

---

# Rotary Encoder Module Documentation

*Release v0.1.4*

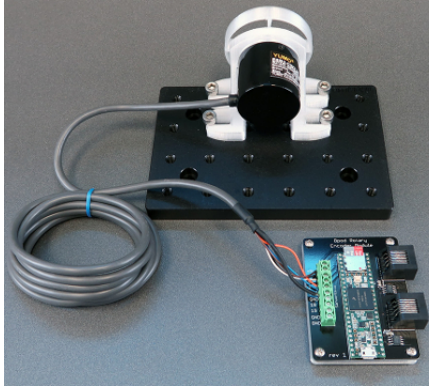
**Ricardo Ribeiro**

**Nov 07, 2019**



<b>1</b>	<b>What is the Rotary Encoder Module</b>	<b>3</b>
1.1	Getting started	3
1.1.1	Requirements	3
1.1.2	Installation	3
1.1.3	Use the module in the pybpod-api library	4
1.1.4	Examples	4
1.1.4.1	Use the rotary encoder module with the pybpod-api	4
1.1.4.2	Access the rotary encoder module directly from the USB port	4
1.1.4.3	Configure the rotary encoder using the GUI	5
1.1.5	Add the Rotary Plugin to the PyBpod-GUI	5
1.2	Changelog	6
1.2.1	0.1.4 (2019-11-07)	6
1.2.2	0.1.3 (2019-07-23)	6
1.2.3	0.1.2 (2019-07-19)	6
1.3	USB	6
1.3.1	Usage example	7
1.4	pybpodapi	8
1.4.1	Usage example	8
	<b>Python Module Index</b>	<b>11</b>
	<b>Index</b>	<b>13</b>







---

## What is the Rotary Encoder Module

---

The **Rotary Encoder Module** is a board developed by **Sanworks**, to record and analyze rotational movements from a motor.

On this documentation it is explained how to use the **pybpod\_rotaryencoder\_module** Python 3 library to control this module.

### 1.1 Getting started

#### 1.1.1 Requirements

This library requires the following Python 3 packages to be installed.

- pyserial>=3.1.1
- python-dateutil
- numpy
- sip
- pyqt5
- matplotlib
- pyforms==4.901.2
- <https://UmSenhorQualquer@bitbucket.org/fchampalimaud/logging-bootstrap.git>

#### 1.1.2 Installation

Execute the following command to install the library on an existing python3 environment.

```
pip install -U pybpod-gui-plugin-rotaryencoder
```

### 1.1.3 Use the module in the pybpod-api library

This module can be connected and disconnected from the Pybpod-api library. For this go to your user\_settings.py file and add the following configuration.

```
PYBPOD_API_MODULES = [  
    'pybpod_rotaryencoder_module'  
]
```

**Note:** The configuration above is configured by default on the pybpod-api library. You only need to do it if you have overwritten the **PYBPOD\_API\_MODULES** variable in your user\_settings.py.

---

### 1.1.4 Examples

#### 1.1.4.1 Use the rotary encoder module with the pybpod-api

```
#...  
  
bpod = Bpod()  
  
for m in bpod.modules:  
    print( m.name, type(m) )  
  
rotary_encoder = bpod.modules[0]  
rotary_encoder.set_position_zero()  
  
bpod.stop()
```

#### 1.1.4.2 Access the rotary encoder module directly from the USB port

```
from pybpod_rotaryencoder_module.module_api import RotaryEncoderModule  
  
m = RotaryEncoderModule('/dev/ttyACM1')  
  
m.enable_stream()  
  
#print the first 100 outputs  
count = 0  
while count<100:  
    data = m.read_stream()  
    if len(data)==0:  
        continue  
    else:  
        count += 1  
        print(data)  
  
m.disable_stream()  
  
print('set', m.set_position(179))  
m.set_zero_position()
```

(continues on next page)



(continued from previous page)

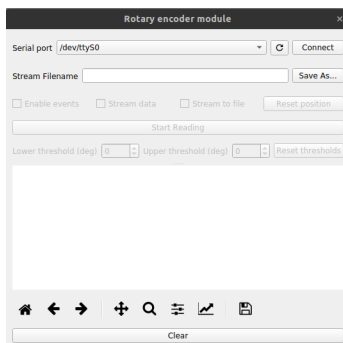
```
m.enable_thresholds([True, False, True, True, False, False, True, True])
print(m.current_position())

m.close()
```

