
XACRO Basics

Estimated time to completion: **4 minutes**

7.7 XACRO Conditional Blocks

XACRO conditional blocks are a way to selectively include or exclude parts of a robot model based on certain conditions. This can be useful to create configurable robots that can be easily customized for different applications or to load different Gazebo plugins depending on the robot's configuration.

XACRO provides two types of conditional blocks: the `<xacro:if>` block and the `<xacro:unless>` block. The `<xacro:if>` block allows you to include a section of the model only if a specified condition is true, while the `<xacro:unless>` block allows you to include a section of the model only if a specified condition is false.

For example, you can use a conditional block to include a laser sensor in your robot model only if a certain argument is set to true. This can be achieved with the following code:

```
In [ ]: <xacro:if value="${include_laser}">
        <!-- Laser Sensor -->
        <joint name="laser_sensor_joint" type="fixed">
            ...
        </joint>
        <link name="laser_sensor_link">
            ...
        </link>
    </xacro:if>
```

In this example, the `<xacro:if>` block checks whether the `include_laser` argument is true, and includes the laser sensor code only if it is. The model does not include the laser sensor code if the argument is false.

Depending on the robot's configuration, conditional blocks can also load different Gazebo plugins. For example, you could load a sensor plugin for an indoor robot and a different sensor plugin for an outdoor robot. This can be achieved with the following code:

```
In [ ]: <xacro:arg name="indoor_robot" default="true"/>
        ...
        <xacro:if value="${indoor_robot}">
            <gazebo>
                <plugin filename="libgazebo_ros_imu_sensor.so" name="imu_plugin">
            </gazebo>
        </xacro:if>
        <xacro:unless value="${indoor_robot}">
            <gazebo>
                <plugin filename="libgazebo_ros_gps_sensor.so" name="$gps_plugin">
            </gazebo>
        </xacro:unless>
```

In this example, the `<xacro:if>` block checks whether the `indoor_robot` argument is true, and loads the `libgazebo_ros_imu_sensor.so` plugin if it is. The `<xacro:unless>` block loads the `libgazebo_ros_gps_sensor.so` plugin if the `indoor_robot` argument is false.

Overall, XACRO conditional blocks are a powerful tool to create configurable robot models that can be easily customized for different applications, or to load different Gazebo plugins depending on the robot's configuration.

You can also mix conditional blocks and macros. To do so, first, do the following:

1. **Define a property** to use for the conditional, which must be defined before calling the "laser_scanner" macro. For instance:

```
In [ ]: <xacro:property name="indoor_robot" value="true"/>
```



1. The macro definition tag must now **include a "params" attribute** that specifies the default value of the "indoor_robot" argument as "true". Additionally, inside the macro body, you have to **include a conditional block** to check the value of the "include_laser" argument:

```
In [ ]: <xacro:macro name="robot_sensors" params="indoor_robot:=true">
<xacro:if value="${indoor_robot}">
    ....
    ....
</xacro:if>
</xacro:macro>
```



1. Finally, inside the call to the `robot_sensors` macro, you must also **pass in the indoor_robot parameter** as an argument:

```
In [ ]: <xacro:robot_sensors indoor_robot="${indoor_robot}"/>
```

