

Temperature & Humidity Digital Sensor

BM25S2021-1
Arduino Library V1.0.1 Description

Revision: V1.01 Date: September 07, 2023

www.bestmodulescorp.com

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Introduction

The BEST MODULES BM25S2021-1 is a temperature and humidity digital sensor, which uses the I²C or the One-wire communication method. This document provides the description of the BM25S2021-1 Arduino Lib functions and how to install the Arduino Lib. The example demonstrates the function of reading the temperature and humidity values with the BME33M251.

Applicable model:

Model	Description
BM25S2021-1	Temperature and humidity digital sensor
BME33M251	Integrated BM25S2021-1 sensor

Arduino Lib Functions

Arduino Lib Name: BM25S2021-1		Lib Version: V1.0.1
Constructors & Initialisation		
1	BM25S2021_1 (TwoWire *theWire)	
	Description	Constructor, select the I ² C communication method
	Parameter	*theWire: I ² C communication interface selection
	Return Value	—
	Note	—
2	BM25S2021_1 (uint8_t datapin = 8)	
	Description	Constructor, select the One-wire communication method
	Parameter	datapin: data pin
	Return Value	—
	Note	—
3	void begin()	
	Description	Module initialisation
	Parameter	—
	Return Value	void
	Note	—
Performance Functions		
4	float readTemperature(bool isFahrenheit = false)	
	Description	Get the temperature value
	Parameter	isFahrenheit: true: °F false: °C (default)
	Return Value	Temperature value
	Note	—
5	float readHumidity()	
	Description	Get the humidity value
	Parameter	—
	Return Value	Humidity value
	Note	Relative humidity = humidity value %

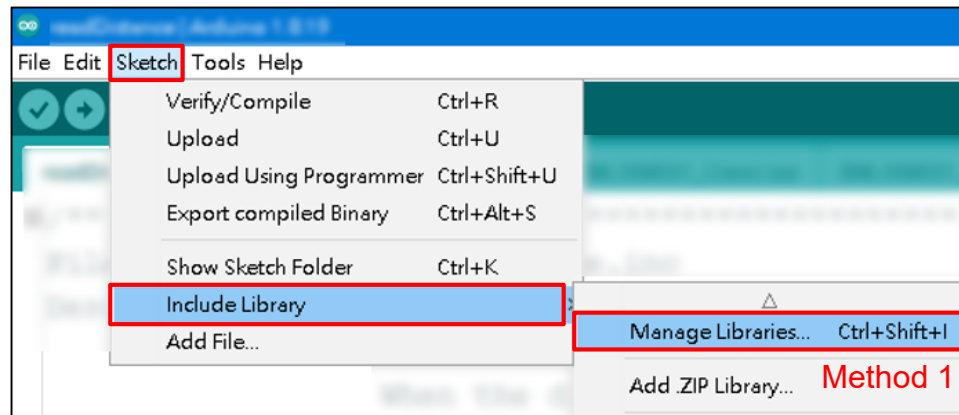
6	uint8_t getFWVer()	
	Description	Get the version number
	Parameter	—
	Return Value	Version number
7	uint16_t getPID()	
	Description	Get the product number
	Parameter	—
	Return Value	Product number
8	uint32_t getSN()	
	Description	Get the serial number
	Parameter	—
	Return Value	Serial number
	Note	—

Arduino Lib Download and Installation

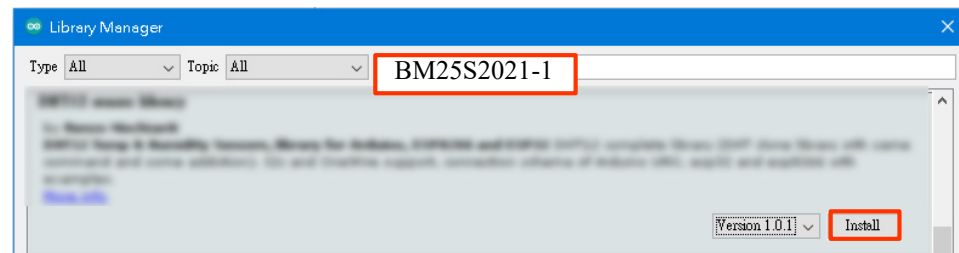
BM25S2021-1 Library: Refer to the following two methods to install the BM25S2021-1 Arduino Library.

