

# GazeboMessages

1.2.5

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## Chapter 1

# Gazebo Messages Reference

Gazebo uses Google Protobufs for message specification and serialization.

Messages Definitions





## Chapter 2

# Class Index

### 2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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## Chapter 3

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## Chapter 4

# Class Documentation

### 4.1 Axis Interface Reference

msgs::Joint axis message

#### 4.1.1 Detailed Description

msgs::Joint axis message

@verbatim

```
import "vector3d.proto";
```

```
message Axis (p. 9) { required Vector3d (p. 35) xyz = 1; required double limit_lower = 2; required double limit_upper = 3; required double limit_effort = 4; required double limit_velocity = 5; required double damping = 6; required double friction = 7; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **axis.proto**

### 4.2 BoxGeom Interface Reference

Information about a box geometry.

#### 4.2.1 Detailed Description

Information about a box geometry.

@verbatim

```
import "vector3d.proto";
```

```
message BoxGeom (p. 9) { required Vector3d (p. 35) size = 1; } ///
```

The documentation for this interface was generated from the following file:

- [boxgeom.proto](#)

## 4.3 CameraSensor Interface Reference

Information about a camera sensor element.

### 4.3.1 Detailed Description

Information about a camera sensor element.

```
@verbatim
```

```
import "vector2d.proto";
```

```
message CameraSensor (p. 10) { optional double horizontal_fov = 1; optional Vector2d (p. 34) image_size = 2; optional string image_format = 3; optional double near_clip = 4; optional double far_clip = 5; optional bool save_enabled = 6; optional string save_path = 7; } ///
```

The documentation for this interface was generated from the following file:

- [camerasensor.proto](#)

## 4.4 Collision Interface Reference

Information about a collision element.

### 4.4.1 Detailed Description

Information about a collision element.

```
@verbatim
```

```
import "header.proto"; import "pose.proto"; import "geometry.proto"; import "surface.proto"; import "visual.proto";
```

```
message Collision (p. 10) { required uint32 id = 1; required string name = 2; optional double laser_retro = 3; optional double max_contacts = 4; optional Pose (p. 25) pose = 5; optional Geometry (p. 14) geometry = 6; optional Surface (p. 33) surface = 7;
```

```
repeated Visual (p. 35) visual = 8; } ///
```

The documentation for this interface was generated from the following file:

- [collision.proto](#)

## 4.5 Color Interface Reference

**Color** (p. 10) message.



### 4.5.1 Detailed Description

**Color** (p. 10) message.

```
@verbatim
```

```
message Color (p. 10) { required float r = 2; required float g = 3; required float b = 4; optional float a = 5 [default = 1.0]; }  
///
```

The documentation for this interface was generated from the following file:

- **color.proto**

## 4.6 Contact Interface Reference

**Contact** (p. 11) message for passing info between two entities.

### 4.6.1 Detailed Description

**Contact** (p. 11) message for passing info between two entities.

```
@verbatim
```

```
import "vector3d.proto";  
message Contact (p. 11) { required string collision1 = 1; required string collision2 = 2;  
repeated Vector3d (p. 35) position = 3; repeated Vector3d (p. 35) normal = 4; repeated double depth = 5; } ///
```

The documentation for this interface was generated from the following file:

- **contact.proto**

## 4.7 Contacts Interface Reference

**Contacts** (p. 11) from collision detection.

### 4.7.1 Detailed Description

**Contacts** (p. 11) from collision detection.

```
@verbatim
```

```
import "contact.proto";  
message Contacts (p. 11) { repeated Contact (p. 11) contact = 1; } ///
```

The documentation for this interface was generated from the following file:

- **contacts.proto**

## 4.8 ContactSensor Interface Reference

Information about a contact sensor element.

### 4.8.1 Detailed Description

Information about a contact sensor element.

@verbatim

```
message ContactSensor (p. 12) { optional string collision_name = 1; } ///
```

The documentation for this interface was generated from the following file:

- **contactsensor.proto**

## 4.9 CylinderGeom Interface Reference

Information about a cylinder geometry.

### 4.9.1 Detailed Description

Information about a cylinder geometry.

@verbatim

```
message CylinderGeom (p. 12) { required double radius = 1; required double length = 2; } ///
```

The documentation for this interface was generated from the following file:

- **cylindergeom.proto**

## 4.10 Entities Interface Reference

Information about all entities in a world.

### 4.10.1 Detailed Description

Information about all entities in a world.

@verbatim

