

```
<!-- DO NOT EDIT: Generated from iris.sdf.jinja -->
<sdf version='1.6'>
  <model name='iris'>
    <link name='base_link'>
      <pose>0 0 0 0 0 0</pose>
      <inertial>
        <pose>0 0 0 0 0 0</pose>
        <mass>1.5</mass>
        <inertia>
          <ixx>0.029125</ixx>
          <ixy>0</ixy>
          <ixz>0</ixz>
          <iyy>0.029125</iyy>
          <iyz>0</iyz>
          <izz>0.055225</izz>
        </inertia>
      </inertial>
      <collision name='base_link_inertia_collision'>
        <pose>0 0 0 0 0 0</pose>
        <geometry>
          <box>
            <size>0.47 0.47 0.11</size>
          </box>
        </geometry>
        <surface>
          <contact>
            <ode>
              <min_depth>0.001</min_depth>
              <max_vel>0</max_vel>
            </ode>
          </contact>
          <friction>
            <ode/>
          </friction>
        </surface>
      </collision>
      <visual name='base_link_inertia_visual'>
        <pose>0 0 0 0 0 0</pose>
        <geometry>
          <mesh>
            <scale>1 1 1</scale>
            <uri>model://iris/meshes/iris.stl</uri>
          </mesh>
        </geometry>
        <material>
          <script>
            <name>Gazebo/DarkGrey</name>
            <uri>file://media/materials/scripts/gazebo.material</uri>
          </script>
        </material>
      </visual>
      <gravity>1</gravity>
      <velocity_decay/>
    </link>
    <link name='/imu_link'>
      <pose>0 0 0 0 0 0</pose>
      <inertial>
        <pose>0 0 0 0 0 0</pose>
        <mass>0.015</mass>
        <inertia>
          <ixx>1e-05</ixx>
          <ixy>0</ixy>
```

```
    <ixz>0</ixz>
    <iyy>1e-05</iyy>
    <iyz>0</iyz>
    <izz>1e-05</izz>
  </inertia>
</inertial>
</link>
<joint name='/imu_joint' type='revolute'>
  <child>imu_link</child>
  <parent>base_link</parent>
  <axis>
    <xyz>1 0 0</xyz>
    <limit>
      <lower>0</lower>
      <upper>0</upper>
      <effort>0</effort>
      <velocity>0</velocity>
    </limit>
    <dynamics>
      <spring_reference>0</spring_reference>
      <spring_stiffness>0</spring_stiffness>
    </dynamics>
    <use_parent_model_frame>1</use_parent_model_frame>
  </axis>
</joint>
<link name='rotor_0'>
  <pose>0.13 -0.22 0.023 0 0 0</pose>
  <inertial>
    <pose>0 0 0 0 0 0</pose>
    <mass>0.005</mass>
    <inertia>
      <ixx>9.75e-07</ixx>
      <ixy>0</ixy>
      <ixz>0</ixz>
      <iyy>0.000273104</iyy>
      <iyz>0</iyz>
      <izz>0.000274004</izz>
    </inertia>
  </inertial>
  <collision name='rotor_0_collision'>
    <pose>0 0 0 0 0 0</pose>
    <geometry>
      <cylinder>
        <length>0.005</length>
        <radius>0.128</radius>
      </cylinder>
    </geometry>
    <surface>
      <contact>
        <ode/>
      </contact>
      <friction>
        <ode/>
      </friction>
    </surface>
  </collision>
  <visual name='rotor_0_visual'>
    <pose>0 0 0 0 0 0</pose>
    <geometry>
      <mesh>
        <scale>1 1 1</scale>
        <uri>model://iris/meshes/iris_prop_ccw.dae</uri>
