



EnoPuck[®] CO2 WALL

EnOcean Sensor and RGB-LED for CO2 and
sound pressure level measurement

EnOcean / 921.7 MHz / KC / KOREA

Version 1.00

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DEUTA Controls GmbH

Paffrather Straße 140
51465 Bergisch Gladbach
Phone: +49 5734 51466 - 15
Fax: +49 5734 51466 - 28
E-Mail: info@deuta-controls.de
Web: www.deuta-controls.net

Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

E-Mail: info@deuta-controls.de

Table of contents

- 1.1 About this manual 5
- 1.2 Notes about this Manual..... 5
- 1.3 Validity of this documentation..... 6
- 1.4 Symbols / Information on safety 7
- 2 Information on product safety 8
 - 2.1 Intended use 8
 - 2.2 Predictable incorrect application..... 8
 - 2.3 Qualification of personnel 10
- 3 Disposal 10
- 4 Device description 12
 - 4.1 Functionality 12
 - 4.2 Multi-Sensor with EnOcean interface 12
 - 4.3 RGB-LED with local or remote control..... 12
 - 4.4 Factory settings..... 13
 - 4.5 External product interface 13
 - 4.5.1 EnoPuck® CO2 WALL 13
 - 4.6 Observe intended use 14
 - 4.7 Observe statutory provisions for operating frequency range..... 14
 - 4.8 Non-conduction mounting surface 14
- 5 Technical data 15
 - 5.1 Communication / EnOcean wireless interface 15
 - 5.2 Sensor: CO2 concentration 15
 - 5.3 Sensor: Rel. humidity (RH)..... 15
 - 5.4 Sensor: Temperature 16
 - 5.5 Sensor: Ambient light / brightness 16
 - 5.6 Sensor: Motion / PIR 16
 - 5.7 User interfaces 16
 - 5.8 Housing / connection technology..... 16
 - 5.9 Power supply..... 17

5.10	Environmental conditions	17
5.11	Dimensions and weight	17
5.12	Approvals	17
5.13	Standards and guidelines	17
6	Functional description in detail	18
6.1	Basic device description	18
6.2	Send Teach-In telegrams	18
6.2.1	CO2 Teach-In (A5-09-04).....	18
6.2.2	PIR Teach-In (A5-07-01).....	19
6.2.3	Brightness Teach-In (A5-08-01)	19
6.3	Transmitting data	19
7	Service / CO2 sensor calibration	20
7.1	Room with windows that can be opened	20
7.2	Room without windows that can be opened	21
8	Device labels	22
8.1	EnoPuck® CO2 WALL / NCC / TAIWAN (AL-602-04-921) / Part nr. 12672.....	22
8.1.1	Label 1:	22
8.1.2	Label 2:	22
	0x00012345	22
9	Ordering information.....	23
10	Revision history	25

1.1 About this manual

This Manual describes the products

- EnoPuck® CO2 WALL / KC / KOREA (AL-602-04-902) / Part. Nr. 12783

(also referred to as "PRODUCT" in this document). These operating instructions are part of the product.

- You may only use the product if you have fully read and understood this manual.
- Verify that this manual is always accessible for any type of work performed on or with the product.
- Pass this manual as well as all other product-related documents to all owners of the product.
- If you feel that this manual errors, inconsistencies, ambiguities or other issues, contact the manufacturer prior to using the product.

This manual is protected by copyright and may only be used as provided for by the corresponding copyright legislation. We reserve the right to modifications. The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe these operating instructions or from failure to comply with directives, regulations and standards and any other statutory requirements applicable at the installation site of the product.

1.2 Notes about this Manual



Note

Always retain this documentation!

This documentation is part of the product. Therefore, retain the documentation during the entire service life of the product. Pass on the documentation to any subsequent user. In addition, ensure that any supplement to this documentation is included, if necessary.



Note

Technical terms in this documentation

The technical terms used in this documentation are available in the glossary at the end of the manual.

