CowManager sensor

Model CWS4-S8 and CWS4-S9

User Manual

Contents

1 Intended use

The CWS4 is part of the CowManager system and is meant to be installed in a bovine's ear to collect information about the ear temperature, activity, rumination and eating behaviour of a cow. The device transmits the collected data via wireless communication to the system.

2 Safety warnings

- The CWS4 is meant to be used for the monitoring of bovine only.
- Do not use the CWS4 on another position than the one indicated by this manual.
- Do not modify or alter the CWS4 in any way. Alteration or modification may affect the safety, performance and/or accuracy.
- Do not expose the sensor to fire or other heat sources.
- Avoid storage in direct sunlight.
- Do not crush or disassemble the sensor and do not subject the sensor to mechanical shock.
- To prevent damage, do not soak or immerse the CWS4 in any liquid solution.
- For cleaning of the CWS4 follow the instructions described in chapter 6 "Maintenance information".
- Do not expose the sensor to excessive heat (above 80°C or 176°F). This may cause electrolyte leakage or explosion of the battery in the device. Don't expose the sensor to excessive cold (below -40°C or -40°F).

3 Installation instructions

To be able to use a CowManager sensor, it must be activated in your CowManager system first. For activation, the CowManager application must be installed on your PC and a so-called "Coordinator" must be connected and configured.

Details regarding activation of the sensor can be found in the CowManager Instruction Guide.

It is important to correctly attach the tags to the cow's ear in a secure manner to avoid them from turning or falling off.

The sensor can be attached to the ear either by using a sensor compatible EID or a blank tag.

Before using (electronic) ear tags for attaching the CM sensor, you should familiarize yourself with the local laws and regulations regarding the use of ear tags in bovines.

In Figure 1 the blank tag and Tagger are shown.

A blank tag assembly consists of two parts, namely, a female front part that is place into the ring of the sensor and a male back pin.

CowManager part numbers:

Female part: CM004012
Male part: CM004011

Female tag part placed into the ring of the sensor

Male tag part to be placed into the tagger

Tagger

Figure 1

3.1 Placing the sensor in the ear

- If your cows don't have ear tags in already, put the new ear tag (blank tag or RFID) in the sensor (Figure 1).
- Make sure that the black insert (Figure 2) is removed, otherwise the sensor won't fit, and place the sensor in the tagger.
- Make sure that the right sensors will be linked to the right cow. You can easily link the sensors to the cows by using the mobile app.
- Place the sensor in the middle of the left ear between the two cartilages (on 1/2 - 1/3). This is the thicker part of the ear.

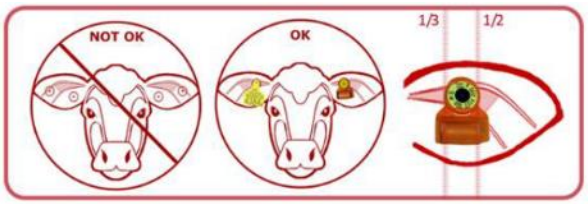

Figure 2

4 Serial number and certification marks

Every CWS4 sensor does have a unique serial number. A label with this number is located at the back of the sensor, see Figure 3 for the model CWS4-S8 and Figure 4 for the model CWS4-S9.
Remark: The real serial number is longer then the two letters and six digits that are displayed on the label. The number starts with “A0000ABB” but since that part is generic for all sensors, this has been omitted.
If the QR-code is scanned all 16 positions of the serial number will be displayed.

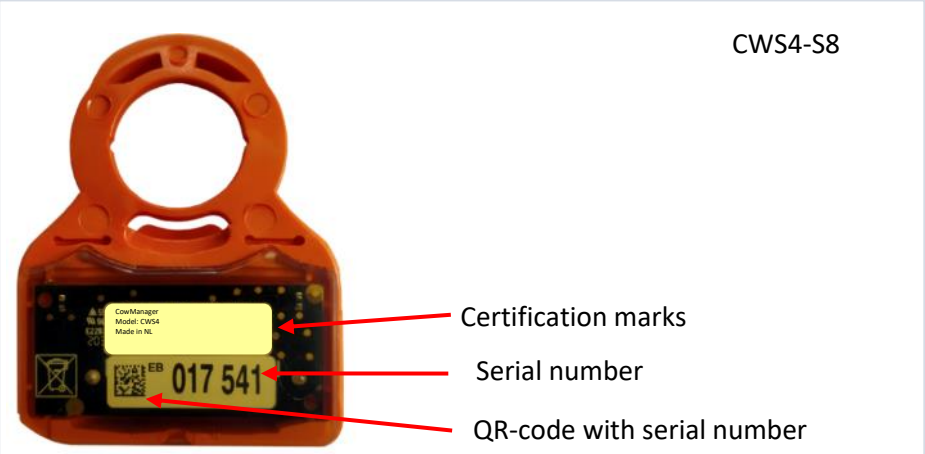

Figure 3

Figure 4

5 Troubleshooting

In order to operate correctly, the sensor needs to be able to communicate every 15 minutes with a so-called Router or Coordinator.

