

Application Note for Sensirion SHTC1 Xplained Pro Extension Board

Getting Started with the SHTC1 Extension Board and Demo Code

Summary

Many of today's smart phones and tablets feature processors to allow low power always-on sensor data processing. Sensirion is partnering with leading sensor hub manufacturer Atmel in their sensor hub initiative, a collaboration to bring together sensor manufacturers and companies developing fusion algorithms and create an expandable, unified platform to prototype new sensor subsystems for smart phones or wearable devices in a simple, plug-and-play fashion.

Sensirion provides a sensor wing board which is compatible with Atmel's Xplained Pro platform. This board includes the SHTC1 humidity and temperature sensor which is built for the consumer and mobile market, with its tiny 2x2x0.8mm³ footprint and 1.8V supply voltage. Sensirion's sensor board can be combined with any of the already available extension boards providing touch controls or display capabilities to quickly build powerful systems and start developing right away.

Required Hardware and Wiring

To run the demo code, the Atmel SAMD20 Xplained Pro Board and the Sensirion SHTC1 Xplained Extension Board are needed. The SHTC1 extension board has to be connected to SERCOM extension position 2 (EXT2) as shown in Figure 1.

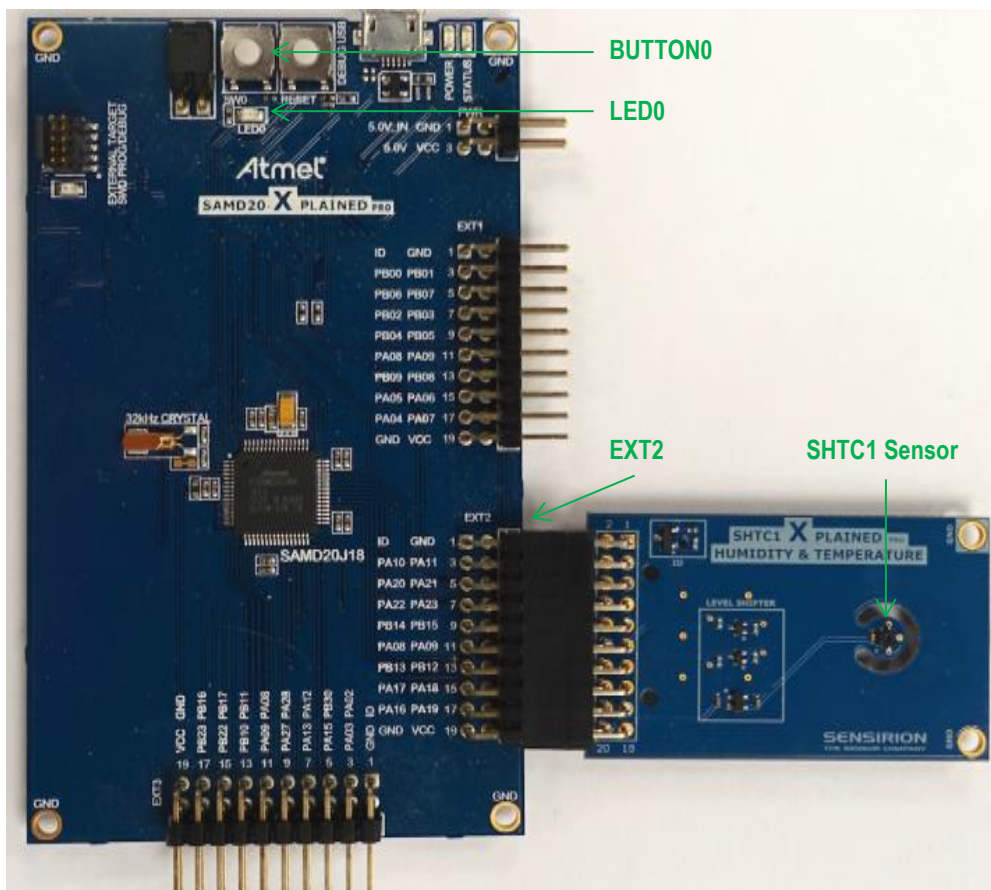


Figure 1: SHTC1 Xplained Extension Board connected to Atmel SAMD20 Xplained Pro Board

Functionality of Demo Code

The provided demo code implements communication with the SHTC1 sensor over the I2C bus. Values are read in a loop and used for detection of breathing on the sensor (so called Air-Touch).