```
import "model.proto";
```

```
message Model_V { repeated Model (p. 22) models = 2; } ///
```

The documentation for this interface was generated from the following file:

- **model\_v.proto**

## 4.11 Factory Interface Reference

Message to create new model in gazebo.

### 4.11.1 Detailed Description

Message to create new model in gazebo.

@verbatim

```
import "header.proto"; import "pose.proto";
```

```
message Factory (p. 13) { optional string sdf = 1; optional string sdf_filename = 2; optional Pose (p. 25) pose = 3; optional string edit_name = 4; optional string clone_model_name = 5; } ///
```

The documentation for this interface was generated from the following file:

- **factory.proto**

## 4.12 Fog Interface Reference

Message for fog data.

### 4.12.1 Detailed Description

Message for fog data.

@verbatim

```
import "color.proto";
```

```
message Fog (p. 13) { enum FogType { NONE = 1; LINEAR = 2; EXPONENTIAL = 3; EXPONENTIAL2 = 4; } optional FogType type = 1; optional Color (p. 10) color = 2; optional float density = 3; optional float start = 4; optional float end = 5; } ///
```

The documentation for this interface was generated from the following file:

- **fog.proto**

## 4.13 Friction Interface Reference

Information about friction.

### 4.13.1 Detailed Description

Information about friction.

@verbatim

```
import "vector3d.proto";

message Friction { optional double mu = 1; optional double mu2 = 2; optional Vector3d (p. 35) fdir1 = 3; optional double slip1 = 4; optional double slip2 = 5; } ///
```

The documentation for this interface was generated from the following file:

- **friction.proto**

## 4.14 Geometry Interface Reference

Information about a geometry element.

### 4.14.1 Detailed Description

Information about a geometry element.

@verbatim

```
import "boxgeom.proto"; import "cylindergeom.proto"; import "spheregeom.proto"; import "planegeom.proto"; import "imagegeom.proto"; import "heightmapgeom.proto"; import "meshgeom.proto"; import "vector3d.proto";
```

```
message Geometry (p. 14) { enum Type { BOX = 1; CYLINDER = 2; SPHERE = 3; PLANE = 4; IMAGE = 5; HEIGHTMAP = 6; MESH = 7; TRIANGLE_FAN = 8; LINE_STRIP = 9; EMPTY = 10; }
```

```
optional Type type = 1; optional BoxGeom (p. 9) box = 2; optional CylinderGeom (p. 12) cylinder = 3; optional PlaneGeom (p. 24) plane = 4; optional SphereGeom (p. 32) sphere = 5; optional ImageGeom (p. 17) image = 6; optional HeightmapGeom (p. 16) heightmap = 7; optional MeshGeom (p. 21) mesh = 8;
```

```
repeated Vector3d (p. 35) points = 9; } ///
```

The documentation for this interface was generated from the following file:

- **geometry.proto**

## 4.15 GUI Interface Reference

Message for a **GUI** (p. 14).

### 4.15.1 Detailed Description

Message for a **GUI** (p. 14).

@verbatim

```
import "gui_camera.proto";
```

```
message GUI (p. 14) { optional bool fullscreen = 1; optional GUICamera (p. 15) camera = 2; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **gui.proto**

## 4.16 GUICamera Interface Reference

Message for a **GUI** (p. 14) Camera.

### 4.16.1 Detailed Description

Message for a **GUI** (p. 14) Camera.

```
@verbatim
```

```
import "pose.proto"; import "track_visual.proto";
```

```
message GUICamera (p. 15) { required string name = 1; optional string view_controller = 2; optional Pose (p. 25) origin = 3; optional TrackVisual track = 4; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **gui\_camera.proto**

## 4.17 GUIOverlayConfig Interface Reference

Message for a gui overlay configuration.

### 4.17.1 Detailed Description

Message for a gui overlay configuration.

```
@verbatim
```

```
message GUIOverlayConfig (p. 15) { required string layout_filename = 1; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **gui\_overlay\_config.proto**

## 4.18 GzString Interface Reference

A message for string data.

### 4.18.1 Detailed Description

A message for string data.

```
@verbatim
```

```
message GzString (p. 15) { required string data = 1; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **gz\_string.proto**

## 4.19 GzString\_V Interface Reference

A message for a vector of string data.

### 4.19.1 Detailed Description

A message for a vector of string data.