1.3 Validity of this documentation

This documentation applies to the following products

- EnoPuck® CO2 WALL / KC / KOREA (AL-602-04-902) / Part. Nr. 12783

and is only applicable starting from products with FW/HW Version 1.0/1.1.

The device must only be installed and operated according to the instructions in this manual.

1.4 Symbols / Information on safety

The symbols in this is document and their meaning are as follows:

 **DANGER****Personal Injury!**

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.



 **DANGER****Personal Injury Caused by Electric Current!**

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING****Personal Injury!**

Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION****Personal Injury!**

Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE**Damage to Property!**

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

**NOTICE****Damage to Property caused by Electrostatic Discharge (ESD)!**

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

**Note****Important Note!**

Indicates a potential malfunction which, if not avoided, however, will not result in damage to property.

**Information****Additional Information:**

Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

2 Information on product safety

2.1 Intended use

The **EnoPuck® CO2 WALL** can be used to measure CO₂ (Carbon Dioxide concentration), room temperature, rel. humidity, brightness and sound pressure level. At the same time, each EnoPuck® CO2 is pre-configured to signal the CO2 concentration by the internal RGB Leds.

The **EnoPuck® CO2 WALL** is supplied by an in-wall mounted power supply 12 V DC, with wall bracket

2.2 Predictable incorrect application

The product EnoPuck® CO2 WALL must never be used in the following cases and for the following purposes:

 **DANGER**

Personal Injury!

Products must never be used solely or in conjunction with devices which are used for health-saving or life-saving purposes, or whose operation may incur hazards to humans, animals or property.

 **DANGER**

Do not use in Hazardous area (EX)

If the products are operated in hazardous areas, sparks may cause deflagrations, fires or explosions

NOTICE

Risk of electric defect due to high humidity

Do not use the EnoPuck® CO2 WALL in rooms that are subject to high humidity (such as bathrooms).

NOTICE

Risk of overheating!

Do not position the EnoPuck® CO2 WALL close to the floor or the ceiling, between shelves or behind curtains.

⚠ CAUTION**Do not use for health-saving or life-saving purposes!**

In conjunction with devices which are used for health-saving or life-saving purposes or whose operation may incur hazards to humans, animals or property!

2.3 Qualification of personnel

NOTICE**Replace defective or damaged devices!**

Replace defective or damaged devices, i.e products or power supplies (e.g., in the event of damaged housings or contacts).

This product is powered by an in-wall mounted power supply. It has to be connected to line voltage. This has to be done by an authorized person only!

**⚠ DANGER****Do not work on devices while energized!**

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

3 Disposal



Electrical and electronic equipment may not be disposed of with household waste. This also applies to products without this symbol.

Electrical and electronic equipment contain materials and substances that can be harmful to the environment and health. Electrical and electronic equipment must be disposed of properly after use.

Note only for EU: WEEE 2012/19/EU applies throughout Europe.
Directives and laws may vary nationally.

4 Device description

4.1 Functionality

The **EnoPuck® CO2 WALL** is basically a multi sensor with integrated LEDs. Each sensor can be configured separately to be switched off, or to send the measured value in a fixed timed interval.

4.2 Multi-Sensor with EnOcean interface

The product **EnoPuck® CO2 WALL** have the following functionality:

Function / property	EnoPuck® CO2 WALL
CO2 concentration [ppm]	Yes
Temperature [°C]	Yes
Rel. humidity [%]	Yes
Brightness [lux]	Yes
PIR / Vibration [0/1]	Yes
15 cm power cord with power connector for in-wall power supply	Yes
Internal RGB LEDs (19)	Yes

Table 1: Product functions

4.3 RGB-LED with local or remote control

The device has 19 RGB LED's, that can be dimmed in 254 steps each. In this way, more or less any color can be setup at any brightness.

