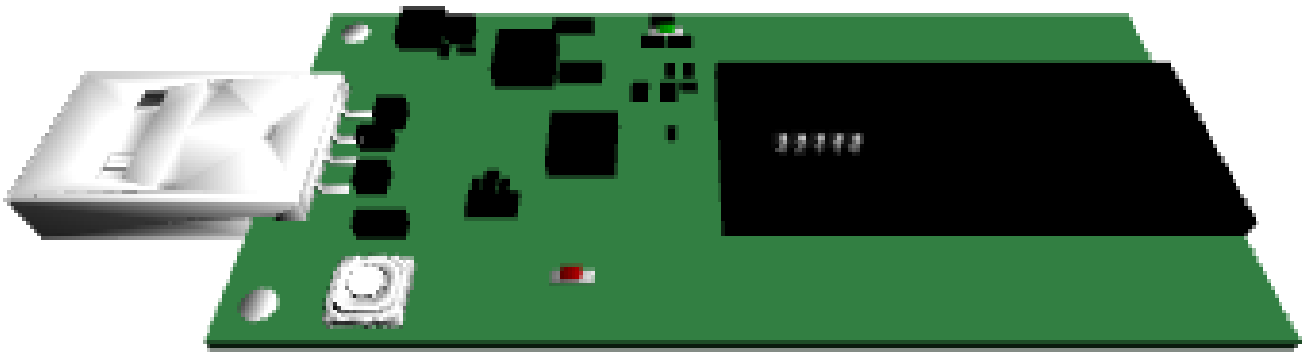
Occupancy and Air Sensor



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Board Description

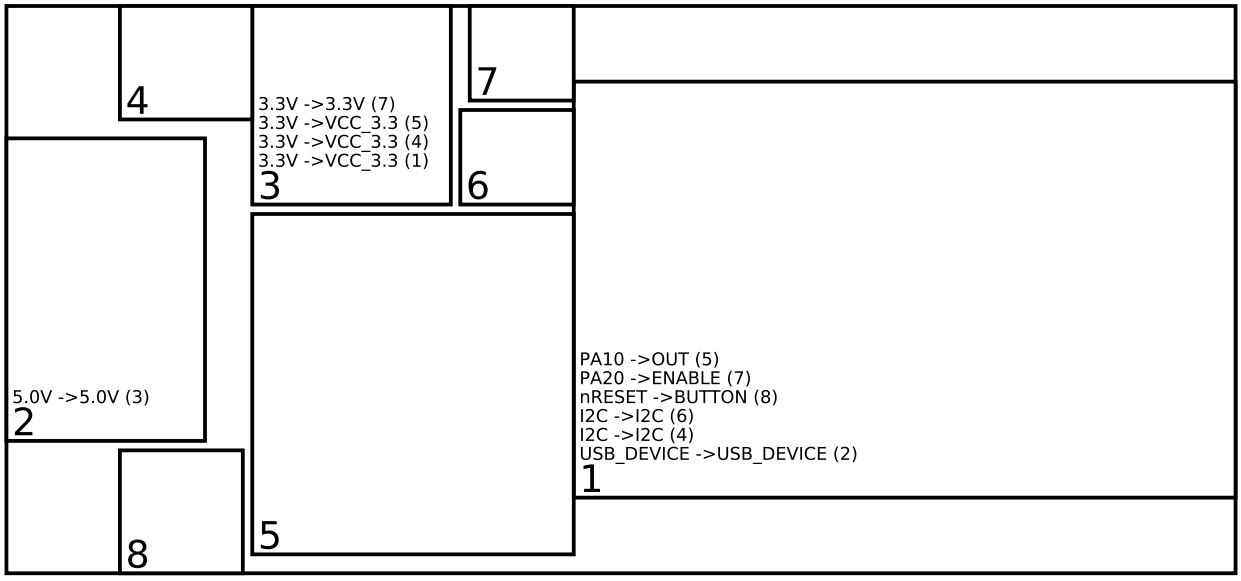
Occupancy and Air Sensor

Board Dimensions

6.5cm x 3cm

Contents

1 Modules on Board



1.1 Processors

1.1.1 ATSAMW25 M0+WiFi (v1) (1)

The Atmel SMART SAMW25 module is based on the industry leading low-power 2.4GHz IEEE 802.11 b/g/n Wi-Fi ATWINC1500 SoC (System on Chip) combined with the ARM Cortex-M0+ based microcontroller technology from Atmel.

