

# Package ‘FSK2R’

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**Type** Package

**Title** An Interface Between the 'FSK-ML' Standard and 'R'

**Version** 0.1.2

**Description** Functions for importing, creating, editing and exporting 'FSK' files <<https://foodrisklabs.bfr.bund.de/fsk-ml-food-safety-knowledge-markup-language/>> using the 'R' programming environment. Furthermore, it enables users to run simulations contained in the 'FSK' files and visualize the results.

**License** GPL-3

**Encoding** UTF-8

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---

`check_manifest_files`    *Checks that the files defined in the manifest exist*

---

### **Description**

Checks that the files defined in the manifest exist

### **Usage**

```
check_manifest_files(my_manifest, file_dir)
```

### **Arguments**

`my_manifest`    A list with the contents of the manifest file.  
`file_dir`        Path to the directory where all the files have been extracted.

---

`convert_metadata_to_lists`  
*Fix the metadat so that it is lists*

---

### **Description**

Fix the metadat so that it is lists

### **Usage**

```
convert_metadata_to_lists(my_metadata)
```

### **Arguments**

`my_metadata`    A list with the information in the GoogleSheet as generated by `metadata_list_to_fsk`.

---

`create_fsk`*Creates an FSK model from an existing R script*

---

## Description

The model includes the R model. If provided as arguments, it also includes the visualization script and the README. Besides, it generates a typical `model_metadata`, as well as a simulation (without parameters). The manifest is left empty.

## Usage

```
create_fsk(  
  r_model,  
  r_visualization = NULL,  
  readme = NULL,  
  other_files = NULL,  
  pkg_frame = NULL  
)
```

## Arguments

`r_model` character with the path to the R script with the model.  
`r_visualization` (optional) character with the path to the R script with the visualization.  
`readme` (optional) path to README file.  
`other_files` (optional) character vector with the path to additional  
`pkg_frame` (optional) data.frame with 2 columns 'Package' files required by the model.

## Value

An instance of FSK2R.

## Examples

```
model_path <- system.file("extdata", "model.r", package = "FSK2R")  
visualization_path <- system.file("extdata", "visualization.r", package = "FSK2R")  
FSK_from_R <- create_fsk(model_path, visualization_path)
```

---

dataframe\_to\_list      *Converts a dataframe to a list*

---

**Description**

This function is needed to convert the output format of rjson to the one used by FSK2R.

**Usage**

```
dataframe_to_list(this_frame)
```

**Arguments**

    this\_frame      data.frame to convert to a list.

---

```
download_metadata_schema  
    #' Download the latest version of the MetaData Master Table as Excel
```

---

**Description**

    #' Download the latest version of the MetaData Master Table as Excel

**Usage**

```
download_metadata_schema(out_path, sheet = NULL)
```

**Arguments**

    out\_path      Character saying where to save the file.  
    sheet      Character specifying what sheet to download. All of them by default (NULL).

**Value**

    None

export\_fsk                    *Exports an object of FSK class as an .fskx file*

---

**Description**

Exports an object of FSK class as an .fskx file

**Usage**

```
export_fsk(fsk_object, out_path, check = TRUE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

**Value**

None

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
class(my_fsk)
export_fsk(my_fsk, out_path=file.path(tempdir(), "out.fskx"))
```

---

export\_manifest              *Functions for exporting the manifest of an FSK2R object*

---

**Description**

Functions for exporting the manifest of an FSK2R object

**Usage**

```
export_manifest(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

---

export_metadata	<i>Function for exporting the metadata of an FSK2R object</i>
-----------------	---

---

**Description**

Function for exporting the metadata of an FSK2R object

**Usage**

```
export_metadata(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

---

export_modelmetadata	<i>Functions for exporting the model metadata of an FSK2R object</i>
----------------------	--

---

**Description**

Functions for exporting the model metadata of an FSK2R object

**Usage**

```
export_modelmetadata(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

---

export\_otherfiles      *Export other files*

---

**Description**

Export other files

**Usage**

