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# **arduino-serial-fixture Documentation**

*Release latest*

**Jan 08, 2022**



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This library provides a fixture for the [Arduino Serial](#) library to allow for offline unit tests.

Please see [ReadTheDocs](#) for the latest documentation.



# CHAPTER 1

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## Introduction

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Offline unit testing of Arduino code is challenging because of missing libraries. In this project, we aim to make code using the standard Serial interface testable using the [Catch2](#) unit testing framework.





In this section we cover retrieval of the latest release or development version of the code.

### 2.1 Prerequisites

This project uses the [Catch2](#) unit testing framework. On Debian based systems, this can be installed via the package manager.

```
apt install catch
```

For other distributions and operating systems, see the [Catch2 documentation](#).

### 2.2 Download

#### 2.2.1 Latest release

Navigate to the [latest release](#) and either download the `.zip` or the `.tar.gz` file.

Unpack the downloaded archive.

#### 2.2.2 From source

The source is hosted on [GitHub](#), to install the latest development version, use the following command.

```
git clone https://github.com/jfjlaros/arduino-serial-fixture.git
```



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In this section we describe how to use the Arduino Serial fixture and how to use a number of additional convenience functions. We assume that the library is installed in the directory where the unit tests reside.

### 3.1 Compilation

First compile the fixture.

```
g++ -c arduino-serial-fixture/src/Arduino.cc
```

For all tests that require the serial interface, i.e., tests that require `Arduino.h`, make sure that the path to the fixture is set.

```
g++ -I arduino-serial-fixture/src -c test_something.cc
```

Finally, compile the test main code and link.

```
g++ -o run_tests test_lib.cc test_something.o Arduino.o
```

### 3.2 Library

The fixture includes most commonly used functions for serial communication. Additionally, some convenience functions are included to make testing easier. These functions can be accessed by including the header.

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

### 3.2.1 Easy reading and writing

The functions `autoRead()` and `autoWrite()` can be used to read or write to the serial device. These functions take care of type encoding automatically. If, for example, we want to read an integer and a float, we use `autoRead()` as follows.

```
int i = Serial.autoRead<int>();
float f = Serial.autoRead<float>();
```

Conversely, easy writing of an integer and a float can be done with `autoWrite()` as follows.

```
autoWrite(1234);
autoWrite(3.14F);
```

### 3.2.2 Inspecting and preparing data

The functions `inspect()` and `prepare()` can be used to inspect the output buffer and to prepare the input buffer. The `inspect()` function works like the `autoRead()` function, except that it operates on the output buffer and does not change any of the internal buffer offsets. If for example, the output buffer contains the string `xyz`, we can use `inspect()` as follows.

```
String s = Serial.inspect<String>(); // Yields "xyz".
char c = Serial.inspect<char>(); // Yields 'x'.
```

The function `prepare()` is used to prepare the input buffer. It accepts an arbitrary amount of variables that are of either basic types (e.g., `int`, `char`, `float`, etc.) or of type `String`. If for example, we want to put a char, a string and an integer in the input buffer, we can use `prepare()` as follows.

```
Serial.prepare('c', "xyz", 10);
```

## CHAPTER 4

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### Contributors

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Find out who contributed:

```
git shortlog -s -e
```