      </mesh>
    </geometry>
  </visual>
</link>
```

```
    </mesh>
  </geometry>
  <material>
    <script>
      <name>Gazebo/Blue</name>
      <uri>file://media/materials/scripts/gazebo.material</uri>
    </script>
  </material>
</visual>
<gravity>1</gravity>
<velocity_decay/>
</link>
<joint name='rotor_0_joint' type='revolute'>
  <child>rotor_0</child>
  <parent>base_link</parent>
  <axis>
    <xyz>0 0 1</xyz>
    <limit>
      <lower>-1e+16</lower>
      <upper>1e+16</upper>
    </limit>
    <dynamics>
      <spring_reference>0</spring_reference>
      <spring_stiffness>0</spring_stiffness>
    </dynamics>
    <use_parent_model_frame>1</use_parent_model_frame>
  </axis>
</joint>
<link name='rotor_1'>
  <pose>-0.13 0.2 0.023 0 0 0</pose>
  <inertial>
    <pose>0 0 0 0 0 0</pose>
    <mass>0.005</mass>
    <inertia>
      <ixx>9.75e-07</ixx>
      <ixy>0</ixy>
      <ixz>0</ixz>
      <iyy>0.000273104</iyy>
      <iyz>0</iyz>
      <izz>0.000274004</izz>
    </inertia>
  </inertial>
  <collision name='rotor_1_collision'>
    <pose>0 0 0 0 0 0</pose>
    <geometry>
      <cylinder>
        <length>0.005</length>
        <radius>0.128</radius>
      </cylinder>
    </geometry>
    <surface>
      <contact>
        <ode/>
      </contact>
      <friction>
        <ode/>
      </friction>
    </surface>
  </collision>
  <visual name='rotor_1_visual'>
    <pose>0 0 0 0 0 0</pose>
    <geometry>
```

```
    <mesh>
      <scale>1 1 1</scale>
      <uri>model://iris/meshes/iris_prop_ccw.dae</uri>
    </mesh>
  </geometry>
  <material>
    <script>
      <name>Gazebo/DarkGrey</name>
      <uri>file://media/materials/scripts/gazebo.material</uri>
    </script>
  </material>
</visual>
<gravity>1</gravity>
<velocity_decay/>
</link>
<joint name='rotor_1_joint' type='revolute'>
  <child>rotor_1</child>
  <parent>base_link</parent>
  <axis>
    <xyz>0 0 1</xyz>
    <limit>
      <lower>-1e+16</lower>
      <upper>1e+16</upper>
    </limit>
    <dynamics>
      <spring_reference>0</spring_reference>
      <spring_stiffness>0</spring_stiffness>
    </dynamics>
    <use_parent_model_frame>1</use_parent_model_frame>
  </axis>
</joint>
<link name='rotor_2'>
  <pose>0.13 0.22 0.023 0 0 0</pose>
  <inertial>
    <pose>0 0 0 0 0 0</pose>
    <mass>0.005</mass>
    <inertia>
      <ixx>9.75e-07</ixx>
      <ixy>0</ixy>
      <ixz>0</ixz>
      <iyy>0.000273104</iyy>
      <iyz>0</iyz>
      <izz>0.000274004</izz>
    </inertia>
  </inertial>
  <collision name='rotor_2_collision'>
    <pose>0 0 0 0 0 0</pose>
    <geometry>
      <cylinder>
        <length>0.005</length>
        <radius>0.128</radius>
      </cylinder>
    </geometry>
    <surface>
      <contact>
        <ode/>
      </contact>
      <friction>
        <ode/>
      </friction>
    </surface>
  </collision>
```

```
<visual name='rotor_2_visual'>
  <pose>0 0 0 0 0 0</pose>
  <geometry>
    <mesh>
      <scale>1 1 1</scale>
      <uri>model://iris/meshes/iris_prop_cw.dae</uri>
