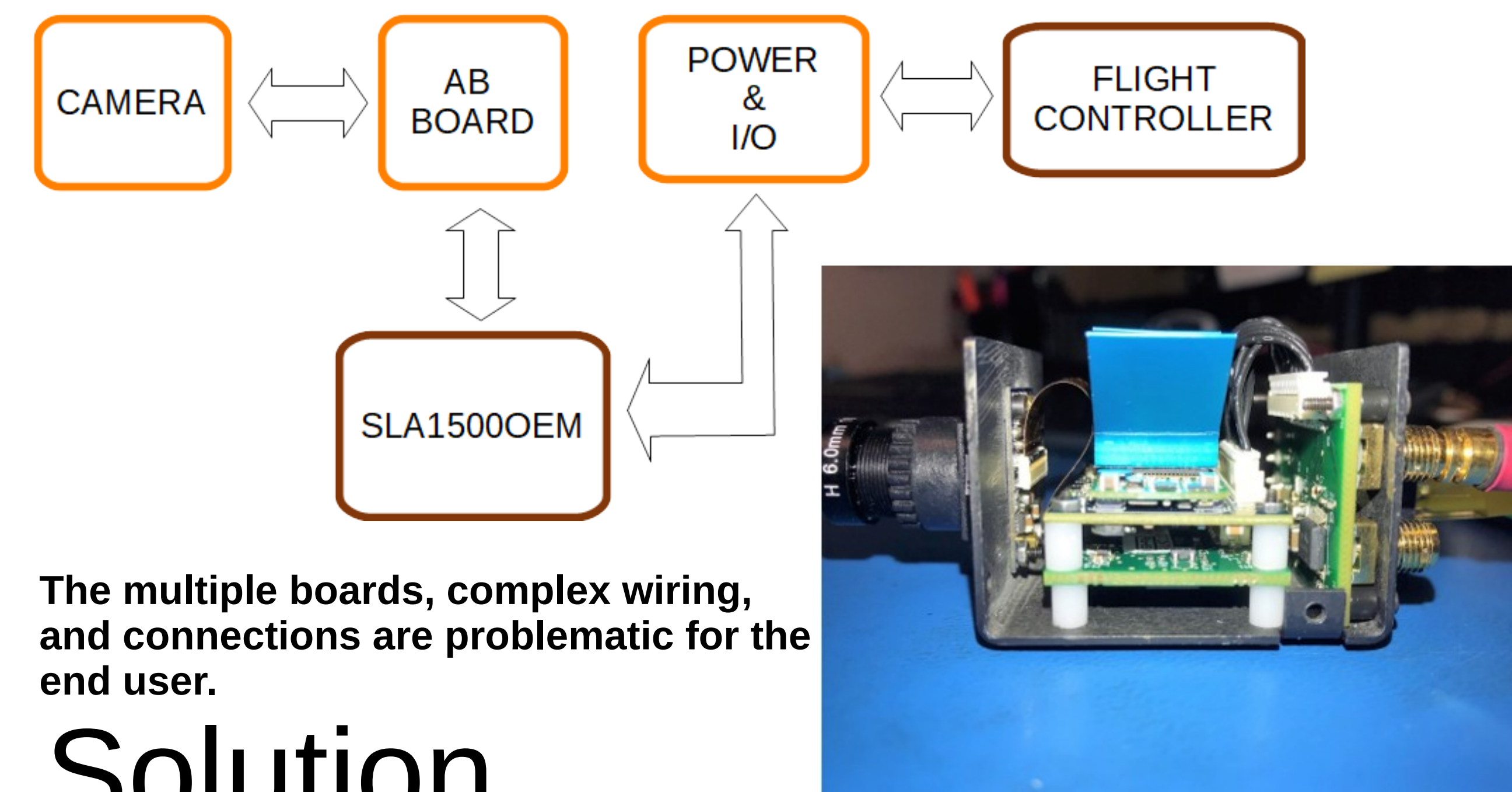


UAV Visual Landing Aid

Premise

SightLine Applications has developed a precision visual landing aid for UAV's. The Landing Aid supports autonomous landing operations by automatically finding and tracking an easy to place landing pattern.



