Schippers

One-stop-shop for livestock farmers

HyCare Gateway

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Important information

Liability

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There are many different applications of this product. Those responsible for the use of this device must ensure that all the necessary steps have been taken to verify that the applications meet all performance and safety requirements including any applicable laws, regulations, codes, and standards.

Eywa BV will under no circumstances assume liability or responsibility for any problems that may arise as a result from the use of undocumented features, timing, or functional side effects found outside the documented scope of this product. The effects caused by any direct or indirect use of such aspects of the product are undefined, and may include e.g. compatibility issues and stability issues.

The examples and illustrations in this document are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular implementation, Eywa BV cannot assume responsibility for actual use based on these examples and illustrations.

Intellectual Property Rights

Eywa BV has the intellectual property rights relating to technology embodied in the product described in this document.

Safety guidelines

Please take the following guidelines seriously, as these can prevent harm to the device, yourself and your environment.

General recommendations

- Never ever break the warranty seal and open the product.
- Do not submerge the product.
- Do not drop, throw or try to bend the product.
- Do not paint the product.
- Do not touch the antenna unnecessarily.
- Do not install the product in the direct vicinity of people.

Ambient temperature

Do not operate the product below -20°C and above 60°C.

Make sure that the ambient temperature does not exceed the specified temperature limits of the AC adapter.

Explosive atmosphere

Turn off the product in areas with a potentially explosive atmosphere. In case of exceptional malfunction the product could generate sparks, which could cause an explosion or fire. Areas with a potentially explosive atmosphere are not always clearly marked. They include fueling areas (petrol filling stations), below deck on boats, fuel or chemical transfer or storage facilities and areas where the air contains chemicals or particles, such as grain, dust, or metal powders. Do not transport or store your product in the compartment of a vehicle which contains flammable gas, liquid or explosives.

Blasting areas – construction sites

Do not use in blasting areas in order to avoid interference with two-way radios used in blasting operations.

Do not use on aircraft

Using a wireless devices on aircraft can cause interference. Do not use it when the plane is on the ground without permission from the aircraft crew.

Medical equipment

Do not use near medical equipment, especially life support equipment that might be susceptible to radio interference.

Electrostatic Discharge (ESD)

Avoid handling the product when ESD precautions are not taken.

EMC

This is a EMC Class A device specifically designed for use in business, industrial and commercial settings, such as offices, industrial facilities, laboratories and other environments in which some degree of electromagnetic emissions is expected. In a domestic environment this product may cause radio interference.

About this document

This manual describes how to install and put the product in service.

For more information and file downloads, please visit our support website at http://help.calculus.group.

Version history

Version	Date	Author	Red.	
V24.1	13/12/2024	VP	VP	Initial version
V25.1	19/03/2025	VP	VP	Added blue/orange connection indicators. Supplemented troubleshooting.

Installation

Delivery contents

- Power supply 12VDC 2A
- Power cable 10 meter
- Gateway Calculus CX
- LoRa antenna
- 4 wall plugs
- 4 screws
- Manual

Installation procedure

Choosing a place of installation

This product is a wireless radio receiver and transmitter, intended for receiving and sending from widely dispersed LoRa devices. To do this adequately and without loss of messages this product requires a high vantage point. The antenna needs to be free and not blocked by radio absorbing materials.

Take into account that direct sunlight can heat up the device beyond workable temperatures. Installation at the north side of a building or with shade covering should be considered.

Since the cloud connectivity of this device is dependent on cellular technology, please be advised about cell phone towers in the area of installation and install the device with the front pointed in the direction of the closest cellular antenna tower.

Using GPS / GNSS requires an open sky.

Mounting the product

This product is wall mountable with the included screws and plugs.

Use the accompanying sheet with the drill holes indicated to drill the 4 mounting holes. Use a drill bit size 6.

The backside of the device functions as a heat sink. Keeping airflow through the heat sink ribbons is essential for keeping temperature inside the device within parameters. Do not obstruct this airflow, whether it be on top, bottom or sides of the device. Keep a distance of 20cm on all sides to maintain airflow.

Mounting the antenna

Remove any packaging from the antenna and mount it on the gateway antenna connector at the top of the device. Screw tightly by hand.

Power

Connect the power cord to the SD-13 connector at the bottom of the device. Connect the cord with the label side to the power supply. Plug the power supply into a 230VAC outlet.

When powering the device, the logo in the front of the housing should light up green within 2 minutes.

Activation of the device

The device comes preconfigured and activated. Additional steps are not required.

