



RoomSensor-Shield

Arduino Compatible Development Tool

Arduino Compatible Development Tool: RoomSensor-Shield

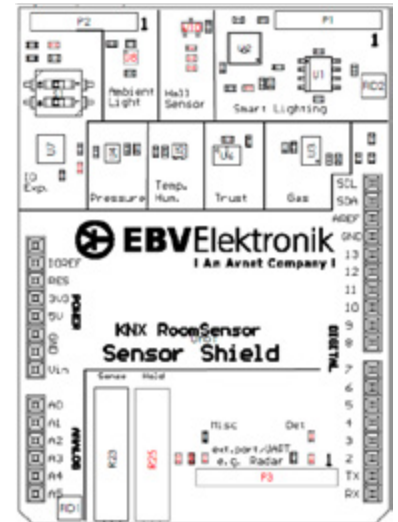
This Arduino compatible Sensor Shield includes the newest sensors relevant for Building and Home Automation. Including sensors for HVAC, presence detection, smart blinds, lighting control and indoor air quality, it paves the way for new capabilities in sensor fusion applications. Together with the optional microcontroller baseboard and the connectivity board, it can be used in a KNX environment and can provide all relevant sensor values to control other actors like lights, blinds, shutters, HVAC and many more. With a reliable presence detection, it can also be the base for e.g. medical surveillance.

APPLICATIONS

- Building automation (hospitality, office, retail)
- Home automation

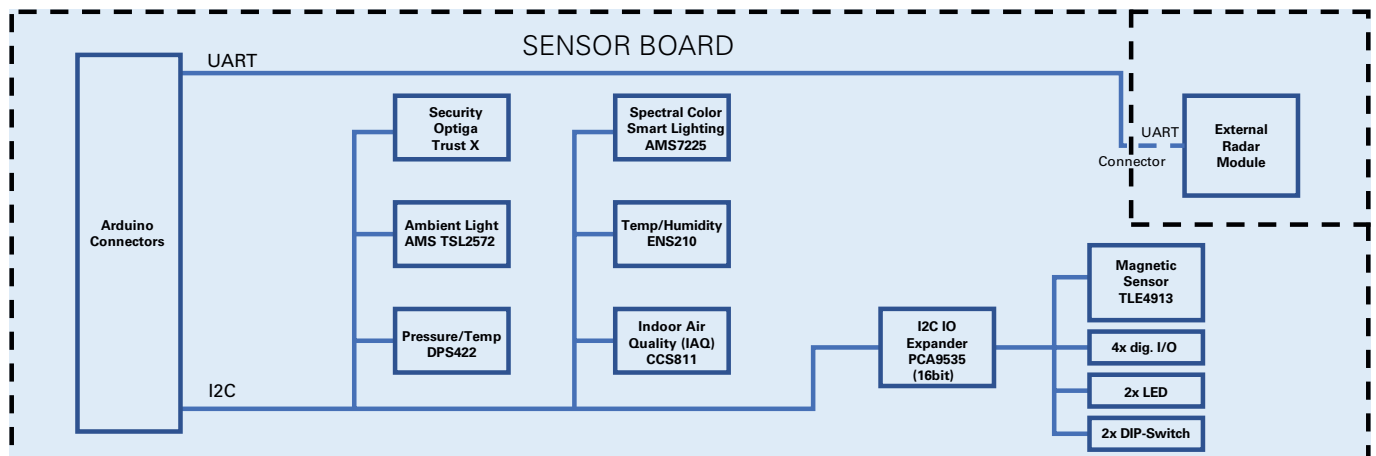
USE CASES

- HVAC (Heating, Ventilation, Air Conditioning)
- Indoor air quality, presence detection, door/ window opening detection, weather forecast
- Lighting control
- Daylight harvesting, human centric lighting, color consistency, presence detection
- Blinds and curtains control
- Safety / security e.g. presence sensing, intruder detection, gas detection