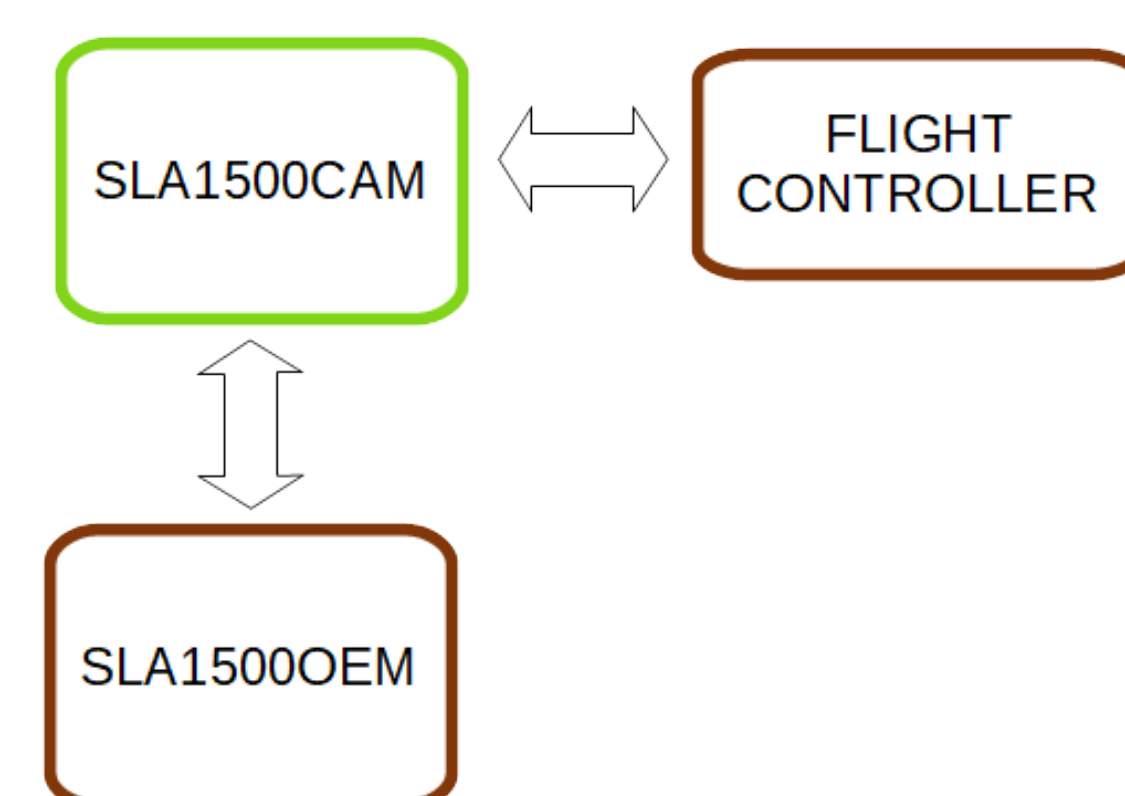
The multiple boards, complex wiring, and connections are problematic for the end user.

