

Erriez LM35 library for Arduino

1.1.0

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# Chapter 1

## LM35 temperature sensor library for Arduino

This is an accurate [LM35](#) analog temperature sensor library for Arduino with noise cancellation.

### Library features

- Synchronous 10-bit unsigned temperature read
- Temperature range: 0.0 .. 110.0 degree Celsius
- Accuracy: 0.1 degree Celsius
- Noise cancellation
- Small footprint

### Hardware

#### Supported hardware

- All ATmega328P MCU (Arduino UNO, Micro, Nano, etc)
- All ATmega32U4 MCU (Arduino Leonardo, Pro Micro, etc)
- Arduino ATmega2560

#### Notes:

- This library changes analog pins to ADC 1.1V internal reference voltage which affects all analog pins.
- The function `analogReference()` may not be supported with other non-AVR MCU's.

Arduino UNO - [LM35](#) example

LM35	Arduino UNO
GND	GND
Vs	5V (or 3.3V)
Vout	A0 (ANALOG pin)

**Notes:**

- Keep wires short to prevent noise.

**LM35 pins****LM35 specifications**

- Supply voltage: 3.3V .. 30V
- Low power: Around 65uA
- Analog voltage interface

**Examples**

Arduino IDE | Examples | Erriez [LM35](#) analog temperature:

- [Example](#)

**Documentation**

- [Doxygen online HTML](#)
- [Doxygen PDF](#)
- [LM35 datasheet](#)

**Usage****Initialization**

```
1 {c++}
2 #include <ErriezLM35.h>
3
4 // Connect LM35 data pin to Arduino DIGITAL pin
5 #define LM35_PIN    A0
6
7 LM35 lm35 = LM35(LM35_PIN);
```

**Read temperature and humidity**

```
1 {c++}
2 void loop()
3 {
4     // Read unsigned temperature from sensor
5     uint16_t lm35_temp = lm35.readTemperature();
6
7     // Print temperature
8     Serial.print(F("LM35: "));
9     Serial.print(lm35_temp / 10);
10    Serial.print(F("."));
11    Serial.print(lm35_temp % 10);
12    Serial.println(F(" *C"));
13
14    // Wait some time
15    delay(2000);
16 }
```

**Serial output**

```
1 Analog LM35 temperature sensor example
2
3 LM35: 18.1 *C
4 LM35: 18.2 *C
5 LM35: 18.2 *C
6
7 ...
```

### Library dependencies

- None

### Library installation

Please refer to the [Wiki](#) page.

### Other Arduino Libraries and Sketches from Erriez

- [Erriez Libraries and Sketches](#)





## Chapter 2

# Class Index

### 2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

<a href="#">LM35</a>	
<a href="#">LM35</a> sensor class . . . . .	<a href="#">9</a>



## Chapter 3

# File Index

### 3.1 File List

Here is a list of all documented files with brief descriptions:

<a href="#">ErriezLM35.cpp</a>	
Analog <a href="#">LM35</a> temperature sensor library for Arduino . . . . .	11
<a href="#">ErriezLM35.h</a>	
Analog <a href="#">LM35</a> temperature sensor library for Arduino . . . . .	11



## Chapter 4

# Class Documentation

### 4.1 LM35 Class Reference

LM35 sensor class.

```
#include <ErriezLM35.h>
```

#### Public Member Functions

- [LM35](#) (uint8\_t pin)  
*LM35 constructor.*
- uint16\_t [readTemperature](#) ()  
*Read unsigned analog temperature.*

#### 4.1.1 Detailed Description

LM35 sensor class.

Definition at line 49 of file ErriezLM35.h.

#### 4.1.2 Constructor & Destructor Documentation

4.1.2.1 [LM35::LM35](#) ( uint8\_t *pin* ) [explicit]

LM35 constructor.

The constructor changes the ADC to 1.1V internal ADC reference voltage for higher accuracy. This affects all ANALOG pins.

##### Parameters

<i>pin</i>	LM35 analog pin.
------------	------------------

Definition at line 42 of file ErriezLM35.cpp.

### 4.1.3 Member Function Documentation

#### 4.1.3.1 uint16\_t LM35::readTemperature ( )

Read unsigned analog temperature.

Sample [LM35](#) analog pin multiple times to find two identical samples to reduce noise. A maximum number of samples can be configured with macro LM35\_MAX\_SAMPLES. The last sampled temperature will be returned when no identical temperatures found.

Temperature range: 0.0 .. 110 degree Celsius: A negative temperature cannot be measured, because the ADC pin can only sample between positive 0.0 and 1.1 Volt.

#### Returns

Divide temperature by 10 to get the temperature integer, temperature modulo 10 results in the fraction, for example: int16\_t temperature = 182 means 18.2 degree Celsius.

Definition at line 73 of file ErriezLM35.cpp.

The documentation for this class was generated from the following files:

- [ErriezLM35.h](#)
- [ErriezLM35.cpp](#)

## Chapter 5

# File Documentation

### 5.1 ErriezLM35.cpp File Reference

Analog [LM35](#) temperature sensor library for Arduino.

```
#include "ErriezLM35.h"
```

#### 5.1.1 Detailed Description

Analog [LM35](#) temperature sensor library for Arduino.

Source: <https://github.com/Erriez/ErriezLM35> Documentation: <https://erriez.github.io/ErriezLM35>

### 5.2 ErriezLM35.h File Reference

Analog [LM35](#) temperature sensor library for Arduino.

```
#include <Arduino.h>
```

#### Classes

- class [LM35](#)  
*[LM35](#) sensor class.*

#### Macros

- #define [LM35\\_MAX\\_SAMPLES](#) 10  
*Check tested platform.*

### 5.2.1 Detailed Description

Analog [LM35](#) temperature sensor library for Arduino.

Source: <https://github.com/Erriez/ErriezLM35> Documentation: <https://erriez.github.io/ErriezLM35>

### 5.2.2 Macro Definition Documentation

#### 5.2.2.1 `#define LM35_MAX_SAMPLES 10`

Check tested platform.

Maximum number of [LM35](#) ADC samples

Definition at line 45 of file ErriezLM35.h.



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