SCD4x CO$_2$ Gadget User Guide
## Sensirion's Reference Design for SCD4x Sensors
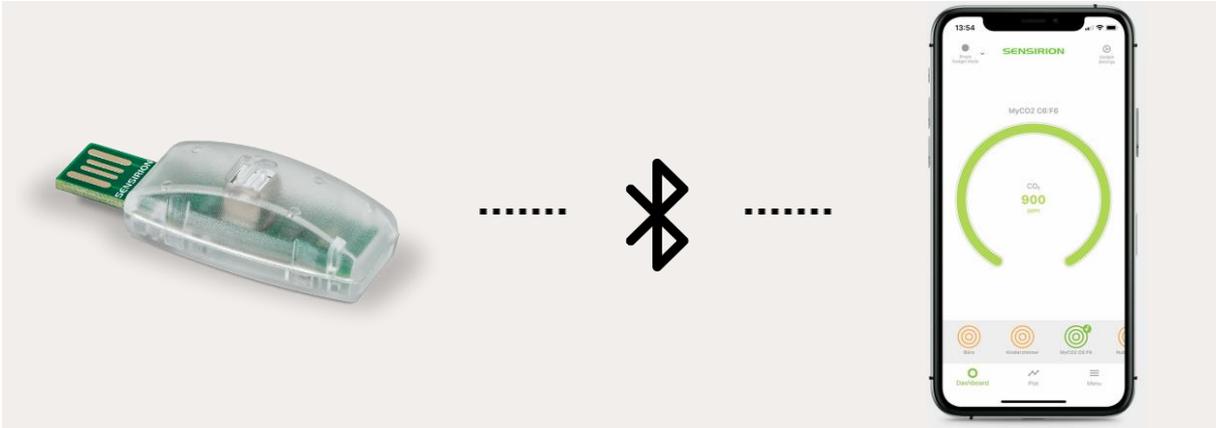
- SCD41 CO$_2$ sensor
- Compact form factor (53mm x 19 mm x 13 mm)
- LED (RGB) to indicate indoor air quality with the traffic light color scheme
- Bluetooth Low Energy (BLE) connectivity to iOS and Android smartphones
- Free iOS and Android app available
- Data logging and export capabilities

Introduction

The SCD4x CO$_2$ Gadget is a simple reference design circuit board which demonstrates the outstanding performance and ease of use of Sensirion's SCD4x CO$_2$ sensor product line. It is equipped with a LED indicating the indoor air quality based on the measured CO$_2$ concentration. It also incorporates a Bluetooth Low Energy module allowing it to communicate with Bluetooth Low Energy (BLE) capable devices like smartphones. Power is supplied via standard USB interface.

CO$_2$ Gadget Content

Download MyAmbience App for free
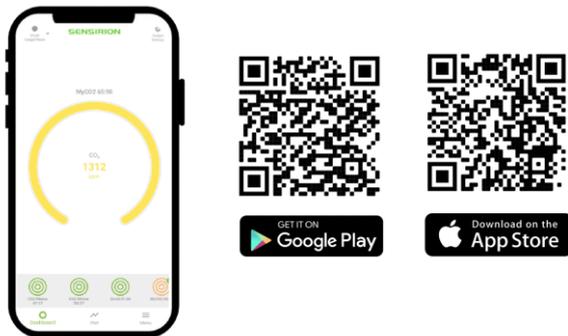
Contents

1 Quick Start Guide

1. Getting Started
 	
  ▪ Plug SCD4x CO_2 Gadget into powered USB port. Please respect polarity order.
 	
2. Standalone Operation
 	
  ▪ CO_2 concentration is indicated by the LED with the traffic light color scheme
     ▪ Green: 400 – 1'000 ppm
     ▪ Yellow: 1'001 – 1'600 ppm
     ▪ Red: > 1'600 ppm
 	
3. Operation with MyAmbience App
 	
  ▪ Download iOS or Android version of the MyAmbience app on your smartphone
  ▪ Open the App to automatically see nearby Sensirion gadgets on your smartphone
  ▪ Once connection is established, the exact CO_2 concentration and the history can be read out via the app.	

2 Standard Operations

2.1 Power SCD4x CO_2 Gadget via standard USB port

The CO_2 Gadget is powered via a standard USB port. The USB port should support a peak current of 200 mA and have a nominal voltage of 5 V.

