

Getting Started with the Sensirion Environmental Sensor Shield

Required Hardware and Wiring

The Environmental Sensor Shield – ESS for short – is a sensor board which enables users to easily develop demos and prototypes using Sensirion’s air quality, relative humidity and temperature sensors. It is designed following the Arduino® footprint, which is a common form factor for reference designs and allows the board to be used with a wide variety of platforms.

It also features a simple 4-pin extension port on the bottom to simplify connecting to platforms which do not follow the Arduino footprint. Additionally, this 4-pin header can be used to move the board further away from the main PCB, which can contain heat sources and thus influence the temperature measurements.

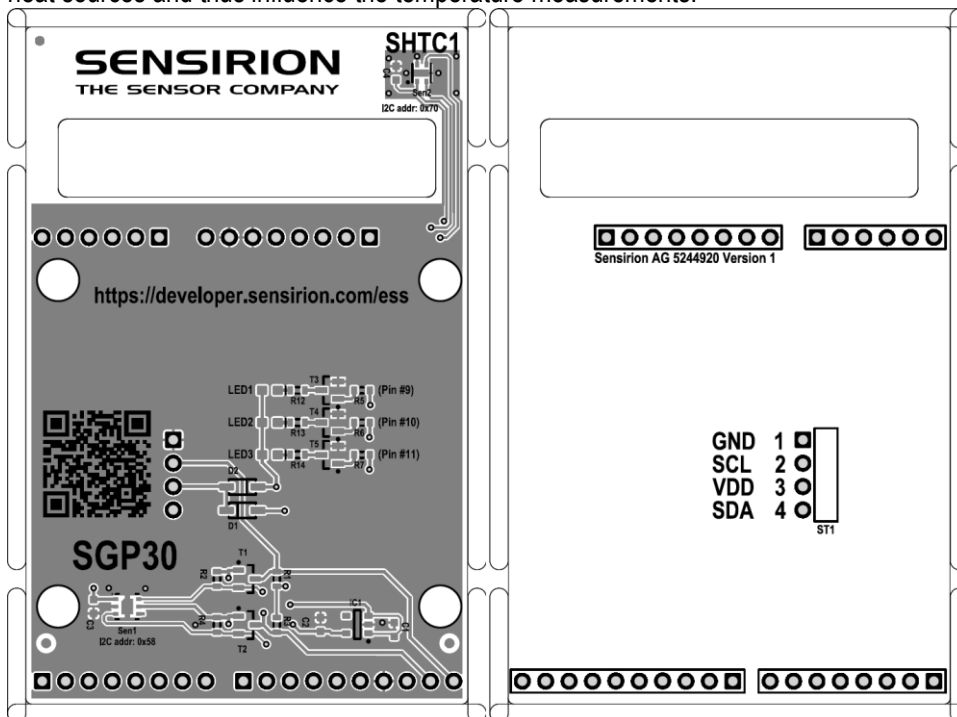


Figure 1: Top and Bottom view of the Sensirion ESS

The ESS includes three main components:

1. SHTC1 humidity and temperature sensor
2. SGP30 Indoor Air Quality (TVOC & CO₂eq) sensor
3. LED “traffic light” to display air quality data

SHTC1 and SGP30 are connected to pins 27 (SDA) and 28 (SCL), which are the standard Arduino I2C clock and data line.

The LEDs are available on the Arduino footprint, and are connected to pins 9 (red), 10 (yellow) and 11 (green) respectively. On Arduino, these pins are typically PWM pins, which allows to dim the LEDs depending on the application.

The pin header on the bottom has four signals, VCC, SDA, SCL, and GND. The LEDs cannot be accessed through the pin connector.

Datasheets

The datasheet for the SHTC1 can be found here: www.sensirion.com/shtc1

The datasheet for the SGP30 can be found here: www.sensirion.com/sgp

Application Note for Sensirion Environmental Sensor Shield

Software – Arduino

The official library for Arduino can be found on our github page: <https://github.com/Sensirion/arduino-ess>

Software - Raspberry Pi and other Linux-based platforms

Linux drivers for SHTC1 are part of the mainline kernels. To learn more about support for SHTC1 on Raspberry Pi and Linux please visit <https://developer.sensirion.com/platforms/raspberry-pi/> and <https://developer.sensirion.com/platforms/generic-linux-support/>

For the SGP30, Linux drivers are being prepared for inclusion in the mainline kernel. Please reach out to your contact person at Sensirion to learn more, or refer to "Software – Other platforms" for alternatives.

Software – Other platforms

Sensirion is providing generic sample drivers for our humidity, temperature and air quality drivers. The code can be found on our github page:

SHTC1: <https://github.com/Sensirion/embedded-sht>

SGP30: <https://github.com/Sensirion/embedded-sgp>

Connecting the ESS to a reference platform

Boards with Arduino footprint

For boards following the Arduino footprint, simply connect the ESS with the Arduino shield. Make sure that the pins of the ESS align with the Arduino board. To remove, simply pull on both sides on the PCB.

Other boards

For other boards, there's a 4-pin connector on the bottom of the PCB. The pins are VCC, SDA, SCL and GND, and they are labeled on the PCB. To connect to any platform, locate the corresponding signals on your platform, and connect using jumper wires.

Next steps

Once the board is running and drivers are in place, you're ready to build a demo or prototype. Depending on the goal, this could be anything from a simple air quality monitor to a internet-connected controller for your air purifier and air conditioning. Feel free to reach out to your Sensirion contact to learn more about use cases around the air quality, humidity and temperature sensors!

Please also visit our developer page on <https://developer.sensirion.com>, where we collect technical documentation like sample code, drivers and tutorials, but also inspirational documents about use cases! We look forward to seeing what you will build with the ESS!

References

Find your local representative at: <http://www.sensirion.com/refs>

Important: Keep in mind that reference boards can be sources of heat. For optimal sensor accuracy, consider moving the sensor shield away from the board using extension cables

Application Note for Sensirion Environmental Sensor Shield

Revision History

| Date | Author | Version | Changes |
|------------|--------|---------|--|
| 26.4.2018 | JWI | 0.2 | Update for ESS first generation release hardware |
| 12.10.2017 | JWI | 0.1 | Pre-release |

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