
oxitopped Documentation

Release 0.2

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oxitopped is a small suite of utilities for extracting data from an OxiTop data logger via a serial (RS-232) port and dumping it to a specified file in various formats. Options are provided for controlling the output, and for listing the content of the device.

1.1 Installation

oxitopped is distributed in several formats. The following sections detail installation on a variety of platforms.

1.1.1 Pre-requisites

Where possible, I endeavour to provide installation methods that provide all pre-requisites automatically - see the following sections for platform specific instructions.

If your platform is not listed (or you're simply interested in what rastools depends on): rastools depends primarily on `matplotlib`. If you wish to use the GUI you will also need `PyQt4` installed.

Additional optional dependencies are:

- `xlwt` - required for Excel writing support
- `matplotlib` - required for graphing support

1.1.2 Ubuntu Linux

For Ubuntu Linux, it is simplest to install from the [PPA](#) as follows (this also ensures you are kept up to date as new releases are made):

```
$ sudo add-apt-repository ppa://waveform/ppa
$ sudo apt-get update
$ sudo apt-get install oxitopped
```

1.1.3 Microsoft Windows

On Windows it is simplest to install from the standalone MSI installation package available from the [homepage](#). Be aware that the installation package requires administrator privileges.

1.1.4 Apple Mac OS X

XXX To be written

1.1.5 Other Platforms

If your platform is *not* covered by one of the sections above, oxitopped is available from PyPI and can therefore be installed with the Python distribute `pip` tool:

```
$ pip install oxiopped
```

Theoretically this should install the mandatory pre-requisites, but optional pre-requisites require suffixes like the following:

```
$ pip install "oxitopped[GUI,XLS]"
```

Please be aware that at this time, the PyQt package does not build “nicely” under `pip`. If it is available from your distro’s package manager I strongly recommend using that as your source of this pre-requisite.

If PyQt is not provided by your distro (or you’re on some esoteric platform without a package manager), you can try following the instructions on the [Veusz wiki](#) for building PyQt (and SIP) under a virtualenv sandbox.

1.1.6 Development

If you wish to develop oxiopped, you can install the pre-requisites, construct a virtualenv sandbox, and check out the source code from GitHub with the following command lines:

```
# Install the pre-requisites
$ sudo apt-get install python-matplotlib python-xlwt python-qt4 python-virtualenv python-sphinx m

# Construct and activate a sandbox with access to the packages we just
# installed
$ virtualenv --system-site-packages sandbox
$ source sandbox/bin/activate

# Check out the source code and install it in the sandbox for development and testing
$ git clone https://github.com/waveform80/oxitopped.git
$ cd oxiopped
$ make develop
```

The above instructions assume you are on Ubuntu Linux. Please feel free to extend this section with instructions for alternate platforms.

1.2 oxioplist

This utility lists the sample results stored on a connected OxiTop Data Logger. If bottle-serial values are specified, the details of those bottles and all heads attached to them will be displayed, otherwise a list of all available bottle serials provided. The bottle-serial values may include *, ?, and [] wildcards.

1.2.1 Synopsis

```
$ oxioplist [options] [bottle-serial]...
```

1.2.2 Description

- version**
show program’s version number and exit
- h, --help**
show this help message and exit
- q, --quiet**
produce less console output
- v, --verbose**
produce more console output

- l** LOGFILE, **--log-file**=LOGFILE
log messages to the specified file
- D, --debug**
enables debug mode (runs under PDB)
- p** PORT, **--port**=PORT
specify the port which the OxiTop Data Logger is connected to. This will be something like /dev/ttyUSB0 on Linux or COM1 on Windows
- r, --readings**
if specified, output readings for each head after displaying bottle details
- a, --absolute**
if specified with `-readings`, output absolute pressure values instead of deltas against the first value
- m** POINTS, **--moving-average**=POINTS
if specified with `-readings`, output a moving average over the specified number of points instead of actual readings