```
@verbatim
```

```
message GzString_V (p. 16) { repeated string data = 1; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **gz\_string\_v.proto**

## 4.20 Header Interface Reference

General information included by many messages.

### 4.20.1 Detailed Description

General information included by many messages.

```
@verbatim
```

```
import "time.proto";
```

```
message Header (p. 16) { optional string str_id = 1; optional Time (p. 33) stamp = 2; optional int32 index = 3; } ///
```

The documentation for this interface was generated from the following file:

- **header.proto**

## 4.21 HeightmapGeom Interface Reference

Message for a heightmap geometry.

### 4.21.1 Detailed Description

Message for a heightmap geometry.

@verbatim

```
import "image.proto"; import "vector3d.proto";
message HeightmapGeom (p. 16) { required Image (p. 17) image = 1; // The height data required Vector3d (p. 35) size
= 2; // Size in meters optional Vector3d (p. 35) origin = 3; // Origin in world coordinate frame
message Texture { required string diffuse = 1; required string normal = 2; required double size = 3; }
message Blend { required double min_height = 1; required double fade_dist = 2; }
repeated Texture texture = 4; // List of textures repeated Blend blend = 5; // How to blend the textures }
///
```

The documentation for this interface was generated from the following file:

- **heightmapgeom.proto**

## 4.22 Image Interface Reference

Message for an image.

### 4.22.1 Detailed Description

Message for an image.

@verbatim

```
message Image (p. 17) { required uint32 width = 1; // Image (p. 17) width (number of columns) required uint32 height
= 2; // Image (p. 17) height (number of rows) required uint32 pixel_format = 3; // Corresponds to Image::PixelFormat
enum required uint32 step = 4; // Full row length in bytes // repeated uint32 data = 5; // Actual data, size if (step * rows)
required bytes data = 5; // Actual data, size if (step * rows) }
///
```

The documentation for this interface was generated from the following file:

- **image.proto**

## 4.23 ImageGeom Interface Reference

Message for a image geometry.

### 4.23.1 Detailed Description

Message for a image geometry.

@verbatim

message **ImageGeom** (p. 17) { required string uri = 1; optional double scale = 2; optional int32 threshold = 3 [default = 255]; optional double height = 4; optional int32 granularity = 5; }

///

The documentation for this interface was generated from the following file:

- **imagegeom.proto**

## 4.24 ImageStamped Interface Reference

Message for an image with a time.

### 4.24.1 Detailed Description

Message for an image with a time.

@verbatim

```
import "time.proto"; import "image.proto";
```

```
message ImageStamped (p. 18) { required Time (p. 33) time = 1; // Time (p. 33) when the data was captured required Image (p. 17) image = 2; }
```

///

The documentation for this interface was generated from the following file:

- **image\_stamped.proto**

## 4.25 Inertial Interface Reference

Information about inertia.

### 4.25.1 Detailed Description

Information about inertia.

@verbatim

```
import "pose.proto";
```

```
message Inertial (p. 18) { optional double mass = 1; optional Pose (p. 25) pose = 2; optional double ixx = 3; optional double ixy = 4; optional double ixz = 5; optional double iyy = 6; optional double iyz = 7; optional double izz = 8; } ///
```

The documentation for this interface was generated from the following file:

- **inertial.proto**

## 4.26 Int Interface Reference

Integer message.



### 4.26.1 Detailed Description

Integer message.

@verbatim

```
message Int (p. 18) { /// Integer data required int32 data = 1; }
///
```

The documentation for this interface was generated from the following file:

- **int.proto**

## 4.27 Joint Interface Reference

Message for creating joint in rendering::Scene.

### 4.27.1 Detailed Description

Message for creating joint in rendering::Scene.

@verbatim

```
import "vector3d.proto"; import "axis.proto"; import "pose.proto";
message Joint (p. 19) { enum Type { REVOLUTE = 1; REVOLUTE2 = 2; PRISMATIC = 3; UNIVERSAL = 4; BALL = 5;
SCREW = 6; }
required string name = 1; repeated double angle = 2; optional Type type = 3; optional string parent = 4; optional string
child = 5; optional Pose (p. 25) pose = 6; optional Axis (p. 9) axis1 = 7; optional Axis (p. 9) axis2 = 8;
optional double cfm = 9; optional double bounce = 10; optional double velocity = 11; optional double fudge_factor = 12;
optional double limit_cfm = 13; optional double limit_erp = 14; optional double suspension_cfm = 15; optional double
suspension_erp = 16; } ///
```

The documentation for this interface was generated from the following file:

- **joint.proto**

## 4.28 JointAnimation Interface Reference

Message for a model joint animation, does not appear to be used.

