

RelativeKinematicsComputationsModel

5.0

Generated by Doxygen 1.8.5

Wed Jun 1 2022 12:09:43

Contents

1	Module Index	1
1.1	Modules	1
2	Namespace Index	3
2.1	Namespace List	3
3	Data Structure Index	5
3.1	Data Structures	5
4	File Index	7
4.1	File List	7
5	Module Documentation	9
5.1	Models	9
5.1.1	Detailed Description	9
5.2	Dynamics	10
5.2.1	Detailed Description	10
5.3	RelKin	11
5.3.1	Detailed Description	11
5.3.2	Macro Definition Documentation	11
5.3.2.1	PATH	11
6	Namespace Documentation	13
6.1	jeod Namespace Reference	13
6.1.1	Detailed Description	13
7	Data Structure Documentation	15
7.1	jeod::RelativeKinematics Class Reference	15
7.1.1	Detailed Description	16
7.1.2	Constructor & Destructor Documentation	16
7.1.2.1	RelativeKinematics	16
7.1.2.2	RelativeKinematics	16
7.1.2.3	~RelativeKinematics	16
7.1.3	Member Function Documentation	16

7.1.3.1	activate_relstate	16
7.1.3.2	add_relstate	16
7.1.3.3	find_relstate	17
7.1.3.4	operator=	17
7.1.3.5	remove_relstate	17
7.1.3.6	update_all	17
7.1.3.7	update_single	17
7.1.4	Friends And Related Function Documentation	17
7.1.4.1	init_attrjeod__RelativeKinematics	17
7.1.4.2	InputProcessor	17
7.1.5	Field Documentation	18
7.1.5.1	num_rel_states	18
7.1.5.2	relative_states	18
7.2	jeod::RelKinMessages Class Reference	18
7.2.1	Detailed Description	19
7.2.2	Constructor & Destructor Documentation	19
7.2.2.1	RelKinMessages	19
7.2.2.2	RelKinMessages	19
7.2.3	Member Function Documentation	19
7.2.3.1	operator=	19
7.2.4	Friends And Related Function Documentation	19
7.2.4.1	init_attrjeod__RelKinMessages	19
7.2.4.2	InputProcessor	19
7.2.5	Field Documentation	19
7.2.5.1	duplicate_entry	19
7.2.5.2	entry_not_found	19
7.2.5.3	invalid_entry	20
8	File Documentation	21
8.1	rel_kin_messages.cc File Reference	21
8.1.1	Detailed Description	21
8.2	rel_kin_messages.hh File Reference	21
8.2.1	Detailed Description	22
8.3	relative_kinematics.cc File Reference	22
8.3.1	Detailed Description	22
8.4	relative_kinematics.hh File Reference	22
8.4.1	Detailed Description	23

Chapter 1

Module Index

1.1 Modules

Here is a list of all modules:

Models	9
Dynamics	10
RelKin	11

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

jeod	Namespace jeod	13
----------------------	--------------------------	----

Chapter 3

Data Structure Index

3.1 Data Structures

Here are the data structures with brief descriptions:

jeod::RelativeKinematics	
Encapsulates functionality for computing relative states	15
jeod::RelKinMessages	
Specifies the message IDs used in the orbital elements model	18

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

rel_kin_messages.cc	Implement the class RelKinMessages	21
rel_kin_messages.hh	Define the class RelKinMessages, the class that specifies the message IDs used in the relative kinematics model	21
relative_kinematics.cc	Define methods for the RelativeKinematics class	22
relative_kinematics.hh	Define the class RelativeKinematics, the class used for calculating the state of some point(s) of interest associated with the subject DynBody relative to some other reference frame	22

Chapter 5

Module Documentation

5.1 Models

Modules

- [Dynamics](#)

5.1.1 Detailed Description

5.2 Dynamics

Modules

- [RelKin](#)

5.2.1 Detailed Description

5.3 RelKin

Files

- file [rel_kin_messages.hh](#)
Define the class `RelKinMessages`, the class that specifies the message IDs used in the relative kinematics model.
- file [relative_kinematics.hh](#)
Define the class `RelativeKinematics`, the class used for calculating the state of some point(s) of interest associated with the subject `DynBody` relative to some other reference frame.
- file [rel_kin_messages.cc](#)
Implement the class `RelKinMessages`.
- file [relative_kinematics.cc](#)
Define methods for the `RelativeKinematics` class.

Namespaces

- [jeod](#)
Namespace `jeod`.

Macros

- `#define` [PATH](#) "dynamics/rel_kin/"

5.3.1 Detailed Description

5.3.2 Macro Definition Documentation

5.3.2.1 `#define` PATH "dynamics/rel_kin/"

Definition at line 39 of file `rel_kin_messages.cc`.

