

COWMATA
TAIL SENSOR

USER MANUAL



FARM EDITION

Model NO.: CMT-FARM-GL

1. Product Introduction

The COWMATA tail sensor is an intelligent wearable device designed for dairy and beef cattle operations. It is worn on the tail and uses multi-modal physiological sensing and AI-based fusion algorithms to provide early warnings for key reproductive and health events—including estrus (including silent heat), calving, pregnancy, and health abnormalities. The system supports precision herd management, reduces breeding risks, and minimises economic losses.

Device components:



Model NO: CMT-FARM-GL

Application: Cattle farm

2. Core Functional Advantages

No.	Category	Function	Description
1	On-device Functions	Estrus Alert	Accurately detect visible estrus and silent heat with an overall accuracy rate $\geq 90\%$; send conception alerts 14 to 21 days after insemination, with accuracy comparable to B-mode ultrasound.
2		Calving Alert	Issue early warnings over 3 hours before calving starts; recall rate $\geq 98\%$, false alarm rate $\leq 10\%$.
3		Pregnancy Alerts	Early notification of abnormal conception to facilitate timely reinsemination or intervention.
4		Livestock Health Monitoring	Continuously track body temperature, activity levels, standing and lying behaviors; auto-alert for abnormal conditions.
5		GPS/GNSS Precision Tracking	Satellite-based location tracking, supporting stray cattle tracking and historical trajectory playback.
6	Mobile App Functions	Alert Statistics	Real-time statistics of alert volumes and cattle lists.
7		Cattle Management	Add cattle profiles, bind devices, configure monitoring parameters.
8		Device Management	Add, activate, self-inspect and update devices; display device roster.
9	Farm Management System	Web Management Platform	Access via web browser; batch view herd data, export reports and manage alerts.

This product leverages multimodal physiological data collection and intelligent decision-making to resolve limitations of traditional sensors that fail to monitor silent heat, conception and calving.

3. Technical Specifications

No.	Category	Item	Specifications
1	Physical Specifications	Dimension	Inner diameter $\Phi 80 \sim 110$ mm (self-adaptive adjustment); main body thickness 15 ~ 60mm.
		Weight	Approx. 340 g
		Housing Material	High-strength engineering plastic, silicone anti-slip pad.
		Ingress Protection Rating	IP67
2	Sensors	Photoplethysmography (PPG)	Accurate high-quality PPG signal acquisition, adaptable to tail skin of cattle with different pigmentation.
		Body Temperature Monitoring	High-precision NTC sensor, tolerance: $\pm 0.1^{\circ}\text{C}$.
		Motion Monitoring	9-axis IMU (accelerometer, gyroscope, magnetometer).
		Positioning	Satellite positioning.
3	Wireless Communication	Cellular Standard	4G LTE Cat-1.
		Supported Frequency Bands	LTE-FDD: B1/B3/B5/B8 LTE-TDD: B34/B38/B39/B40/B41 *Only compatible with 4G frequency bands of mainland China telecom carriers.
		Network Requirement	4G IoT SIM card. IoT SIM card is pre-installed inside the device, no manual SIM installation is required by users.

Glossary (Term Explanations)

9-axis IMU: Integrates 3-axis accelerometer, 3-axis gyroscope and 3-axis magnetometer for collection of device attitude and motion data.

NTC: High-precision negative temperature coefficient thermistor deployed for precise livestock body surface temperature measurement.

IP67: Fully dust-tight, resistant to temporary water immersion; suited for harsh ranch conditions including water spraying and muddy ground.

4. Management Platform

No.	Category	Configuration Details
1	Mobile App Terminal	Compatible with iOS 12.0, Android 8.0, HarmonyOS 2.0 and above; works with all mainstream smartphones to check cattle alerts and health data anytime.
2	Web Management Platform	Accessible via web browsers; supports multi-herd management, data export and batch alert configuration.

5. Warranty & Support

No.	After-sales Service	Technical Support & Contact Information
1	Warranty Period	12 months from the date of purchase.
2	Non-Warranty Scope	Damage caused by human error, cow biting, unauthorized disassembly or force majeure is not covered under warranty. The magnetic charging cable is a consumable part and excluded from free warranty service.
3	After-sales Hotline	+86 519-86668306
4	Official Website	www.cowmata.com
5	After-sales Email	service@cowmata.com
6	Manufacturer	Yangling Yuanshangyuan Intelligent Technology Co., Ltd.
7	Address	No.16 Shennong Road, Yangling Demonstration Zone, Shaanxi Province.