### 4.28.1 Detailed Description

Message for a model joint animation, does not appear to be used.

\xrefitem todo 1. @verbatim

```
import "pose.proto"; import "time.proto";
message JointAnimation (p. 19) { message Joint (p. 19) { repeated string name = 1; repeated double angle = 2; }
required string model_name = 1; repeated Joint (p. 19) joint = 2; repeated Time (p. 33) time = 3; }
///
```

The documentation for this interface was generated from the following file:

- **joint\_animation.proto**

## 4.29 JointCmd Interface Reference

Message for joint command, used by physics::JointControlWidget.

### 4.29.1 Detailed Description

Message for joint command, used by physics::JointControlWidget.

@verbatim

```
import "vector3d.proto"; import "axis.proto"; import "pose.proto"; import "pid.proto";
message JointCmd (p. 20) { required string name = 1; optional int32 axis = 2 [default=0]; optional double force = 3;
optional PID (p. 23) position = 4; optional PID (p. 23) velocity = 5; optional bool reset = 6; } ///
```

The documentation for this interface was generated from the following file:

- **joint\_cmd.proto**

## 4.30 Light Interface Reference

Message for a light.

### 4.30.1 Detailed Description

Message for a light.

@verbatim

```
import "header.proto"; import "pose.proto"; import "vector3d.proto"; import "color.proto";
message Light (p. 20) { required string name = 1; enum LightType { POINT = 1; SPOT = 2; DIRECTIONAL = 3; } optional
LightType type = 2;
optional Pose (p. 25) pose = 3; optional Color (p. 10) diffuse = 4; optional Color (p. 10) specular = 5; optional float
attenuation_constant = 6; optional float attenuation_linear = 7; optional float attenuation_quadratic = 8; optional Vec-
tor3d (p. 35) direction = 9; optional float range = 10; optional bool cast_shadows = 11; optional float spot_inner_angle =
12; optional float spot_outer_angle = 13; optional float spot_falloff = 14; }
///
```

The documentation for this interface was generated from the following file:

- [light.proto](#)

## 4.31 Link Interface Reference

Information about a link.

### 4.31.1 Detailed Description

Information about a link.

@verbatim

```
import "header.proto"; import "inertial.proto"; import "collision.proto"; import "visual.proto"; import "sensor.proto"; import "projector.proto"; import "pose.proto";
```

```
message Link (p. 21) { required uint32 id = 1; required string name = 2; optional bool self_collide = 3; optional bool gravity = 4; optional bool kinematic = 5; optional bool enabled = 6; optional Inertial (p. 18) inertial = 7; optional Pose (p. 25) pose = 8; repeated Visual (p. 35) visual = 9; repeated Collision (p. 10) collision = 10; repeated Sensor (p. 30) sensor = 11; repeated Projector (p. 26) projector = 12; } ///
```

The documentation for this interface was generated from the following file:

- [link.proto](#)

## 4.32 Material Interface Reference

Information about a material.

### 4.32.1 Detailed Description

Information about a material.

@verbatim

```
import "color.proto";
```

```
message Material (p. 21) { enum ShaderType { VERTEX = 1; PIXEL = 2; NORMAL_MAP_OBJECT_SPACE = 3; NORMAL_MAP_TANGENT_SPACE = 4; }
```

```
message Script { required string uri = 1; required string name = 2; }
```

```
optional Script script = 1; optional ShaderType shader_type = 2; optional string normal_map = 3; optional Color (p. 10) ambient = 4; optional Color (p. 10) diffuse = 5; optional Color (p. 10) specular = 6; optional Color (p. 10) emissive = 7; } ///
```

The documentation for this interface was generated from the following file:

- [material.proto](#)

## 4.33 MeshGeom Interface Reference

Message for a mesh geometry.

### 4.33.1 Detailed Description

Message for a mesh geometry.

```
@verbatim
```

```
import "vector3d.proto";
message MeshGeom (p. 21) { required string filename = 1; optional Vector3d (p. 35) scale = 2; }
///
```

The documentation for this interface was generated from the following file:

- **meshgeom.proto**

## 4.34 Model Interface Reference

Information about a model.