Chapter 6

Namespace Documentation

6.1 jeod Namespace Reference

Namespace jeod.

Data Structures

- class [RelKinMessages](#)
Specifies the message IDs used in the orbital elements model.
- class [RelativeKinematics](#)
Encapsulates functionality for computing relative states.

6.1.1 Detailed Description

Namespace jeod.

Chapter 7

Data Structure Documentation

7.1 jeod::RelativeKinematics Class Reference

Encapsulates functionality for computing relative states.

```
#include <relative_kinematics.hh>
```

Public Member Functions

- [RelativeKinematics](#) ()
Construct a [RelativeKinematics](#) object.
- [~RelativeKinematics](#) ()
Destruct a [RelativeKinematics](#) object.
- void [add_relstate](#) (RelativeDerivedState &relstate)
Add a relative state to the list of ones maintained by this model.
- void [remove_relstate](#) (RelativeDerivedState &relstate)
Remove a relative state from the list of ones maintained by this model.
- RelativeDerivedState * [find_relstate](#) (const char *relstate_name)
Find a specific relative state maintained by this model.
- void [activate_relstate](#) (RelativeDerivedState &relstate, bool raf)
Set flag for a relative state to be activated or deactivated by the RelKin manager.
- void [update_single](#) (const char *relstate_name)
Update a single relative state maintained by this model.
- void [update_all](#) (void)
Update all relative states maintained by this model.

Data Fields

- unsigned int [num_rel_states](#)
Length of above list of relative states being maintained by this.
- JeodPointerVector
 < RelativeDerivedState >::type [relative_states](#)
List of relative states to be computed and maintained by this model.

Private Member Functions

- [RelativeKinematics](#) (const [RelativeKinematics](#) &)
- [RelativeKinematics](#) & [operator=](#) (const [RelativeKinematics](#) &)

Friends

- class [InputProcessor](#)
- void [init_attrjeod__RelativeKinematics](#) ()

7.1.1 Detailed Description

Encapsulates functionality for computing relative states.

Definition at line 56 of file `relative_kinematics.hh`.

7.1.2 Constructor & Destructor Documentation

7.1.2.1 `jeod::RelativeKinematics::RelativeKinematics (const RelativeKinematics &) [private]`

7.1.2.2 `jeod::RelativeKinematics::RelativeKinematics (void)`

Construct a [RelativeKinematics](#) object.

Definition at line 63 of file `relative_kinematics.cc`.

References `relative_states`.

7.1.2.3 `jeod::RelativeKinematics::~~RelativeKinematics (void)`

Destruct a [RelativeKinematics](#) object.

Definition at line 77 of file `relative_kinematics.cc`.

References `relative_states`.

7.1.3 Member Function Documentation

7.1.3.1 `void jeod::RelativeKinematics::activate_relstate (RelativeDerivedState & relstate, bool raf)`

Set flag for a relative state to be activated or deactivated by the RelKin manager.

Parameters

<i>in</i>	<i>relstate_name</i>	Relstate to activate/deactivate
<i>in</i>	<i>raf</i>	bool Relstate activation flag

Definition at line 173 of file `relative_kinematics.cc`.

References `jeod::RelKinMessages::entry_not_found`, `find_relstate()`, and `jeod::RelKinMessages::invalid_entry`.

7.1.3.2 `void jeod::RelativeKinematics::add_relstate (RelativeDerivedState & relstate)`

Add a relative state to the list of ones maintained by this model.

Parameters

<i>in</i>	<i>relstate</i>	Relstate to add
-----------	-----------------	-----------------

Definition at line 90 of file `relative_kinematics.cc`.

References `jeod::RelKinMessages::duplicate_entry`, `find_relstate()`, `num_rel_states`, and `relative_states`.

7.1.3.3 RelativeDerivedState * jeod::RelativeKinematics::find_relstate (const char * *relstate_name*)

Find a specific relative state maintained by this model.

Returns

Void

Parameters

in	<i>relstate_name</i>	Relstate to find
----	----------------------	------------------

Definition at line 149 of file relative_kinematics.cc.

References num_rel_states, and relative_states.

Referenced by activate_relstate(), add_relstate(), and update_single().

7.1.3.4 RelativeKinematics& jeod::RelativeKinematics::operator= (const RelativeKinematics &) [private]

7.1.3.5 void jeod::RelativeKinematics::remove_relstate (RelativeDerivedState & *relstate*)

Remove a relative state from the list of ones maintained by this model.

Parameters

in	<i>relstate</i>	Relstate to remove
----	-----------------	--------------------

Definition at line 122 of file relative_kinematics.cc.

