**Indoor air quality meter demonstrator**

**Description of sensors interfaces**

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| **GTC INTERNAL CODE:** |  |
| **DEPARTMENT :** | Sensors for Application and Processes |

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| **DOCUMENT NUMBER:** | v01 |

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1. **Si7013 temperature and humidity sensor**

The Si7013 sensor uses I2C interface to communicate with the Arduino board. Full descriptions of the available commands and registers see in the specification (page 21).

A custom library is developed to be used in iAQ demo firmware. In the current firmware version two functions from the library are used - to read humidity value and to read temperature value.

Other functions in the library allow to enable an integrated heater and to set a heater current.

1. **TSL2561T ambient light sensor**

The sensor uses I2C interface to communicate with the Arduino board. Full descriptions of the available commands and registers see in the specification (page 18).

A custom library is developed to be used in iAQ demo firmware. In the current firmware version a function to read output of a broadband photodiode (visible plus infrared) is used.

Other function in the library allows reading output of a separate infrared-responding photodiode.

1. **SDS021 particulate matter sensor**

The sensor uses UART interface to communicate with the Arduino board. Full descriptions of the available commands see in the specification (page 5).

Two functions from a developed library are used. One is to read PM2.5 concentration and another one is to read PM10 concentration.

1. **COZIR ambient carbon dioxide sensor**

The sensor uses UART interface to communicate with the Arduino board. Full descriptions of the available commands see in the Cozir user’s guide (page 7).

Sensor library includes a function to read CO2 concentration.

1. **MiCS-5524 VOCs sensor**

The sensor is an analog resistive device. It works as a part of voltage divider circuit. The output of the circuit is connected to ADC of the Arduino board. In order to simplify firmware code a library is developed. The library function takes averaged value from 5 ADC measurements with 100ms delay between each. The function also converts ADC counts to voltage value.

1. **Noise sensor based on the SPM0404HE5H-T microphone**

The microphone is an analog MEMS device. The electronic part of the sensor allows amplifying and filtering signal. The circuit output is connected to the Arduino ADC. To read the voltage value a library function is used. The function takes median value of 5 ADC measurements (100 ms delay) and converts ADC counts to voltage value.