### 4.34.1 Detailed Description

Information about a model.

```
@verbatim
```

```
import "joint.proto"; import "link.proto"; import "pose.proto"; import "visual.proto";
message Model (p. 22) { required string name = 1; optional uint32 id = 2; optional bool is_static = 3; optional Pose
(p. 25) pose = 4; repeated Joint (p. 19) joint = 5; repeated Link (p. 21) link = 6; optional bool deleted = 7; repeated
Visual (p. 35) visual = 8; } ///
```

The documentation for this interface was generated from the following file:

- **model.proto**

## 4.35 ModelConfiguration Interface Reference

Message for model configuration (joint positions)

### 4.35.1 Detailed Description

Message for model configuration (joint positions)

```
@verbatim
```

```
import "time.proto"; import "pose.proto";
message ModelConfiguration (p. 22) { required Time (p. 33) time = 1; // Time (p. 33) when the pose should be enforced
repeated string joint_names = 2; repeated double joint_positions = 3; optional Pose (p. 25) pose = 4; // Specify model
pose optional string link_name = 5; // Option to set model pose by specifying pose of link } ///
```

The documentation for this interface was generated from the following file:

- [model\\_configuration.proto](#)

## 4.36 Packet Interface Reference

Message that encapsulates another message with a type description.

### 4.36.1 Detailed Description

Message that encapsulates another message with a type description.

@verbatim

```
import "time.proto";
message Packet (p. 23) { required Time (p. 33) stamp = 1; required string type = 2; required bytes serialized_data = 3; }
///
```

The documentation for this interface was generated from the following file:

- [packet.proto](#)

## 4.37 Physics Interface Reference

A message containing a description of the global physics properties.

### 4.37.1 Detailed Description

A message containing a description of the global physics properties.

@verbatim

```
import "vector3d.proto"; import "header.proto";
message Physics (p. 23) { enum Type { ODE = 1; } required Type type = 2[default=ODE];
optional string solver_type = 3; optional double dt = 4; optional int32 iters = 5; optional double sor = 6; optional double
cfm = 7; optional double erp = 8; optional double contact_max_correcting_vel = 9; optional double contact_surface_layer
= 10; optional Vector3d (p. 35) gravity = 11; optional double update_rate = 12; } ///
```

The documentation for this interface was generated from the following file:

- [physics.proto](#)

## 4.38 PID Interface Reference

Message for simple **PID** (p. 23) controllers.

### 4.38.1 Detailed Description

Message for simple **PID** (p. 23) controllers.

```
@verbatim
```

```
message PID (p. 23) { optional double target = 1[default=0.0]; optional double p_gain = 2[default=0.0]; optional double i_gain = 3[default=0.0]; optional double d_gain = 4[default=0.0]; optional double i_max = 5[default=0.0]; optional double i_min = 6[default=0.0]; optional double limit = 7[default=0.0]; } ///
```

The documentation for this interface was generated from the following file:

- **pid.proto**

## 4.39 PlaneGeom Interface Reference

Message for a plane geometry.

### 4.39.1 Detailed Description

Message for a plane geometry.

```
@verbatim
```

```
import "vector3d.proto"; import "vector2d.proto";
```

```
message PlaneGeom (p. 24) { required Vector3d (p. 35) normal = 1; required Vector2d (p. 34) size = 2; optional double d = 3 [default = 0]; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **planegeom.proto**

## 4.40 Plugin Interface Reference

A message containing visual information for gazebo::Plugin.

### 4.40.1 Detailed Description

A message containing visual information for gazebo::Plugin.

```
@verbatim
```

```
message Plugin (p. 24) { required string name = 1; required string filename = 2; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **plugin.proto**

## 4.41 Pose Interface Reference

Message for a pose.

### 4.41.1 Detailed Description

Message for a pose.

```
@verbatim
```

```
import "vector3d.proto"; import "quaternion.proto";
```

```
message Pose (p. 25) { optional string name = 1; required Vector3d (p. 35) position = 2; required Quaternion (p. 27) orientation = 3; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **pose.proto**

## 4.42 PoseAnimation Interface Reference

Message for a model pose animation.

### 4.42.1 Detailed Description

Message for a model pose animation.

```
@verbatim
```

```
import "pose.proto"; import "time.proto";
```

```
message PoseAnimation (p. 25) { required string model_name = 1; repeated Pose (p. 25) pose = 2; repeated Time (p. 33) time = 3; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **pose\_animation.proto**

## 4.43 PoseStamped Interface Reference

Message for a pose with a time.