On reset/start, a reference humidity value is calculated. During operation, humidity values are read in a loop and the difference between current value and reference value is calculated. If the difference exceeds a given threshold, LED0 is turned on. BUTTON0 can be used to re-initialize the reference value.

In addition, humidity values and calculated dew point values are sent to host PC over USART. When the example from Atmel studio is running, the output can be read with any serial port terminal program (e.g., hyper-terminal or Tera term) from EDBG Virtual COM Port.

Code Structure

The code is structured as follows:

- **SHTC1 driver (shtc1.c and shtc1.h)**- Implements I2C driver for SHTC1 sensor
- **Main file (main.c)** – Contains an entry point of an example. The code in this file calls initialization routines and subsequently starts the main loop, where values from the SHTC1 sensor are read and air-touch is detected
- **Helpers (demo_tools.c and demo_tools.h)** Contains implementation of helper functions, e.g., printing messages back to the terminal (for debugging purposes) and initialization of I2C board support.

References

More information on the SHTC1 can be found at www.sensirion.com/SHTC1.

License

Copyright (c) 2014, SENSIRION AG
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Headquarter and Sales Offices

SENSIRION AG
Laubisruetistr. 50
CH-8712 Staefa ZH
Switzerland
Phone: + 41 (0)44 306 40 00
Fax: + 41 (0)44 306 40 30
info@sensirion.com
www.sensirion.com

SENSIRION Inc
Westlake Pl. Ctr. I, suite 204
2801 Townsgate Road
Westlake Village, CA 91361
USA
Phone: +1 805-409 4900
Fax: +1 805-435 0467
michael.karst@sensirion.com
www.sensirion.com

SENSIRION Japan
Sensirion Japan Co. Ltd.
Shinagawa Station Bldg. 7F
4-23-5 Takanawa
Minato-ku, Tokyo, Japan
Phone: +81 3-3444-4940
Fax: +81 3-3444-4939
info@sensirion.co.jp
www.sensirion.co.jp

SENSIRION Korea Co. Ltd.
#1414, Anyang Construction Tower B/D,
1112-1, Bisan-dong, Anyang-city,
Gyeonggi-Province, South Korea
Phone: +82-31-440-9925~27
Fax: +82-31-440-9927
info@sensirion.co.kr
www.sensirion.co.kr

SENSIRION China Co. Ltd.
Room 2411, Main Tower
Jin Zhong Huan Business Building,
Postal Code 518048
Futian District, Shenzhen, PR China
Phone: +86 755 8252 1501
Fax: +86 755 8252 1580
info@sensirion.com.cn
www.sensirion.com.cn

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

Revision History

Date	Author	Version	Changes
07.08.2014	SDE/TPO	1	First Version
23.09.2014	CCO	1.1	Layout changes
09.10.2014	CCO/JWI	1.2	Released
24.10.2014	CCO	1.3	Minor changes

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Multiple Function Sensor Development Tools](#) *category:*

Click to view products by [Sensirion](#) *manufacturer:*

Other Similar products are found below :

[MAXWSNENV#](#) [STEVAL-MKIT01V1](#) [KT-O2-25%-TB200A-E](#) [KT-TVOC-200-TB200A](#) [KT-NmHc-200-TB200A](#) [SEN0344](#) [PIM520](#)
[PIM518](#) [PIM519](#) [PIM502](#) [AS7022-EVALKIT](#) [ALTEHTG2SMIP](#) [MAX30101WING#](#) [OB1203SD-U-EVK](#) [MIKROE-4265](#) [A000070](#)
[EV_ICG-20660L](#) [GX-F12A-P](#) [GX-F15A](#) [GX-F8AI-P](#) [GX-H15AI-P](#) [GX-H6A-P](#) [GX-HL15B-P](#) [1093](#) [MIKROE-2455](#) [MIKROE-2458](#)
[MIKROE-2507](#) [MIKROE-2508](#) [MIKROE-2516](#) [MIKROE-2529](#) [1458](#) [MIKROE-1628](#) [176](#) [189](#) [1893](#) [2106](#) [ATQT4-XPRO](#) [GP30-DEMO](#)
[MODULE](#) [GX-F12AI-P](#) [GX-F15A-P](#) [GX-FL15B-P](#) [GX-H12AI-P](#) [GX-H15A-P](#) [GX-H6AI-P](#) [GX-H8A-P](#) [GX-F15AI-P](#) [GX-FL15A-P](#) [AAS-](#)
[AQS-UNO](#) [DFR0018](#) [DFR0131](#)