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IIO libiio



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*Libio* is a complete library which offers tools and an interface to develop an application using IIO subsystem.

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## 1 Article purpose

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The purpose of this article is to:

- briefly introduce the *libio* main features and API
- provide few examples, using *libio* tools



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## 2 Introduction

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- *Libiio* is a user space library that provides an **interface** for user space applications. It is basically a wrapper that resides above the following interfaces:

1. `/sys/bus/iio/devices` sysfs interface (for configuration/setting)

2. `/dev/iio/deviceX` device interface (for data)

- *Libiio* also provides **tools** that can be used for testing

- *Libiio* design goals:

1. Interface with the kernel, to access IIO<sup>[1]</sup> devices

2. Provide proper data structures and functions to the user application

3. Support for local and remote backends allowing applications to access the devices when running on a local or a remote machine

The full description of the IIO library is provided by the author of the library, see below references:

- What is libiio<sup>[2]</sup>.

- About libiio<sup>[3]</sup>.



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### 3 API description

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The API description can be found here: <https://analogdevicesinc.github.io/libiio>



## 4 Tools

Libiio offers tools such as:

- *iiod* server daemon
- *iio\_info* to dump attributes

```

root@stm32mp1:~# iio_info
Library version: 0.8 (git tag: v0.8)
IIO context created with local backend.
Backend version: 0.8 (git tag: v0.8)
Backend description string: Linux stm32mp1 4.14.0-00004-gafe4a31 #778 SMP PREEMPT Tue Aug
28 14:02:25 CEST 2018 armv7l
IIO context has 3 devices:
  trigger1: tim6_trgo
    0 channels found:
    3 device-specific attributes found:
      attr 0: sampling_frequency value: 100
      attr 1: master_mode value: reset
      attr 2: master_mode_available value: reset enable update
compare_pulse 0C1REF 0C2REF 0C3REF 0C4REF
  iio:device0: 48003000.adc:adc@0 (buffer capable)
    2 channels found:
      voltage0: (input, index: 0, format: le:U16/16>>0)
        3 channel-specific attributes found:
          attr 0: raw value: 72
          attr 1: offset value: 0
          attr 2: scale value: 0.044250488
      voltage1: (input, index: 1, format: le:U16/16>>0)
        3 channel-specific attributes found:
          attr 0: raw value: 1746
          attr 1: offset value: 0
          attr 2: scale value: 0.044250488
...

```

- *iio\_readdev*<sup>[4]</sup> (to read or scan from a device)

```

STM32AP [rc=0]# iio_readdev -t trigger1 -s 8 -b 8 iio:device0 voltage0 voltage1 | hexdump
00000000 0068 055a 0058 0520 00b4 03df 0070 055f
00000010 0096 03d6 0089 038f 0077 05c8 0096 03b3

```

See also: [How to use the IIO user space interface](#)



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## 5 Source code

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*Libiio* can be downloaded on a public github<sup>[5]</sup>. It can be cloned using git command:

```
git clone https://github.com/analogdevicesinc/libiio.git
```

Tools source code can be found under libiio "tests" directory.



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## 6 Installation on your target

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*Libiio* and the tools it provides are embedded by default in OpenSTLinux distribution.





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## 7 References

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- IIO overview, IIO subsystem overview
- <https://wiki.analog.com/resources/tools-software/linux-software/libiio>, What is libiio
- [https://wiki.analog.com/resources/tools-software/linux-software/libiio\\_internals](https://wiki.analog.com/resources/tools-software/linux-software/libiio_internals), About libiio
- [https://wiki.analog.com/resources/tools-software/linux-software/libiio/iio\\_readdev](https://wiki.analog.com/resources/tools-software/linux-software/libiio/iio_readdev), iio\_readdev
- <https://github.com/analogdevicesinc/libiio>, libiio download link

Application programming interface

System File System (See <https://en.wikipedia.org/wiki/Sysfs> for more details)

Industrial I/O Linux<sup>®</sup> subsystem

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symetric multiprocessing