

# Connected AirWits CO2 User Manual

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Connected AirWits CO2 is a connected carbon dioxide (CO2), temperature, and humidity metering device

AirWits CO2

R4

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# Using this manual

Thank you for choosing this Connected Inventions device. This device will provide you high-quality IoT with Connected Inventions' exceptional technology and high standards. This manual has been specially designed to guide you through the functions and features of your device.

## Read me first

- Before using your device, read the entire manual and all safety instructions to ensure safe and proper use.
- The descriptions in this manual are based on the default settings of your device.
- The images used in this manual may differ from the actual product.
- The contents of this manual may differ from software provided by service providers or carriers, and are subject to change without prior notice.
- Access the Connected Inventions website ([www.connectedinventions.com](http://www.connectedinventions.com)) for the latest version of the manual.
- Available features and additional services may vary by service provider.

- Applications on this device may perform differently from comparable applications and may not include all functions available (by ie. downlink messaging features)
- Connected Inventions is not liable for performance issues caused by third-party applications or improper installation.
- Please keep this manual for future reference.

## Malfunction

- In case of malfunction, deliver the device to the supplier. Do not open the cover.

## Transportation

- Do not remove packing material and do not repack the device unless necessary. Contact the shipping agent before transportation. Inside the device there is a battery which contains approximately 3.0 g of lithium.

## Disposal

- Return the device to a disposal station which collects electronics waste and batteries.

## Operation

- Protect the device from moisture, water, and dirt.

# About

Connected Inventions AirWits CO2 is a connected carbon dioxide (CO2), temperature and humidity metering device for real-time and accurate indoor air quality monitoring with low lifetime costs. The device measures and sends CO2, temperature and humidity data once in every 30 minutes. AirWits CO2 uses world-wide Sigfox IoT network for data transmission, enabling very low lifetime cost and long battery life of five years. The device is versatile, connected and accurate, making it a reliable solution for easy longterm and cost-efficient indoor air quality measurement. The device has a real carbon dioxide sensor and thus it is a great solution for air quality measuring for instance in offices, schools or private homes.



# Assembly & Installation



- 1 Save the identifier and the key of the device. The identifier and the PAC key are on the label on the bottom of the device. You can also read the identifier and the PAC key using the QR code.

- 2 Install the wall mount carefully to the surface of your choosing (e.g. to the wall).



- 3 Turn the device on using the power switch at the bottom of the device. The switch is inside of the most left opening.

- 4 Attach the device to the wall mount.





The device needs to be calibrated. During the first 24 hours of initialisation the device needs minimum of 1 hour of fresh air in order to work properly. This means that the device needs a minimum of 1 hour after initialisation in an environment without any CO<sub>2</sub>

**!** Please note! Avoid placing device closer than 15cm from any metal or magnetic object, electric cables, electric devices or selective glass as this will dramatically reduce radio performance as well as battery life of the device.

# Uplink: Payload Description

BYTE	BIT	DESCRIPTION
0	1-2	Temperature
0	3	Humidity
	4 - 5	Carbon dioxide level

## Conversion formulas

Temperature  $\langle \text{value} \rangle / 10 - 40$  ( °C )

Humidity  $\langle \text{value} \rangle$  ( % )

Carbon dioxide  $\langle \text{value} \rangle$  ( PPM )

## Example

Message 0x02713203C3

Temperature  $0x271 / 10 - 40 = 625 / 10 - 40 = 22,5$  °C

Humidity  $0x32 = 50$  %

Carbon dioxide  $0x3C3 = 963$  PPM



# Downlink

The settings of the device can be updated with the downlink message

- The device requests new settings every 50 messages

You must be very careful when you update the settings

- The settings affect both the subscription and the battery life of the device

The downlink message is optional

If the downlink message is not sent, the device continues with the current settings

By default, the device measures and transmits every 30 minutes

The measurement and transmission intervals can be adjusted with the settings

- The device transmits if the carbon dioxide level has exceeded the threshold or the temperature or the humidity have changed more than the threshold after the previous transmission