4.4 Factory settings

The basic configuration of an **EnoPuck® CO2 WALL** is actually as follows:

EnoPuck® Color	Level R/red [%]	Level green/G [%]	Level blue/B [%]
Green	0	4	0
Yellow	10	7	0
Orange	6	1	0

4.5 External product interface

4.5.1 EnoPuck® CO2 WALL

The product has the following external interface:

- Passive infrared sensor for people detection (front)
- Service button to send teach in / learn telegram and to start re-calibration
- Two mounting knobs on the backside to attach to a wall-mount bracket
- 15 cm power cord with power connector for in-wall power supply



Figure 1: External interfaces EnoPuck® CO2 WALL

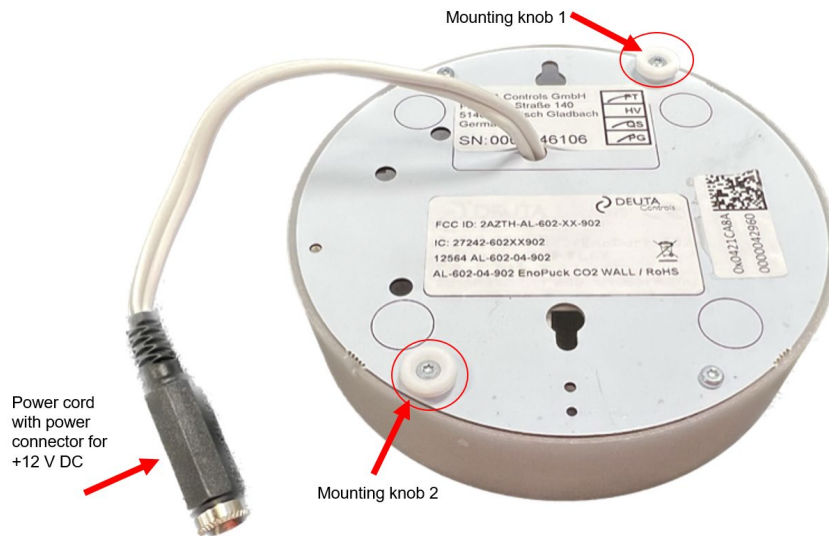


Figure 2: External power connection and mounting knobs EnoPuck® CO2 WALL

4.6 Observe intended use

The **EnoPuck® CO2 WALL** must not be used in any relation with equipment that supports, directly or indirectly, human health or life or with applications that can result in danger for people, animals or real value.

4.7 Observe statutory provisions for operating frequency range.

The **EnoPuck® CO2 WALL** must only be operated in compliance with the country-specific provisions regarding operation of radio equipment.

4.8 Non-conduction mounting surface

A non-conductive mounting surface is necessary.
Ensure the **EnoPuck® CO2 WALL** is mounted on a non-conductive surface. If it is not, performance may be adversely affected.

5 Technical data

5.1 Communication / EnOcean wireless interface

Type	EnOcean
Number	1
Transmit / receive center frequency	921.7 MHz
Transmission power	0 dBm
Modulation type	FSK
Number of channels	Ch 24 (921,7 MHz)
Transfer / data rate	125 kbit / s

Table 2: Technical data / communication

5.2 Sensor: CO2 concentration

Measuring range	0 .. 2.550 ppm (with MSC instead of standard EEP up to 10.000 ppm, on request)
Accuracy	± 30 ppm + 3% MV (@ 25 °C, range 400 – 2.550 ppm)
Repeatability	10 ppm
Temperature stab.	2,5 ppm / °C
Response time	Typ. 25 s

Table 3: Technical data CO2

5.3 Sensor: Rel. humidity (RH)

Measuring range	0 – 100 %
accuracy	± 2 %
Repeatability	0,1 %
Response time	Typ. 8 s

Table 4: Technical data RH

5.4 Sensor: Temperature

Measuring range	- 40 – 120 °C
Accuracy	± 0,5 °C
Repeatability	0,1 °C
Response time	Typ. 2 s