```
export_otherfiles(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

---

export\_packages      *Functions for exporting the packages of an FSK2R object*

---

**Description**

Functions for exporting the packages of an FSK2R object

**Usage**

```
export_packages(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.



---

`export_readme`*Functions for exporting the README of an FSK2R object*

---

**Description**

Functions for exporting the README of an FSK2R object

**Usage**

```
export_readme(fsk_object, out_path, check = FALSE)
```

**Arguments**

<code>fsk_object</code>	The instance of FSK2R to be exported.
<code>out_path</code>	Path where the file is to be saved.
<code>check</code>	Whether checks are made. TRUE by default.

---

`export_R_model`*Functions for exporting the R model of an FSK2R object*

---

**Description**

Functions for exporting the R model of an FSK2R object

**Usage**

```
export_R_model(fsk_object, out_path, check = FALSE)
```

**Arguments**

<code>fsk_object</code>	The instance of FSK2R to be exported.
<code>out_path</code>	Path where the file is to be saved.
<code>check</code>	Whether checks are made. TRUE by default.

---

export\_sbmlModel      *Export the model.sbml*

---

**Description**

Export the model.sbml

**Usage**

```
export_sbmlModel(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

---

export\_simulation      *Export the sim.sedml*

---

**Description**

Export the sim.sedml

**Usage**

```
export_simulation(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

---

export\_visualization *Functions for exporting the visualization script of an FSK2R object*

---

**Description**

Functions for exporting the visualization script of an FSK2R object

**Usage**

```
export_visualization(fsk_object, out_path, check = FALSE)
```

**Arguments**

fsk_object	The instance of FSK2R to be exported.
out_path	Path where the file is to be saved.
check	Whether checks are made. TRUE by default.

---

find\_packages *Finds where packages are stored*

---

**Description**

Finds where packages are stored

**Usage**

```
find_packages(pckgs)
```

**Arguments**

pckgs	Character vector with packages names
-------	--------------------------------------

**Value**

A list of packages locations. If one is not present, a character(0).

---

FSK_runner	<i>Startup FSK runner</i>
------------	---------------------------

---

**Description**

Starts FSK runner within RStudio.

**Usage**

```
FSK_runner()
```

**Value**

None

---

get_background	<i>Returns the background of an FSK object</i>
----------------	--

---

**Description**

Returns the background of an FSK object

**Usage**

```
get_background(fsk_obj)
```

**Arguments**

fsk\_obj      An object of class FSK2R

**Value**

A nested list with the following entries:

- studyTitle
- studyDescription

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_background(my_fsk)
```

---

get\_general\_info      *Returns the general info of an FSK object*

---

### **Description**

Returns the general info of an FSK object

### **Usage**

```
get_general_info(fsk_obj)
```

### **Arguments**

fsk\_obj      An object of class FSK2R

### **Value**

A nested list with the following entries:

- name
- source
- identifier
- creationDate
- rights
- language
- software
- creators
- reference

### **Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_general_info(my_fsk)
```

get\_modelmath                      *Returns the model math of an FSK object*

---

**Description**

Returns the model math of an FSK object

**Usage**

```
get_modelmath(fsk_obj)
```

**Arguments**

fsk\_obj                      An object of class FSK2R

**Value**

A nested list with the following entries:

- parameter

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_modelmath(my_fsk)
```

---

get\_readme                      *Readme of an FSK object*

---

**Description**

Readme of an FSK object

**Usage**

```
get_readme(fsk_obj)
```

**Arguments**

fsk\_obj                      An object of class FSK2R

**Value**

A character vector with the text in the README file.

