

Package: kwb.dswt (via r-universe)

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Title R Package for the Project DSWT

Version 0.1.0

Description This package contains functions to be used in KWB project DSWT.

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URL <https://github.com/KWB-R/kwb.dswt>

BugReports <https://github.com/KWB-R/kwb.dswt/issues>

Imports kwb.utils, kwb.datetime, kwb.event, kwb.plot, kwb.read, kwb.monitoring, kwb.logger

Suggests covr, knitr, kwb.fakin, kwb.code, RCurl, rmarkdown

Remotes github::kwb-r/kwb.code, github::kwb-r/kwb.datetime, github::kwb-r/kwb.event, github::kwb-r/kwb.fakin, github::kwb-r/kwb.logger, github::kwb-r/kwb.monitoring, github::kwb-r/kwb.plot, github::kwb-r/kwb.read, github::kwb-r/kwb.utils

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Repository <https://kwb-r.r-universe.dev>

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.siteNameToDN

Find DN for Given Site

Description

Find DN for Given Site

Usage

.siteNameToDN(sitename)

Arguments

sitename name of monitoring site

addTotalVolumeAndMaxQ *Add Total Volume and Max Q*

Description

Add Total Volume and Max Q

Usage

```
addTotalVolumeAndMaxQ(qValues, events, eventnr, digitsV = 3, digitsMaxQ = 3)
```

Arguments

qValues vector of discharge values given in L/s
 events event information as retrieved by `kwb.event::hsEvents`
 eventnr integer vector of same length as *qValues* giving the number of the event to which the Q value belongs, as returned by `kwb.event::hsEventNumber`.
 digitsV number of decimal places for V in m3
 digitsMaxQ number of decimal places for max. Q in L/s

Value

events with columns *V_m3* and *maxQ_L_s* added

completeTimeColumns *Complete Time Columns*

Description

Complete Time Columns

Usage

```
completeTimeColumns(  
  x,  
  wanted = c("BerlinDateTime", "UTCOffset", "DateTimeUTC")  
)
```

Arguments

x data frame with time columns
 wanted Default: c("BerlinDateTime", "UTCOffset", "DateTimeUTC")

Value

(Hopefully) data frame with columns *BerlinDateTimeNoDST*, *BerlinDateTime*, *UTCOffset*, *Date-TimeUTC*,

convertQUnits	<i>Convert Q in L/h to L/s, m3/s and m3/h</i>
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Description

Convert Q in L/h to L/s, m3/s and m3/h

Usage

```
convertQUnits(hq)
```

Arguments

hq data frame containing a column *Q_L_h* containing flows in L/h

Value

data frame with columns *H_m*, *Q_L_s*, *Q_m3_s*, *Q_L_h*, *Q_m3_h*

correctHandCalculateQ	<i>Correct Level with Offset and Calculate Q</i>
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Description

Correct Level with Offset and Calculate Q

Usage

```
correctHandCalculateQ(hdat, hoffset, DN)
```

Arguments

hdat data frame containing at least a column *Hraw_m*, as e.g. retrieved by readLogger_Ori_MLog
hoffset offset in m to be subtracted from raw levels before the HQ relationship is applied
DN DN in mm, must be one of 150, 300

Value

data frame with additional columns *H_m*, *Q_L_s*

dirFtpPath	<i>List Files on FTP Server</i>
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Description

List Files on FTP Server

Usage

```
dirFtpPath(url, userpwd, full.names = FALSE)
```

Arguments

url	base url in which to look for files
userpwd	user and password, separated by colon ":"
full.names	logical (default: FALSE). Determines whether to return relative paths or the full URLs including the base url

Value

vector of urls or relative paths

dirUploadedFiles	<i>List Uploaded Files</i>
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Description

You need to set the system environment variable "DSWT_FTP_LOGIN" to "user:pwd" where "user" is the username and "pwd" the password for the account that is allowed to access the FTP server where the files are stored.

Usage

```
dirUploadedFiles(full.names = FALSE)
```

Arguments

full.names	if TRUE the full absolute URLs are returned, otherwise only the relative paths.
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Value

list with elements *PN, H, RD, F, LPR, Q, BPR* containing URLs to sampler files, water level files, rain data files, photos, laboratory protocol files, discharge files and operation protocol files, respectively, that are available at the DSWT server at sysprovide.de

`dswtdir` *Path to Subfolder "DSWT" in tempdir()*

Description

Path to subfolder "DSWT" in tempdir(). If the subfolder does not yet exist it is created

Usage

`dswtdir()`

Value

path to subfolder "DSWT" in tempdir()

`DSWT_BWB_CODE_TO_SITE_CODE`
Map BWB Rain Gauge Names to DSWT SiteCodes

Description

Map BWB Rain Gauge Names to DSWT SiteCodes

Usage

`DSWT_BWB_CODE_TO_SITE_CODE()`

Value

list with BWB names as element names and DSWT SiteCodes as elements

`DSWT_DICTIONARY_FILE` *Path to Default Path Dictionary File*

Description

Default "dictionary" file describing the folder structure to be used in DSWT

Usage

`DSWT_DICTIONARY_FILE()`

Value

path to path dictionary file stored in the (installed) package

DSWT_FILE_TYPES *List of File Type Definitions*

Description

Containing e.g. a file name pattern

Usage

DSWT_FILE_TYPES()

Value

list mapping keywords to file name patterns

DSWT_H_OFFSETS *Water Level Offsets to be Subtracted from Measurement*

Description

Water level offsets H_{offset} to be subtracted from measured level in order to get the water level above the plume: $H = H_{\text{raw}} - H_{\text{offset}}$. H is then used to calculate Q by using the relationship given by [H_Q_Table](#)

Usage

DSWT_H_OFFSETS()

Value

list of named elements with names corresponding to the monitoring site and the value corresponding to the offset in metres.