Table 5: Technical data temperature

5.5 Sensor: Ambient light / brightness

Measuring range	0 – 64.000 lux
Accuracy	± 10 %

Table 6: Technical data ambient light sensor

5.6 Sensor: Motion / PIR

Detection angle	120 degrees
Detection range	0.5 – 2 m

Table 7: Technical data / PIR sensor

5.7 User interfaces

Service button	Yes
Service LED	-

Table 8: Technical data / user interfaces

5.8 Housing / connection technology

Connection technology	-
Housing	Plastic, PC, white / opaque

Table 9: Technical data / housing

5.9 Power supply

Power supply voltage	+12 V DC
Power consumption	Typ. 1.5 W, ma. 5 W (depends on LED configuration)

Table 10: Technical data / power supply

5.10 Environmental conditions

Operating temp.	0°.. 50 °C
Storage temp.	-20 ..+70 °C
Rel. humidity	0..95 % rel. humidity, non condensing
Protection class	IP20

Table 11: Technical data / environmental conditions

5.11 Dimensions and weight

Weight	150 g
Dimensions	100 x 28 mm

Table 12: Technical data / dimensions and weight

5.12 Approvals

FCC Rule parts	15.249
ISED/IC (Canada)	Yes / Passed

Table 13: Technical data / tests and approvals

5.13 Standards and guidelines

EMC	EN IEC 61000-6-2 :2016 EN IEC 61000-3-2 :2019 EN 61000-3-3 :2013 EN 55032 :2012/AC :2013
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Table 14: Technical data / standards and guidelines

6 Functional description in detail

6.1 Basic device description

The **EnoPuck® CO2 WALL** is basically a multi sensor with integrated LEDs. Each sensor can be configured to be switched off, or to send the measured value in a fixed timed interval.

6.2 Send Teach-In telegrams

To be able to use standardized EEP (EnOcean Equipment Profiles), the **EnoPuck® CO2 WALL** can send all data in a sequence, using different ID's and different EEP's.

To connect to any building automation system, a so called Teach-In telegram will be send by the device using the Service button.



Figure 3: Location of Service buttons

The button is located on the side, and can be operated with a paper clip.

6.2.1 CO2 Teach-In (A5-09-04)

If the button is pressed **1x briefly within 2 seconds**, a learning telegram for the EEP A5-09-04 is sent after the 2 seconds have elapsed.

6.2.2 PIR Teach-In (A5-07-01)

If the button is pressed **2x briefly within 2 seconds**, a learning telegram for the EEP A5-07-01 is sent after the 2 seconds have elapsed.

6.2.3 Brightness Teach-In (A5-08-01)

If the button is pressed **3x briefly within 2 seconds**, a learning telegram for the EEP A5-08-01 is sent after the 2 seconds have elapsed.

6.3 Transmitting data

The EnOcean wireless standard defines so called EnOcean Equipment Profiles (EEP). Each EnOcean based product sends and receives data according to at least one standardized data format. The **EnoPuck® CO2 WALL** transmits data described as follows:

Nr.	EEP	Description	Tx-ID
1	A5-09-04	CO2-Sensor (Humidity, CO2, temperature)	Base-ID + 100 (dec.)
2	A5-07-01	Occupancy sensor with supply voltage monitor (PIR, Vibration)	Base-ID + 101 (dec.)
3	A5-08-01	Brightness	Base-ID + 102 (dec.)

Table 15: Technical data / EnOcean EEP for TX

7 Service / CO2 sensor calibration

NOTICE

Do not open the housing / no serviceable parts inside

There are no serviceable parts inside the product. Do not open the housing. Otherwise warranty will be void, and electronic components might be damaged.

If the **EnoPuck® CO2 WALL** has been exposed to mechanical stress such as impact, strong vibration or a fall, the measurement of the CO2 value may no longer be correct.



Note

Avoid mechanical impact after re-calibration!

Any mechanical stress between calibration and finally mounting of the **EnoPuck® CO2** might again influence calibration.

7.1 Room with windows that can be opened

If you can open windows in the room where the **EnoPuck® CO2 WALL** is mounted, open the window for at least 15 minutes, so the air inside the room will have the same CO2 concentration as the air outside.

The start calibration process as described above. You can leave the **EnoPuck® CO2 WALL** mounted to the wall. Push the service button while it is mounted on the wall-bracket.



