# Erle-Copter simulation

1. This guide demonstrates how to simulate an Erle-Copter in Gazebo, and control it with APM Planner. Make sure to follow the installation instructions first.For a brief demonstration, view the *'Control an Erle-Copter in Gazebo*' video.

## Installation

* + First, we set up an UDP connection to control the simulated Erle-Copter with APM Planner.
    - Open APM Planner by running the ***apmplanner2*** executable in the */apm\_planner/release* folder
    - Go to the '*Communication'* tab and select '**Add link' > 'UDP'**
    - Type '**14551'** as 'UDP port'
    - Click on **'Add IP'** and type '**localhost:14551'** in the pop-up window
    - Close APM Planner
  + Second, we spawn the Erle-Copter in a simulated world. Follow the *'Create a simulated world'* manual to create your own world.
    - Open a terminal and execute  
       ***cd ~/simulation/ardupilot/Arducopter  
       ../Tools/autotest/sim\_vehicle.sh -j 4 -f Gazebo***
    - In a new terminal, run  
       ***roslaunch ardupilot\_sitl\_gazebo\_plugin erlecopter\_spawn.launch***
    - Go back to the first terminal and type  
       ***param set ARMING\_CHECK 0  
       param set SYSID\_MYGCS 1***
  + Now, we can control the Erle-Copter. There are multiple ways to do this:
    - For the first method, we return to the first terminal window (where we set the parameters) and run these commands to make the Erle-Copter take-off to 2 metres  
       **mode GUIDED  
       arm throttle  
       takeoff 2**To land, simply type  
       **mode LAND**
    - The second method will make use of APM Planner.
      * Connect a PS3 controller to your computer via USB, open a new terminal and type  
         ***sixpair***Then, in the same terminal, type  
         ***sixad --start***You will be prompted to push the PS-button on your controller. The PS3 controller should be connected now.
      * Open APM Planner by running the *apmplanner2* executable in the */apm\_planner/release* folder.
      * Go to '**File' > 'Joystick'** and click '**Activate'**
      * Go to the 'Actions' tab and select the flight mode that you want to use. I suggest 'LOITER' or 'ALT\_HOLD' for stable flight.
      * Click 'ARM' to arm the Erle-Copter, you can now use the sticks on your PS3 controller to steer the Erle-Copter!