Coordinator/Router (CR3)
WIB2000
User manual

Contents

1 Intended use

The WIB2000 is part of the CowManager system and is used to establish a wireless connection between the Cow Wellness Sensor (CWS) that is attached to the cow's ear, and the computer with the CowManager application installed. The WIB2000 can be configured to act as a Coordinator or Router in the network. A Coordinator is always required because this device functions a base station. If the distance between the CWS and Coordinator becomes too large, extra Routers can be added an installed nearby the location of the sensors.

2 Safety warnings

- The WIB2000 is meant to be used for communication with the CWS or other WIB2000's.
- Install the WIB2000 according to the installation instructions in this manual.
- Use CowManager supplied parts only.
- Do not modify or alter the WIB2000 in any way. Alteration or modification may affect the safety, performance and/or accuracy.
- Do not crush or disassemble the WIB2000.
- To prevent damage, do not soak or immerse the WIB2000 in any liquid solution.
- For cleaning of the WIB2000 follow the instructions described in chapter 7 "Maintenance information".
- Do not expose the WIB2000 to excessive heat (above 80°C or 176°F) or cold (below -40°C or -40°F).

3 Installation instructions

Place the supplied antenna on the WIB2000 and connect the USB cable according to Figure 1.

Figure 1

Remark:

- The length of the supplied USB cable is 4.5 meter (15 feet) for a Coordinator and 3 meter (10 feet) for a Router.
- The use of USB extension cords and secondary USB hubs is not allowed!

Important installation notes:

- For both the antenna and blue ring of the USB connector it is important to securely tighten them. Don't use pliers but tighten them firmly by hand.
- To be able to use the WIB2000, it must be activated in your CowManager system first. Details regarding activation of the WIB2000 can be found in the CowManager Instruction Guide.
- A Coordinator always needs to stay attached to the computer! This device makes sure that the data received by the Sensors and Router(s) in the network will be collected and processed. Also, power for the coordinator is supplied via the USB port of the computer. Make sure that the computer is always switched on, connected with the internet and that the sleep mode is disabled in Windows!
- The WIB2000 must be installed indoors.
- In order to have the best signal coverage the device must be placed around 3.5 meters or 11ft above the ground. At all times we strive for a free line of sight to other devices with the antenna pointing and secured up. Make sure there is a distance of at least 1 meter between the roof and the antenna.
- The supplied screws or cable ties can be used for mounting the WIB2000.

Screws and cable ties supplied with the WIB2000.

Example of using cable ties to mount the WIB2000 on a pole.

- In case of a Router installation, the supplied power adapter must be used as power supply.
- Make sure that the antenna is always in a vertical up position. In case the WIB2000 is placed in a horizontal position, the cable tie should not be placed.

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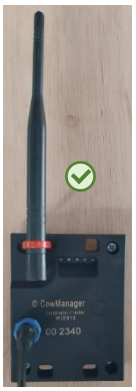
- Avoid sharp bending of the USB cable on the computer, power adapter and WIB2000 side.

WIB2000 installed in horizontal position.	WIB2000 installed in vertical position.	Avoid sharp bending of the USB cable.
 	 	

4 Serial number and certification marks

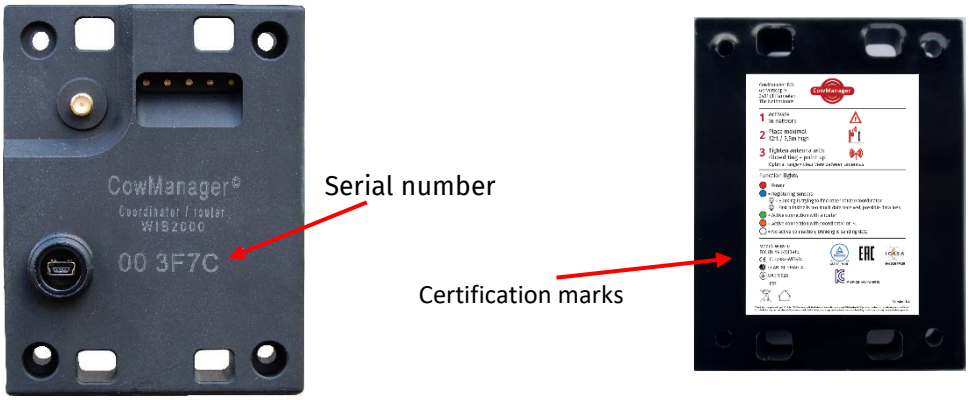


Figure 2

Every WIB2000 does have a unique serial number. See Figure 2 for the location of it.
Remark: The real serial number is longer then the six digits that are present on device.
The number starts with “0000F00000” but since that part is generic for all devices this is omitted.

5 Indicator lights on the WIB2000

On the WIB2000, five indicator lights are present to check the status of the device. Depending on the function of the WIB2000 (Coordinator or Router) some indicators have a different function.