Check that the new settings are valid before applying them

- The measurement interval cannot be longer than the transmission interval
- The transmission interval must be multiple of the measurement interval

If the new settings are not valid, the device continues with the current settings

BYTES	DESCRIPTION
1	Transmission interval
2	Measurement interval
3	Temperature delta threshold
4	Humidity delta threshold
5 - 6	Carbon dioxide threshold
7 - 8	Not applicable, set to zeroes

# Downlink: Transmission interval

VALUE	INTERVAL	VALUE	INTERVAL
0	NOT APPLICABLE	8	NOT APPLICABLE
1	10 MINS	9	NOT APPLICABLE
2	20 MINS	A	NOT APPLICABLE
3	30 MINS (DEFAULT)	B	NOT APPLICABLE
4	1 H	C	NOT APPLICABLE
5	2 H	D	NOT APPLICABLE
6	NOT APPLICABLE	E	NOT APPLICABLE
7	NOT APPLICABLE	F	NOT APPLICABLE

# Downlink: Measurement interval

VALUE	INTERVAL	VALUE	INTERVAL
0	NOT APPLICABLE	8	NOT APPLICABLE
1	10 MINS	9	NOT APPLICABLE
2	20 MINS	A	NOT APPLICABLE
3	30 MINS (DEFAULT)	B	NOT APPLICABLE
4	1 H	C	NOT APPLICABLE
5	2 H	D	NOT APPLICABLE
6	NOT APPLICABLE	E	NOT APPLICABLE
7	NOT APPLICABLE	F	NOT APPLICABLE

## Conversion formulas

- Temperature delta threshold  $\langle \text{value} \rangle / 10$  ( °C )
- Humidity delta threshold  $\langle \text{value} \rangle$  ( % )
- Carbon dioxide threshold  $\langle \text{value} \rangle$  ( PPM )

## Default settings

- Message 0x 0303 0000 0000 0000
- Transmission interval 0x03 = 30 MIN
- Measurement interval 0x03 = 30 MIN
- Temperature delta threshold Not applicable
- Humidity delta threshold Not applicable
- Carbon dioxide threshold Not applicable

## Example


- Message 0x 0301 0505 02BC 0000
- Transmission interval 0x03 = 30 MIN
- Measurement interval 0x01 = 10 MIN
- Temperature delta threshold  $0x05 / 10 = 5 / 10 = 0,5$  °C
- Humidity delta threshold 0x05 = 5 %
- Carbon dioxide threshold 0x2BC = 700 PPM

# Troubleshooting

- Ensure the power is switched on
- Check there is Sigfox network coverage available
- Ensure the device is not installed near metallic objects, electric cables, electric devices or selective windows.
- Metallic roofs, steel reinforced concrete, underground location and other obstacles can dramatically reduce radio signal.
- Check the operation mode of the device.
- Incorrect downlink configuration will affect the behaviour of the product.
- Ensure the configuration is properly done.

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# Technical Specification

<b>Description</b>	AirWits CO2 is a carbon dioxide, temperature and humidity metering device.
<b>Size</b>	100 x 100 x 27 mm
<b>Weight</b>	170 g
<b>IP rating</b>	IP20
<b>Batteries</b>	3 x AA 3.6 V
<b>Battery capacity</b>	12,300
<b>Battery life</b>	5 years with 30 min measuring interval
<b>Sensors</b>	GSS CozIR LP / Sensirion SHT30
<b>Environment</b>	Temperature 0 °C ... 50 °C Humidity 0 ... 95 % CO2 0 ... 5 000 ppm
<b>Radio configurations</b>	Sigfox 868 / 902 / 920 MHz
<b>Antenna</b>	Internal helical antenna
<b>Communication</b>	Uplink & Downlink
<b>Certification</b>	FCC, CE, Sigfox Class 0U P_010A_2B91_01 (RCZ1) P_010A_AC4B_01 (RCZ2) P_010A_0054_01 (RCZ4)
<b>Product Code</b>	CICO2-3005-R3 (RCZ1) CICO2-3205-R4 (RCZ2) CICO2-3405-R3 (RCZ4)

