

Quick-start guide for XENSIV™ PAS CO2 Sensor2Go evaluation kit

About this document

This document will help users to work with the XENSIV™ PAS CO2 Sensor2Go evaluation kit. The XENSIV™ PAS CO2 Sensor2Go evaluation kit is developed as a plug-and-play module for the assessment of the XENSIV™ PAS CO2 sensor.

Scope and purpose

This document will define XENSIV™ PAS CO2 Sensor2Go evaluation kit functions, the procedure for integrating with the XENSIV™ PAS CO2 mini-evaluation board, and the necessary steps required to get a readout from the kit.

Intended audience

Application engineers, system engineers, and system architects of an application where the XENSIV™ PAS CO2 mini-evaluation board will be integrated.

Sales part codes

SP005582413 – XENSIV™ PAS CO2 Sensor2Go evaluation kit

SP005577475 – XENSIV™ PAS CO2 mini-evaluation board

Table of contents

About this document	1
Table of contents	1
1 Introduction to XENSIV™ PAS CO2 Sensor2Go evaluation kit	2
2 Hardware details	3
2.1 Connection of the mini-evaluation board with the motherboard	3
2.2 XENSIV™ PAS CO2 mini-evaluation board	4
3 Software	5
3.1 Step 1: Downloading the GUI	5
3.2 Step 2: Installing the GUI.....	5
3.3 Step 3: Connect XENSIV™ PAS CO2 Sensor2Go.....	7
3.4 Additional features.....	8
4 Appendix	10
4.1 Schematics for evaluation motherboard	10
Revision history	11

1 Introduction to XENSIV™ PAS CO2 Sensor2Go evaluation kit

The XENSIV™ PAS CO2 is a real CO₂ sensor that improves the size and performance of existing CO₂ sensor solutions. This sensor has been designed based on the unique photoacoustic spectroscopy (PAS) principle. To ensure efficient and quick evaluation, the XENSIV™ PAS CO2 Sensor2Go Evaluation kit is offered. An easy-to-use PC GUI is offered along with the package. The contents of the kits are shown in Figure 1.

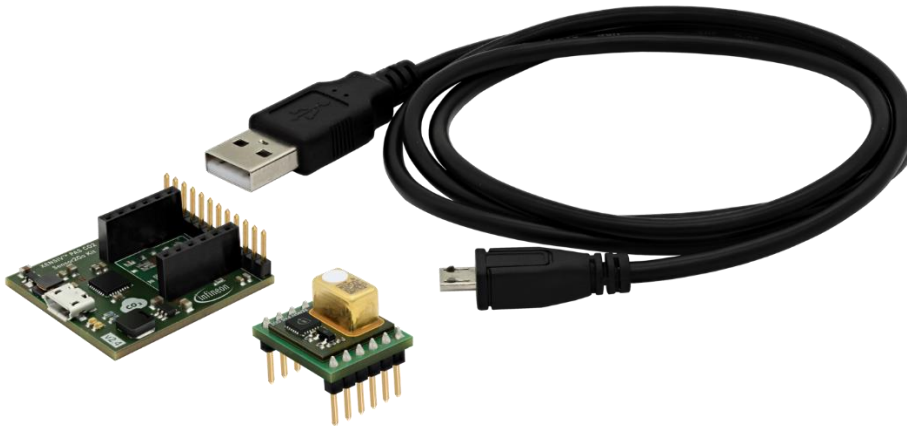


Figure 1 XENSIV™ PAS CO2 Sensor2Go Evaluation kit

The complete Sensor2Go evaluation kit includes:

- XENSIV™ PAS CO2 evaluation motherboard
- XENSIV™ PAS CO2 mini-evaluation board
- micro-USB cable

Key features:

- Communication to a PC GUI via micro USB
- Power management unit ensuring stable 12V for the light source

2 Hardware details

2.1 Connection of the mini-evaluation board with the motherboard

Connect the mini-evaluation board and motherboard as shown in Figure 2. For proper connection please connect pin 1 of the mini-board as shown in the figure.