5.1 Function of the indicator lights on a Coordinator

Lights on the Router	Function
Red	On -> Power is present.
Blue	On -> Registering of Sensors.
Green	On -> Active connection with a Router.
Orange	On -> Active connection with a PC. Blinking -> Connection is lost.
White	On -> Coordinator activated, but no active connection. Blinking -> Sending data.

5.2 Function of the indicator lights on a Router

Lights on the Router	Function
Red	On -> Power is present.
Blue	Blinking -> Trying to connect to another Router or Coordinator. Fast Blinking -> To much data received, possible data loss.
Green	On -> Another Router is connected to this one.
Orange	On -> Active connection with a Coordinator or other Router. Blinking -> Connected to another Router but not to a Coordinator yet (via that Router).
White	On -> No active connection. Blinking -> Sending data.

6 Troubleshooting

Communication can be disturbed because of the following reasons:

1. If the distance between Routers or the Coordinator is too large. The operating distance between the WIB2000 devices could go up to 800 meter or 2600ft, when having a free line of sight. Anything in the free line of sight has impact: walls, roofs, foliage, topography, or bad weather conditions. Metal objects and concrete walls are major obstacles.
2. A strong transmitter that operates in the same frequency band as the WIB2000. For example, Wi-Fi equipment like Routers, Access Point and Repeaters, but also P2P devices. The WIB2000 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 does not use Wi-Fi channel 1.
3. The antenna is not in the vertical up position. See “Installation instructions”.

The WIB2000 has an operating temperature range from -20°C (-4°F) up to 40°C (104°F). When the environmental temperature is outside this range the operating distance of the device will decrease, and irreversible damage could occur.

In case of malfunction check the indicator lights, power supply and wiring of the device.

7 Maintenance information

The WIB2000 is moulded with a waterproof material, as is the blue USB connector on the cable. The device can be placed outside and is rain-proof when the USB cable and antenna are connected correctly.
In case cleaning is required:

- Always use water without additives, with a maximum temperature of 40°C (104°F), and a soft brush.
- The device may not be submerged.
- Leave the antenna and USB cable connected to avoid water entering the connectors.
- Do not dry the WIB2000 in an oven or microwave, always use a cloth.
- Always handle the device with care.

8 Information on disposal of the WIB2000

The WIB2000 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 device, 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.

9 Technical specifications

Parameter	Value	Unit
Power		
Supply voltage Current	5 Average 35, peak 200	VDC mA
Supply source	USB interface	-
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)	800 / 2600	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	109 x 84 x 31	mm
Weight	271	g

10 Approvals, Regulatory Compliance

10.1 FCC and IC declarations

Federal Communication Commission (FCC) statements

This equipment has been tested and found to comply with the limits for a class A 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 frequent energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. 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 into an outlet on a circuit different from that to which the receiver.

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.
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. To ensure compliance with FCC regulations, use only the

shielded interface cables provided with the product, or additional specified components or accessories that can be used with the installation of the product. To comply with FCC and Industry Canada RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20 cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada statements

This Device complies with Industry Canada License-exempt ISED 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.
This Class A digital apparatus complies with Canadian ICES-003.
To comply with FCC and Industry Canada RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20 cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.
This radio transmitter IC: 22382-WIB2000 has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.
The following antenna must be used with the device:
Model GC-AP11 as delivered with the device. The antenna has a gain of 5 dBi.

Le présent appareil est conforme aux CNR d'ISDE Canada applicables aux appareils radio exempts de licence.
L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
Cet appareil numérique de Classe A est conforme à la norme Canadienne ICES-003.
Pour se conformer aux limites d'exposition aux rayonnements RF de la FCC et d'Industrie Canada pour la population générale, la ou les antennes utilisées pour cet émetteur doivent être installées de telle sorte qu'une distance de séparation minimale de 20 cm soit maintenue entre le radiateur (antenne) et toutes les personnes à tout moment et ne doit pas être co-localisé ou fonctionner en conjonction avec toute autre antenne ou émetteur.
Cet émetteur radio IC: 22382-WIB2000 a été approuvé par Industrie Canada pour fonctionner avec les types d'antennes indiqués ci-dessous avec le gain maximal admissible indiqué. Les types d'antenne non inclus dans cette liste, ayant un gain supérieur au gain maximal indiqué pour ce type, sont strictement interdits pour être utilisés avec cet appareil.
L'antenne suivante doit être utilisée avec l'appareil :
Modèle GC-AP11 livré avec l'appareil.
L'antenne a un gain de 5 dBi.

10.2 Approvals

Certification approval logo can be found on product. In case of limited space, certification approval logo can be found on packaging according to regulations.

Canada	IC: 22382-WIB2000
United States	FCC ID: Y8K-WIB2000

The WIB2000 is in conformity with the Radio Equipment Directive (RED) 2014/53/EU and RoHS Directive 2011/65/EU.

11 Explanation of Markings

Disposal of the WIB2000; it means that the WIB2000 should not be mixed with general household waste.

IP67 Ingress protection code is 67.

The CE mark shows that the WIB2000 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.

12 Contact details

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