Erriez Timestamp library for Arduino

1.1.0

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Contents

Chapter 1

Timestamp measuring library for Arduino

This is a timestamp library for Arduino that can be used to measure execution time in microseconds or milliseconds.

Hardware

Any Arduino / ESP8266 board.

Library documentation

- Doxygen online HTML
- Doxygen PDF

Examples

Arduino IDE | Examples | Erriez Timestamp:

- Microseconds
- Milliseconds

Example output Timestamp | Microseconds

```
1 Timestamp with microseconds resolution example
2
3 Printing this message takes: 768us
4 And this message takes: 2044us
5 delayMicroseconds(15) duration: 20us
6 analogRead() duration: 212us
7 digitalRead() duration: 4us
```

Example output Timestamp | Milliseconds

```
1 Timestamp with milliseconds resolution example
2
3 delay(15) takes:
4 15ms
5 14ms
6 16ms
7 15ms
8 15ms
9 16ms
10 14ms
11 15ms
12 16ms
13 15ms
```

Usage

Initialization

Add include file:

```
1 {c++}
2 #include <ErriezTimestamp.h>
```

Create timestamp object with microseconds resolution:

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

Create timestamp object with milliseconds resolution:

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

Single measurement

```
1 {c++}
2 unsigned long duration;
3
4 // Start measurement
5 timestamp.start();
6 // Do something
7 duration = timestamp.delta();
8
9 // Start new measurement
10 timestamp.start();
11 // Do something
12 duration = timestamp.delta();
```

Multiple measurements

```
1 {c++}
2 // Start timestamp
3 timestamp.start();
4 // Do something and print timstamp
5 timestamp.print();
6
7 // Do something and print timestamp without calling start()
8 timestamp.print();
```

Constraints

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

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

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

The timestamp functions introduce a small calling overhead on low-end microcontrollers. For example calling `start()` and `delta()` on an Arduino UNO may take an additional 4 to 8 microseconds. This is overhead is negligible on targets with a higher CPU clock such as the ESP8266.

Library installation

Please refer to the Wiki page.

Other Arduino Libraries and Sketches from Erriez

- Erriez Libraries and Sketches

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

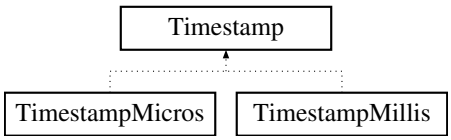
Class Documentation

5.1 Timestamp Class Reference

Timstamp class.

`#include <ErriezTimestamp.h>`

Inheritance diagram for Timestamp:



Public Member Functions

- Timestamp ()

  Timestamp constructor.
- virtual void start ()=0

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

  Derived class must implement delta()
- virtual void print ()=0

  Derived class must implement print()

Public Attributes

- unsigned long timestampStart

  Timestamp at the beginning of a measurement.

5.1.1 Detailed Description

Timstamp class.

Definition at line 42 of file ErriezTimestamp.h.

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

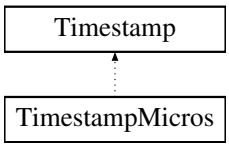
- ErriezTimestamp.h
- ErriezTimestamp.cpp

5.2 TimestampMicros Class Reference

TimestampMicros class derived from Timestamp.

`#include <ErriezTimestamp.h>`

Inheritance diagram for TimestampMicros:



Public Member Functions

- void start () override

  Start measurement in microseconds.
- unsigned long delta () override

  End measurement.
- void print () override

  Print measurement in microseconds.

5.2.1 Detailed Description

TimestampMicros class derived from Timestamp.

Definition at line 57 of file ErriezTimestamp.h.

5.2.2 Member Function Documentation

5.2.2.1 unsigned long TimestampMicros::delta ( ) [override], [virtual]

End measurement.

Returns

Duration in micro seconds

Implements Timestamp.

Definition at line 58 of file ErriezTimestamp.cpp.

5.2.2.2 void TimestampMicros::print ( ) [override], [virtual]

Print measurement in microseconds.

Print millis() - start time and restart measurement

Returns

Duration in microseconds

Implements Timestamp.

Definition at line 70 of file ErriezTimestamp.cpp.

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

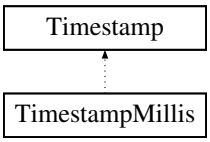
- ErriezTimestamp.h
- ErriezTimestamp.cpp

5.3 TimestampMillis Class Reference

TimestampMillis class derived from Timestamp.

`#include <ErriezTimestamp.h>`

Inheritance diagram for TimestampMillis:



Public Member Functions

- void start () override

  Start measurement in milliseconds.
- unsigned long delta () override

  End measurement.
- void print () override

  Print measurement in milliseconds.

5.3.1 Detailed Description

TimestampMillis class derived from Timestamp.

Definition at line 68 of file ErriezTimestamp.h.

5.3.2 Member Function Documentation

5.3.2.1 unsigned long TimestampMillis::delta ( ) [override], [virtual]

End measurement.

Returns

Duration in milliseconds

Implements Timestamp.

Definition at line 94 of file ErriezTimestamp.cpp.

5.3.2.2 void TimestampMillis::print ( ) [override], [virtual]

Print measurement in milliseconds.

Print millis() - start time and restart measurement

Returns

Duration in milliseconds

Implements Timestamp.

Definition at line 106 of file ErriezTimestamp.cpp.

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

- ErriezTimestamp.h
- ErriezTimestamp.cpp

Chapter 6

File Documentation

6.1 ErriezTimestamp.cpp File Reference

Timestamp library for Arduino.

```
#include "ErriezTimestamp.h"
```

6.1.1 Detailed Description

Timestamp library for Arduino.

Source: https://github.com/Erriez/ErriezTimestamp Documentation: https://erriez.↩
github.io/ErriezTimestamp

6.2 ErriezTimestamp.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.

Source: https://github.com/Erriez/ErriezTimestamp Documentation: https://erriez.↩
github.io/ErriezTimestamp

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