Package 'presens'

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Type Package

Title R Interface for PreSens Fiber Optic Data

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Description Makes output files from select PreSens Fiber Optic Oxygen Transmitters easier to work with in R. See <http://www.presens.de> for more information about PreSens (Precision Sensing GmbH).

Imports birk, marelac (>= 2.1.4)

License GPL-3

Encoding UTF-8

R topics documented:

`import_o2` *Import Data from PreSens O2 Transmitter*

Description

Imports the standard txt file output from most PreSens fiber optic O2 transmitters and converts data into a usable data.frame.

Usage

```
import_o2(file, o2_unit = "percent_a.s.", date = "%d/%m/%y",
  salinity = 35)
```

Arguments

`file`	a character string. The filepath for the file to be read.
`o2_unit`	a character string. The unit of O2 measurement to be output in the data.frame. Options are: **percent_a.s.** percent air saturation **percent_o2** percent O2 **hPa** hPa **torr** torr **mg_per_l** mg O2 per liter **umol_per_l** umol O2 per liter
`date`	a character string. The date format to be passed to `strptime`.
`salinity`	salinity of water sample (ppt). Default is 35 ppt.

Details

The following PreSens fiber optic O2 transmitters are supported:

Fibox 3

Fibox 3 trace

Fibox 3 LCD trace

Microx TX3

Microx TX3 trace

OXY-4 mini

OXY-4 micro

OXY-4 trace

OXY-10 mini

OXY-10 micro

OXY-10 trace

It is very important to note that the PreSens fiber optics O2 transmitters that are supported with this function DO NOT account for salinity (i.e. they assume salinity = 0 ppt). If the water sample measured was not fresh water, the oxygen concentrations (e.g. mg per liter or umol per liter) are incorrect in the PreSens txt file. This function corrects these O2 concentrations based on the salinity value defined by the `salinity` argument. Absolute partial pressures (i.e. hPa and torr) will also be slightly different due to the slight influence of salinity on water's vapor pressure. This difference is typically ~0.05% of the recorded value.

Value

A data.frame with seven columns is returned.

TIME Date and time, POSIXct format.

DURATION Duration of measurement trial.

oxygen Oxygen measurement in desired unit. Column name changes based on `o2_unit` argument.

PHASE Phase recorded. Phase is inversely related to O2.

AMPLITUDE Amplitude recorded. Amplitude is an indicator of the quality of the signal.

TEMPERATURE Temperature recorded or defined at beginning of measurement trial.

ERROR_CODE Error code from transmitter. See user manual for translation of error code.

Note

Conversions are estimates based on the marelac package and therefore differ slightly from the conversions provided by PreSens.

Author(s)

Matthew A. Birk, <matthewabirk@gmail.com>

Examples

```
## Not run:
file <- system.file('extdata', 'all_o2_units.txt', package = 'presens')
import_o2(file, o2_unit = 'umol_per_l', salinity = 25)

## End(Not run)
```

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o2_unit_conv *Convert Units of Oxygen*

Description

Given the percent of oxygen compared to air-saturated water (at equilibrium with air) (i.e. percent air saturation), a list of commonly used units of oxygen partial pressures and concentrations are returned.

Usage

```
o2_unit_conv(perc_a.s. = 100, salinity = 35, temp = 25,
  air_pres = 1.013253)
```

Arguments

perc_a.s.	percent of air saturation. Default is 100%.
salinity	salinity of water sample (ppt). Default is 35 ppt.
temp	temperature of water sample (°C). Default is 25 °C.
air_pres	pressure of air overlying water sample (bar). Default is 1.013253 bar.

Details

Conversions are based on relationships and values from the package marelac.

Author(s)

Matthew A. Birk, <matthewabirk@gmail.com>

Examples

```
o2_unit_conv(perc_a.s. = 50)
o2_unit_conv(perc_a.s. = 50, salinity = 0, temp = 10, air_pres = 1.2)['umol_per_l']
```

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