2.2 Operating in Standalone Mode

This is the default operating mode. The measured CO_2 concentration is indicated via the integrated LED.

< 1000ppm   1000 – 1600 ppm   > 1600ppm

2.3 Connecting to a Bluetooth Device

Bluetooth mode is enabled by default. To connect the CO_2 Gadget to a smartphone, the smartphone must have the MyAmbience app installed, and Bluetooth enabled. For Android devices, location permission needs to be granted to the app for it to work, although the user location will not be used at any time. The app will automatically connect to surrounding Sensirion Gadgets with Bluetooth enabled. To display values from a specific CO_2 Gadget, the corresponding Gadget must be selected in the list of connected gadgets. The MyAmbience app can be downloaded from the corresponding app stores:

GET IT ON
Google Play

https://play.google.com/store/apps/details?id=com.sensirion.myam

Download on the
App Store

https://apps.apple.com/app/sensirion-myambience/id1529131572

2.4 System Requirement

In order for a mobile device to work with the CO_2 Gadget it needs to be Bluetooth 4.0 (also known as Bluetooth Low Energy or BLE) compatible. This is the case for most Android devices from 2013 and newer, Apple iPhones generation 4S and newer, and Apple iPad generation 3 and newer. The CO_2 Gadget apps run with Android 4.4 or later and iOS 9.0 or later, respectively.

2.5 Important Security Advice

- Keep out of reach of children and pets (contains swallowable parts)
- If any part is swallowed, contact a physician immediately
- CO_2 Gadget operating temperature range: -10 to 60 °C
- The CO_2 Gadget is intended for indoor use
- The CO_2 Gadget is sensitive to electrostatic discharge (ESD) – please take precautions

3 MyAmbience Application

3.1 Device selection

When Bluetooth is enabled, MyAmbience automatically scans for devices to connect with. When in the dashboard or plot panels, the devices which are connected to the application are displayed as concentric circles with the gadget's name underneath. Press on a device to select it. The selected device has a check mark on it and its information will be displayed in the dashboard or plot panel.
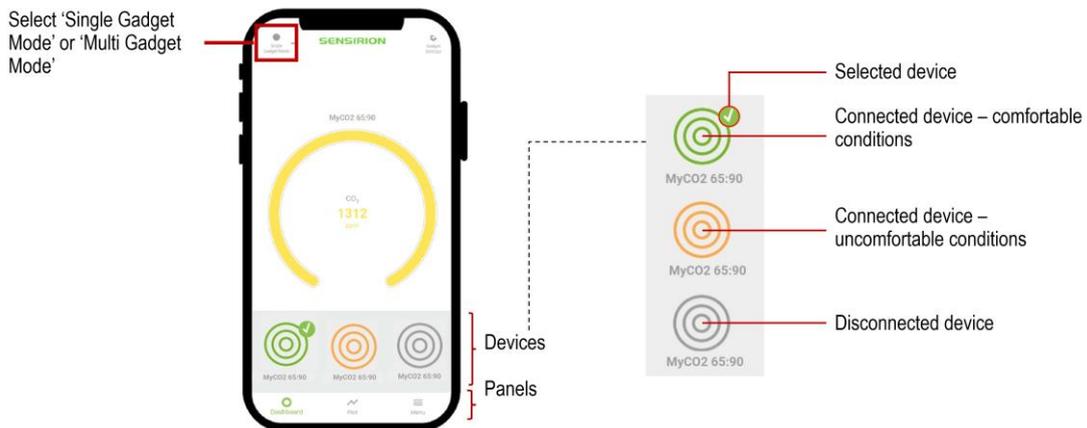
When the gadget logo (concentric circles) is green, it means that the environmental conditions measured by the gadget are deemed comfortable. If a device was connected during the runtime of the application but the connection is subsequently lost, the device logo will appear as grey in the list.
To select several Sensirion Gadgets simultaneously, the 'Multi Gadget Mode' must be selected on the upper right of the dashboard panel.

3.2 Dashboard Panel

The dashboard view displays the summary information of the Gadget's sensor readings. The color of the signal indicates the indoor air quality level. Good indoor air quality is indicated by a green color and represents CO_2 concentrations below 1000 ppm. Yellow color represented intermediate indoor air quality (1000 ppm – 1600 ppm). Finally, bad indoor air quality is represented by red color (> 1600 ppm).
The LED brightness and the logging interval of the CO_2 Gadget can be adjusted in the gadget settings. To display the sensor outputs from several Sensirion Gadgets simultaneously, the 'Multi Gadget Mode' must be selected.