Datasheet available at:

`http://ww1.microchip.com/downloads/en/DeviceDoc/Atmel-42395-SmartConnect-ATSAMW25-MR210PA_Datasheet.pdf`

Requires:

- VCC_3.3 from 3.3V/1.5A Regulator (3)

Provides:

- USB_DEVICE to Standard-A Plug (2)
- I2C to:
  - Humidity Sensor (4)
  - Barometer (6)
- VLOGIC to:
  - Humidity Sensor (4)
  - Barometer (6)
  - Tactile Switch (8)

  - Passive Infrared (PiR) - Motion Sensor (5)
- nRESET to Tactile Switch (8)
- PA20 to Top-side LED (7)
- PA10 to Passive Infrared (PiR) - Motion Sensor (5)

1.2 USB

1.2.1 Standard-A Plug (v6) (2)

A standard-A USB plug allows your board to be connected as a device to an external host. It can also be used to power the board off the 5V power drawn from the USB host.

The module exposes USB_DEVICE on ATSAMW25 M0+WiFi (1).

It supplies 5.0V to:

- 3.3V/1.5A Regulator (3)

1.3 Power

1.3.1 3.3V/1.5A Regulator (v11) (3)

This DC to DC step down regulator provides a 3.3V DC output at 1.5A needed by certain components on this board. It is capable of accepting an input voltage between 3.1 to 16V DC and output is controlled by the TI TPS6211 buck regulator.
It recieves 5.0V from Standard-A Plug (2).

The dataheet for the TPS6211 regulator is available at:

`http://www.ti.com/lit/ds/symlink/tps62110.pdf`

This regulator provides 3.3V to:

- ATSAMW25 M0+WiFi (1)
- Humidity Sensor (4)
- Passive Infrared (PiR) - Motion Sensor (5)
- Top-side LED (7)

1.4 Sensors

1.4.1 Humidity Sensor (v3) (4)

The humidity sensor module uses the Silicon Labs Si7021-A20 humidity and temperature sensor to measure ambient humidity. The module communicates with host devices serially over I^2C.

The Si7021-A20 sensor's datasheet is available at:

https://www.silabs.com/Support%20Documents%2FTechnicalDocs%2FSi7021-A20.pdf

Highlights

Maximum resolution	0.025	5°RH
Maximum temp. resolution	0.01	°C
I^2C slave address		0x40

Connections
The humidity sensor module is connected to I2C on ATSAMW25 M0+WiFi (1).

1.4.2 Passive Infrared (PiR) - Motion Sensor (v1) (5)

This module uses the Murata IRS-B210ST01-R1 sensor with the ON Semiconductor NCS36000 Passive Infrared (PIR) Detector Controller.

This sensor output is connected via GPIO to ATSAMW25 M0+WiFi (1).

1.4.3 Barometer (v8) (6)

The barometer module is an ultra-compact, low-power barometric preasure sensor useful for aerial vehicles. The module's MS5611-01BA03 Barometric Pressure Sensor offers a high resolution reading, accurate to within 10 cm and is optimized for altimeter and variometer applications. It can communicate serially either over I^2C or SPI buses. *At altitudes close to sea level, covering the barometer module with a light piece of foam may help to improve the accuracy of readings.*

Highlights

Max resolution:	0.065	mbar
Range:	10 – 1200	mbar
Min response time:	0.5	ms
I^2C slave addr:		0x76

Connections
This module is connected to I2C on ATSAMW25 M0+WiFi (1).

Visit http://www.meas-spec.com/downloads/MS5611-01BA03.pdf for details.