Solution

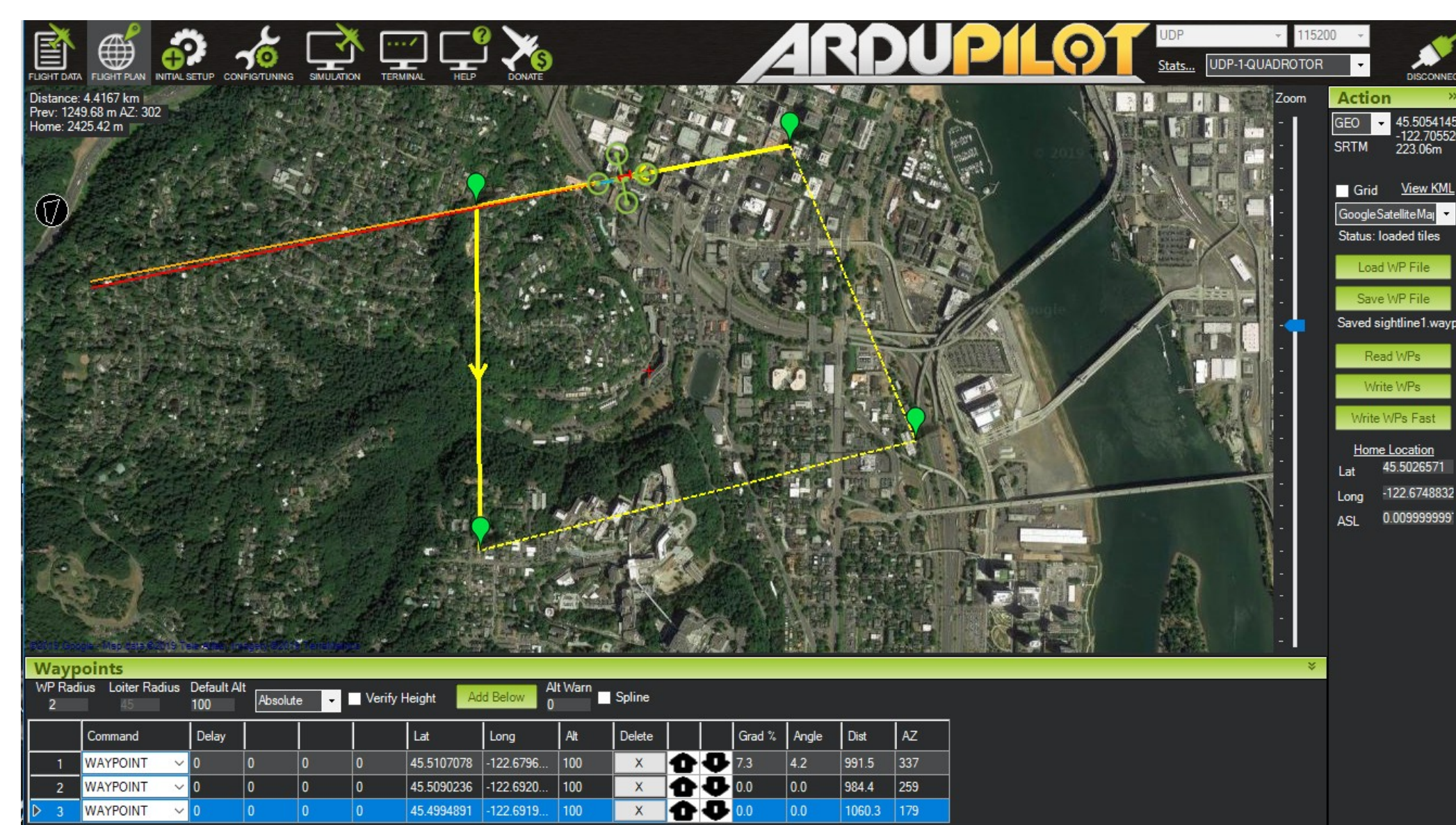
The proposed solution is to develop an all in one unit with plug and play capabilities that can be directly connected to the SightLine hardware.



By doing so camera connectivity and selection problems are eliminated, and deployment is made much easier for the end user.

