# Erriez Timestamp library for Arduino

1.0.0

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# Contents

# Chapter 1

# Timestamp measuring library for Arduino

This is a timestamp library for Arduino to measure execution durations in microseconds or milliseconds resolution.

## Hardware

Any Arduino / ESP8266 board.

## Usage

### Initialization

Add include file:

```
{c++}
#include <Timestamp.h>
```

Create timestamp object with microseconds resolution:

```
{c++}
TimestampMicros timestamp;
```

Create timestamp object with milliseconds resolution:

```
{c++}
TimestampMillis timestamp;
```

### Single measurement

```
{c++}
unsigned long duration;

// Start measurement
timestamp.start();
// Do something
duration = timestamp.end();

// Start new measurement
timestamp.start();
// Do something
duration = timestamp.end();
```

### Multiple measurements

```
{c++}
// Start timestamp
timestamp.start();
// Do something and print timstamp
timestamp.print();

// Do something and print timestamp without calling start()
timestamp.print();
```

## Examples

The following examples are available:

- Timestamp | Microseconds
- Timestamp | Milliseconds

## Example output Timestamp | Microseconds

```
Timestamp with microseconds resolution example

Printing this message takes: 768us
And this message takes: 2044us
delayMicroseconds(15) duration: 20us
analogRead() duration: 212us
digitalRead() duration: 4us
```

## Example output Timestamp | Milliseconds

```
Timestamp with milliseconds resolution example

delay(15) takes:
15ms
14ms
16ms
15ms
15ms
16ms
14ms
15ms
16ms
15ms
```

## Constraints

TimestampMicros uses the function micros(). TimestampMillis uses the function millis().

Please refer to the description of these functions for the maximum possible duration:

- https://www.arduino.cc/reference/en/language/functions/time/micros/
- https://www.arduino.cc/reference/en/language/functions/time/millis/

## Library documentation

- Doxygen online HTML
- Doxygen PDF

## Library installation

1. Start the Arduino IDE.
2. Download the latest version from:
   https://github.com/Erriez/ErriezTimestamp/archive/master.zip
3. Click Sketch | Include Library | Add .ZIP Library... and select this ZIP.
4. Run the example.

# Chapter 2

# Hierarchical Index

## 2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

# Chapter 3

# Class Index

## 3.1 Class List

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

# Chapter 4

# File Index

## 4.1 File List

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

# Chapter 5

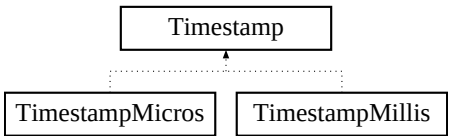
# Class Documentation

## 5.1 Timestamp Class Reference

Timstamp class.

`#include <Timestamp.h>`

Inheritance diagram for Timestamp:




### Public Member Functions

- Timestamp ()

  *Timestamp constructor.*
- virtual void start ()=0

  *Derived class must implement start()*
- virtual unsigned long end ()=0

  *Derived class must implement end()*
- virtual unsigned long print ()=0

  *Derived class must implement print()*

### Protected Attributes

- unsigned long _timestampStart

  *Timestamp at the beginning of a measurement.*

### 5.1.1 Detailed Description

Timstamp class.

Definition at line 41 of file Timestamp.h.

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

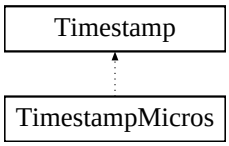
- Timestamp.h
- Timestamp.cpp

## 5.2 TimestampMicros Class Reference

TimestampMicros class derived from Timestamp.

`#include <Timestamp.h>`

Inheritance diagram for TimestampMicros:




### Public Member Functions

- void start () override

  *Start measurement in microseconds.*
- unsigned long end () override

  *End measurement.*
- unsigned long print () override

  *Print measurement in microseconds.*

### 5.2.1 Detailed Description

TimestampMicros class derived from Timestamp.

Definition at line 57 of file Timestamp.h.

### 5.2.2 Member Function Documentation

#### 5.2.2.1 end()

```
unsigned long TimestampMicros::end ( )  [override], [virtual]
```

End measurement.

**Returns**

Duration in micro seconds

Implements Timestamp.

Definition at line 56 of file Timestamp.cpp.

#### 5.2.2.2 print()

```
unsigned long TimestampMicros::print ( )  [override], [virtual]
```

Print measurement in microseconds.

**Returns**

Duration in microseconds

Implements Timestamp.

Definition at line 70 of file Timestamp.cpp.

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

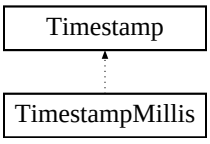
- Timestamp.h
- Timestamp.cpp

## 5.3 TimestampMillis Class Reference

TimestampMillis class derived from Timestamp.

```
#include <Timestamp.h>
```

Inheritance diagram for TimestampMillis:



### Public Member Functions

- void start () override
  *Start measurement in milliseconds.*
- unsigned long end () override
  *End measurement.*
- unsigned long print () override
  *Print measurement in milliseconds.*

## 5.3.1 Detailed Description

TimestampMillis class derived from Timestamp.

Definition at line 68 of file Timestamp.h.

## 5.3.2 Member Function Documentation

### 5.3.2.1 end()

```
unsigned long TimestampMillis::end ( )  [override], [virtual]
```

End measurement.

**Returns**

Duration in milliseconds

Implements Timestamp.

Definition at line 99 of file Timestamp.cpp.

### 5.3.2.2 print()

```
unsigned long TimestampMillis::print ( )  [override], [virtual]
```

Print measurement in milliseconds.

**Returns**

Duration in milliseconds

Implements Timestamp.

Definition at line 113 of file Timestamp.cpp.

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

- Timestamp.h
- Timestamp.cpp

# Chapter 6

# File Documentation

## 6.1 Timestamp.cpp File Reference

Timestamp library for Arduino.

```
#include "Timestamp.h"
```

### 6.1.1 Detailed Description

Timestamp library for Arduino.

https://github.com/Erriez/ErriezTimestamp

## 6.2 Timestamp.h File Reference

Timestamp library for Arduino.

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

### Classes

- class Timestamp

  *Timstamp class.*
- class TimestampMicros

  *TimestampMicros class derived from Timestamp.*
- class TimestampMillis

  *TimestampMillis class derived from Timestamp.*

### 6.2.1 Detailed Description

Timestamp library for Arduino.

https://github.com/Erriez/ErriezTimestamp

# Index