Method 1: Search for installation

Arduino IDE → Sketch → Include Library → Manage Libraries → Search for BM25S2021-1 → Install



Search for Installation Step 1

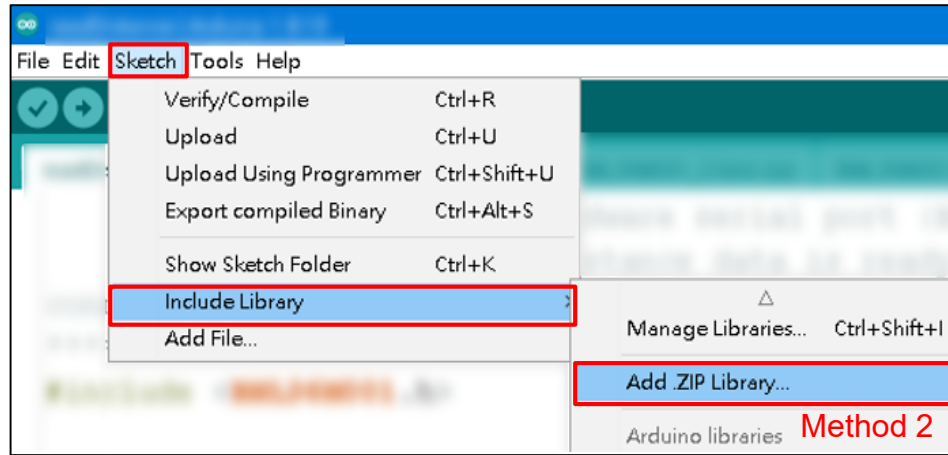


Search for Installation Step 2

Method 2: Download the .ZIP library before adding it

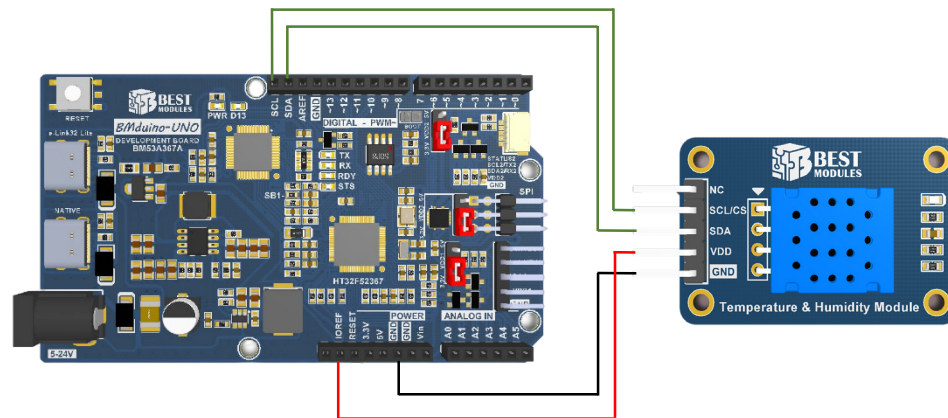
Download the Arduino example (BM25S2021-1 Library) under the DOCUMENTS menu from the Best Modules website (<https://www.bestmodulescorp.com/bm25s2021-1.html>).

Add .ZIP library: Arduino IDE → Sketch → Include Library → Add .ZIP Library...



Arduino Example

Example 1: readTemperatureAndHumidityWithIIC



Physical Connection Diagram

Example 1 function: Communicate with the module in I²C method, get the temperature and humidity values and display them in the serial monitor.