Figure 4: Service button of EnoPuck® CO2 WALL

7.2 Room without windows that can be opened

If you can not open the windows of the room where the **EnoPuck® CO2 WALL** is mounted, or there are simply no windows in the room, you have to go somewhere where you can open the windows to have fresh air for calibration procedure.



DANGER

The in-wall power supply is line powered!

De-energize the in-wall power supply before to dismantle the **EnoPuck® CO2 WALL**.

Dismount the **EnoPuck® CO2 WALL** from the bracket, and then disconnect the 12 V DC power plug in between the EnoPuck CO2 WALL and the in-wall power supply.

To be able to re-calibrate, you will need an external power supply with the correct power connector (round, 2.1 x 5.5 mm, male).

The process for re-calibration ist the same as described above.

After re-calibration, connect the power plug again, and re-mount the EnoPuck CO2 WALL to the wall-mount bracket.



Note

Avoid mechanical impact after re-clibration!

Any mechanical stress between calibration and finally mounting of the **EnoPuck® CO2 WALL** might again influence calibration.

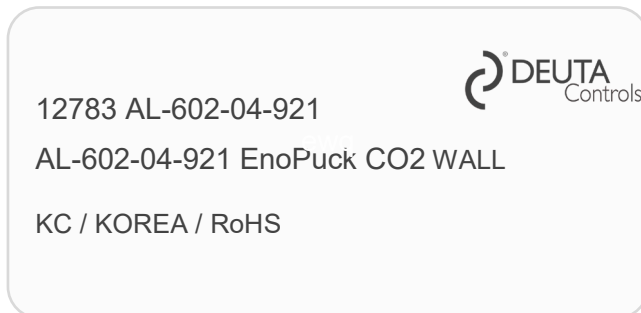
Finally. power up the in-wall power supply. The **EnoPuck CO2 WALL** should re-start immediately.

8 Device labels

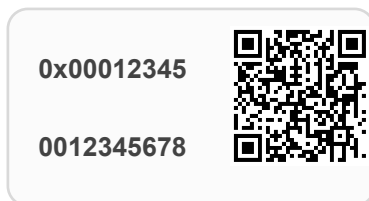
The following labels are placed on the bottom side of the devices:

8.1 EnoPuck® CO2 WALL / KC / KOREA (AL-602-04-921) / Part nr. 12783

8.1.1 Label 1:



8.1.2 Label 2:



Label 2, Line 2: Serial number

Label 2, Line 1: BASE ID

QR-Code: <EURID>+<Product ID>+<Ordering Code>+<Serial Number>+<BASE ID>

9 Ordering information

Part name	Part nr.	Description
AL-602-01-921 EnoPuck CO2 WALL / KC / KOREA	12672	CO2 traffic light, EnoPuck CO2 WALL, RGB LED, Multisensor for CO2, humidity, temperature, vibration, PIR; Supply voltage 12 V DC (+/- %), dimensions 100 x 22 mm, PC white diffuse; EnOcean 921 MHz, KC, KOREA, with rear connection cables for external power supply 12 V DC; cable length approx. 30 cm, ideal for mounting on a flush-mounted box; (power supply unit not included);

List of tables

Table 1: Product functions	12
Table 2: Technical data / communication	15
Table 3: Technical data CO2	15
Table 4: Technical data RH	15
Table 5: Technical data temperature	16
Table 6: Technical data ambient light sensor.....	16
Table 7: Technical data / PIR sensor.....	16
Table 8: Technical data / user interfaces	16
Table 9: Technical data / housing	16
Table 10: Technical data / power supply	17
Table 11: Technical data / environmental conditions	17
Table 12: Technical data / dimensions and weight	17
Table 13: Technical data / tests and approvals.....	17
Table 14: Technical data / standards and guidelines	17
Table 15: Technical data / EnOcean EEP for TX.....	19

10 Revision history

Version	Author	Reviewer	Date	Major changes
1.00	Lehzen	Pohl	21.07.2023	Initial release

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