DSWT_H_OFFSETS_SINCE *DSWT_H_OFFSETS_SINCE*

Description

DSWT_H_OFFSETS_SINCE

Usage

DSWT_H_OFFSETS_SINCE()

DSWT_RAIN_GAUGES *Rain Gauges Used in DSWT Project*

Description

Rain Gauges Used in DSWT Project

Usage

DSWT_RAIN_GAUGES()

Value

data frame with columns *FUB_STATION*, *FUB_SHORT*, *BWB_SHORT*

DSWT_SITES *Names of Sites Monitored in DSWT Project*

Description

Names of Sites Monitored in DSWT Project

Usage

DSWT_SITES()

Value

named vector of SiteID values in ODM database

DSWT_TIMESERIES *Foreign Keys Identifying Time Series in the ODM Data Model*

Description

Foreign Keys Identifying Time Series in the ODM Data Model

Usage

DSWT_TIMESERIES()

Value

list of lists

getActionsFromAutoSamplerFile
Get Actions from Autosampler File

Description

Get Actions from Autosampler File

Usage

```
getActionsFromAutoSamplerFile(pnFile, fileNumber = 1, remove.errors = FALSE)
```

Arguments

pnFile full path to ORI Auto sampler log files PN_<yyyymmdd>_<station>.csv
fileNumber file number (will be included in the plot title). Useful if this function is called in a sequence for multiple files.
remove.errors if TRUE, actions containing "Fehler" are removed

getActionsFromAutoSamplerFiles
Get Actions from Autosampler Files

Description

Get Actions from Autosampler Files

Usage

```
getActionsFromAutoSamplerFiles(pnFiles)
```

Arguments

pnFiles full path(s) to ORI Auto sampler log files PN_<yyyymmdd>_<station>.csv

getDswtFilePaths *Get DSWT File Paths*

Description

Browse for files of given type (DSWT-specific)

Usage

```
getDswtFilePaths(srcdir, filetype, recursive = FALSE)
```

Arguments

srcdir	source directory
filetype	one of the file types contained in DSWT_FILE_TYPES
recursive	search in subdirectories?

Value

vector of file paths

getHQSeriesFromCSV *Get H and Q Series from CSV File*

Description

Get H and Q Series from CSV File

Usage

```
getHQSeriesFromCSV(  
  srcfile,  
  DN,  
  sep = "\t",  
  timeFormat = NULL,  
  hoffset = 0.02,  
  addTimeColumns = TRUE,  
  additionalColumns = c("I_mA", "Battery_V"),  
  ...  
)
```

Arguments

srcfile	full path to csv file generated by radar probe
DN	DN in mm. Must be one of 150, 300.
sep	column separator. Default: Tabulator "\t"
timeFormat	format of timestamp. Default: "%d.%m.%Y %H:%M"
hoffset	level offset to be subtracted from the measured level in order to get the level above the flume
addTimeColumns	if TRUE, time columns containing local date and time are added
additionalColumns	names of additional columns to be imported. One of c("I_mA", "Battery_V", "DeviceID")
...	further arguments passed to readLogger_Ori_MLog, e.g. <i>stopOnMissingColumns</i>

Value

data frame with columns *BerlinDateTimeNoDST* (no daylight saving time adjustment!), *Hraw_m* (measured height in m), *H_m* (corrected height [= measured height minus offset] in m), *Q_L_s* (calculated discharge in L/s). If *addTimeColumns* is TRUE the columns *BerlinDateTime* and *UTCOffset* will be added.

getLevelFilesForSite *Level Files for Site*

Description

Level Files for Site

Usage

```
getLevelFilesForSite(config, station)
```

Arguments

config	configuration object (list) with elements "dictionaryFile" and elements required by pathDictionary
station	name of monitoring station

Value

vector of file paths

getLevelFilesInfo2	<i>Get Level Files Info 2</i>
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Description

Get Level Files Info 2

Usage

```
getLevelFilesInfo2(levelData)
```

Arguments

levelData	data frame with columns <i>myDateTime</i> (character), <i>file</i> , <i>row</i> , as returned by readAllLevelFiles
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Value

data frame with columns *file*, *rows*, *min*, *first*, *last*, *max*

H_Q_Table	<i>H-Q-Relationship Given by Manufacturer</i>
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Description