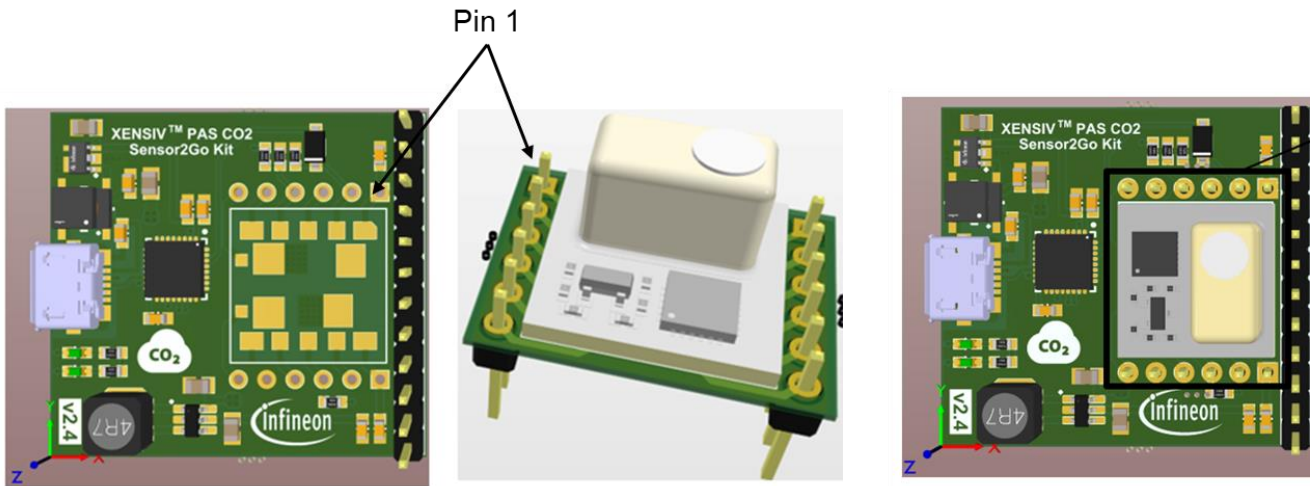


Figure 2 Connection of the mini-evaluation board with the sensor to go evaluation kit motherboard

The relevant pin description of the XENSIV™ PAS CO2 mini evaluation board is presented in the following table.

Pin (mini-board connection)	Pin (external pin header)	Symbol	Type	Description
1	3	VDD3.3	Power supply (3.3 V)	3.3 V digital power supply
2	4	RX	Input/Output	UART receiver pin
3	6	SCL	Input/Output	I ² C clock pin (3.3 V domain)
4	5	TX/SDA	Output	UART transmitter pin (3.3 V domain)/I ² C data pin (3.3 V domain)
5	9	PWM_DIS	Input	PWM disable input pin (3.3 V domain)
5b	11	SWD	N/A	Do not connect
6b	12	SWCLK	N/A	Do not connect
6	1	GND	Ground	Ground
7	8	INT	Output	Interrupt output pin (3.3 V domain)
8	7	PSEL	Input	Communication interface select input pin (3.3 V domain)
9	10	PWM	Output	PWM output pin (3.3 V domain)
10	2	VDD12	Power supply (12 V)	12 V power supply for the IR emitter

2.2 XENSIV™ PAS CO2 mini-evaluation board

The XENSIV™ PAS CO2 sensor is assembled on the mini-evaluation board as shown in Figure 3. The mini-evaluation board has extended male pin headers and can be treated as a standalone sample. Its internal registers can be accessed via external pins using communication protocols such as I²C, UART, or PWM.