6. Alert SMS Templates

The system independently generates and sends the following SMS alerts in real time:

No.	SMS Content	Explanation
1	[COWMATA] Cow No.1234: High estrus risk with obvious physical signs and elevated activity & temperature. Manual confirmation before insemination is recommended.	Visible / Silent Estrus Alert
2	[COWMATA] Cow No.1234: Calving warning activated, entering high-risk monitoring status.	Pre-calving Alert
3	[COWMATA] Cow No.1234: Critical calving risk! Conduct on-site inspection and assist delivery immediately.	Emergency Calving Alert
4	[COWMATA] Cow No.1234: Conception confirmed, probability 91%.	Successful Conception Notification
5	[COWMATA] Cow No.1234: Abnormal conception alert, B-mode ultrasound recheck recommended.	Empty Womb / Abortion Risk Alert
6	[COWMATA] Cow No.1234: Abnormal bovine physical signs with reduced activity. Close observation required.	General Health Abnormality Alert
7	[COWMATA] Device No.1234: Battery level below 15%, please charge promptly.	Low Battery Reminder
8	[COWMATA] Device No.1234: Device detachment detected, please inspect and handle on site without delay.	Device Fall-off Alert

Notes: 1.Regular straining refers to periodic uterine contractions and pushing movements before calving;
2.Cow No. stands for the unique ID of each cow, which must be entered accurately in the App.

7. Daily Maintenance

7.1 Cleaning & Care

(1) Standard cleaning steps after removing the device:

- Rinse the housing and silicone pads with clean water;
- Or wipe the surface with a dry soft brush or slightly damp soft cloth.

✗ Prohibited Operations:

- (1) No high-pressure water/steam/solvent (acetone, thinners) cleaning.
- (2) Do not refit pad or power on with damp charging ports.
- (3) Prohibit submersion in disinfectants & chemicals.

7.2 Battery Maintenance

- (1) Under normal operating conditions, battery life lasts approximately 6 months. SMS and App reminders will be sent when power drops below 15%;
- (2) For long-term storage (3 months): Charge the battery to 50% ~ 70% then power off the unit. Storage temperature: -10°C ~ 35°C, relative humidity <75%. Recharge to 50% ~ 70% every 6 months.

- ✗ Prohibition: Do not store the device with fully depleted batteries for long periods, as this will cause irreversible damage to battery cells.

7.3 Firmware Update

- (1) Firmware updates are automatically and silently deployed over 4G networks with no manual operation required;
- (2) Check the current firmware version in the App: Device Management → Device Details.

7.4 Standard Procedure for Long-term Device Deactivation

No.	Category	Operation
1	Unbind Device	Unbind the device in the App to disconnect data linkage with the target cow.
2	Battery Preparation	Charge the device to 50% ~ 70% power level.
3	Power Off	Press the power button for 3 seconds until the indicator light turns off.
4	Storage Environment	Store in a cool, shaded and dry location.
5	Periodic Maintenance	Take out the device every 6 months and recharge to 50% ~ 70% to preserve battery activity.

- ✗ Do not store the device at power $\leq 15\%$ or with fully drained batteries;
- ✗ Do not store in environments with temperatures above 35°C, below -10°C, or high humidity.

⚠ Reactivation Tip: Before reusing the device, connect the charging cable to activate the battery first, then follow standard wearing and binding procedures.

8. FAQ Quick Reference

No.	Problem	Quick Solution
1	Unable to power on	Charge for 30 minutes; check activation status if the issue persists.
2	Solid red light after startup	Verify whether the device has been activated.
3	No SMS alerts received	Check network signal, built-in SIM card and notification mobile numbers configured in the App.
4	Low battery reminder	Charge the device (refer to the battery percentage shown in the App).
5	Inaccurate positioning	Move cattle to open ground and clean the surface of the tail sensor.
6	How to reset the device	Unbind the device in the App for automatic reset.
7	How to use herd positioning	Select target cattle in the App and use the "Herd Location" function to locate them.

