

# Quick-start guide for XENSIV<sup>™</sup> PAS CO2 Sensor2Go evaluation kit

## About this document

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

#### Scope and purpose

This document will define XENSIV<sup>™</sup> PAS CO2 Sensor2Go evaluation kit functions, the procedure for integrating with the XENSIV<sup>™</sup> 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<sup>™</sup> PAS CO2 mini-evaluation board will be integrated.

#### Sales part codes

SP005582413 – XENSIV<sup>™</sup> PAS CO2 Sensor2Go evaluation kit

SP005577475 – XENSIV<sup>™</sup> PAS CO2 mini-evaluation board

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## 1 Introduction to XENSIV<sup>™</sup> PAS CO2 Sensor2Go evaluation kit

The XENSIV<sup>TM</sup> PAS CO2 is a real CO<sub>2</sub> sensor that improves the size and performance of existing CO<sub>2</sub> sensor solutions. This sensor has been designed based on the unique photoacoustic spectroscopy (PAS) principle. To ensure efficient and quick evaluation, the XENSIV<sup>TM</sup> 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<sup>™</sup> PAS CO2 Sensor2Go Evaluation kit

The complete Sensor2Go evaluation kit includes:

- XENSIV<sup>™</sup> PAS CO2 evaluation motherboard
- XENSIV<sup>™</sup> PAS CO2 mini-evaluation board
- micro-USB cable

#### Key features:

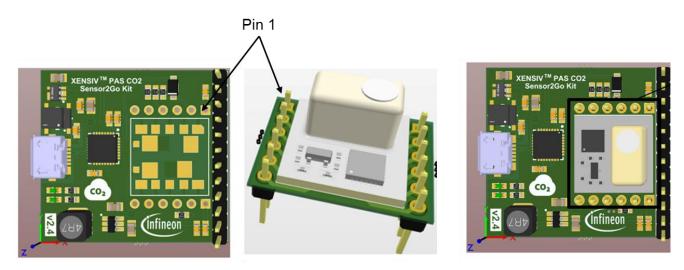
- Communication to a PC GUI via micro USB
- Power management unit ensuring stable 12V for the light source



# 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

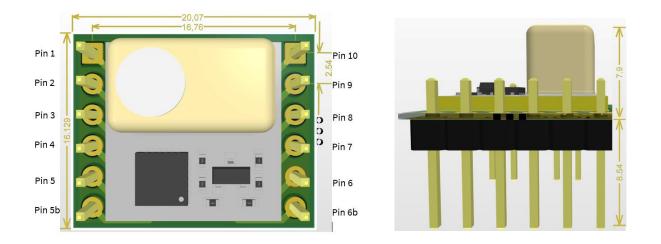
The relevant pin description of the XENSIV<sup>™</sup> PAS CO2 mini evaluation board is presented in the following table.

Pin (mini- board connection)	Pin (external pin header)	Symbol	Туре	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 <sup>2</sup> C clock pin (3.3 V domain)
4	5	TX/SDA	Output	UART transmitter pin (3.3 V domain)/l <sup>2</sup> 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<sup>™</sup> PAS CO2 mini-evaluation board

The XENSIV<sup>™</sup> PAS CO2 sensor is assembled on the mini-evaluation board as shown in Figure 3. The minievaluation 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 I<sup>2</sup>C, UART, or PWM.



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

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

Pin	Symbol	Туре	Description
1	VDD3.3	Power supply (3.3 V)	3.3 V digital power supply
2	RX	Input/Output	UART receiver pin
3	3 SCL Input/Output		I <sup>2</sup> C clock pin (3.3 V domain)
4 TX/SDA Output		Output	UART transmitter pin (3.3 V domain)/I <sup>2</sup> 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

For further details on the mini-board, please have a look at the mini-board evaluation web page under www.infineon.com/CO2.



## 3 Software

XENSIV<sup>™</sup> PAS CO2 Sensor2Go kit can be evaluated on the XENSIV<sup>™</sup> 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 CO<sub>2</sub> sensor.