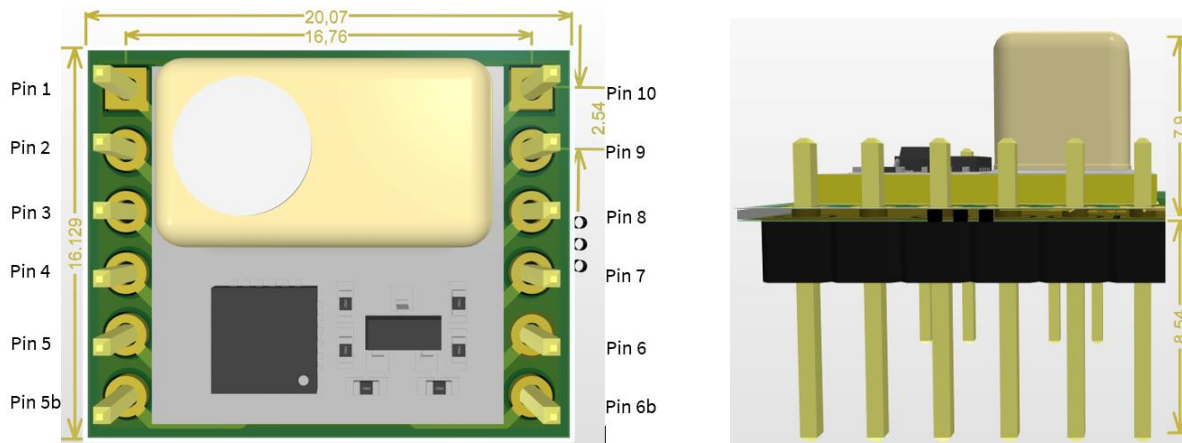


Figure 3 Top and side view of XENSIV™ PAS CO2 mini-evaluation board; all dimensions are in mm

The relevant pin descriptions of the XENSIV™ PAS CO2 mini-evaluation board are presented in the following table.

Pin	Symbol	Type	Description
1	VDD3.3	Power supply (3.3 V)	3.3 V digital power supply
2	RX	Input/Output	UART receiver pin
3	SCL	Input/Output	I ² C clock pin (3.3 V domain)
4	TX/SDA	Output	UART transmitter pin (3.3 V domain)/I ² C data pin (3.3 V domain)
5	PWM_DIS	Input	PWM disable input pin (3.3 V domain)
5b	SWD	N/A	Do not connect
6b	SWCLK	N/A	Do not connect
6	GND	Ground	Ground
7	INT	Output	Interrupt output pin (3.3 V domain)
8	PSEL	Input	Communication interface select input pin (3.3 V domain)
9	PWM	Output	PWM output pin (3.3 V domain)
10	VDD12	Power supply (12 V)	12 V power supply for the IR emitter

Note: Before performing the evaluation, it is recommended to perform Forced Compensation (FC) or enable Automatic Baseline Offset Correction (ABOC).

3 Software

XENSIV™ PAS CO2 Sensor2Go kit can be evaluated on the XENSIV™ PAS CO2 Sensor2Go GUI. It is a plug-and-play solution. Just install the tool in your PC, connect the evaluation kit with your PC and start evaluating the CO₂ sensor.

3.1 Step 1: Downloading the GUI

Before installing the XENSIV™ PAS CO2 Sensor2Go GUI, please uninstall any previous version of the same GUI. Then download the latest version of the GUI from the following link. (Sometimes customers may experience issues downloading the installer using Microsoft Edge. We recommend using the latest version of Google Chrome). The XENSIV™ PAS CO2 Sensor2Go GUI can be downloaded from the Infineon toolbox. The tool is shown in Figure 4. Please, download the toolbox from the following link:

Link to GUI: <https://www.infineon.com/cms/en/tools/landing/infineontoolbox.html>

Then search for ‘XENSIV PAS CO2 Sensor2Go GUI’ within the toolbox launcher and install.