Communication can be disturbed because of the following reasons:

1. If the distance between the sensor and Router/Coordinator is too large. The operating distance of the CWS4 series is around 100 meters (about 330 feet) in a free line of sight situation.
   Obstacles like walls, roofs, metal objects, foliage, topography or bad weather conditions will have a negative influence on the operating distance.
2. A strong transmitter that operates in the same frequency band as the sensor. For example, Wi-Fi equipment like Routers, Access Point and Repeaters, but also P2P devices The sensor communicates using Zigbee channel 11 in the 2,4GHz frequency band and this overlaps with channel 1 of a Wi-Fi network. In case of communication problems, check the configuration of Wi-Fi and other network equipment to make sure that this equipment doesn't use Wi-Fi channel 1.

   The 3.x series have an operating temperature range from -20 up to 40 degrees Celsius or -4 up to 104 Fahrenheit. When the environmental temperature is outside this range the operating distance of the device may decrease and irreversible damage could occur.

If the sensor cannot communicate because of a technical issue with the sensor itself, this is made visible by a blinking LED. See Figure 5 for the location of the LED. Replace the sensor if this occurs.

CWS4-S8

CWS4-S9

Figure 5, location of the LED

6 Maintenance information

The sensor is moulded with a waterproof material that also protects the sensor against barn gases and manure. In case cleaning of the sensor is required:

- Always use water without additives, with a maximum temperature of 40°C (104°F), and a soft brush.
- The device should not be submerged.
- Do not dry the sensor in an oven or microwave but always use a cloth.
- Always handle sensors with care.

7 Information on disposal of the sensor

The sensor is marked with this symbol. It means that electrical and electronic products should **not** be mixed with general household waste. There is a separate collection system for these products.

Attention: If you want to dispose of this sensor, please take this product to electronic waste collection points.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest electronic waste collection point.

8 Technical specifications

Parameter	Value	Unit
Power		
Supply voltage	3.6	V
Battery capacity (at 20 °C)	1200	mAh
Battery chemistry	Lithium Thionyl	-
Wireless		
Standard	IEEE802.15.4a	
Operational frequency	2405 - 2480	MHz
Operating channel (default)	11	-
Modulation	OQPSK	-
Transmission power	<10	dBm
Antenna polarization	Omnidirectional	-
Range of RF link (outdoor, free line of sight)	100 / 330	m / ft
Environmental		
Environmental protection level / IP rating	IP67	-
Operating temperature	-20 – 40	°C
Operating relative humidity	10 – 95	%RH
Storage temperature	0 – 40	°C
Physical		
Dimensions	50 x 65 x 19	mm
Weight	30	g

9 Approvals, Regulatory Compliance

9.1 FCC and IC declarations

FCC ID: Y8K-CWS4
IC ID: 22382-CWS4

Compliance statement (part 15.19)
This device complies with part 15 of the FCC Rules and with the Industry 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Warning (part 15.21)
Changes or modifications not explicitely approved by the party responsible for compliance could void the user's authority to operate the equipment.

9.2	KC Certification South Korea	Approval pending
9.3	ICASA South Africa	Approval pending
9.4	Taiwan	Approval pending
9.5	Ukraine	Approval pending
9.6	Europe	Approval pending
9.7	United Kingdom	Approval pending

The CWS4 is in conformity with the Radio Equipment Directive (RED) (2014/53/EU) and RoHS Directive 2011/65/EU?? (To be defined with Kiwa).

10 Explanation of Markings

Disposal of the CWS4; it means that the CWS4 should not be mixed with general household waste.

IP67 Ingress protection code is 67.

The CE mark shows that the CWS4 meets the requirements for safety and health (Article 3.1(a)), electromagnetic compatibility (Article 3.1(b)), and the efficient use of the radio spectrum (Article 3.2) of the RED directive 2014/53/EU.

11 Contact details

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