

Package ‘xlum’

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Type Package

Title Read, Write, and Convert XLUM Data

Version 0.1.0

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Description Support for the XLUM file format for exchange and long-term preservation of luminescence data. Facilitated are the import and export of XLUM files and the conversion from other formats commonly used to store luminescence (dating) data.

License GPL-3

Depends R (>= 4.1),
utils

Imports methods,
base64enc (>= 0.1),
Luminescence (>= 0.9.19),
xml2 (>= 1.3.3)

Suggests spelling (>= 2.2),
testthat (>= 3.1.3)

Encoding UTF-8

Language en-GB

LazyData true

RoxygenNote 7.3.2

Collate 'convert_Daybreak2xlum.R'
'convert_binx2xlum.R'
'convert_psl2xlum.R'
'convert_rlum2xlum.R'
'convert_xsyg2xlum.R'
'methods.R'
'read_xlum.R'
'utils.R'
'validate_xlum.R'
'write_xlum.R'
'xlum-package.R'

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xlum-package	<i>Read, Write, and Convert xlum Data</i>
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Description

Support for the XLUM-file format for exchange and long-term preservation of luminescence data. Facilitated are the import and export of XLUM-files and the conversion from other ASCII and binary formats commonly used to store luminescence (dating) data.

Details

Support contact

- <https://github.com/R-Lum/xlum/discussions>

Bug reporting

- <https://github.com/R-Lum/xlum/issues>

Project source code repository

- <https://github.com/R-Lum/xlum>

Package maintainer

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<sebastian.kreutzer@uni-heidelberg.de>

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Author(s)

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Other contributors:

- Christoph Burow ([ORCID](#)) [contributor]

convert_binx2xlum	<i>Convert Risø BIN/BINX to XLUM</i>
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Description

Wrapped function to quickly convert BIN/BINX files to xlum (files)

Usage

```
convert_binx2xlum(file, out_file = NULL, ...)
```

```
convert_bin2xlum(file, out_file = NULL)
```

Arguments

file	character (required): file
out_file	character (optional): output file, if set a file output is created
...	support for a limited number of additional arguments to be forwarded to Luminescence::read_BIN2R : position, n.records

Value

Depending on the setting. If out_file == NULL an [xml2::xml_document](#) object is returned, if file is set the function attempts to write an *.xlum file⁴.

Function version

0.1.0

How to cite

Kreutzer, S., 2025. convert_binx2xlum(): Convert Risø BIN/BINX to XLUM. Function version 0.1.0. In: Kreutzer, S., 2025. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

[convert_rlum2xlum](#), [Luminescence::read_BIN2R](#)

Examples

```
## Not run:
file <- system.file("extdata/BINfile_V8.binx", package = "Luminescence")
convert_binx2xlum(file)

## End(Not run)
```

convert_Daybreak2xlum *Convert Daybreak TXT and DAT files to XLUM*

Description

Wrapped function to quickly convert Daybreak files to xlum (files)

Usage

```
convert_Daybreak2xlum(file, out_file = NULL)
```

Arguments

file **character (required)**: file
out_file **character (optional)**: output file, if set a file output is created

Value

Depending on the setting. If out_file == NULL an [xml2::xml_document](#) object is returned, if file is set the function attempts to write an *.xlum file`.

Function version

0.1.0

How to cite

Kreutzer, S., 2025. convert_Daybreak2xlum(): Convert Daybreak TXT and DAT files to XLUM. Function version 0.1.0. In: Kreutzer, S., 2025. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

[convert_rlum2xlum](#), [Luminescence::read_Daybreak2R](#)

Examples

```
## load package example data  
## for loading own data use  
## file <- file.choose()  
file <- system.file("extdata/Daybreak_TestFile.txt", package = "Luminescence")  
convert_Daybreak2xlum(file)
```

convert_psl2xlum	<i>Convert SUERC PSL-files to XLUM</i>
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Description

Wrapped function to quickly convert PSL files to xlum (files) from the portable luminescence system produced by the SUERC

Usage

```
convert_psl2xlum(file, out_file = NULL)
```

Arguments

file	character (required): file
out_file	character (optional): output file, if set a file output is created

Value

Depending on the setting. If out_file == NULL an [xml2::xml_document](#) object is returned, if file is set the function attempts to write an *.xlum file'.

Function version

0.1.0

How to cite

Kreutzer, S., 2025. convert_psl2xlum(): Convert SUERC PSL-files to XLUM. Function version 0.1.0. In: Kreutzer, S., 2025. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

[convert_rlum2xlum](#), [Luminescence::read_PSL2R](#)

Examples

```
## load package example data
## for loading own data use
## file <- file.choose()
file <- system.file("extdata", "DorNie_0016.psl", package = "Luminescence")
convert_psl2xlum(file)
```

convert_rlum2xlum	<i>Convert RLum-class objects to the XLUM format</i>
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Description

Converts [Luminescence::RLum](#) objects to xlum format

Usage

```
convert_rlum2xlum(rlum, file = NULL)
```

Arguments

rlum	Luminescence::RLum.Data and Luminescence::RLum.Analysis or a list of it (required): input for the conversion
file	character (<i>optional</i>): file name for the export, if NULL (the default), an xml2::xml_document object is returned

Details

The function tries to make a best possible conversion of the [Luminescence::RLum](#) to the xlum format. [Luminescence::RLum.Results](#) objects are not supported.