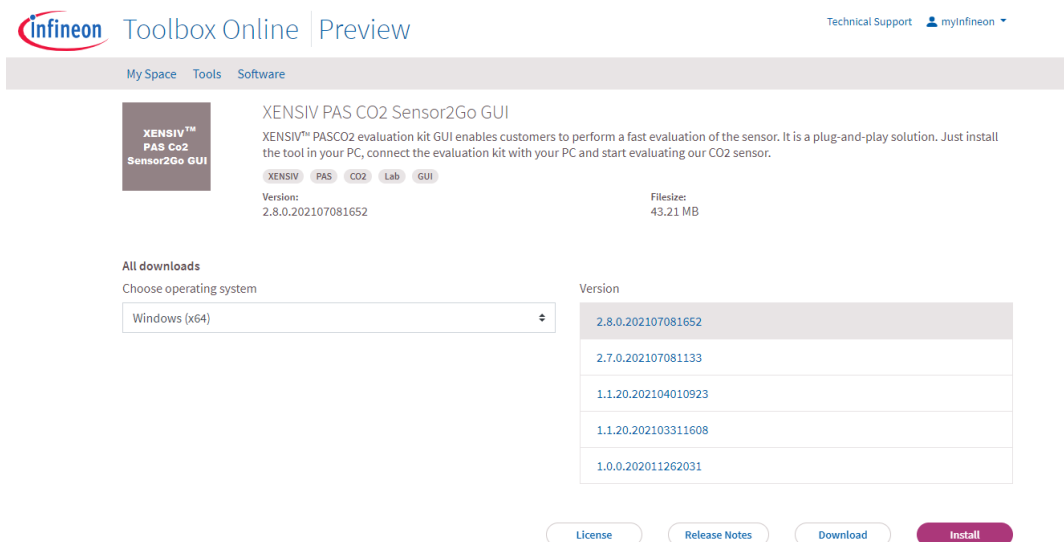


Figure 4 XENSIV™ PAS CO2 Sensor2Go GUI download page

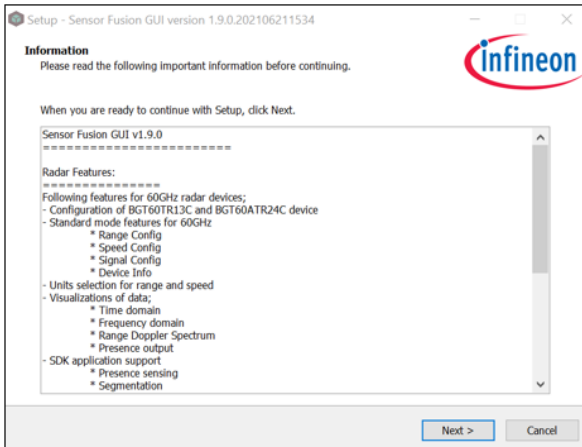
3.2 Step 2: Installing the GUI

After downloading, simply run the downloaded file with the ‘.exe’ extension from your download folder and go through the installation procedure. The ‘.exe’ file name should start from ifxpasco2gui_ followed by version no. of software you downloaded.

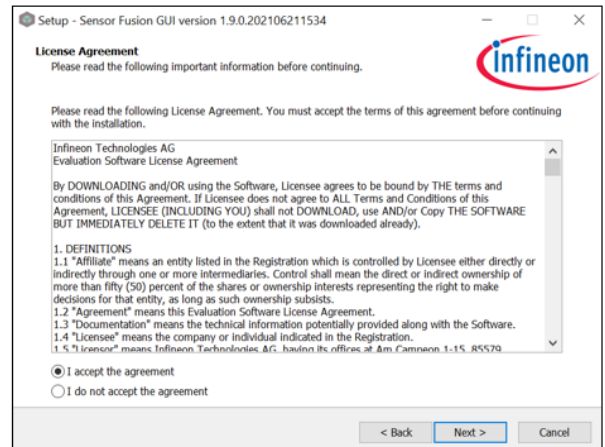
Quick-start guide for XENSIV™ PAS CO2 Sensor2Go evaluation kit