## 3.1 Step 1: Downloading the GUI

Before installing the XENSIV<sup>™</sup> 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<sup>™</sup> 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.

infineon	Toolbox On	line	Preview	Technical Support	L myInfineon ▼		
	My Space Tools Sol	ftware					
	XENSIV <sup>746</sup> PAS Co2 Sensor2Go GUI	XENSIV <sup>†</sup> the tool XENSIV Version:	in your PC, connect the evaluation kit with y		perform a fast evaluation of the sensor. It is a and start evaluating our CO2 sensor. Filesize: 43.21 MB	plug-and-play solut	ion. Just install
	All downloads Choose operating system	n			Version		
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					1.1.20.202104010923		
					1.1.20.202103311608		
					1.0.0.202011262031		
					License Release Notes	Download	Install

Figure 4 XENSIV<sup>™</sup> 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<sup>™</sup> PAS CO2 Sensor2Go evaluation kit



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Sensor Fusion GUI v1.9.0	^
Radar Features:	
Following features for 60GHz radar devices;	
<ul> <li>Configuration of BGT60TR13C and BGT60ATR24C device</li> </ul>	
<ul> <li>Standard mode features for 60GHz</li> </ul>	
* Range Config	
* Speed Config	
* Signal Config * Device Info	
- Units selection for range and speed	
- Visualizations of data;	
* Time domain	
* Frequency domain	
* Range Doppler Spectrum	
* Presence output	
- SDK application support	
* Presence sensing	
* Segmentation	~



Setup - Sensor Fusion GUI version 1.9.0.202106211534	(infineor
Please read the following important information before continuing.	Infineor
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Step 2

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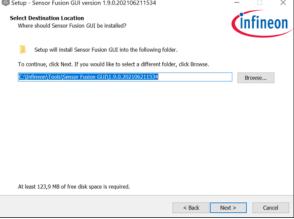
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Step 6



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



Device Elle	n GUI e <u>S</u> ettings <u>R</u> eco	rding <u>P</u> layback	Windows Held									-	٥	
				Start Acquisition					(	0	Start Rec	ording   🔅	Ē	
						DEVICE DISCONNE	TED							

Figure 5 Start-up screen

## 3.3 Step 3: Connect XENSIV<sup>™</sup> PAS CO2 Sensor2Go

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



#### Figure 6 XENSIV<sup>™</sup> 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<sup>™</sup> 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.

er Fusion GUI Device Settings Windows Help	Fusion GUI Device Settings Windows Help	
Co2 (COM35) CO2 View X	Co2 (COM35) V C Disconnect Stop Acquisition	
3000.0 3000.0		2 View 🗙
()	Pressure compensation:     O     [hPa]     Reference CO2 value:     O     [ppm]	3000.0
	(i)	

#### 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.

⇔ Fusion GUI Device §ettings ∭indows ∐elp	Evice Settings Windows Help	
Co2 (COM35) V Disconnect Stop Acquisition	Co2 (COM35) V O Disconnect Stop Acquisition	
©.	Forced Calibration	CO2 View X
3000.0	Reference CO2 value: 0 [ppm]	3000.0
<b>(i)</b>		

Figure 9 Enabling forced compensation

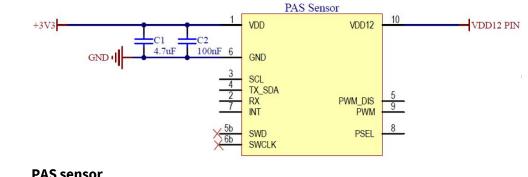
*Note:* Before enabling the Force compensation, the reference CO2 concentration needs to be determined.



## 4 Appendix

## 4.1 Schematics for evaluation motherboard

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





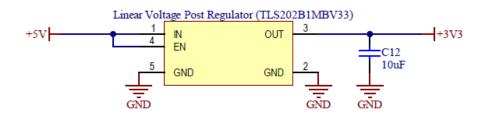


Figure 11 Infineon fixed linear voltage post regulator

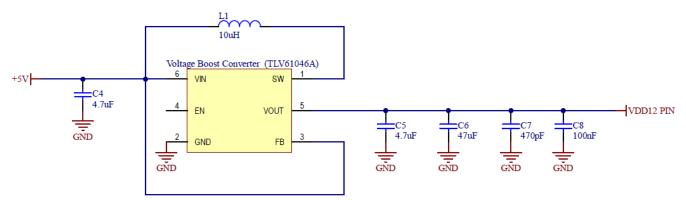


Figure 12 Example voltage boost converter to generate stable 12V



# **Revision history**

Document version	Date of release	Description of changes
V1.0	02.06.2021	Creation

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