### 1.1.4.3 Configure the rotary encoder using the GUI

```
import pyforms
from pybpod_rotaryencoder_module.module_gui import RotaryEncoderModuleGUI

pyforms.start_app( RotaryEncoderModuleGUI, geometry=(0,0,600,500) )
```

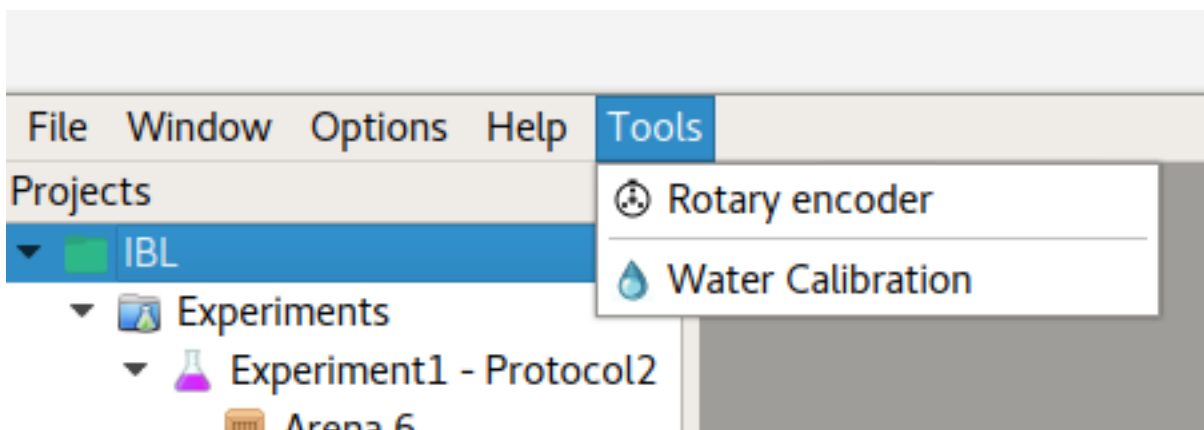


### 1.1.5 Add the Rotary Plugin to the PyBpod-GUI

In the GUI settings add the next configuration to the list of plugins

```
GENERIC_EDITOR_PLUGINS_LIST = [
    ...
    'pybpod_rotaryencoder_module',
]
```

After open the PyBpod-GUI a access the plugin in the Tools menu.



## 1.2 Changelog

### 1.2.1 0.1.4 (2019-11-07)

- Add support for enabling/disabling moduleOutputStream in the GUI

### 1.2.2 0.1.3 (2019-07-23)

- Minor documentation fixes
- Fixed ReadTheDocs requirements

### 1.2.3 0.1.2 (2019-07-19)

- Added ComboBox and a refresh button for the serial port selection for the Rotary Encoder

## 1.3 USB

**class** `pybpod_rotaryencoder_module.module_api.RotaryEncoderModule` (*serialport=None*)  
Constructor of the RotaryEncoderModule object A serial connection to the Rotary Encoder board is opened at the construction of the object.

**Variables** `serialport` (*str*) – PC serial port where the module is connected

**open** (*serialport*)

Opens a serial connection to the Rotary Encoder board.

**Variables** `serialport` (*str*) – PC serial port where the module is connected

**close** ()

Closes the serial connection to the Rotary Encoder board.

**enable\_evt\_transmission** ()

Enables the transmission of threshold crossing events to the Bpod state machine.

**disable\_evt\_transmission** ()

Disables the transmission of events.

**enable\_module\_outputstream** ()

Enables the streaming of current position data directly to another Bpod module (e.g. DDS, AnalogOutput).

**disable\_module\_outputstream** ()

Disables the streaming of current position data directly to another Bpod module.

**enable\_stream** ()

Enables the streaming of the position and the time measurements to the USB port.

**disable\_stream** ()

Disables the streaming of the position and the time measurements to the USB port.

**read\_stream** ()

Reads the data being streamed through the USB port.

**current\_position** ()

Retrieves the current position.

**set\_zero\_position** ()

Sets current rotary encoder position to zero.

**set\_position** (*degrees*)

Sets the current position in degrees.

**Variables** **degrees** (*int*) – current position in degrees.

**enable\_thresholds** (*thresholds*)

Enables the thresholds.

**Variables** **thresholds** (*list (boolean)*) – list of 6 booleans indicating which thresholds are active to trigger events.

