

RelativeKinematicsComputationsModel

5.3

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Module Index

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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.

5.3.1 Detailed Description

Chapter 6

Namespace Documentation

6.1 jeod Namespace Reference

Namespace jeod.

Data Structures

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

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.
- [RelativeKinematics](#) (const [RelativeKinematics](#) &)=delete
- [RelativeKinematics](#) & operator= (const [RelativeKinematics](#) &)=delete
- 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 std::string &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 std::string &relstate_name)
Update a single relative state maintained by this model.
- void [update_all](#) ()
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.

Friends

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

7.1.1 Detailed Description

Encapsulates functionality for computing relative states.

Definition at line 85 of file `relative_kinematics.hh`.

7.1.2 Constructor & Destructor Documentation

7.1.2.1 `RelativeKinematics()` [1/2]

```
jeod::RelativeKinematics::RelativeKinematics ( )
```

Construct a [RelativeKinematics](#) object.

Definition at line 55 of file `relative_kinematics.cc`.

References `relative_states`.

7.1.2.2 `~RelativeKinematics()`

```
jeod::RelativeKinematics::~~RelativeKinematics ( )
```

Destruct a [RelativeKinematics](#) object.

Definition at line 65 of file `relative_kinematics.cc`.

References `relative_states`.

7.1.2.3 `RelativeKinematics()` [2/2]

```
jeod::RelativeKinematics::RelativeKinematics (
    const RelativeKinematics & ) [delete]
```

7.1.3 Member Function Documentation

7.1.3.1 `activate_relstate()`

```
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

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

Definition at line 151 of file `relative_kinematics.cc`.

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

7.1.3.2 add_relstate()

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

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

Parameters

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

Definition at line 74 of file `relative_kinematics.cc`.

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

7.1.3.3 find_relstate()

```
RelativeDerivedState * jeod::RelativeKinematics::find_relstate (
    const std::string & 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 128 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 operator=()

```
RelativeKinematics& jeod::RelativeKinematics::operator= (
    const RelativeKinematics & ) [delete]
```

7.1.3.5 remove_relstate()

```
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 105 of file relative_kinematics.cc.

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

7.1.3.6 update_all()

```
void jeod::RelativeKinematics::update_all ( )
```

Update all relative states maintained by this model.

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

Definition at line 198 of file relative_kinematics.cc.

References num_rel_states, and relative_states.

7.1.3.7 update_single()

```
void jeod::RelativeKinematics::update_single (
    const std::string & relstate_name )
```

Update a single relative state maintained by this model.

Parameters

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

Definition at line 187 of file relative_kinematics.cc.

References `find_relstate()`.

7.1.4 Friends And Related Function Documentation

7.1.4.1 init_attrjeod__RelativeKinematics

```
void init_attrjeod__RelativeKinematics ( ) [friend]
```

7.1.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 87 of file relative_kinematics.hh.

7.1.5 Field Documentation

7.1.5.1 num_rel_states

```
unsigned int jeod::RelativeKinematics::num_rel_states {}
```

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

`trick_units(-)`

Definition at line 92 of file relative_kinematics.hh.

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

7.1.5.2 relative_states

```
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 99 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>
```

Public Member Functions

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

Static Public Attributes

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

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 81 of file rel_kin_messages.hh.

7.2.2 Constructor & Destructor Documentation

7.2.2.1 RelKinMessages() [1/2]

```
jeod::RelKinMessages::RelKinMessages ( ) [delete]
```

7.2.2.2 RelKinMessages() [2/2]

```
jeod::RelKinMessages::RelKinMessages (
    const RelKinMessages & ) [delete]
```

7.2.3 Member Function Documentation

7.2.3.1 operator=()

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

7.2.4 Friends And Related Function Documentation

7.2.4.1 init_attrjeod__RelKinMessages

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

7.2.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 83 of file rel_kin_messages.hh.

7.2.5 Field Documentation

7.2.5.1 duplicate_entry

```
char const * jeod::RelKinMessages::duplicate_entry = "dynamics/rel_kin/" "duplicate_entry"
[static]
```

Issued when a duplicate entry is found.

trick_units(-)

Definition at line 88 of file rel_kin_messages.hh.

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

7.2.5.2 entry_not_found

```
char const * jeod::RelKinMessages::entry_not_found = "dynamics/rel_kin/" "entry_not_found"
[static]
```

Issued when an entry is not found.

trick_units(-)

Definition at line 93 of file rel_kin_messages.hh.

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

7.2.5.3 invalid_entry

```
char const * jeod::RelKinMessages::invalid_entry = "dynamics/rel_kin/" "invalid_entry" [static]
```

Issued when function input is invalid.

trick_units(-)

Definition at line 98 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 "utils/message/include/make_message_code.hh"
#include "../include/rel_kin_messages.hh"
```

Namespaces

- [jeod](#)
Namespace jeod.

Macros

- `#define` [MAKE_RELKIN_MESSAGE_CODE](#)(id) JEOD_MAKE_MESSAGE_CODE(RelKinMessages, "dynamics/rel_kin/", id)

8.1.1 Detailed Description

Implement the class RelKinMessages.

8.1.2 Macro Definition Documentation

8.1.2.1 MAKE_RELKIN_MESSAGE_CODE

```
#define MAKE_RELKIN_MESSAGE_CODE(  
    id ) JEOD_MAKE_MESSAGE_CODE(RelKinMessages, "dynamics/rel_kin/", id)
```

Definition at line 43 of 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.

8.3 relative_kinematics.cc File Reference

Define methods for the RelativeKinematics class.

```
#include <algorithm>
#include <cstdlib>
#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/rel_kin_messages.hh"
#include "../include/relative_kinematics.hh"
```

Namespaces

- [jeod](#)
Namespace jeod.

8.3.1 Detailed Description

Define methods for the RelativeKinematics class.

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.

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