References jeod::RelKinMessages::entry_not_found, num_rel_states, and relative_states.

7.1.3.6 void jeod::RelativeKinematics::update_all (void)

Update all relative states maintained by this model.

relstates that have been deactivated from RelKin will not be update.

Definition at line 229 of file relative_kinematics.cc.

References num_rel_states, and relative_states.

7.1.3.7 void jeod::RelativeKinematics::update_single (const char * *relstate_name*)

Update a single relative state maintained by this model.

Parameters

in	<i>relstate_name</i>	Relstate to update
----	----------------------	--------------------

Definition at line 212 of file relative_kinematics.cc.

References find_relstate().

7.1.4 Friends And Related Function Documentation

7.1.4.1 void init_attrjeod_RelativeKinematics () [friend]

7.1.4.2 friend class InputProcessor [friend]

Definition at line 58 of file relative_kinematics.hh.

7.1.5 Field Documentation

7.1.5.1 unsigned int jeod::RelativeKinematics::num_rel_states

Length of above list of relative states being maintained by this.

trick_units(-)

Definition at line 67 of file relative_kinematics.hh.

Referenced by add_relstate(), find_relstate(), remove_relstate(), and update_all().

7.1.5.2 JeodPointerVector<RelativeDerivedState>::type jeod::RelativeKinematics::relative_states

List of relative states to be computed and maintained by this model.

Note that this list is not restricted to be relative states associated with only a single DynBody.trick_io(**)

Definition at line 74 of file relative_kinematics.hh.

Referenced by add_relstate(), find_relstate(), RelativeKinematics(), remove_relstate(), update_all(), and ~RelativeKinematics().

The documentation for this class was generated from the following files:

- [relative_kinematics.hh](#)
- [relative_kinematics.cc](#)

7.2 jeod::RelKinMessages Class Reference

Specifies the message IDs used in the orbital elements model.

```
#include <rel_kin_messages.hh>
```

Static Public Attributes

- static char const * [duplicate_entry](#)
Issued when a duplicate entry is found.
- static char const * [entry_not_found](#)
Issued when an entry is not found.
- static char const * [invalid_entry](#)
Issued when function input is invalid.

Private Member Functions

- [RelKinMessages](#) (void)
- [RelKinMessages](#) (const [RelKinMessages](#) &)
- [RelKinMessages](#) & operator= (const [RelKinMessages](#) &)

Friends

- class [InputProcessor](#)
- void [init_attrjeod__RelKinMessages](#) ()

7.2.1 Detailed Description

Specifies the message IDs used in the orbital elements model.

Definition at line 49 of file rel_kin_messages.hh.

7.2.2 Constructor & Destructor Documentation

7.2.2.1 `jeod::RelKinMessages::RelKinMessages (void)` `[private]`

7.2.2.2 `jeod::RelKinMessages::RelKinMessages (const RelKinMessages &)` `[private]`

7.2.3 Member Function Documentation

7.2.3.1 `RelKinMessages& jeod::RelKinMessages::operator= (const RelKinMessages &)` `[private]`

7.2.4 Friends And Related Function Documentation

7.2.4.1 `void init_attrjeod__RelKinMessages ()` `[friend]`

7.2.4.2 `friend class InputProcessor` `[friend]`

Definition at line 52 of file rel_kin_messages.hh.

7.2.5 Field Documentation

7.2.5.1 `char const * jeod::RelKinMessages::duplicate_entry` `[static]`

Initial value:

```
=
"dynamics/rel_kin/" "duplicate_entry"
```

Issued when a duplicate entry is found.

trick_units(−)

Definition at line 61 of file rel_kin_messages.hh.

Referenced by jeod::RelativeKinematics::add_relstate().

7.2.5.2 `char const * jeod::RelKinMessages::entry_not_found` `[static]`

Initial value:

```
=
"dynamics/rel_kin/" "entry_not_found"
```

Issued when an entry is not found.

trick_units(−)

Definition at line 66 of file rel_kin_messages.hh.

Referenced by jeod::RelativeKinematics::activate_relstate(), and jeod::RelativeKinematics::remove_relstate().

7.2.5.3 `char const * jeod::RelKinMessages::invalid_entry` `[static]`

Initial value:

```
=  
    "dynamics/rel_kin/" "invalid_entry"
```

Issued when function input is invalid.

`trick_units(-)`

Definition at line 71 of file `rel_kin_messages.hh`.

Referenced by `jeod::RelativeKinematics::activate_relstate()`.