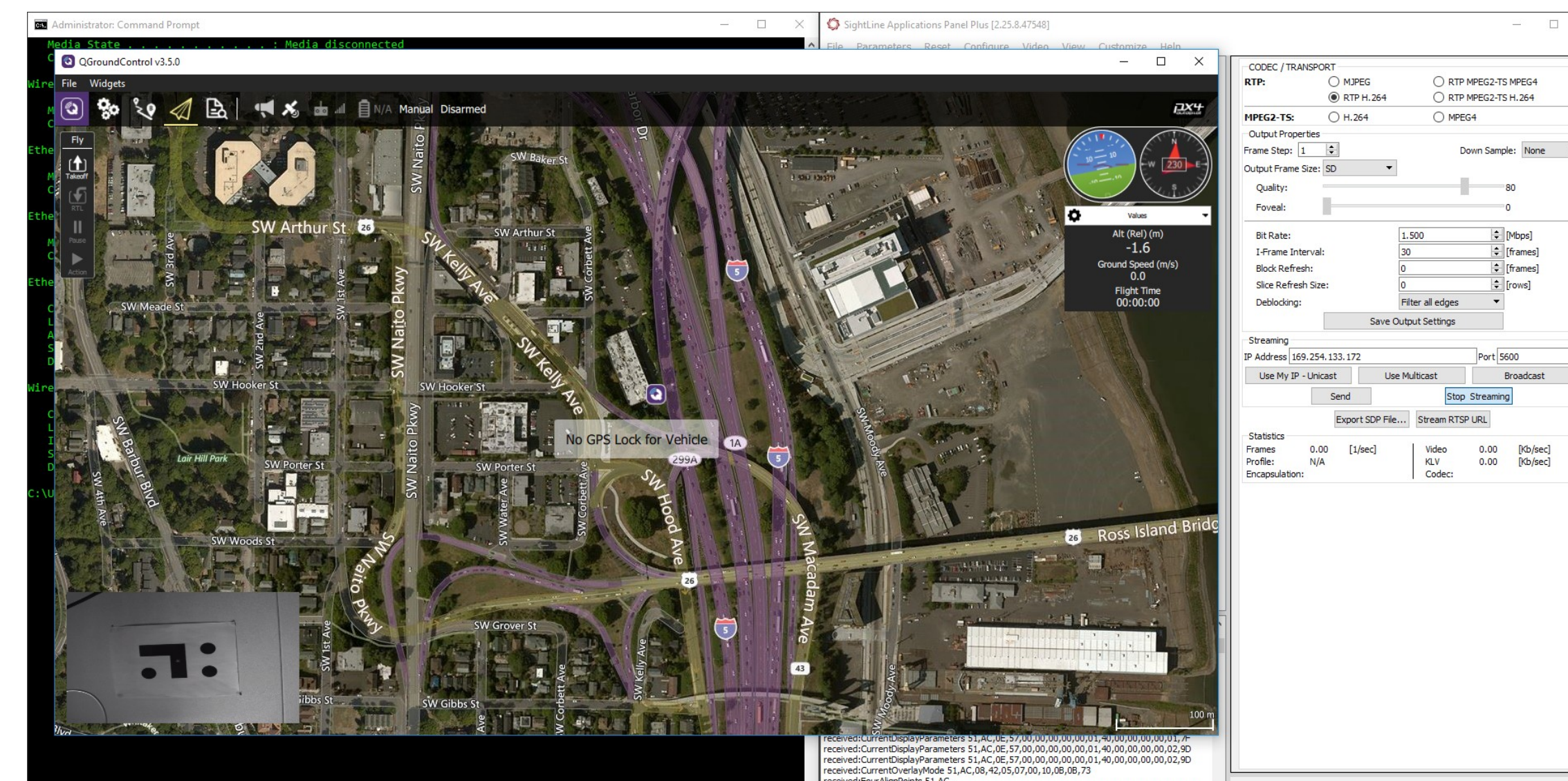


Software



Mission planner is an open source software that allows users and developers to fully control their drone. In this project, we used Mission Planner for setting up flight simulations.

This helped us to understand the drone's behavior and how adjusting the drone's parameters could affect the behavior of the drone.



Qgroundcontrol is an open-source software that allows users and developers to control their drone fully and autonomously. We used Qgroundcontrol as the ground control station to send commands to the Pixhawk4 and control the quad copter.