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_readme(my_fsk)
```

---

get_scope	<i>Returns the scope of an FSK object</i>
-----------	---

---

**Description**

Returns the scope of an FSK object

**Usage**

```
get_scope(fsk_obj)
```

**Arguments**

fsk\_obj      An object of class FSK2R

**Value**

A nested list with the following entries:

- product
- hazard

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_scope(my_fsk)
```

---

get_session_info	<i>Extract session information</i>
------------------	------------------------------------

---

**Description**

Extract session information

**Usage**

```
get_session_info()
```

**Value**

A list with 3 elements: r\_version, platform and pckgs. The latter is a data.frame with two columns: package and version.

---

get_simulations	<i>Returns a summary of the simulations of an FSK object (NULL)</i>
-----------------	---

---

**Description**

The function is not in-use. It is kept here for compatibility with older versions.

**Usage**

```
get_simulations(fsk_obj)
```

**Arguments**

fsk_obj	An object of class FSK2R
---------	--------------------------

---

import_fsk	<i>Import an FSK model into R</i>
------------	-----------------------------------

---

**Description**

Importst the file in file\_path and transforms it into a list of class FSK2R.

**Usage**

```
import_fsk(file_path, check = FALSE)
```



**Arguments**

file\_path      Path where the file is located.  
 check          Whether checks are made. FALSE by default.

**Value**

An instance of FSK2R.

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_general_info(my_fsk)
```

---

import_fsk_join	<i>Import of FSK with join node</i>
-----------------	-------------------------------------

---

**Description**

Join nodes are not yet supported by FSK2R. It just gives an error message when called.

**Usage**

```
import_fsk_join(file_path, check = TRUE)
```

**Arguments**

file\_path      Path where the file is located.  
 check          Whether checks are made. FALSE by default.

---

is.FSK2R	<i>Is it an instance of FSK2R?</i>
----------	------------------------------------

---

**Description**

Is it an instance of FSK2R?

**Usage**

```
is.FSK2R(object)
```

**Arguments**

object            Object to check

**Value**

A logical vector

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
is.FSK2R(my_fsk)
```

---

is\_fsk\_with\_r

*Does the object have an R model?*

---

**Description**

Does the object have an R model?

**Usage**

```
is_fsk_with_r(fsk_obj)
```

**Arguments**

fsk\_obj            An object of class FSK2R

**Value**

A logical vector.

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
is_fsk_with_r(my_fsk)
```

---

map_FSK_metadata	<i>Map for the contents of the metadata</i>
------------------	---

---

### Description

Maps the location (range) of different pieces of data within the Excel/Google Sheets template. It also includes the names of the sheets.

### Usage

```
map_FSK_metadata(type_of_model = "generic", fsk_version = "1.04")
```

### Arguments

`type_of_model` Type of model, as defined in the FSK-ML documentation. By default, 'generic'.  
`fsk_version` Character stating the version of FSK-ML.

### Value

A list with two components: the 'range' where each piece of information is stored and 'ws\_name' with the name of the relevant sheet in the GoogleSheet template.

---

map_metadata_xml_template	<i>Map between the names used in the template and the xml</i>
---------------------------	---

---

### Description

Returns a map of the names used within the sheets of the Excel/GoogleSheets template and the ones in metadata.json.

### Usage

```
map_metadata_xml_template()
```

---

metadata\_list\_to\_fsk *From read\_fsk\_metadata\_XX to FSK2R format*

---

**Description**

Converts the contents of the Excel/Google Sheets template into a list with the format of the FSK2R object.

**Usage**

```
metadata_list_to_fsk(my_metadata, fsk_version = "1.0.5")
```

**Arguments**

my_metadata	A list generated by
fsk_version	Version of the FSK template.

---

n\_simuls\_fsk *Number of simulations in the FSK2R object*

---

**Description**

Number of simulations in the FSK2R object

**Usage**

```
n_simuls_fsk(fsk_obj)
```

**Arguments**

fsk_obj	An instance of FSK2R
---------	----------------------

**Value**

An integer vector of length one.

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
n_simuls_fsk(my_fsk)
```

---

`read_fsk_json_metadata`*Read the metadata.json file*

---

**Description**

Read the metadata.json file

**Usage**

```
read_fsk_json_metadata(file_dir, check = FALSE, filename = "metaData.json")
```

**Arguments**

<code>file_dir</code>	path to the file.
<code>check</code>	Whether to make checks. FALSE by default.
<code>filename</code>	Name of the file with the information (metaData.json by default).