1. Open the example: File → Examples → Select Lib (BM25S2021-1) → Select example (readTemperatureAndHumidityWithIIC)

2. Example Description:

a. Create object & initialise object

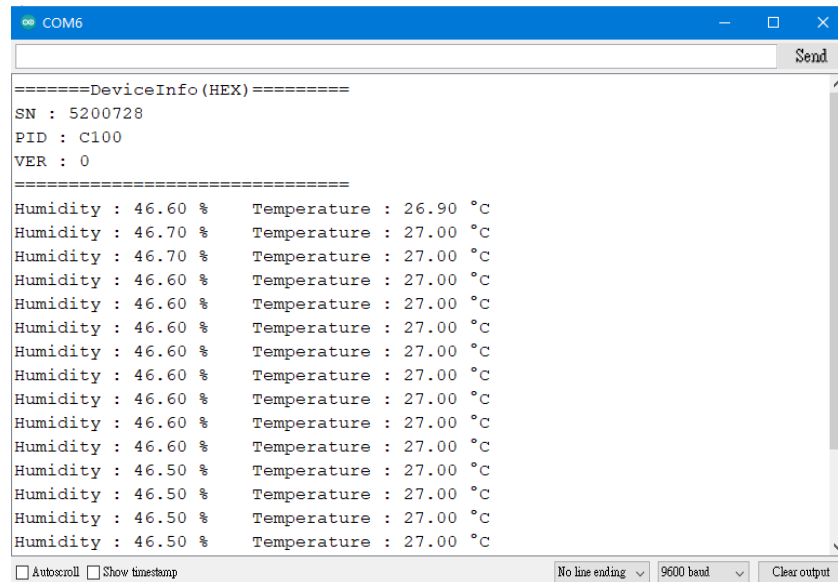
```
#include "BM25S2021-1.h"
BM25S2021_1 BMht(&Wire)           // Select the I2C communication method

void setup() {
    BMht.begin();                  // Module initialisation
    Serial.begin(9600);            // The serial baud rate is 9600
    /* Get the product information of the module */
    Serial.println("====DeviceInfo (HEX)====");
    Serial.print("SN : ");
    Serial.println(BMht.getSN(), HEX);
    Serial.print("PID : ");
    Serial.println(BMht.getPID(), HEX);
    Serial.print("VER : ");
    Serial.println(BMht.getFWVer(), HEX);
    Serial.println("====");
    delay(2000);
}
```

b. Get the temperature and humidity values and display them in the serial monitor

```
void loop() {
    Serial.print("Humidity : ");
    Serial.print(BMht.readHumidity());
    Serial.print(" % ");
    Serial.print("Temperature : ");
    Serial.print(BMht.readTemperature());
    Serial.println(" °C ");
    delay(2000);
}
```

