

# Miniature Data Link (MDL) for Micro UAVs



Data links are essential components of unmanned aerial vehicles (UAVs), such as micro drones. For micro UAVs in particular, strict payload limitations demand that onboard datalink systems be extremely compact, lightweight, energy-efficient, and cost-effective. Furthermore, the increasing use of disposable or mission-specific UAVs requires datalinks that are not only high-performing but also cost-effective and scalable. This project focuses on the design and prototyping of a miniature datalink solution tailored specifically to the constraints and operational requirements of micro UAVs.

The primary goal of this project is to design and develop a prototype miniature datalink that is:

- Lightweight ( $\leq 250$  g) and Cost-effective
- Capable of reliable, high-throughput communication over significant distances.

By the end of the project, students will deliver a functional datalink prototype using Commercial-Off-The-Shelf (COTS) components, optimized for integration into micro UAVs.

The MDL design should have the following features:

- **Communication Range:** At least 10 km
- **Operation Frequency:** ISM bands
- **Data Throughput:** Minimum 5 Mbps
- **Weight Constraint:** Entire datalink system on the UAV must weigh no more than 250 g
- **Operation Duration:** Should support at least 5 minute long operations
- **Computer-aided user interface (UI):** Develop a UI for real-time monitoring and control of the datalink.

Some possible extra features of the design can be the following:

- Enable the transmission of live video data over the link.