# RelativeKinematicsComputationsModel

5.0

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  *Implement the class RelKinMessages.*
- file relative_kinematics.cc

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### 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**

| | | |
|---|---|---|
| in | *relstate_name* | Relstate to activate/deactivate |
| in | *raf* | 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**

| | | |
|---|---|---|
| in | *relstate* | 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 | *relstate_name* | 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 | *relstate* | 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 | *relstate_name* | 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.

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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.

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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 <cstddef>
#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.

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