1.5 IO

1.5.1 Top-side LED (v4) (7)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on PA20 from ATSAMW25 M0+WiFi (1).

1.5.2 Tactile Switch (v16) (8)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal nRESET on ATSAMW25 M0+WiFi (1).

2 Module Connections Graph

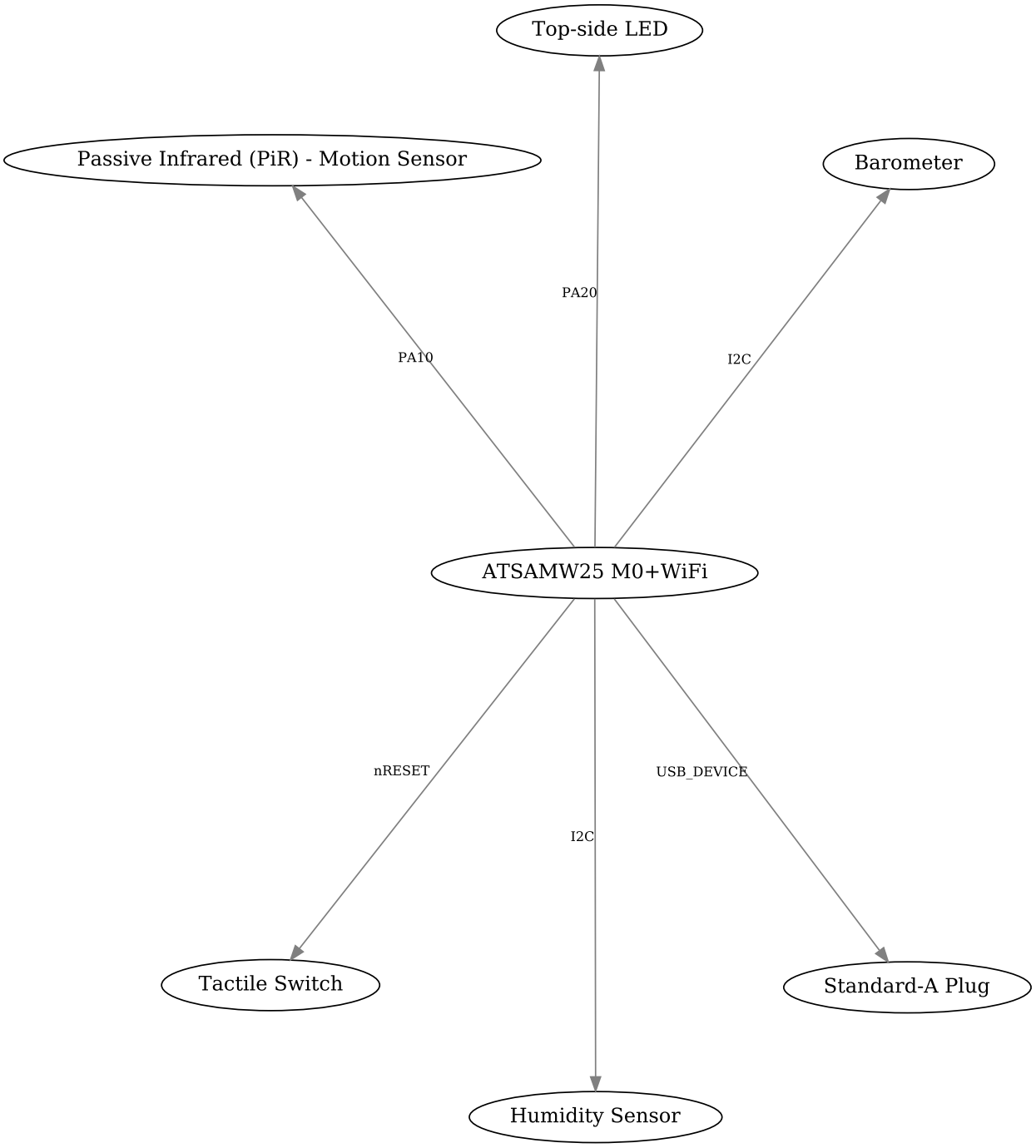


Figure 1: excludes power modules

3 Module Power Graph

Mouser Electronics

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