    </mesh>
  </geometry>
  <material>
    <script>
      <name>Gazebo/Blue</name>
      <uri>file://media/materials/scripts/gazebo.material</uri>
    </script>
  </material>
</visual>
<gravity>1</gravity>
<velocity_decay/>
</link>
<joint name='rotor_2_joint' type='revolute'>
  <child>rotor_2</child>
  <parent>base_link</parent>
  <axis>
    <xyz>0 0 1</xyz>
    <limit>
      <lower>-1e+16</lower>
      <upper>1e+16</upper>
    </limit>
    <dynamics>
      <spring_reference>0</spring_reference>
      <spring_stiffness>0</spring_stiffness>
    </dynamics>
    <use_parent_model_frame>1</use_parent_model_frame>
  </axis>
</joint>
<link name='rotor_3'>
  <pose>-0.13 -0.2 0.023 0 0 0</pose>
  <inertial>
    <pose>0 0 0 0 0 0</pose>
    <mass>0.005</mass>
    <inertia>
      <ixx>9.75e-07</ixx>
      <ixy>0</ixy>
      <ixz>0</ixz>
      <iyy>0.000273104</iyy>
      <iyz>0</iyz>
      <izz>0.000274004</izz>
    </inertia>
  </inertial>
  <collision name='rotor_3_collision'>
    <pose>0 0 0 0 0 0</pose>
    <geometry>
      <cylinder>
        <length>0.005</length>
        <radius>0.128</radius>
      </cylinder>
    </geometry>
    <surface>
      <contact>
        <ode/>
      </contact>
      <friction>
        <ode/>
      </friction>
    </surface>
  </collision>
</link>
```

```
    </friction>
  </surface>
</collision>
<visual name='rotor_3_visual'>
  <pose>0 0 0 0 0 0</pose>
  <geometry>
    <mesh>
      <scale>1 1 1</scale>
      <uri>model://iris/meshes/iris_prop_cw.dae</uri>
    </mesh>
  </geometry>
  <material>
    <script>
      <name>Gazebo/DarkGrey</name>
      <uri>file://media/materials/scripts/gazebo.material</uri>
    </script>
  </material>
</visual>
<gravity>1</gravity>
<velocity_decay/>
</link>
<joint name='rotor_3_joint' type='revolute'>
  <child>rotor_3</child>
  <parent>base_link</parent>
  <axis>
    <xyz>0 0 1</xyz>
    <limit>
      <lower>-1e+16</lower>
      <upper>1e+16</upper>
    </limit>
    <dynamics>
      <spring_reference>0</spring_reference>
      <spring_stiffness>0</spring_stiffness>
    </dynamics>
    <use_parent_model_frame>1</use_parent_model_frame>
  </axis>
</joint>
<plugin name='rosbag' filename='libgazebo_multirotor_base_plugin.so'>
  <robotNamespace/>
  <linkName>base_link</linkName>
  <rotorVelocitySlowdownSim>10</rotorVelocitySlowdownSim>
</plugin>
<plugin name='front_right_motor_model' filename='libgazebo_motor_model.so'>
  <robotNamespace/>
  <jointName>rotor_0_joint</jointName>
  <linkName>rotor_0</linkName>
  <turningDirection>ccw</turningDirection>
  <timeConstantUp>0.0125</timeConstantUp>
  <timeConstantDown>0.025</timeConstantDown>
  <maxRotVelocity>1100</maxRotVelocity>
  <motorConstant>5.84e-06</motorConstant>
  <momentConstant>0.06</momentConstant>
  <commandSubTopic>/gazebo/command/motor_speed</commandSubTopic>
  <motorNumber>0</motorNumber>
  <rotorDragCoefficient>0.000175</rotorDragCoefficient>
  <rollingMomentCoefficient>1e-06</rollingMomentCoefficient>