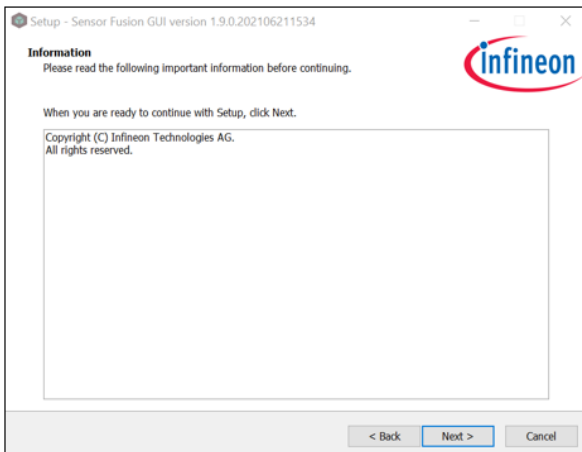
Step 1



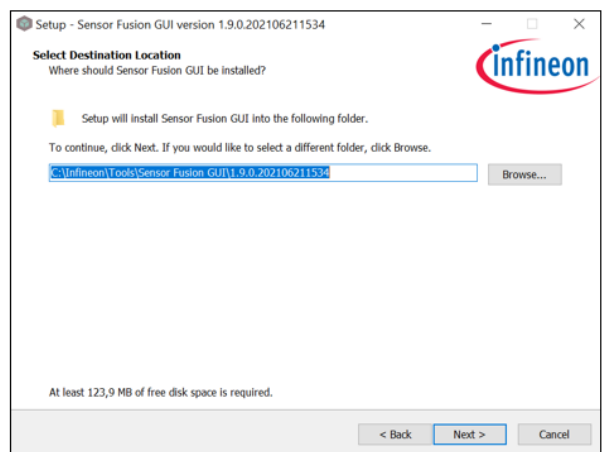
Step 2



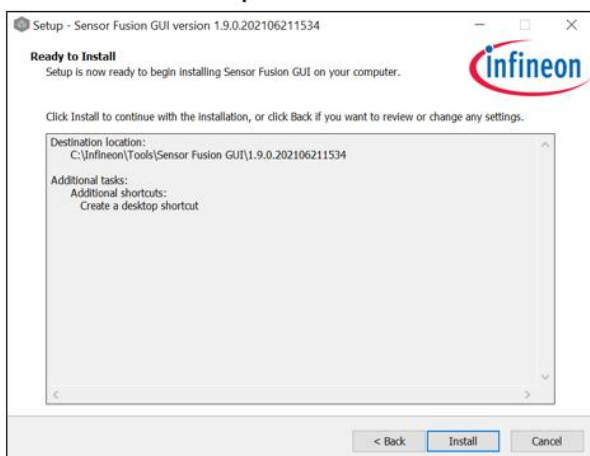
Step 3



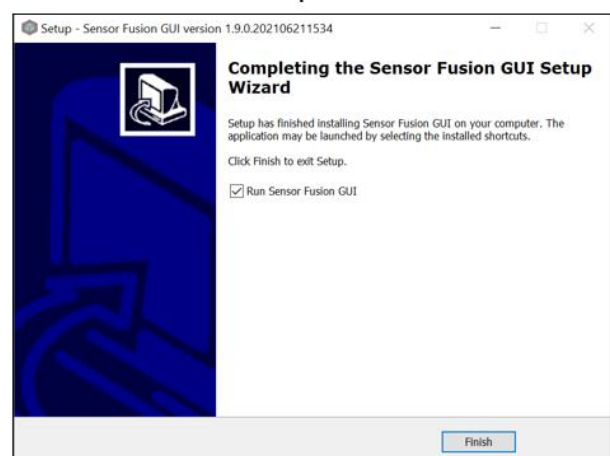
Step 4



Step 5



Step 6



After performing all the necessary steps, Press 'Finish' to exit setup and launch XENSIV™ PAS CO2 Sensor2Go GUI. The startup screen will look like Figure 5.

