SEK-SensorBridge Technical Guide

Connecting Bridge with 2 Sensor Ports

Highlights

- I2C Bus with speeds up to 1MHz
- 1.2V-5.5V Selectable supply in voltage steps
- Connect up to 2 Sensor Evaluation Kits

- Micro USB Virtual COM Port
- RS485 Serial Connector

The SEK-SensorBridge (referred to as SensorBridge) is the universal tool of Sensirion when it comes to evaluation. Sensirion offers a huge variety of sensors and SensorBridge is used to connect the different Evaluation Kits and the different evaluation tools and drivers Sensirion offers.
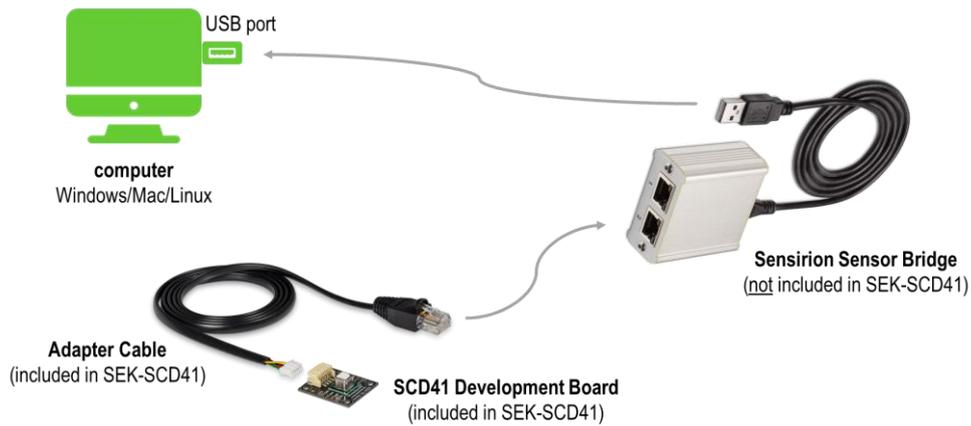
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Contents

1   Quick Start Guide

To connect a Sensor Evaluation Kit (SEK) via SensorBridge to your computer follow the next steps:

1. Use the adapter cable supplied with your SEK and connect it to the female connector on the evaluation board
2. Connect the RJ45 connector of the adapter cable to either of the two RJ45 ports on the SensorBridge
3. Use the supplied Micro USB to USB cable to power and connect the SensorBridge to your computer
4. Launch ControlCenter

Figure 1. Typical connection diagram to a computer with a SensorBridge and Sensor Evaluation Kit.

Find about the evalution kits on Sensirion Website: Sensor evaluation (sensirion.com)
Find about the compatibility list of SensorBridge in the Evaluation Kit Compatibility list

2   SensorBridge Hardware Specifications

Figure 2: SensorBridge with a usb cable

The hardware specifications of the SensorBridge are the following:

- Two independent channels are provided through two RJ45 ports, each offering:
    - I2C Bus with speeds up to 1MHz
    - 1.2V-5.5V Selectable supply in voltage steps
    - Analog In Pin (0V – 5V)
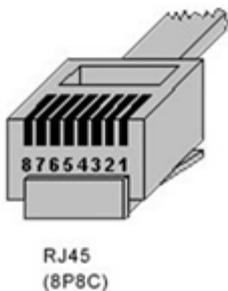- Micro USB Virtual COM Port
- RS485 Serial Connector

Packaging includes:
- SEK-Sensorbridge
- Micro USB to USB-A cable
- Flyer with information

Total weight with packaging and USB cable: 140g

2.1   RJ45 Connection

Each one of the two RJ45 connectors can be used to connect one Sensor Evaluation Kit via the supplied cable with the specific sensor evaluation kit. The Pinout and the Pin association with the connector are shown in the following table and diagram:

Pin	
1	GND
2	SCK
3	SCL
4	MISO
5	VDD
6	MOSI
7	SDA
8	Analog In

Table 1. Pinout and Pin association Diagram for the RJ45 Connector

A standard MicroUSB connector is used to connect the SensorBridge with the computer. This is used both for the evaluation through ControlCenter and to access the sensor through the Python Library for Sensorbridge.