  <motorSpeedPubTopic>/motor_speed/0</motorSpeedPubTopic>
  <rotorVelocitySlowdownSim>10</rotorVelocitySlowdownSim>
</plugin>
<plugin name='back_left_motor_model' filename='libgazebo_motor_model.so'>
  <robotNamespace/>
  <jointName>rotor_1_joint</jointName>
```

```
<linkName>rotor_1</linkName>
<turningDirection>ccw</turningDirection>
<timeConstantUp>0.0125</timeConstantUp>
<timeConstantDown>0.025</timeConstantDown>
<maxRotVelocity>1100</maxRotVelocity>
<motorConstant>5.84e-06</motorConstant>
<momentConstant>0.06</momentConstant>
<commandSubTopic>/gazebo/command/motor_speed</commandSubTopic>
<motorNumber>1</motorNumber>
<rotorDragCoefficient>0.000175</rotorDragCoefficient>
<rollingMomentCoefficient>1e-06</rollingMomentCoefficient>
<motorSpeedPubTopic>/motor_speed/1</motorSpeedPubTopic>
<rotorVelocitySlowdownSim>10</rotorVelocitySlowdownSim>
</plugin>
<plugin name='front_left_motor_model' filename='libgazebo_motor_model.so'>
  <robotNamespace/>
  <jointName>rotor_2_joint</jointName>
  <linkName>rotor_2</linkName>
  <turningDirection>cw</turningDirection>
  <timeConstantUp>0.0125</timeConstantUp>
  <timeConstantDown>0.025</timeConstantDown>
  <maxRotVelocity>1100</maxRotVelocity>
  <motorConstant>5.84e-06</motorConstant>
  <momentConstant>0.06</momentConstant>
  <commandSubTopic>/gazebo/command/motor_speed</commandSubTopic>
  <motorNumber>2</motorNumber>
  <rotorDragCoefficient>0.000175</rotorDragCoefficient>
  <rollingMomentCoefficient>1e-06</rollingMomentCoefficient>
  <motorSpeedPubTopic>/motor_speed/2</motorSpeedPubTopic>
  <rotorVelocitySlowdownSim>10</rotorVelocitySlowdownSim>
</plugin>
<plugin name='back_right_motor_model' filename='libgazebo_motor_model.so'>
  <robotNamespace/>
  <jointName>rotor_3_joint</jointName>
  <linkName>rotor_3</linkName>
  <turningDirection>cw</turningDirection>
  <timeConstantUp>0.0125</timeConstantUp>
  <timeConstantDown>0.025</timeConstantDown>
  <maxRotVelocity>1100</maxRotVelocity>
  <motorConstant>5.84e-06</motorConstant>
  <momentConstant>0.06</momentConstant>
  <commandSubTopic>/gazebo/command/motor_speed</commandSubTopic>
  <motorNumber>3</motorNumber>
  <rotorDragCoefficient>0.000175</rotorDragCoefficient>
  <rollingMomentCoefficient>1e-06</rollingMomentCoefficient>
  <motorSpeedPubTopic>/motor_speed/3</motorSpeedPubTopic>
  <rotorVelocitySlowdownSim>10</rotorVelocitySlowdownSim>
</plugin>
<model name='gps0'>
  <link name='link'>
    <pose>0 0 0 0 0 0</pose>
    <inertial>
      <pose>0 0 0 0 0 0</pose>
      <mass>0.01</mass>
      <inertia>
        <ixx>2.1733e-06</ixx>
        <ixy>0</ixy>
        <ixz>0</ixz>
        <iyy>2.1733e-06</iyy>
        <iyz>0</iyz>
        <izz>1.8e-07</izz>
      </inertia>
    </link>
  </model>
```

```
</inertial>
<visual name='visual'>
  <geometry>
    <cylinder>
      <radius>0.01</radius>
      <length>0.002</length>
    </cylinder>
  </geometry>
  <material>
    <script>
      <name>Gazebo/Black</name>
      <uri>__default__</uri>
    </script>
  </material>
</visual>