### 4.43.1 Detailed Description

Message for a pose with a time.

```
@verbatim
```

```
import "time.proto"; import "pose.proto";
```

```
message PoseStamped (p. 25) { required Time (p. 33) time = 1; // Time (p. 33) when the data was captured required Pose (p. 25) pose = 2; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **pose\_stamped.proto**

## 4.44 PoseTrajectory Interface Reference

Message for a pose trajectory.

### 4.44.1 Detailed Description

Message for a pose trajectory.

```
@verbatim
```

```
import "pose_stamped.proto";
```

```
message PoseTrajectory (p. 26) { optional string name = 1; optional uint32 id = 2; repeated PoseStamped (p. 25) pose_stamped = 3; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **pose\_trajectory.proto**

## 4.45 Projector Interface Reference

Information about a projector.

### 4.45.1 Detailed Description

Information about a projector.

```
@verbatim
```

```
import "pose.proto";
```

```
message Projector (p. 26) { required string name = 1; optional string texture = 2; optional Pose (p. 25) pose = 3; optional double fov = 4[default=0.785]; optional double near_clip = 5[default=0.1]; optional double far_clip = 6[default=10.0]; optional bool enabled = 7[default=true]; } ///
```

The documentation for this interface was generated from the following file:

- **projector.proto**



## 4.46 Publish Interface Reference

Message that contains information about a publisher of data.

### 4.46.1 Detailed Description

Message that contains information about a publisher of data.

@verbatim

```
message Publish (p. 27) { required string topic = 1; required string msg_type = 2; required string host = 3; required uint32 port = 4; }
```

///

The documentation for this interface was generated from the following file:

- **publish.proto**

## 4.47 Publishers Interface Reference

A list of publishers.

### 4.47.1 Detailed Description

A list of publishers.

@verbatim

```
import "publish.proto";
```

```
message Publishers (p. 27) { repeated Publish (p. 27) publisher = 1; }
```

///

The documentation for this interface was generated from the following file:

- **publishers.proto**

## 4.48 Quaternion Interface Reference

A message for a quaternion.

### 4.48.1 Detailed Description

A message for a quaternion.

@verbatim

```
message Quaternion (p. 27) { required double x = 2; required double y = 3; required double z = 4; required double w = 5; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **quaternion.proto**

## 4.49 RaySensor Interface Reference

Information about a ray sensor element.

### 4.49.1 Detailed Description

Information about a ray sensor element.

```
@verbatim
```

```
message RaySensor (p. 28) { optional bool display_scan = 1; optional int32 horizontal_samples = 2; optional double horizontal_resolution = 3; optional double horizontal_min_angle = 4; optional double horizontal_max_angle = 5;
```

```
optional int32 vertical_samples = 6; optional double vertical_resolution = 7; optional double vertical_min_angle = 8; optional double vertical_max_angle = 9;
```

```
optional double range_min = 10; optional double range_max = 11; optional double range_resolution = 12; } ///
```

The documentation for this interface was generated from the following file:

- **raysensor.proto**

## 4.50 Request Interface Reference

A message containing a string request.

### 4.50.1 Detailed Description

A message containing a string request.

```
@verbatim
```

```
message Request (p. 28) { required int32 id = 1; required string request = 2; optional string data = 3; optional double dbl_data = 4; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **request.proto**

## 4.51 Response Interface Reference

Message that encapsulates a response message with a type description.

### 4.51.1 Detailed Description

Message that encapsulates a response message with a type description.

@verbatim

```
message Response (p. 29) { required int32 id = 1; required string request = 2; required string response = 3; optional string type = 4; optional bytes serialized_data = 5; }
```

///

The documentation for this interface was generated from the following file:

- **response.proto**

## 4.52 Road Interface Reference

Message for a road.

### 4.52.1 Detailed Description

Message for a road.

@verbatim

```
import "vector3d.proto";
```

```
message Road (p. 29) { required string name = 1; required double width = 2; repeated Vector3d (p. 35) point = 3; }
```

///

The documentation for this interface was generated from the following file:

- **road.proto**

## 4.53 Scene Interface Reference

A message containing a description of a scene.

### 4.53.1 Detailed Description

A message containing a description of a scene.