The documentation for this class was generated from the following files:

- [rel_kin_messages.hh](#)
- [rel_kin_messages.cc](#)

Chapter 8

File Documentation

8.1 rel_kin_messages.cc File Reference

Implement the class RelKinMessages.

```
#include "../include/rel_kin_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

Macros

- #define [PATH](#) "dynamics/rel_kin/"

8.1.1 Detailed Description

Implement the class RelKinMessages.

Definition in file [rel_kin_messages.cc](#).

8.2 rel_kin_messages.hh File Reference

Define the class RelKinMessages, the class that specifies the message IDs used in the relative kinematics model.

```
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class [jeod::RelKinMessages](#)

Specifies the message IDs used in the orbital elements model.

Namespaces

- [jeod](#)

Namespace jeod.

8.2.1 Detailed Description

Define the class RelKinMessages, the class that specifies the message IDs used in the relative kinematics model.

Definition in file [rel_kin_messages.hh](#).

8.3 relative_kinematics.cc File Reference

Define methods for the RelativeKinematics class.

```
#include <cstdint>
#include <algorithm>
#include "dynamics/derived_state/include/relative_derived_state.hh"
#include "utils/memory/include/jeod_alloc.hh"
#include "utils/message/include/message_handler.hh"
#include "utils/named_item/include/named_item.hh"
#include "../include/relative_kinematics.hh"
#include "../include/rel_kin_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

8.3.1 Detailed Description

Define methods for the RelativeKinematics class.

Definition in file [relative_kinematics.cc](#).

8.4 relative_kinematics.hh File Reference

Define the class RelativeKinematics, the class used for calculating the state of some point(s) of interest associated with the subject DynBody relative to some other reference frame.

```
#include "dynamics/derived_state/include/class_declarations.hh"
#include "utils/container/include/pointer_vector.hh"
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class [jeod::RelativeKinematics](#)

Encapsulates functionality for computing relative states.

Namespaces

- [jeod](#)

Namespace jeod.

8.4.1 Detailed Description

Define the class RelativeKinematics, the class used for calculating the state of some point(s) of interest associated with the subject DynBody relative to some other reference frame.

Definition in file [relative_kinematics.hh](#).

Index

- ~RelativeKinematics
 - jeod::RelativeKinematics, [16](#)
- activate_relstate
 - jeod::RelativeKinematics, [16](#)
- add_relstate
 - jeod::RelativeKinematics, [16](#)
- duplicate_entry
 - jeod::RelKinMessages, [19](#)
- Dynamics, [10](#)
- entry_not_found
 - jeod::RelKinMessages, [19](#)
- find_relstate
 - jeod::RelativeKinematics, [16](#)
- init_attrjeod__RelKinMessages
 - jeod::RelKinMessages, [19](#)
- init_attrjeod__RelativeKinematics
 - jeod::RelativeKinematics, [17](#)
- InputProcessor
 - jeod::RelativeKinematics, [17](#)
 - jeod::RelKinMessages, [19](#)
- invalid_entry
 - jeod::RelKinMessages, [19](#)
- jeod, [13](#)
- jeod::RelKinMessages, [18](#)
 - duplicate_entry, [19](#)
 - entry_not_found, [19](#)
 - init_attrjeod__RelKinMessages, [19](#)
 - InputProcessor, [19](#)
 - invalid_entry, [19](#)
 - operator=, [19](#)
 - RelKinMessages, [19](#)
- jeod::RelativeKinematics, [15](#)
 - ~RelativeKinematics, [16](#)
 - activate_relstate, [16](#)
 - add_relstate, [16](#)
 - find_relstate, [16](#)
 - init_attrjeod__RelativeKinematics, [17](#)
 - InputProcessor, [17](#)
 - num_rel_states, [18](#)
 - operator=, [17](#)
 - relative_states, [18](#)
 - RelativeKinematics, [16](#)
 - remove_relstate, [17](#)
 - update_all, [17](#)
 - update_single, [17](#)
- Models, [9](#)
- num_rel_states
 - jeod::RelativeKinematics, [18](#)
- operator=
 - jeod::RelativeKinematics, [17](#)
 - jeod::RelKinMessages, [19](#)
- PATH
 - RelKin, [11](#)
- rel_kin_messages.cc, [21](#)
- rel_kin_messages.hh, [21](#)
- RelKin, [11](#)
 - PATH, [11](#)
- RelKinMessages
 - jeod::RelKinMessages, [19](#)
- relative_kinematics.cc, [22](#)
- relative_kinematics.hh, [22](#)
- relative_states
 - jeod::RelativeKinematics, [18](#)
- RelativeKinematics
 - jeod::RelativeKinematics, [16](#)
- remove_relstate
 - jeod::RelativeKinematics, [17](#)
- update_all
 - jeod::RelativeKinematics, [17](#)
- update_single
 - jeod::RelativeKinematics, [17](#)