H-Q-Relationship Given by Manufacturer

Usage

```
H_Q_Table(DN)
```

Arguments

DN	DN in mm, must be one of 150, 300
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Value

data frame with columns *H_m*, *Q_L_s*, *Q_m3_s*, *Q_L_h*, *Q_m3_h*

H_to_Q *Calculate Q from Height Above flume*

Description

Calculates Q from height h above flume as $Q = a \cdot H^b$ with a and b retrieved from linear regression between $\log(H)$ and $\log(Q)$ with H and Q values taken from manufacturer's table

Usage

H_to_Q(H, DN)

Arguments

H height above flume in m
 DN DN in mm, must be one of 150, 300

insertLocalDateTimeColumns
 Insert LocalDateTime Columns

Description

Insert LocalDateTime Columns

Usage

insertLocalDateTimeColumns(mydata)

Arguments

mydata data frame with character column *BerlinDateTimeNoDST*

Value

data frame with additional columns *BerlinDateTime* (character), *UTCOffset* (numeric)

`insertUtcDateTimeColumn`*Insert DateTimeUTC Column*

Description

Insert DateTimeUTC Column

Usage

```
insertUtcDateTimeColumn(mydata)
```

Arguments

mydata data frame with column BerlinDateTimeNoDST

Value

mydata with additional column *DateTimeUTC*

`keyFields_DSWT`*Key Field Values in DSWT Project*

Description

Key Field Values in DSWT Project

Usage

```
keyFields_DSWT()
```

Value

A list with each entry representing a time series, i.e. the measurement of one variable at one site.

```
prepareSingleVariableDataValuesForOdm
    Prepare Single Variable Data Values for ODM
```

Description

Prepare Single Variable Data Values for ODM

Usage

```
prepareSingleVariableDataValuesForOdm(
  dataframe,
  colName,
  noDataValue = -9999,
  dbg = TRUE
)
```

Arguments

dataFrame	data frame containing the data
colName	column name
noDataValue	value indicating "no data", default: -9999
dbg	logical. If TRUE, debug messages are shown

```
Q_to_H    Back-Calculate Height Above Flume From Discharge
```

Description

back-calculates height H above flume from discharge Q. $Q = a * H^b \Leftrightarrow H = (Q/a)^{1/b}$ with a and b retrieved from linear regression between log(H) and log(Q) with H and Q values taken from manufacturer's table

Usage

```
Q_to_H(Q, DN)
```

Arguments

Q	discharge Q in height above flume (in which unit?)
DN	DN in mm, must be one of 150, 300

readAllLevelFiles	<i>Read all Level Files</i>
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Description

Read all Level Files

Usage

```
readAllLevelFiles(levelFiles, dbg = TRUE)
```

Arguments

levelFiles	vector of file paths
dbg	if TRUE, debug messages are shown.

readAndPlotAutoSamplerFiles	<i>Read and Plot Autosampler Files</i>
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Description

Read and Plot Autosampler Files

Usage

```
readAndPlotAutoSamplerFiles(
  filePaths,
  removePattern = "Power|Bluetooth|Modem|SMS|Sonde",
  to.pdf = TRUE,
  evtSepTime = 30 * 60
)
```

Arguments

filePaths	full path(s) to ORI Auto sampler log files PN_<yyyymmdd>_<station>.csv
removePattern	regular expression pattern matching logged actions to be removed before plotting. Set to "" in order not to remove any action
to.pdf	if TRUE, graphical output is directed to PDF
evtSepTime	event separation time in seconds. Minimum time of "no signal" between two distinct events.

reformatEvents	<i>Reformat Event List</i>
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Description

Reformat event list: convert to minutes and rename columns

Usage

```
reformatEvents(events)
```

Arguments

events	event list as retrieved by <code>kwb.event : : hsEvents</code>
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Value

events with *tBeg* renamed *Ereignisbeginn_UTC*, *tEnd* renamed *Ereignisende_UTC*, *dur* renamed *Dauer_min*, *pBefore* renamed *Pause_davor_min* and *pAfter* renamed *Pause_danach_min* and original columns *iBeg* and *iEnd* removed

toLevelFileInfo	<i>Create Information on Water Level File</i>
-----------------	---

Description

Create Information on Water Level File

Usage

```
toLevelFileInfo(filePath, timestamps)
```

Arguments

filePath	path to water level file
timestamps	vector of timestamps (read from the file?)

validate_HQ_relationships
Validate H-Q-Relationships

Description

Validate HQ relationships for DN = 150 and DN = 300

Usage

validate_HQ_relationships()

writeEventListToCSV *Write Event List to CSV File*

Description

Write Event List to CSV File

Usage

writeEventListToCSV(events, csv, sep = ";", dec = ",")

Arguments

events	data frame containing event data
csv	full path to csv file
sep	column separator. Default: ";"
dec	decimal character. Default: "."

writeHQSeriesToCSV *Write H-Q-Series to CSV File*

Description

Write H-Q-Series to CSV File

Usage

writeHQSeriesToCSV(hqSeries, csv, sep = ";", dec = ",")

Arguments

hqSeries	data frame containing HQ time series
csv	full path to csv file
sep	column separator. Default: ";"
dec	decimal character. Default: "."

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