@verbatim

```
import "header.proto"; import "color.proto"; import "fog.proto"; import "sky.proto"; import "shadows.proto"; import
"visual.proto"; import "pose.proto"; import "light.proto"; import "joint.proto"; import "model.proto";
```

```
message Scene (p. 29) { required string name = 1; optional Color (p. 10) ambient = 2; optional Color (p. 10) background
= 3; optional Sky (p. 31) sky = 4; optional bool shadows = 5 [default = true]; optional Fog (p. 13) fog = 6; optional bool
grid = 7;
```

```
repeated Model (p. 22) model = 8; repeated Light (p. 20) light = 9; repeated Joint (p. 19) joint = 10; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **scene.proto**

## 4.54 Selection Interface Reference

A message for **GUI** (p. 14) selection data.

### 4.54.1 Detailed Description

A message for **GUI** (p. 14) selection data.

```
@verbatim
```

```
import "header.proto";
```

```
message Selection (p. 30) { required uint32 id = 1; required string name = 2; optional bool selected = 3 [default = false];
}
```

```
///
```

The documentation for this interface was generated from the following file:

- **selection.proto**

## 4.55 Sensor Interface Reference

Information about a sensor element.

### 4.55.1 Detailed Description

Information about a sensor element.

```
@verbatim
```

```
import "pose.proto"; import "camerasensor.proto"; import "raysensor.proto"; import "contactsensor.proto";
```

```
message Sensor (p. 30) { required string name = 1; required string parent = 2; required string type = 3; optional bool
always_on = 4; optional double update_rate = 5; optional Pose (p. 25) pose = 6; optional CameraSensor (p. 10) camera
= 7; optional RaySensor (p. 28) ray = 8; optional ContactSensor (p. 12) contact = 9; optional bool visualize = 10;
optional string topic = 11; } ///
```

The documentation for this interface was generated from the following file:

- **sensor.proto**

## 4.56 ServerControl Interface Reference

A message that allows for control of the server functions.

### 4.56.1 Detailed Description

A message that allows for control of the server functions.

```
@verbatim
```

```
import "header.proto";
```

```
message ServerControl (p. 31) { optional string save_world_name = 1; optional string save_filename = 2; optional string open_filename = 3; optional bool new_world = 4; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **server\_control.proto**

## 4.57 Shadows Interface Reference

A message for shadow data.

### 4.57.1 Detailed Description

A message for shadow data.

```
@verbatim
```

```
import "color.proto";
```

```
message Shadows (p. 31) { enum ShadowType { STENCIL_ADDITIVE = 1; STENCIL_MODULATIVE = 2; TEXTURE_ADDITIVE = 3; TEXTURE_MODULATIVE = 4; } optional ShadowType type = 5; optional Color (p. 10) color = 6; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **shadows.proto**

## 4.58 Sky Interface Reference

Information about the sky.

### 4.58.1 Detailed Description

Information about the sky.

```
@verbatim
```

```
import "color.proto";
```

```
message Sky (p. 31) { optional double time = 1; optional double sunrise = 2; optional double sunset = 3;  
optional double wind_speed = 4; optional double wind_direction = 5; optional Color (p. 10) cloud_ambient = 6; optional  
double humidity = 7; optional double mean_cloud_size = 8; } ///
```

The documentation for this interface was generated from the following file:

- **sky.proto**

## 4.59 SphereGeom Interface Reference

Information about a sphere geometry.

### 4.59.1 Detailed Description

Information about a sphere geometry.

```
@verbatim
```

```
message SphereGeom (p. 32) { required double radius = 1; } ///
```

The documentation for this interface was generated from the following file:

- **spheregeom.proto**

## 4.60 Subscribe Interface Reference

A message for subscription data.

### 4.60.1 Detailed Description

A message for subscription data.

```
@verbatim
```

```
message Subscribe (p. 32) { required string topic = 1; required string host = 2; required uint32 port = 3; required string  
msg_type = 4; optional bool latching = 5 [default=false]; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **subscribe.proto**

## 4.61 Surface Interface Reference

Information about a surface element.

### 4.61.1 Detailed Description

Information about a surface element.

@verbatim

```
import "friction.proto";
```

```
message Surface (p. 33) { optional Friction friction = 1; optional double restitution_coefficient = 2; optional double bounce_threshold = 3; optional double soft_cfm = 4; optional double soft_erp = 5; optional double kp = 6; optional double kd = 7; optional double max_vel = 8; optional double min_depth = 9; } ///
```

The documentation for this interface was generated from the following file:

- **surface.proto**

## 4.62 Test Interface Reference

A test message.