1.2.3 Examples

The basic usage of `oxitoplist` is to dump a list of the bottles stored on the connected device:

```
$ oxitoplist -p /dev/ttyUSB0
Serial      ID  Started      Finished      Complete Mode           Heads
-----
110222-06  999  2011-02-22  2011-03-08  Yes      Pressure 14d 1
121119-03   3    2012-11-19  2012-11-22  Yes      Pressure 3d 1
120323-01   1    2012-03-23  2012-04-20  Yes      Pressure 28d 2

3 results returned
```

If one or more *bottle-serial* numbers are listed on the command line (which may include wildcards), the details of the bottles listed are output instead:

```
$ oxitoplist -p /dev/ttyUSB0 12*

Serial          121119-03
ID              3
Started        2012-11-19 13:53:04
Finished       2012-11-19 13:53:04
Readings Interval 0:12:00
Completed      Yes
Mode           Pressure 3d
Bottle Volume  510.0ml
Sample Volume  432.0ml
Dilution      1+0
Desired no. of Values 360
Actual no. of Values 0
Heads         1

Serial          120323-01
ID              1
Started        2012-03-23 17:32:23
Finished       2012-03-23 17:32:23
Readings Interval 1:52:00
Completed      Yes
Mode           Pressure 28d
Bottle Volume  510.0ml
Sample Volume  432.0ml
Dilution      1+0
Desired no. of Values 360
```

```
Actual no. of Values  361
Heads                 2
```

The `-r` option can be used to include the readings from selected bottles. These are excluded by default as it's probably more useful to use `oxitopdump` for those purposes:

```
$ oxi toplist -p /dev/ttyUSB0 -r 110222-06

Serial          110222-06
ID              999
Started         2011-02-22 16:54:55
Finished        2011-02-22 16:54:55
Readings Interval 0:56:00
Completed       Yes
Mode            Pressure 14d
Bottle Volume   510.0ml
Sample Volume   432.0ml
Dilution       1+0
Desired no. of Values 360
Actual no. of Values 361
Heads           1

                Head
Timestamp       60108
-----
2011-02-22 16:54:55 0.0
2011-02-22 17:50:55 -5.0
2011-02-22 18:46:55 -5.0
2011-02-22 19:42:55 -5.0
2011-02-22 20:38:55 -5.0
2011-02-22 21:34:55 -5.0
2011-02-22 22:30:55 -6.0
2011-02-22 23:26:55 -5.0
2011-02-23 00:22:55 -5.0
...
2011-03-08 11:18:55 -8.0
2011-03-08 12:14:55 -8.0
2011-03-08 13:10:55 -8.0
2011-03-08 14:06:55 -8.0
2011-03-08 15:02:55 -8.0
2011-03-08 15:58:55 -9.0
2011-03-08 16:54:55 -8.0
```

Readings are always given in chronological order and are delta readings by default. If you want the absolute pressure readings, use the `-a` option.

1.3 oxi topdump

This utility dumps the sample readings stored on a connected OxiTop Data Logger to files in CSV or Excel format. If bottle-serial values are specified, the details of those bottles and all heads attached to them will be exported, otherwise a list of all available bottles is exported. The bottle-serial values may include `*`, `?`, and `[]` wildcards. The filename value may include references to bottle attributes like `{bottle.serial}` or `{bottle.id}`.