9. System Roles & Permission List

COWMATA's permission system unifies access rules for its mobile App and web management platform.

Mobile App: For farm frontline workers (feeders, supervisors).

Supports on-site tasks: device binding, alert handling and cattle status tagging, optimized for quick field operation.

Web Platform: For managers and farm owners. Offers multi-farm data dashboards, breeding reports, staff permission setup, incident review and system configuration for overall centralized management.

A unified access model defines permission limits for both ends, guaranteeing identical role access rights on the App and web with no inconsistencies.

Overview of Role Hierarchy:

No.	Role	Description
1	Enterprise Super Admin Account	Highest-level authority with full access to all enterprise management functions.
2	Enterprise Manager	Enterprise-level management; manages farm supervisors and all farms.
3	Farm Supervisor	Farm-level management; manages system administrators and feeders.
4	System Administrator	Farm operation maintenance and full device management.
5	Feeder	Daily cattle management and basic device assignment operations.

*Enterprise Super Admin Accounts and Enterprise Managers focus on remote overall planning; Farm Supervisors and System Administrators handle on-site operation and maintenance; Feeders only manage cattle and perform basic device operations.

Detailed Permissions by Role:

Role	Permission Category	Permission Scope
Enterprise Super Admin Account	Account Management	Create accounts, edit account details, reset passwords.
	Staff Management	Create, delete and edit enterprise administrator accounts.
	Enterprise Administration	Full enterprise governance permissions: create/delete/update ranches, view all ranch reports & operational data, receive enterprise-level major incident alerts, etc.
	Inherited Permissions	Possess all permissions assigned to enterprise administrators.

Enterprise Administrator	Account Management	Edit account details, reset passwords.
	Staff Management	Create accounts, edit account details, reset passwords.
	Ranch Management	Create, delete and edit ranches.
	Data Viewing	Access reports and operational data of all ranches.
	Message Reception	Receive enterprise-grade incident alerts: cattle epidemic warnings, data monitoring exceptions, custom enterprise emergency events.
	Inherited Permissions	Inherit all ranch supervisor privileges.
Ranch Supervisor	Staff Management	Manage system admins and feeders.
	Inherited Permissions	Inherit all system administrator privileges.
System Administrator	Ranch Management	Edit local ranch data, view operational metrics.
	Device O&M	Configure devices, handle inventory, repairs & asset retirement.
	Inherited Permissions	Inherit all feeder privileges.
Feeder	Cattle Management	Edit cattle profiles, tag status, view live sensor data.
	Device Operation	Bind/unbind hardware (no device configuration or asset disposal rights).
	Message Reception	View all platform system notifications.
	Account Management	Modify personal profile & login password.

Message Types & Recipient Coverage:

Message Type	Content	Target Recipient Roles
Enterprise-Level Major Incidents	Herd epidemic early warnings, custom enterprise major incidents.	Enterprise Super Admin Accounts, Enterprise Administrators
Daily Ranch Management Events	Ranch-level major incidents, device detachment, low battery alerts, calving alerts, estrus alerts, conception results, etc.	Ranch Supervisors, System Administrators, Feeders

10. Critical Safety & Legal Statements

No.	Safety Notes	Legal Disclaimer
1	Cattle-Only Application	Auxiliary ranch tool, not veterinary diagnosis reference; validate alerts via manual checks or vet opinions.
2	Livestock Safety	Sanitize the cattle's tail skin before fitting. Take off the device promptly if skin irritation or abrasion occurs after first use.
3	Battery Safety Warning	Built-in lithium battery: no disassembly, impact, squeezing or flame exposure.
4	Usage Restriction	Do not activate wireless functions close to medical gear (pacemakers etc.).
5	Environmental Protection Guidelines	Avoid high-pressure rinsing of sensor windows; keep the product away from strong acids & alkalis.
6	Disposal Instruction	Complies with EU WEEE Directive; never dispose of it as household garbage.
7	Child Safety	Keep hardware & charging parts out of children's reach against strangulation and choking risks.

*Yangling Yuanshangyuan Intelligent Technology Co., Ltd. may revise product specs with no advance notification.