### 4.62.1 Detailed Description

A test message.

@verbatim

```
message Test (p. 33) { required Header (p. 16) header = 1; }  
///
```

The documentation for this interface was generated from the following file:

- **test.proto**

## 4.63 Time Interface Reference

A message for time data.

### 4.63.1 Detailed Description

A message for time data.

@verbatim

message **Time** (p. 33) { required int32 sec = 1; required int32 nsec = 2; }

///

The documentation for this interface was generated from the following file:

- **time.proto**

## 4.64 TopicInfo Interface Reference

A message for topic information.

### 4.64.1 Detailed Description

A message for topic information.

@verbatim

```
import "publish.proto"; import "subscribe.proto";
```

```
message TopicInfo (p. 34) { required string msg_type = 1; repeated Publish (p. 27) publisher = 2; repeated Subscribe (p. 32) subscriber = 3; }
```

///

The documentation for this interface was generated from the following file:

- **topic\_info.proto**

## 4.65 Trackvisual Interface Reference

Message for a tracking a rendering::Visual with a rendering::Camera.

### 4.65.1 Detailed Description

Message for a tracking a rendering::Visual with a rendering::Camera.

@verbatim

```
message TrackVisual { required string name = 1; optional bool inherit_orientation = 2; optional double min_dist = 3; optional double max_dist = 4; }
```

///

The documentation for this interface was generated from the following file:

- **track\_visual.proto**

## 4.66 Vector2d Interface Reference

Message for a vector2 double.



### 4.66.1 Detailed Description

Message for a vector2 double.

@verbatim

```
import "header.proto";
message Vector2d (p. 34) { required double x = 1; required double y = 2; }
///
```

The documentation for this interface was generated from the following file:

- **vector2d.proto**

## 4.67 Vector3d Interface Reference

Message for a vector3 double.

### 4.67.1 Detailed Description

Message for a vector3 double.

@verbatim

```
import "header.proto";
message Vector3d (p. 35) { required double x = 2; required double y = 3; required double z = 4; }
///
```

The documentation for this interface was generated from the following file:

- **vector3d.proto**

## 4.68 Visual Interface Reference

A message containing visual information for rendering::Visual.

### 4.68.1 Detailed Description

A message containing visual information for rendering::Visual.

@verbatim

```
import "pose.proto"; import "geometry.proto"; import "material.proto"; import "plugin.proto";
message Visual (p. 35) { required string name = 1; optional string parent_name = 2; optional bool cast_shadows = 3;
optional double transparency = 4; optional double laser_retro = 5; optional Pose (p. 25) pose = 6; optional Geometry
(p. 14) geometry = 7; optional Material (p. 21) material = 8;
```

```
optional bool visible = 9; optional bool delete_me = 11; optional bool is_static = 12; optional Plugin (p. 24) plugin = 13; }  
///
```

The documentation for this interface was generated from the following file:

- **visual.proto**

## 4.69 WorldModify Interface Reference

A message that allows for modifying (open, close) worlds.

### 4.69.1 Detailed Description

A message that allows for modifying (open, close) worlds.

```
@verbatim
```

```
message WorldModify (p. 36) { required string world_name = 1; optional bool remove = 2; optional bool create = 3; }  
///
```

The documentation for this interface was generated from the following file:

- **world\_modify.proto**

## 4.70 WorldReset Interface Reference

A message that controls how the world is reset.

### 4.70.1 Detailed Description

A message that controls how the world is reset.

```
@verbatim
```

```
import "header.proto";
```

```
message WorldReset (p. 36) { optional bool all = 1[default = true]; optional bool time_only = 2[default = false]; optional  
bool model_only = 3[default = false]; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **world\_reset.proto**

## 4.71 WorldStatistics Interface Reference

A message statistics about a world.

### 4.71.1 Detailed Description

A message statistics about a world.

```
@verbatim
```

```
import "header.proto"; import "time.proto";
```

```
message WorldStatistics (p. 36) { required Time (p. 33) sim_time = 2; required Time (p. 33) pause_time = 3; required Time (p. 33) real_time = 4; required bool paused = 5; optional int32 model_count = 6; }
```

```
///
```

The documentation for this interface was generated from the following file:

- **world\_stats.proto**



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