<sensor name='gps' type='gps'>
  <pose>0 0 0 0 0 0</pose>
  <plugin name='gps_plugin' filename='libgazebo_gps_plugin.so'>
    <robotNamespace/>
    <gpsNoise>1</gpsNoise>
    <gpsXYRandomWalk>2.0</gpsXYRandomWalk>
    <gpsZRandomWalk>4.0</gpsZRandomWalk>
    <gpsXYNoiseDensity>0.0002</gpsXYNoiseDensity>
    <gpsZNoiseDensity>0.0004</gpsZNoiseDensity>
    <gpsVXYNoiseDensity>0.2</gpsVXYNoiseDensity>
    <gpsVZNoiseDensity>0.4</gpsVZNoiseDensity>
  </plugin>
</sensor>
</link>
</model>
<joint name='gps0_joint' type='fixed'>
  <parent>base_link</parent>
  <child>gps0::link</child>
</joint>
<plugin name='groundtruth_plugin' filename='libgazebo_groundtruth_plugin.so'>
  <robotNamespace/>
</plugin>
<plugin name='magnetometer_plugin' filename='libgazebo_magnetometer_plugin.so'>
  <robotNamespace/>
  <pubRate>100</pubRate>
  <noiseDensity>0.0004</noiseDensity>
  <randomWalk>6.4e-06</randomWalk>
  <biasCorrelationTime>600</biasCorrelationTime>
  <magTopic>/mag</magTopic>
</plugin>
<plugin name='barometer_plugin' filename='libgazebo_barometer_plugin.so'>
  <robotNamespace/>
  <pubRate>50</pubRate>
  <baroTopic>/baro</baroTopic>
  <baroDriftPaPerSec>0</baroDriftPaPerSec>
</plugin>
<plugin name='mavlink_interface' filename='libgazebo_mavlink_interface.so'>
  <robotNamespace/>
  <imuSubTopic>/imu</imuSubTopic>
  <magSubTopic>/mag</magSubTopic>
  <baroSubTopic>/baro</baroSubTopic>
  <mavlink_addr>INADDR_ANY</mavlink_addr>
  <mavlink_tcp_port>4560</mavlink_tcp_port>
  <mavlink_udp_port>14560</mavlink_udp_port>
  <serialEnabled>0</serialEnabled>
  <serialDevice>/dev/ttyACM0</serialDevice>
  <baudRate>921600</baudRate>
</plugin>
```



```
<qgc_addr>INADDR_ANY</qgc_addr>
<qgc_udp_port>14550</qgc_udp_port>
<sdk_addr>INADDR_ANY</sdk_addr>
<sdk_udp_port>14540</sdk_udp_port>
<hil_mode>0</hil_mode>
<hil_state_level>0</hil_state_level>
<send_vision_estimation>0</send_vision_estimation>
<send_odometry>1</send_odometry>
<enable_lockstep>1</enable_lockstep>
<use_tcp>1</use_tcp>
<motorSpeedCommandPubTopic>/gazebo/command/motor_speed</
motorSpeedCommandPubTopic>
<control_channels>
  <channel name='rotor1'>
    <input_index>0</input_index>
    <input_offset>0</input_offset>
    <input_scaling>1000</input_scaling>
    <zero_position_disarmed>0</zero_position_disarmed>
    <zero_position_armed>100</zero_position_armed>
    <joint_control_type>velocity</joint_control_type>
  </channel>
  <channel name='rotor2'>
    <input_index>1</input_index>
    <input_offset>0</input_offset>
    <input_scaling>1000</input_scaling>
    <zero_position_disarmed>0</zero_position_disarmed>
    <zero_position_armed>100</zero_position_armed>
    <joint_control_type>velocity</joint_control_type>
  </channel>
  <channel name='rotor3'>
    <input_index>2</input_index>
    <input_offset>0</input_offset>
    <input_scaling>1000</input_scaling>
    <zero_position_disarmed>0</zero_position_disarmed>
    <zero_position_armed>100</zero_position_armed>
    <joint_control_type>velocity</joint_control_type>