1.3.1 Synopsis

```
$ oxi topdump [options] [bottle-serial]... filename
```

1.3.2 Description

- version**
show program's version number and exit
- h, --help**
show this help message and exit
- q, --quiet**
produce less console output
- v, --verbose**
produce more console output
- l LOGFILE, --log-file=LOGFILE**
log messages to the specified file
- D, --debug**
enables debug mode (runs under PDB)
- p PORT, --port=PORT**
specify the port which the OxiTop Data Logger is connected to. This will be something like /dev/ttyUSB0 on Linux or COM1 on Windows
- a, --absolute**
if specified, export absolute pressure values instead of deltas against the first value
- m POINTS, --moving-average=POINTS**
if specified, export a moving average over the specified number of points instead of actual readings
- H, --header**
if specified, a header row will be written in the output file
- R, --row-colors**
if specified, alternate row coloring will be used in the output file (.xls only)
- C DELIMITER, --column-delimiter=DELIMITER**
specifies the column delimiter in the output file. Defaults to , (.csv only)
- L LINETERMINATOR, --line-terminator=LINETERMINATOR**
specifies the line terminator in the output file. Defaults to dos (.csv only)
- Q QUOTECHAR, --quote-char=QUOTECHAR**
specifies the character used for quoting strings in the output file. Defaults to " (.csv only)
- U QUOTING, --quoting=QUOTING**
specifies the quoting behaviour used in the output file. Defaults to minimal (.csv only). Can be none, all, minimal, or nonnumeric
- T TIMESTAMP_FORMAT, --timestamp-format=TIMESTAMP_FORMAT**
specifies the formatting of timestamps in the output file. Defaults to %Y-%m-%d %H:%M:%S (.csv only)

1.3.3 Examples

When *oxitopdump* is invoked without specifying a *bottle-serial* the list of bottles will be exported to the specified filename. Typically you will want to use *oxitoplist* to discover the content of the connected device before exporting the readings for a specific bottle like so:

```
$ oxioplist -p /dev/ttyUSB0
Serial    ID  Started    Finished    Complete Mode           Heads
-----
110222-06 999 2011-02-22 2011-03-08 Yes        Pressure 14d 1
121119-03 3    2012-11-19 2012-11-22 Yes        Pressure 3d 1
120323-01 1    2012-03-23 2012-04-20 Yes        Pressure 28d 2
```

```
3 results returned
$ oxitopdump -p /dev/ttyUSB0 120323-01 readings.csv
$ cat readings.csv
0,2012-03-23 17:32:23,0:00:00,0.0,0.0
1,2012-03-23 19:24:23,1:52:00,-12.0,-5.0
2,2012-03-23 21:16:23,3:44:00,-13.0,-5.0
3,2012-03-23 23:08:23,5:36:00,-13.0,-5.0
4,2012-03-24 01:00:23,7:28:00,-13.0,-5.0
...
357,2012-04-20 11:56:23,"27 days, 18:24:00",-16.0,-8.0
358,2012-04-20 13:48:23,"27 days, 20:16:00",-17.0,-8.0
359,2012-04-20 15:40:23,"27 days, 22:08:00",-17.0,-9.0
360,2012-04-20 17:32:23,"28 days, 0:00:00",-16.0,-8.0
```

If you specify multiple *bottle-serials* or if you specify a *bottle-serial* with wildcards which matches multiple bottles, you will need to specify a filename containing a substitution template like `{bottle.serial}` so that each bottle is output to a unique file. For example:

```
$ oxitopdump -p /dev/ttyUSB0 12* readings_{bottle.serial}.xls
$ ls *.xls
readings_120323-01.xls  readings_121119-03.xls
```

Various options are provided for customizing the output of the formats available. For example, to include a header row and force space separation:

```
$ oxitopdump -p /dev/ttyUSB0 -H -D " " 11* test.csv
$ head test.csv
No. Timestamp Offset "Head 60108"
0 "2011-02-22 16:54:55" 0:00:00 0.0
1 "2011-02-22 17:50:55" 0:56:00 -5.0
2 "2011-02-22 18:46:55" 1:52:00 -5.0
3 "2011-02-22 19:42:55" 2:48:00 -5.0
4 "2011-02-22 20:38:55" 3:44:00 -5.0
5 "2011-02-22 21:34:55" 4:40:00 -5.0
6 "2011-02-22 22:30:55" 5:36:00 -6.0
7 "2011-02-22 23:26:55" 6:32:00 -5.0
8 "2011-02-23 00:22:55" 7:28:00 -5.0
```

1.4 License

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