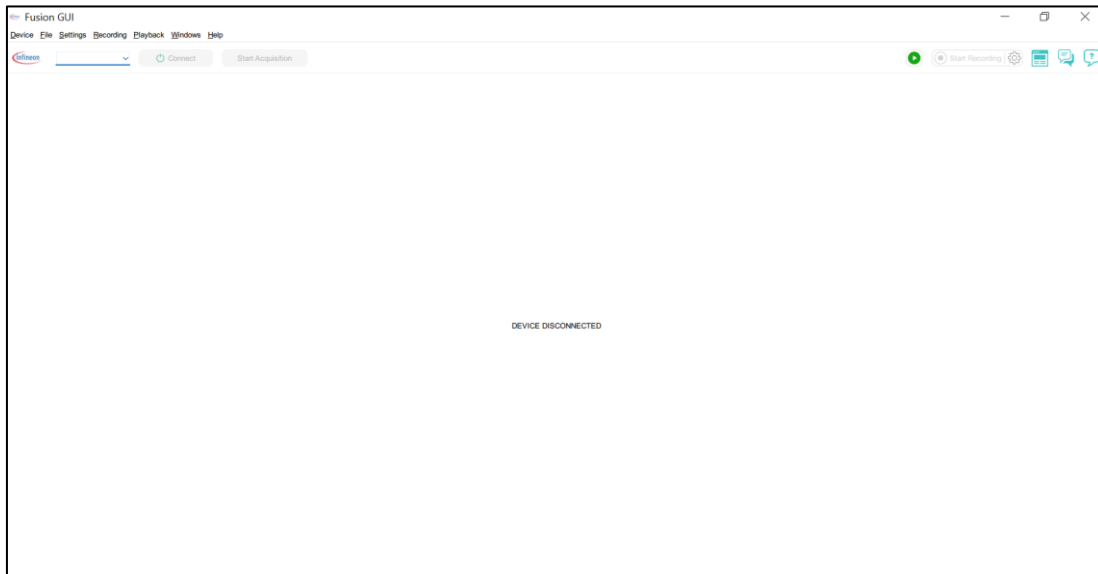


Figure 5 Start-up screen

3.3 Step 3: Connect XENSIV™ PAS CO2 Sensor2Go

Connect a XENSIV™ PAS CO2 Sensor2Go evaluation kit using a micro USB cable as shown in Figure 6.



Figure 6 XENSIV™ PAS CO2 Sensor2Go Evaluation kit connection to PC via micro USB cable

After connecting the sensor and starting the value acquisition process, the first CO2 concentration value will appear after a delay of 10 s.

Using a single motherboard in combination with multiple mini-boards, it is advised to put a sticker and give each sensor a separate serial number. This way, it will be easy to evaluate and process the data at a later time.

Data Logging:

If the automatic logging column is not checked, each time when a user connects the sensor, GUI will prompt the user asking for a path of .CSV logging file. If the popup is discarded, no default path is provided and automatic logging is disabled. The logging settings can be changed by clicking the 'logging settings' menu at the top right

corner of the GUI. Again, for the log files, it is advised to use the same serial number as it has been used by the user for the sensor.

Note: Multiple sensor connection to GUI is not supported with this GUI version.

3.4 Additional features

In the installed GUI customers can use the different functionalities of the XENSIV™ PAS CO2 sensor.

ABOC and Pressure compensation:

Automatic Baseline Offset Correction (ABOC) and Pressure compensation can be triggered by manually setting the values in the ‘CO2 setting’ menu. This menu button can be found at the top left corner as shown in Figure 7.