  </channel>
  <channel name='rotor4'>
    <input_index>3</input_index>
    <input_offset>0</input_offset>
    <input_scaling>1000</input_scaling>
    <zero_position_disarmed>0</zero_position_disarmed>
    <zero_position_armed>100</zero_position_armed>
    <joint_control_type>velocity</joint_control_type>
  </channel>
  <channel name='rotor5'>
    <input_index>4</input_index>
    <input_offset>1</input_offset>
    <input_scaling>324.6</input_scaling>
    <zero_position_disarmed>0</zero_position_disarmed>
    <zero_position_armed>0</zero_position_armed>
    <joint_control_type>velocity</joint_control_type>
    <joint_control_pid>
      <p>0.1</p>
      <i>0</i>
      <d>0</d>
      <iMax>0.0</iMax>
      <iMin>0.0</iMin>
      <cmdMax>2</cmdMax>
      <cmdMin>-2</cmdMin>
    </joint_control_pid>
    <joint_name>zephyr_delta_wing::propeller_joint</joint_name>
```

```
</channel>
<channel name='rotor6'>
  <input_index>5</input_index>
  <input_offset>0</input_offset>
  <input_scaling>0.524</input_scaling>
  <zero_position_disarmed>0</zero_position_disarmed>
  <zero_position_armed>0</zero_position_armed>
  <joint_control_type>position</joint_control_type>
  <joint_name>zephyr_delta_wing::flap_left_joint</joint_name>
  <joint_control_pid>
    <p>10.0</p>
    <i>0</i>
    <d>0</d>
    <iMax>0</iMax>
    <iMin>0</iMin>
    <cmdMax>20</cmdMax>
    <cmdMin>-20</cmdMin>
  </joint_control_pid>
</channel>
<channel name='rotor7'>
  <input_index>6</input_index>
  <input_offset>0</input_offset>
  <input_scaling>0.524</input_scaling>
  <zero_position_disarmed>0</zero_position_disarmed>
  <zero_position_armed>0</zero_position_armed>
  <joint_control_type>position</joint_control_type>
  <joint_name>zephyr_delta_wing::flap_right_joint</joint_name>
  <joint_control_pid>
    <p>10.0</p>
    <i>0</i>
    <d>0</d>
    <iMax>0</iMax>
    <iMin>0</iMin>
    <cmdMax>20</cmdMax>
    <cmdMin>-20</cmdMin>
  </joint_control_pid>
</channel>
<channel name='rotor8'>
  <input_index>7</input_index>
  <input_offset>0</input_offset>
  <input_scaling>0.524</input_scaling>
  <zero_position_disarmed>0</zero_position_disarmed>
  <zero_position_armed>0</zero_position_armed>
  <joint_control_type>position</joint_control_type>
</channel>
</control_channels>
</plugin>
<static>0</static>
<plugin name='rotors_gazebo_imu_plugin' filename='libgazebo_imu_plugin.so'>
  <robotNamespace/>
  <linkName>/imu_link</linkName>
  <imuTopic>/imu</imuTopic>
  <gyroscopeNoiseDensity>0.00018665</gyroscopeNoiseDensity>
  <gyroscopeRandomWalk>3.8785e-05</gyroscopeRandomWalk>
  <gyroscopeBiasCorrelationTime>1000.0</gyroscopeBiasCorrelationTime>
  <gyroscopeTurnOnBiasSigma>0.0087</gyroscopeTurnOnBiasSigma>
  <accelerometerNoiseDensity>0.00186</accelerometerNoiseDensity>
  <accelerometerRandomWalk>0.006</accelerometerRandomWalk>
  <accelerometerBiasCorrelationTime>300.0</accelerometerBiasCorrelationTime>
  <accelerometerTurnOnBiasSigma>0.196</accelerometerTurnOnBiasSigma>
</plugin>
</model>
```

</sdf>