LED indicators

The device lights up from the sides and the front through the logo. There is a difference in the light between clearly pulsating, rotating and constantly on (with a subtle 'breath-like' animation).

Color and intensity varies to indicate the following:

LEDs off	No power, shut down or within 2 minutes of receiving power
Rotating green	Device is booting
Constant breathing green	Device is working as intended
Dimmed breathing green	Device is running hot but functional
Pulsating red	Device is without power and currently working on its backup power battery.
Constant red	Device malfunction
Rotating blue	Device is rebooting or shutting down

Powering off the device

To power down the device, when e.g. sending back the product for a RMA, the device needs to be shut down. Do this by holding the device upside down (with the LoRa connector pointing towards the earth) and tapping gently but confidently on the back of the device. The LEDs shall start animating blue with white and the device will shut down within a minute. When the LEDs are off the device has successfully shut down.

Technical data

Mechanical

Mounting	Pole or wall mounting
Enclosure protection degree	IP66
Weight	1575 g
Operating temperature	-20°C … +60°C (<0°C and >+45°C the battery will not be charged as a safety precaution.)
Storage temperature	-10°C … +60°C (up to one month, for longer periods 25°C max.)
Operational position	Horizontal or vertical
Measurements	260 x 180 x 67mm (without antenna) 260 x 520 x 67mm (with antenna)

Power Supply

Nominal voltage	12-24V DC
Power consumption	6 Watt nominal, 20 Watt peak
Recommended power supply	minimum 20 Watt
Power connections	SD13 2-pin
Reversed polarity protection	Yes
Internal protection	Yes, by fuse
Last breath battery	11,5Wh 2-cell LiFEPO4

Basic Properties

Processor	Arm® Cortex®-A53 64bit 1.2GHz Processor
Internal memory	4 GB user data available
Internal temp. monitoring	Yes
Internal power monitoring	Yes
Internal battery	Yes

GPS	Yes
Software	Calculus platform
	ChirpStack compatible
	Over-the-air updates
	Fog computing capabilities
Motion sensor for wake-up	Yes

Wired/ Wireless

Ethernet	10/100 Mbit/s, RJ45
Cellular	2G, 3G and 4G
LoRa	
Connector	N-type coax connector
Antenna	3dBi 360° Fiberglass Antenna included
Standard	EU868
Channels	8
LoRa Class	A, B, C
Tx Power	27dBm
Rx sensitivity	-139dBm@SF12, BW 125 KHz

Communication

Industrial ethernet protocols	Modbus TCP
Modbus RTU / RS-485	Yes

Software

Calculus portal compliant	Yes
VPN tunneling	Yes

Regulatory compliance

EMC Compliance (CE)

This product (Calculus CX V1) is in conformity with the essential requirements of Annex IV of R&TTE Directive 1999/5/EC.

According to the principle of presumption of conformity, this certificate constitutes support for an EC Declaration of Conformity and CE marking according to following directives:

- EMC directive 2014/30/EU
- RE directive 2014/53/EU
- LV directive 2014/35/EU
- RoHS directive 2011/65/EU
- REACH regulation 1907/2006

Troubleshooting

Occurrence	Recommended action
No incoming data in the platform and bottom right LED indicator is blue.	Gateway is re-initializing the cellular connection. Please wait.
Gateway LEDs are off	Check if the platform is still receiving data. If data is being received LEDs will turn off when internal temperature reaches a critical point. LEDs will turn on when temperature drops. No data is being received. Check power supply High temperature has caused the device to shut down to prevent damage. Wait until the ambient and device temperature are back within normal range. The device will recover itself within half an hour when reaching normal temperatures.
Gateway LEDs stay off after applying power.	If light stays off for more than 2 minutes after powering up and the device is within normal temperatures, the device could be faulty. Initiate an RMA via http://help.calculus.group.
Gateway LEDs are pulsating red.	This indicates a power failure. Check the power supply. The backup battery lasts approximately an hour.
No data is incoming. LEDs constantly frozen (there is no visible animation of the LEDs)	The gateway might have had an exceptional malfunction. Unplug the gateway power supply for a full day (24 hours) and plug back in. If this does not help please initiate an RMA via http://help.calculus.group.
Bottom right LED indicator is orange and possibly no incoming data in platform **Or** Poor reception or cloud connectivity is indicated via the platform	There is no active cellular connection or reception is below average and a stable cellular connection cannot be guaranteed. Action is advised. Make sure the gateway has good reception, move to another location if necessary. (e.g. reposition the gateway to a higher vantage point or direct it to a different cellular tower.)

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