**Value**

A list with the contents of the metadata file.

---

`read_fsk_manifest`*Read the manifest of an FSK file and convert it to a data.frame*

---

**Description**

Read the manifest of an FSK file and convert it to a data.frame

**Usage**

```
read_fsk_manifest(file_dir, check = FALSE, filename = "manifest.xml")
```

**Arguments**

<code>file_dir</code>	path to the file.
<code>check</code>	Whether to make checks. FALSE by default.
<code>filename</code>	Name of the file with the information (manifest.xml by default).

**Value**

A data.frame with the contents of the xml file.

---

read_fsk_metadata	<i>Reads the metadata contained in a Google Sheet</i>
-------------------	---

---

**Description**

Reads the metadata contained in a Google Sheet

**Usage**

```
read_fsk_metadata(fsk_object, title, type_of_model = "generic")
```

**Arguments**

fsk_object	FSK2R object where to save the metadata
title	Character identifying the Google Sheet
type_of_model	Character identifying the type of model.

**Value**

A list with the information in the GoogleSheet as generated by metadata\_list\_to\_fsk.

---

read_fsk_metadata_excel	<i>FSK metadata from local Excel file</i>
-------------------------	---

---

**Description**

FSK metadata from local Excel file

**Usage**

```
read_fsk_metadata_excel(
  fsk_object,
  path,
  type_of_model = "generic",
  fsk_version = "1.0.5"
)
```

**Arguments**

fsk_object	FSK2R object where to save the data
path	character describing the path to the file
type_of_model	character identifying the type of model
fsk_version	Character describing the version of FSK-ML ("1.04" by default).

**Value**

A list with the information in the Excel file as generated by metadata\_list\_to\_fsk.

---

read_fsk_model	<i>Read the model.sbml</i>
----------------	----------------------------

---

**Description**

Read the model.sbml

**Usage**

```
read_fsk_model(file_dir, check = FALSE, filename = "model.sbml")
```

**Arguments**

file_dir	path to the file.
check	Whether to make checks. FALSE by default.
filename	Name of the file with the information (model.sbml by default).

**Value**

A list with the contents of the .xml file.

---

read_fsk_packages	<i>Read the packages.json</i>
-------------------	-------------------------------

---

**Description**

Read the packages.json

**Usage**

```
read_fsk_packages(file_dir, check = FALSE, filename = "packages.json")
```

**Arguments**

file_dir	path to the file.
check	Whether to make checks. FALSE by default.
filename	Name of the file with the information (packages.json by default).

**Value**

A list with the contents of the JSON file.

---

read\_fsk\_rdf\_metadata *Read the metadata.rdf*

---

**Description**

Read the metadata.rdf

**Usage**

```
read_fsk_rdf_metadata(file_dir, check = FALSE, filename = "metadata.rdf")
```

**Arguments**

file_dir	path to the file.
check	Whether to make checks. FALSE by default.
filename	Name of the file whith the information (metadata.rdf by default).

**Value**

A list with the contents of the .xml file.

---

read\_fsk\_readme *Read the README file*

---

**Description**

Read the README file

**Usage**

```
read_fsk_readme(file_dir, check = FALSE, filename = "README.txt")
```

**Arguments**

file_dir	path to the file.
check	Whether to make checks. FALSE by default.
filename	Name of the file whith the information (README.txt by default).

**Value**

A character string with the content of the README file.