Hardware

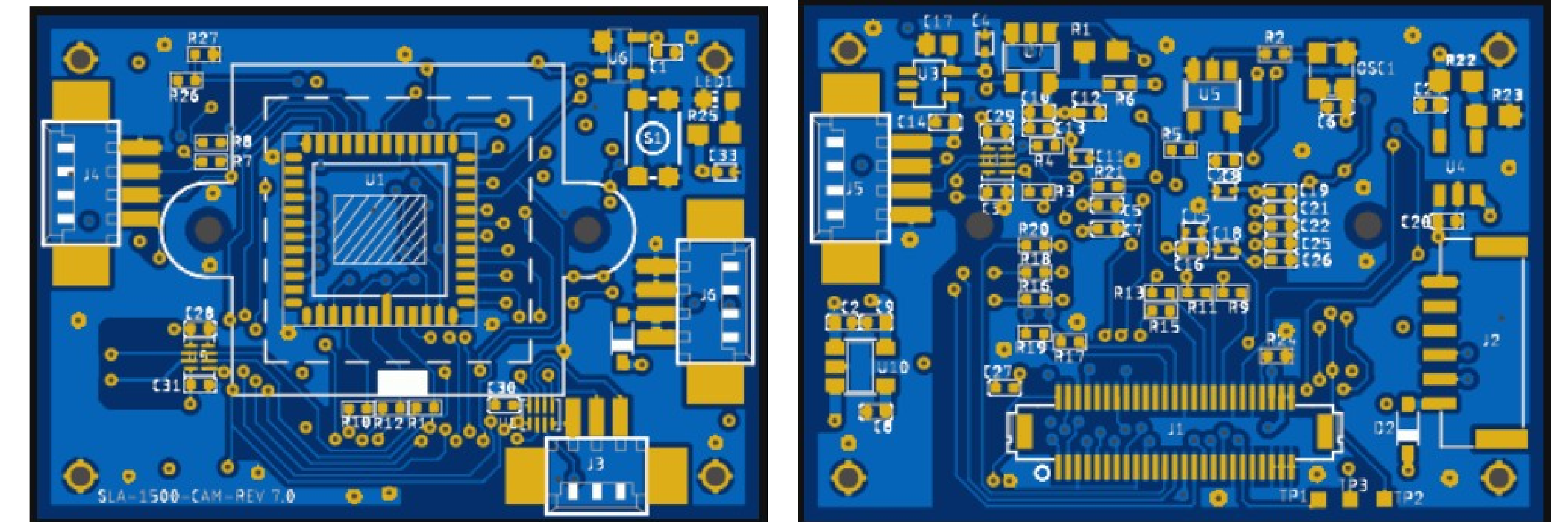
For testing purposes we built a custom quad copter with a Pixhawk4 flight controller.



Using QGroundcontrol software we were able to fly the quad-copter to different way points and land the UAV autonomously via the ground control station.



This was vital to our understanding of UAV operation, and end user experience.



The 1x1.5" SLA1500CAM utilizes the On-Semi AR0134CS a monochrome 1/3-inch 1.2 Mp CMOS digital sensor with a 74MHz output

- ◆ Connects seamlessly with the SightLine SLA1500OEM image processing hardware eliminating a handful of cable, and connectivity issues.
- ◆ With 5V input converts and distributes the 3.3V, 2.8V, and 1.8V required for operation
- ◆ Provides level translation for communication between the SightLine hardware, the flight controller, and the optical sensor
- ◆ Offers additional power and communication I/O

Results

- ◆ Successfully developed the SLA1500CAM
- ◆ Gained insight into communication between QGroundcontrol, Pixhawk4, and SightLine hardware
- ◆ Successfully completed autonomous flight and precision landing with custom quad-copter and QGroundcontrol

Future Developments

- ◆ Compatibility issues remain with QGroundcontrol, SightLine hardware, and Pixhawk4
- ◆ Potentially, a new project will focus on software and communication for a future team that is interested in drone communication protocols
- ◆ With our achievements on this project we believe that full integration of the SLA1500CAM with plug and play capabilities can be achieved