Please make sure to use a cable suitable for data transfer through USB and **not** a cable suitable **only** for power transfer.

2.2 RS485 Connection

SensorBridge supports serial connections through an RS485 connector.

The physical connector is a 4Pin 1.25mm pitch connector from JST (type GHR-04V-S). The pinout and the characteristics of the connector are shown in the following figures:

Pin	
1	RS485 A+
2	RS485 B-
3	GND
4	5V

Table 2. Pinout and Pin association Diagram for the RS485 Connector

Please note that for the RS485 connection to work Sensorbridge **must not** be connected through the Micro USB connector.

3   Software Compatibility

The users have three ways to connect to a sensor via the SensorBridge:
1. For plug and play evaluation of the sensor the SensorBridge is compatible with ControlCenter
2. For prototyping with Python and UART the users can connect via either:
   a. The microUSB and the virtual COM port or
   b. The RS485 connector as explained in earlier sections

3.1   ControlCenter compatibility

SensorBridge is compatible with Sensirion's ControlCenter. Please visit Sensirion's website to download the latest version of ControlCenter.
To connect a Sensor Evaluation Kit (SEK) via SensorBridge to your computer follow the next steps:

1. Use the adapter cable supplied with your SEK and connect it to the female connector on the evaluation board
2. Connect the RJ45 connector of the adapter cable to either of the two RJ45 ports on the SensorBridge
3. Use the supplied Micro USB to USB cable to power and connect the SensorBridge to your computer
4. Launch ControlCenter

3.2   Python compatibility

For users who want to prototype using their Sensor Evaluation Kits and Sensorbridge, Sensirion provides a Python Library to connect through the SensorBridge to the Sensor.
The library implements the Sensirion SHDLC protocol based on the UART protocol.
This library is compatible both through the virtual COM port connection with the MicroUSB connector and through the serial RS485 connector.
You can find more information about the library in the underline relevant Github repository.
Currently only Python is supported for SensorBridge support.

3.3   How many sensors can I connect at the same time?

Each SensorBridge can support up to two independent i2c buses through the two RJ45 ports
There is no limit as to how many SensorBridges can be connected at the same computer. The only limitation is that each SensorBridge can have at most 3kHz frequency in the measurements.

3.4   How many SensorBridges can I connect at the same time?

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4 Evaluation Kit Compatibility list

Evaluation Kit	Material Number
SEK-SHT40	3.000.462
SEK-SHT40 Filter	3.000.892
SEK-SHT41	3.000.637
SEK-SHT40I	3.000.639
SEK-SHT41I	3.000.640
SEK-SHT40A	3.000.706
SEK-SHT41A	3.000.707
SEK-SHT45	3.000.730
SEK-SHTC3	3.000.110
SEK-SHTW2	3.000.109
SEK-SHT31	3.000.112
SEK-SHT35	3.000.113
SEK-SCC30-DB	3.000.171
SEK-STS40	3.000.703
SEK-STC31	3.000.472
SEK-SCD4x	3.000.455
SEK-SCD30	3.000.055
SEK-SEN5x	3.000.670
SEK-SDP8xx	3.000.764
SEK-SDP31	3.000.763
SEK-SFM4300-20-P	3.000.399
SEK-SFM4200	3.000.326
SEK-SFM4100	3.000.325
SEK-SFM3200	3.000.324
SEK-SFM3119	3.000.613
SEK-SFM3019	3.000.420
SEK-SFM3013	3.000.525
SEK-SFM3003	3.000.524
SEK-SFM3000	3.000.323

Table 3. Evaluation Kit Compatibility List.

5 Revision History

Date	Version	Pages	Changes
Date (Month Year)	1	all	Initial version
Date (Month Year)			

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.

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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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