Sensor- and connector placement on the board, board-dimensions

BLOCK DIAGRAM



DEVICES BY SUPPLIER

Supplier	Device description	Application details
 www.ams.com	Temperature & humidity sensor – ENS210	Relative humidity & temperature for HVAC and as reference for VOC sensor
	Gas Sensor VOC – AMS CCS 811	Total VOC (Volatile Organic Compound) and equivalent CO2 (eCO2) indication for indoor air quality monitoring
	Ambient Light Sensor – AMS TSL25721	Ambient light conditions for sun shades, daylight harvesting and HVAC control
	Smart Lighting Director – AS7225	Closed loop CCT, tunable-white and/or daylighting management for luminaires & lamps
	Pressure / Temperature Sensor – DPS422	Door/window open detection, intruder detection, weather forecasting
	Radar Module – RFbeam K-LD2	Motion detection, micro movement detection, proximity sensor
	Secure Element – Optiga Trust X	Secure key (private key storage, symmetric key generation), software protection, anti-cloning
	Magnetic Sensor - TLE4913	Integrated Hall-Effect Sensor designed specifically to meet the requirements of low-power e.g. battery operated devices. It offers precise magnetic switching points and high temperature stability

OPERATING CONDITIONS, CONNECTIONS USED ON SENSOR SHIELD

Operating Conditions	min	typ	max
VCC Operating Voltage		3,3 V	
ICC Operating Current		15 mA*	

* Radar-Sensor not connected

Arduino connections used	
I2C	Sensor connection, I2C chain
UART	UART from baseboard to radar-connector

CONNECTORS / LED DESCRIPTION

Arduino Connector

Digital Pins	Function Room Sensor Shield	Analog Pins	Function Room Sensor Shield
D0	Serial Port RX	A5	-
D1	Serial Port TX	A4	-
D2	-	A3	-
D3	-	A2	-
D4	-	A1	Interrupt, sensorboard IO Expander
D5	-	A0	-
D6	-	Vin	-
D7	-	GND	GND
D8	-	GND	GND
D9	-	5V	-
D10	-	3V3	VCC
D11	-	RES	-
D12	-	IOREF	-
D13	-		
GND	GND		
ARef	-		
SDA	I2C Data		
DCL	I2C Clock		

P1 (FlashCAT-Connector)

Pin	Function Sensor Board
1	VCS
2	CLK
3	MOSI
4	MISO
5	set Pin5 to GND to enable programming
6	GND

P3 (digital IOs)

Pin	Function Sensor Board
1	VCC (3V3)
2	IO Expander IO4
3	IO Expander IO5
4	IO Expander IO6
5	IO Expander IO7
6	GND

P2 (Radar-Connector)

Pin	Function Sensor Board
1	Radar GND
2	Radar Detect
3	Radar VCC (3V3)
4	Radar Serial Port RX
5	Radar Serial Port TX
6	Radar Hold Time
7	Radar Sensitivity
8	Radar MiscOut

LEDs

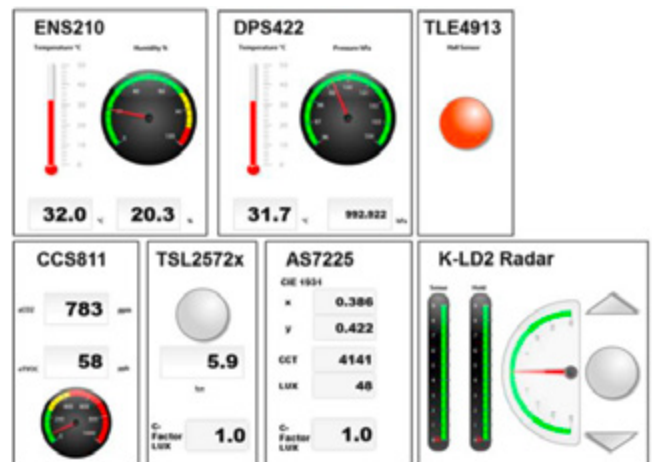
Pin	Function Sensor Board
D1	Yellow, Magentic Sens TLE4913
D2	Yellow, Smart Lighting AS7225 Boot OK
D3	Green, dig.IO
D4	Red, dig.IO
D5	Green, Radar Misc
D6	Green, Radar Det

DEMO-SOFTWARE AND APPLICATION EXAMPLES

In addition to this RoomSensor-Shield, a demo software with application examples is available for the XMC1400-bootkit, the optional microcontroller baseboard.

This C-program shows how to interface each sensor in software and includes a PC-visualization tool.

More information like sources and quick start instruction guide is available at:
www.ebv.com/roomsensorshield



Screenshot of the GUI: KNX RoomSensor-Shield

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