3. Open the serial monitor and set the baud rate to be 9600. The serial monitor will display as follows:

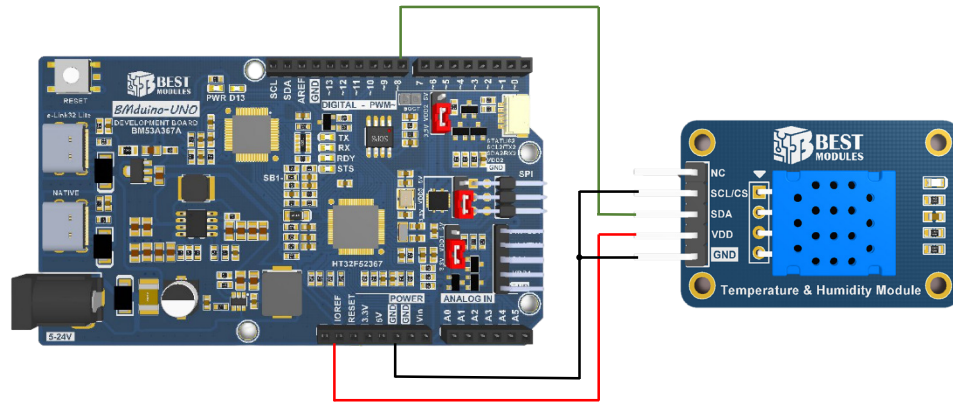


The screenshot shows the Serial Monitor window for COM6. The output displays device information followed by a continuous stream of temperature and humidity readings. The device information includes SN: 5200728, PID: C100, and VER: 0. The temperature readings are consistently 27.00 °C, and the humidity readings fluctuate between 46.50% and 46.70%.

```
====DeviceInfo (HEX)====
SN : 5200728
PID : C100
VER : 0
====
Humidity : 46.60 %    Temperature : 26.90 °C
Humidity : 46.70 %    Temperature : 27.00 °C
Humidity : 46.70 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.60 %    Temperature : 27.00 °C
Humidity : 46.50 %    Temperature : 27.00 °C
Humidity : 46.50 %    Temperature : 27.00 °C
Humidity : 46.50 %    Temperature : 27.00 °C
Humidity : 46.50 %    Temperature : 27.00 °C
```

Note: The continuous reading time must be greater than or equal to 2 seconds.

Example 2: readTemperatureAndHumidityWithOneWire



Connection Schematic Diagram

Example 2 function: Communicate with the module in one-wire method, get the temperature and humidity values and display them in the serial Monitor.

1. Open the example: File → Examples → Select Lib (BM25S2021-1) → Select example (readTemperatureAndHumidityWithOneWire)
2. Example Description:
 - a. Create object & initialise object

```
#include "BM25S2021-1.h"
BM25S2021_1 BMht(8); // Select the one-wire communication method and
                      // set the pin8 as the data pin

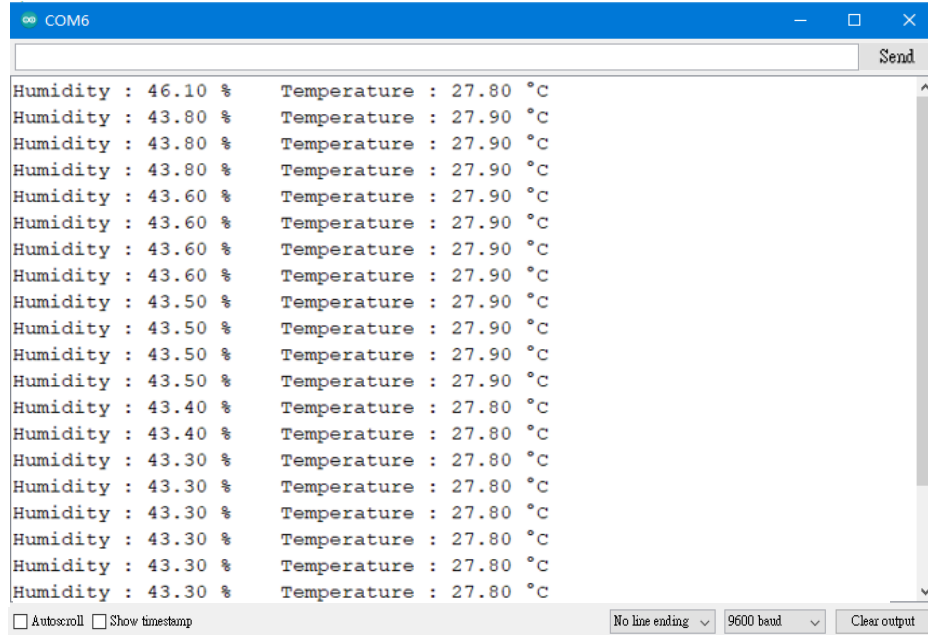
void setup() {
    BMht.begin();           // Module initialisation
    Serial.begin(9600);     // The serial baud rate is 9600
}
```

- b. Get the temperature and humidity values and display them in the serial monitor

```
void loop() {
    Serial.print("Humidity : ");
    Serial.print(BMht.readHumidity());
    Serial.print(" %    ");

    Serial.print("Temperature : ");
    Serial.print(BMht.readTemperature());
    Serial.println(" °C ");
    delay(2000);
}
```

3. Open the serial monitor and set the baud rate to be 9600. The serial monitor will display as follows:



Note: The continuous reading time must be greater than or equal to 2 seconds.

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