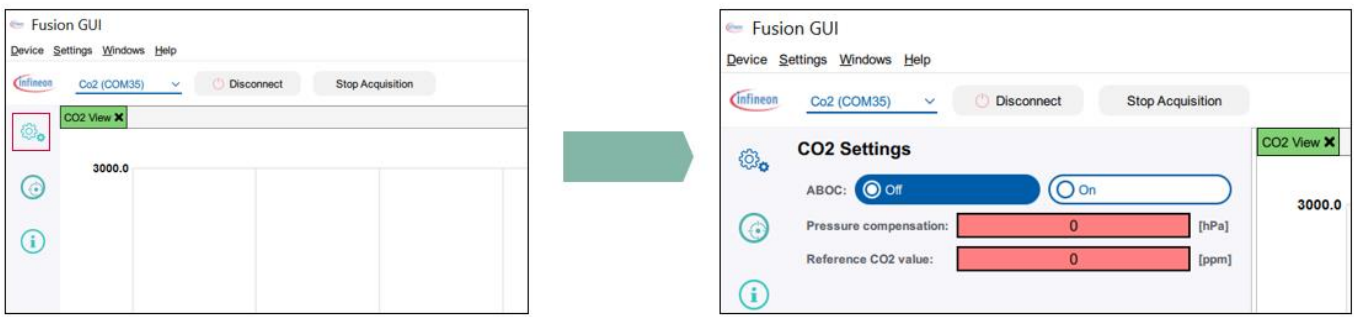


Figure 7 Enabling ABOC and pressure compensation

After changing the related settings press enter and click the “Apply all settings” button from the bottom left corner of the screen as shown in Figure 8.

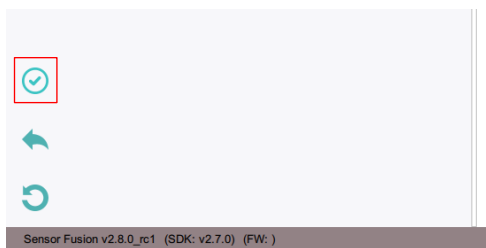


Figure 8 The “Apply all settings” button

Forced compensation:

Force compensation can be triggered by manually setting the values in the 'Force calibration' menu. This menu button can be found at the top left corner as shown in Figure 9.

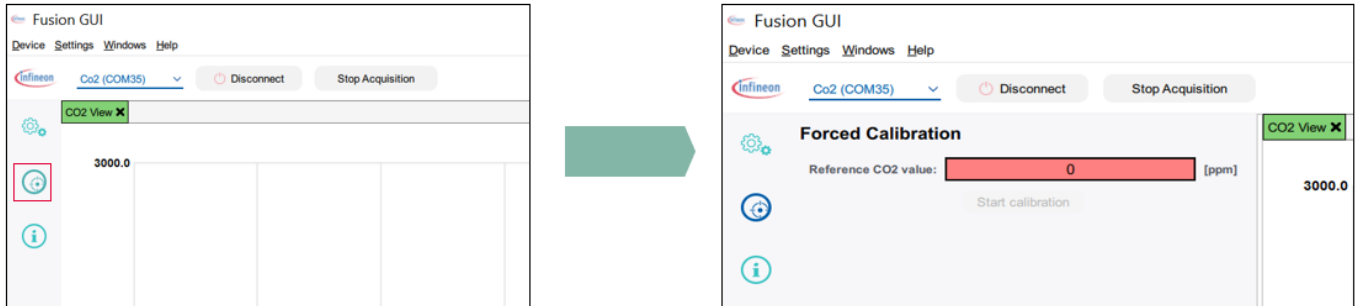


Figure 9 Enabling forced compensation

Note: Before enabling the Force compensation, the reference CO2 concentration needs to be determined.

4 Appendix

4.1 Schematics for evaluation motherboard

Customers who are using the XENSIV™ PAS CO2 mini-evaluation board or standalone XENSIV™ PAS CO2 sensor without the XENSIV™ PAS CO2 evaluation motherboard are encouraged to use the same application circuits for a single and stable power supply.

