will read (it is “activated”).

Note that each break-away zone has two fine beak points and that both must be broken on at least one of the zones for activation.

The tags are designed to activate when mounting activity is more than tentative. There is, however, a fair amount a variability depending on factors such as how the tag was applied and positioned, the relative anatomy of the two animals, variability of the tag itself, and of course, the amount and nature of the mounting activity. Ideally, the tags will activate when about 30% -50% of the scratch-off has been removed. Tags can be activated with little or no scratch off.



Tag activated and about 30-50% scratch-off activate



Break both traces in either zone to activate

3.1.2 Tag Reading

Normally, tags will read if activated and not read if not activated. So long as the antenna is positioned properly, this will usually be the case. There are some problematic conditions which can affect tag reading even if the antenna is positioned correctly. Here are some factors which can reduce reading range and reliability:

- The specific tag (individual tags vary somewhat).
- The tuning of the antenna (e.g., de-tuning by a metal or concrete too close or because something is in contact with the antenna).
- The angle of the tag with respect to the antenna plane. Tag parallel to the antenna reads the best.
- The position of the tag under the antenna. The RF field is typically strongest toward the center under then antenna.
- The amount of water on the top of the tag (a wet tag will not respond as well).
- Whether the tag is bent (curved over the spine) more than a certain amount. A sharp or steep bend will reduce range.
- Radio “noise” from nearby getting into the antenna (e.g., from a welder, motor, etc. nearby). These can cause a significant loss of reading range.

Information Transfer Equipment (ITE):

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 the receiver.**
- Connect the equipment into an output on a circuit different from that to which the receiver is connected.**
- Consult the dealer or an experienced radio/TV technician for help.**

This device complies with Part 15 of the FCC Rules and Innovation, Science and Economic Development Canada license-exempt RSS standard(s). 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,

Ce produit est conforme à la norme FCC et aux limites d'exposition au rayonnement RSS-102 d'Industrie Canada définies pour un environnement non contrôlé.

Cet appareil est conforme à des règlements Innovation, Sciences et Développement économique Canada exempts de licence standard RSS (s). Son fonctionnement est soumis aux deux conditions Suivantes: (1) Ce dispositif ne doit pas causer d'interférences nuisibles, et (2) cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant entraîner un fonctionnement indésirable.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

4 Hand Held Tag Reader Operating Specifications

4.1 Specifications

RFID Frequency: 13.56 MHz (HF) RFID Frequency: 134.2 kHz (LF)
RFID Maximum Power: 200 mW
Tag: Custom lamination
Eartag: Standard (LF) ISO Protocol 11784/85
Reading range for activated tag: 10-15 cm typical (tag flat and parallel to antenna).
Reading range for eartag: 15-18 cm typical for LF eartag
Tag Reading Angle: +/- 30° from antenna plane
Temperature (Storage (< 1 month)) -20°C to +45°C (-4°F to +113°F)
Temperature (Storage (> 1 month)) 0°C to +30°C (32°F to +86°F)
Temperature (operating) -20°C to +40°C (-4°F to +104°F)
Temperature (charging) +10°C to +35°C (50°F to 95°F)
Humidity: 5% to 95%(non-condensing)
Ingress Protection: IP54
Altitude: 0-2000 m.
Battery: 3.7V / 650 mAH Lithium Ion Rechargeable
Battery Certifications: UL1644; UL2045; IEC 62133; UN 38.2
Radio Certifications: FCC, AS/NZ RCM, R_NZ. (pending), CAN
USB Charger Input Power: 100-240 VAC 50-60 Hz 0.2 A
USB Charger Certifications: CE, RCM /SAA, TUV (AS/NZ60950-1)

Pursuant to FCC 15.21 of the FCC rules, changes not expressly approved by Genesis Instruments or by I.D.ology of Eau Claire, WI, USA might cause harmful interference and void the FCC authorization to operate this product.

This product complies with FCC & Industry Canada's RSS-102 radiation exposure limits set forth for an uncontrolled environment.

This manual is available upon request in electronic format.

Appendix A Troubleshooting



WARNING: RISK OF FIRE OR EXPLOSION: Do not open the device or attempt to replace the battery or service. There are no user-serviceable parts.

Symptom	Likely Cause	Recommendations
No visible LEDs on Reader Panel	The power is OFF. The battery may be discharged. Shipping lock is set.	Verify that the unit is turned ON by pressing the Power button. Try charging the unit. Verify that the shipping lock is not still engaged (see the first page). If the Status LED doesn't come on or comes on briefly, try charging the unit. Contact Service.
Red status LED but not Yellow status LED when Read button is pressed.	Faulty unit.	Contact Service.
Reader Doesn't Read Tag even though Read button is held pressed and Status LED is yellow.	Tag not activated. Tag not close enough to read. Nearby metal is detuning the antenna and tag. Strong RF interference from nearby electrical equipment or radio transmitters	Verify Reader is powered and Status Yellow Light is lighted. Try a different tag. Try Switching Reader OFF and then ON. Verify there is no welder or similar running nearby. Contact Service.
Reader reads tag but reading distance is poor (i.e., less than 10 cm).	Tag isn't fully activated. Antenna or tag are too close to metal such as a fence. Tag is wet or damaged. RF noise in environment is too high.	Try another tag. Check there is no metal on or near antenna. Verify there is no welder or similar equipment running nearby. Contact Service. Remote dial-in may be needed.
Reader reads a tag which is not activated	Tag is too close to antenna. Tag is actually activated.	Make sure the built-in spacer is separating the tag from the antenna. Try a different tag.
No RED Charge LED when charger is connected. (or Green if battery is fully charged)	No AC power to USB charger. USB cable not properly connected or bad cable.	Check power and connections. Try another cable. Contact Service.
Charge LED shows yellow (orange yellow).	Unit has a charging error. Could be too cold or too hot. There could be a problem with the battery or charger.	Check temperature is within the specified charging temperature range. Contact Service.

Status LED lights Green but no beeper sounds.	Beeper only sounds when tag enters the RF field. Unit may be defective.	Remove tag from field and green Status LED should turn yellow. Beep should sound on next tag read. Contact Service.
Reader keeps shutting down.	Battery is low.	Charge battery.