**enable\_logging** ()

Enables the logging to the SD Card.

**disable\_logging** ()

Disables the logging to the SD Card.

**get\_logged\_data** ()

Retrieves the logged data in the SD Card.

**set\_prefix** (*prefix*)

Sets 1-character prefix for module output stream.

**Variables** **prefix** (*char*) – One character to be used as prefix.

**set\_thresholds** (*thresholds*)

Sets the thresholds values to trigger the events.

**Variables** **thresholds** (*list (int)*) – List, in maximum, of 6 thresholds to trigger events.

**set\_wrappoint** (*wrap\_point*)

Sets wrap point (number of tics in a half-rotation)

**Variables** **wrap\_point** (*int*) – number of tics in a half-rotation.

### 1.3.1 Usage example

```
from pybpod_rotaryencoder_module.module_api import RotaryEncoderModule

m = RotaryEncoderModule('/dev/ttyACM1')

m.start_logging()

m.enable_stream()

#print the first 100 outputs
count = 0
while count<100:
    data = m.read_stream()
    if len(data)==0:
        continue
    else:
        count += 1
        print(data)

m.disable_stream()
```

(continues on next page)

(continued from previous page)

```
m.stop_logging()
m.set_zero_position()
m.close()
```

## 1.4 pybpodapi

```
class pybpod_rotaryencoder_module.module.RotaryEncoder (connected=False,
                                                    module_name="",
                                                    firmware_version=0,
                                                    events_names=[],
                                                    n_serial_events=0,      se-
                                                    rial_port=None)

Bases: pybpodapi.bpod_modules.bpod_module.BpodModule
```

---

**Note:** This API was based on the [Rotary Encoder board documentation](#).

---

```
create_resetpositions_trigger ()
    Create a trigger to reset the positions and the thresholds :return: trigger_id

activate_outputstream ()
    Activate module output stream.

deactivate_outputstream ()
    Deactivate module output stream.

stop_streaming_and_logging ()
    Stops streaming + logging.

enable_positions_threshold ()
    Enable all position thresholds.

set_position_zero ()
    Set current rotary encoder position to zero.

starts_logging ()
    Start logging position+time data to the microSD card.

stops_logging ()
    Finish logging position+time data to the microSD card.

timestamp_byte (value)
    value as to be a byte
```

### 1.4.1 Usage example

```
#...

bpod = Bpod()

# get the module connected to the first bpod serial port.
rotary_encoder = bpod.modules[0]
```

(continues on next page)

(continued from previous page)

```
# call a function of the module
rotary_encoder.activate_outputstream()

bpod.stop()
```



**p**

pybpodapi, 6





**A**

activate\_outputstream() (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
 method), 8

enable\_module\_outputstream() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

enable\_positions\_threshold() (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
 method), 8

**C**

close() (pyb*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

create\_resetpositions\_trigger() (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
 method), 8

current\_position() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

enable\_stream() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

enable\_thresholds() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 7

**D**

deactivate\_outputstream() (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
 method), 8

get\_logged\_data() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 7

disable\_evt\_transmission() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

disable\_logging() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 7

disable\_module\_outputstream() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

disable\_stream() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

**E**

enable\_evt\_transmission() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

enable\_logging() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 7

enable\_stream() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

enable\_thresholds() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 7

**G**

get\_logged\_data() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 7

**O**

open() (pyb*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

**P**

PodRotaryEncoderModule (module), 3, 6, 8

**R**

read\_stream() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 6

RotaryEncoder (class in pyb-  
*pod\_rotaryencoder\_module.module*), 8

RotaryEncoderModule (class in pyb-  
*pod\_rotaryencoder\_module.module\_api*),  
 6

**S**

set\_position() (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
 method), 7

`set_position_zero()` (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
*method*), 8

`set_prefix()` (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
*method*), 7

`set_thresholds()` (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
*method*), 7

`set_wrappoint()` (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
*method*), 7

`set_zero_position()` (pyb-  
*pod\_rotaryencoder\_module.module\_api.RotaryEncoderModule*  
*method*), 6

`starts_logging()` (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
*method*), 8

`stop_streaming_and_logging()` (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
*method*), 8

`stops_logging()` (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
*method*), 8

## T

`timestamp_byte()` (pyb-  
*pod\_rotaryencoder\_module.module.RotaryEncoder*  
*method*), 8