Because of the nature the [Luminescence::RLum](#) structure, the nodes `<xlum/>`, `<sample/>` are set automatically because the [Luminescence::RLum](#) does not distinguish between different samples.

Value

Depending on the setting. If `file == NULL` an [xml2::xml_document](#) object is returned, if file is set the function attempts to write an `*.xlum` file'.

Function version

0.1.0

How to cite

Kreutzer, S., 2025. `convert_rlum2xlum()`: Convert RLum-class objects to the XLUM format. Function version 0.1.0. In: Kreutzer, S., 2025. `xlum`: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

[Luminescence::RLum.Data](#), [write_xlum](#)

Examples

```
data(ExampleData.RLum.Analysis,  
  envir = environment(),  
  package = "Luminescence")  
convert_rlum2xlum(IRSAR.RF.Data)
```

convert_xsyg2xlum	<i>Convert Freiberg Instruments XSYG files to XLUM</i>
-------------------	--

Description

Wrapped function to quickly convert Freiberg Instruments XSYG-files to xlum (files)

Usage

```
convert_xsyg2xlum(file, out_file = NULL)
```

Arguments

file	character (required): file
out_file	character (optional): output file, if set a file output is created

Value

Depending on the setting. If out_file == NULL an [xml2::xml_document](#) object is returned, if file is set the function attempts to write an *.xlum file'.

Function version

0.1.0

How to cite

Kreutzer, S., 2025. convert_xsyg2xlum(): Convert Freiberg Instruments XSYG files to XLUM. Function version 0.1.0. In: Kreutzer, S., 2025. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

[convert_rlum2xlum](#), [Luminescence::read_XSYG2R](#)

Examples

```
## load package example data  
## for loading own data use  
## file <- file.choose()  
file <- system.file("extdata/XSYG_file.xsyg", package = "Luminescence")  
convert_xsyg2xlum(file)
```

read_xlum	<i>Import XLUM files</i>
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Description

Imports XLUM-files using [xml2::read_xml](#). Comes with a few convenience features, such as the transformation of string lists to numeric vectors where meaningful.

Usage

```
read_xlum(file, verify = TRUE, output = "xlum_list")
```

Arguments

file	character (required): path to file
verify	logical (<i>with default</i>): enable/disable format validation
output	character (<i>with default</i>): output object of the import, supported are "xml_document", "list", "xlum_list" (the default)

Details

Supported output options

"xlum_list" (default): imports XML-data and coerces them to list. Numeric values for level <curve> are transposed into [numeric](#) vectors for better handling

"list": imports XML-data and coerces it to a [list](#), no further treatment of data

"xml_document": unprocessed output from [xml2::read_xml](#)

Value

The output depends on the setting selected in output. It will be either an [xml2::xml_document](#), [list](#), or a [list](#) of class `xlum_list`.

Function version

0.1.0

How to cite

Kreutzer, S., 2025. `read_xlum()`: Import XLUM files. Function version 0.1.0. In: Kreutzer, S., 2025. `xlum`: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

[xml2::read_xml](#), [validate_xlum](#), [write_xlum](#)

Examples

```
file <- system.file("extdata/xlum_example.xlum", package="xlum")
read_xlum(file)
```

 validate_xlum

Validate xlum format against an XSD reference schema

Description

A a convenience wrapper around [xml2::xml_validate](#) against the reference format description shipped with [xlum-package](#)

Usage

```
validate_xlum(file, xsd_version = NULL)
```

Arguments

file [xml2::xml_document](#) (**required**): object to test

xsd_version [numeric](#) (*optional*): specify format version for the validation, e.g., 1, 1.1. The default is NULL, which will use the most recent version

Value

Results of the validation [logical](#) with attributes

How to cite

Kreutzer, S., 2025. validate_xlum(): Validate xlum format against an XSD reference schema. In: Kreutzer, S., 2025. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Geography & Earth Sciences, Aberystwyth University

Examples

```
file <- system.file("extdata/xlum_prototype.xlum", package = "xlum")
validate_xlum(file)
```

write_xlum	<i>Write XLUM-files</i>
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Description

Create XLUM-files using [xml2::read_xml](#)

Usage

```
write_xlum(x, file, encode_base64 = FALSE, ...)
```

Arguments

x	xlum_list, list , xml2::xml_document (required) : input object
file	character (required): valid file path and file name with ending .xlum (will be add automatically if needed)
encode_base64	logical (<i>with default</i>): enable/disable base64 encoding for values in the <curve/> node. Please note that this parameter works only if the input is of class xlum_list
...	further arguments to be passed to xml2::write_xml

Value

Creates an XML-file with ending *.xlum

Function version

0.1.0

How to cite

Kreutzer, S., 2025. write_xlum(): Write XLUM-files. Function version 0.1.0. In: Kreutzer, S., 2025. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

[xml2::write_xml](#), [read_xlum](#)

Examples

```
file <- system.file("extdata/xlum_prototype.xlum", package="xlum")
out_file <- tempfile()

xlum_data <- read_xlum(file)
write_xlum(xlum_data, out_file)
```

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