3.3 Plot Panel

In the plot panel it is possible to plot the evolution of the environmental signals through time. On the top-right corner, the Fetch Data button allows to download environmental data stored in the gadget's memory. The CO_2 gadget stores the last 8192 CO_2 values. The downloaded data can then be displayed on a graph. Next to the Fetch Data button, the Export button enables to save and send the recorded data as an .edf file. Visit www.sensirion.com/co2-gadget for more information on how to process .edf files.
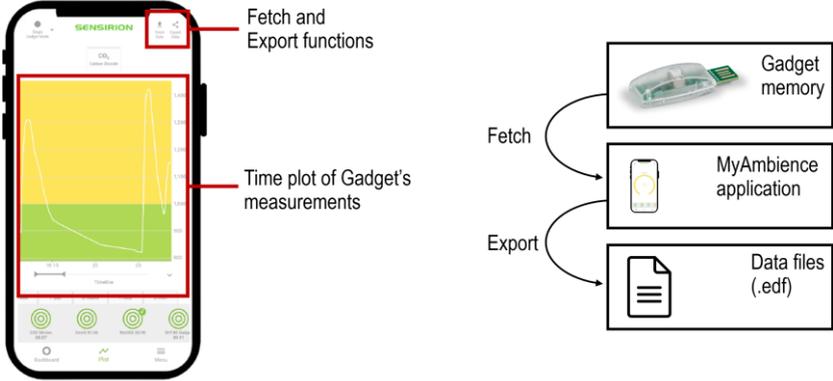
4 Version History

Date	Version	Changes
21. September 2021	0.9	Preliminary version

Important Notices

Warning, Personal Injury

Do not use this product as safety or emergency stop devices or in any other application where failure of the product could result in personal injury. Do not use this product for applications other than its intended and authorized use. Before installing, handling, using or servicing this product, please consult the data sheet and application notes. Failure to comply with these instructions could result in death or serious injury.

If the Buyer shall purchase or use SENSIRION products for any unintended or unauthorized application, Buyer shall defend, indemnify and hold harmless SENSIRION and its officers, employees, subsidiaries, affiliates and distributors against all claims, costs, damages and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if SENSIRION shall be allegedly negligent with respect to the design or the manufacture of the product.

ESD Precautions

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation, take customary and statutory ESD precautions when handling this product.
See application note "ESD, Latchup and EMC" for more information.

Warranty

SENSIRION warrants solely to the original purchaser of this product for a period of 12 months (one year) from the date of delivery that this product shall be of the quality, material and workmanship defined in SENSIRION's published specifications of the product. Within such period, if proven to be defective, SENSIRION shall repair and/or replace this product, in SENSIRION's discretion, free of charge to the Buyer, provided that:

- notice in writing describing the defects shall be given to SENSIRION within fourteen (14) days after their appearance;
- such defects shall be found, to SENSIRION's reasonable satisfaction, to have arisen from SENSIRION's faulty design, material, or workmanship;
- the defective product shall be returned to SENSIRION's factory at the Buyer's expense; and
- the warranty period for any repaired or replaced product shall be limited to the unexpired portion of the original period.

This warranty does not apply to any equipment which has not been installed and used within the specifications recommended by SENSIRION for the intended and proper use of the equipment. EXCEPT FOR THE WARRANTIES EXPRESSLY SET FORTH HEREIN, SENSIRION MAKES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT. ANY AND ALL WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY EXCLUDED AND DECLINED.

SENSIRION is only liable for defects of this product arising under the conditions of operation provided for in the data sheet and proper use of the goods. SENSIRION explicitly disclaims all warranties, express or implied, for any period during which the goods are operated or stored not in accordance with the technical specifications.

SENSIRION does not assume any liability arising out of any application or use of any product or circuit and specifically disclaims any and all liability, including without limitation consequential or incidental damages. All operating parameters, including without limitation recommended parameters, must be validated for each customer's applications by customer's technical experts. Recommended parameters can and do vary in different applications.

SENSIRION reserves the right, without further notice, (i) to change the product specifications and/or the information in this document and (ii) to improve reliability, functions and design of this product.

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