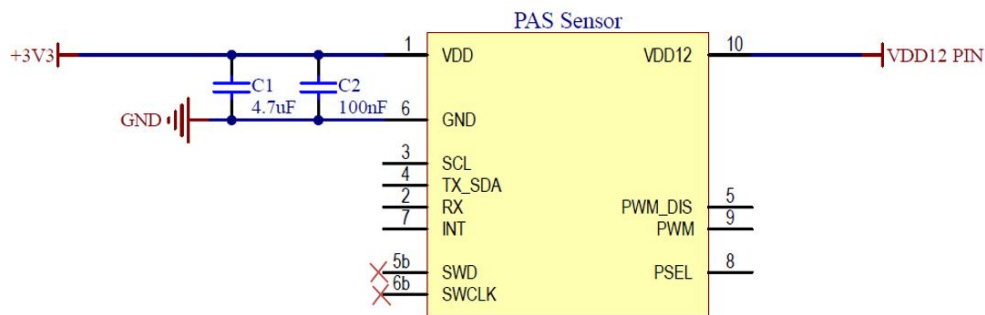


Figure 10 PAS sensor

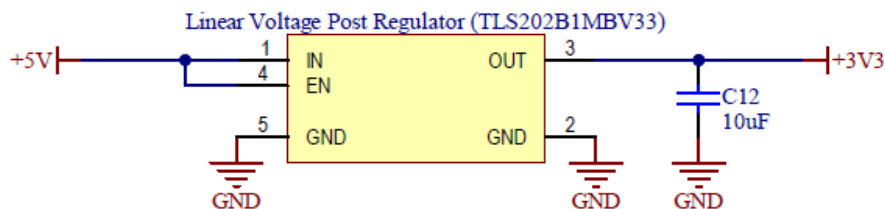


Figure 11 Infineon fixed linear voltage post regulator

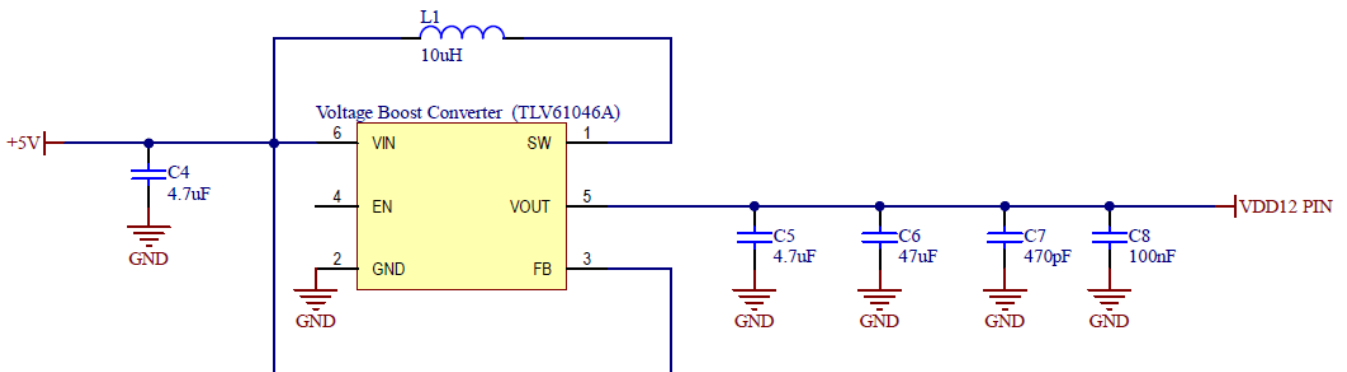


Figure 12 Example voltage boost converter to generate stable 12V

Revision history

Document version	Date of release	Description of changes
V1.0	02.06.2021	Creation
V1.1	26.08.2021	Updated notes

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

Edition 2021-08-26

Published by

Infineon Technologies AG

81726 Munich, Germany

© 2021 Infineon Technologies AG.

All Rights Reserved.

Do you have a question about this document?

Email: erratum@infineon.com

Document reference

AppNote Number

IMPORTANT NOTICE

The information contained in this application note is given as a hint for the implementation of the product only and shall in no event be regarded as a description or warranty of a certain functionality, condition or quality of the product. Before implementation of the product, the recipient of this application note must verify any function and other technical information given herein in the real application. Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind (including without limitation warranties of non-infringement of intellectual property rights of any third party) with respect to any and all information given in this application note.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.