---

read_fsk_sim	<i>Read the sim.sedml file</i>
--------------	--------------------------------

---

**Description**

Read the sim.sedml file

**Usage**

```
read_fsk_sim(file_dir, check = FALSE, filename = "sim.sedml")
```

**Arguments**

file_dir	path to the file.
check	Whether to make checks. FALSE by default.
filename	Name of the file whith the information (sim.sedml by default).

**Value**

A list with the content of the xml file.

---

read_other_files	<i>Read "other files"</i>
------------------	---------------------------

---

**Description**

The R models may require further files that we can not predict. This functions just reads all the "unrecognized" files included in the manifest and copies them to the working directory.

**Usage**

```
read_other_files(my_tempdir, my_manifest, check = FALSE)
```

**Arguments**

my_tempdir	Temporary directory to extract contents of the zyp file.
my_manifest	A list with the information in the manifest file
check	Whether checks are made.

---

read_R_model	<i>Reads the R model in an FSK model</i>
--------------	--

---

**Description**

Reads the R model in an FSK model

**Usage**

```
read_R_model(file_dir, check = FALSE, filename = "model.R")
```

**Arguments**

file_dir	path to the file.
check	Whether to make checks. FALSE by default.
filename	Name of the file (model.R by default).

**Value**

A character string with the contents of the R file.

---

read_visualization	<i>Reads the visualization script in an FSK model</i>
--------------------	---

---

**Description**

Reads the visualization script in an FSK model

**Usage**

```
read_visualization(file_dir, check = FALSE, filename = "visualization.R")
```

**Arguments**

file_dir	path to the file.
check	Whether to make checks. FALSE by default.
filename	Name of the file with the information (visualization.R by default).

**Value**

A character string with the contents of the R file.

---

run\_all\_simulations     *Run every simulation in an FSK object*

---

**Description**

Runs every simulation defined in the FSK object. This includes the ones originally included in the FSK container, as well as the ones added using `set_new_simulation()`.

**Usage**

```
run_all_simulations(fsk_object, run_visualization = FALSE)
```

**Arguments**

`fsk_object`     Instance of FSK2R  
`run_visualization`     Whether to call the visualization script. FALSE by default.

**Value**

None

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")  
my_fsk <- import_fsk(path_example)  
run_all_simulations(my_fsk)
```

---

run\_simulation     *Run one simulation in an FSK object*

---

**Description**

Runs the simulation corresponding to `index`. If defined, it also calls any visualization script.

**Usage**

```
run_simulation(fsk_object, index, run_visualization = FALSE)
```

**Arguments**

`fsk_object`     Instance of FSK2R  
`index`     Index of the simulation  
`run_visualization`     Whether to call the visualization script. FALSE by default.

**Value**

None

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
run_simulation(my_fsk, 1)
```

---

set\_new\_simulation      *Define a new simulation in an FSK2R object*

---

**Description**

Sets a new simulation using the parameters defined in simulation\_pars. The method updates all the relevant methods.

**Usage**

```
set_new_simulation(fsk_object, simulation_id, parameters)
```

**Arguments**

fsk_object	Instance of FSK2R
simulation_id	A character with an id for the new simulation.
parameters	A list whose names are the parameters to modify and their values their values for the simulation.

**Value**

An instance of FSK2R with the additional simulation data.

---

set_readme	<i>Readme of an FSK object</i>
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**Description**

Readme of an FSK object

**Usage**

```
set_readme(fsk_object, readme_text)
```

**Arguments**

fsk\_object      An instance of FSK2R.  
readme\_text     A character vector of length 1 with the content of the README file.

**Value**

An instance of FSK2R.

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")  
my_fsk <- import_fsk(path_example)  
set_readme(my_fsk, "This is the README.")
```

---

update_manifest	<i>Updates the manifest file</i>
-----------------	----------------------------------

---

**Description**

Updates the manifest file

**Usage**

```
update_manifest(fsk_object)
```

**Arguments**

fsk\_object      An instance of FSK2R.

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