Testing Presentation (Group 9)

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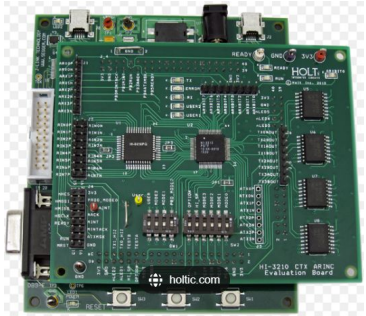
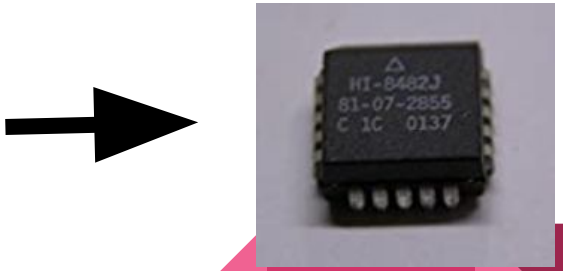
Problem Statement

Currently in order to read Arinc 429 data there is a need for a bulky and expensive data receiver and transmitter. We will be altering a size and cost-effective bus reader to meet a variety of requirements so it can be used in the avionics industry and replace the bulky and expensive one.

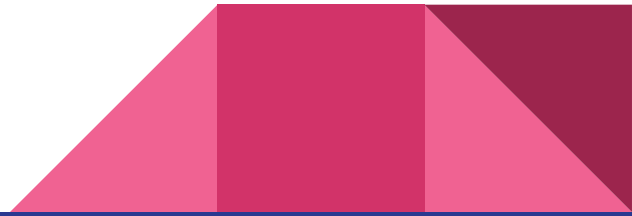
- ESP32S3
  - Primary Substitute
- Flutter Application
  - Debug and User App





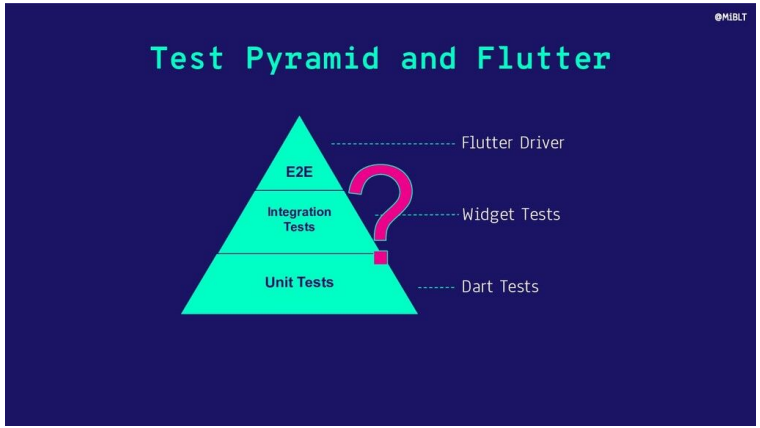
Testing (Introduction)

- Break down the process into several steps
- Test different components individually, interfaces, and integration
- Test qualities from broad and specific perspectives
- Hope to cover all bases and gain a better understanding of the system
- Most difficult challenges will be incorporating BLE and testing firmware and Flutter



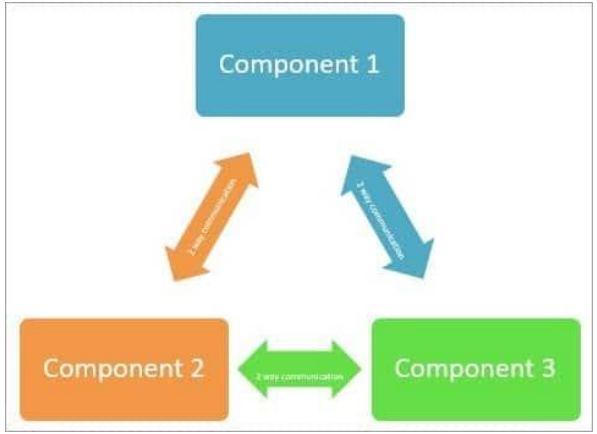
Unit Testing

- We will be using Mockito and the built-in Flutter testing framework for all of our Flutter components
  - ex.) Converter, Label Handler
- We be using the built-in ESP-IDF testing framework (Unity) for firmware testing



Interface Testing

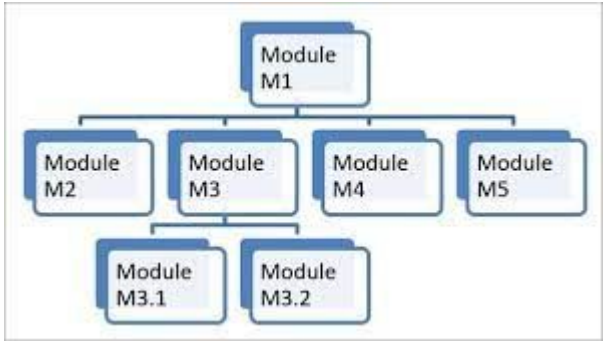
- Flutter GUI
  - Flutter’s built-in support
    - Ensure information is passed correctly
    - GUI elements are behaving appropriately



- Flutter & ESP32 BLE Interfacing
  - Flutter and ESP-IDF
    - Validating before transmission
    - Validating after transmission

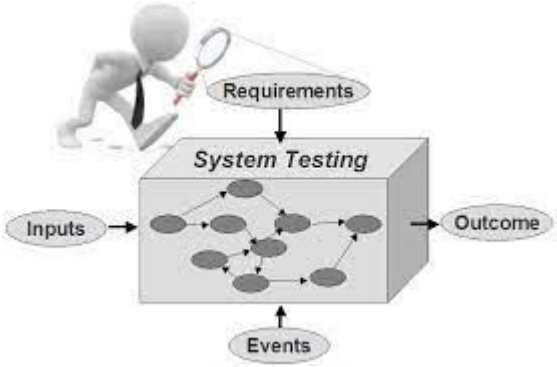
Integration Testing

- We will be using increment testing
- There should be little roadblocks if we are using this method
- To integrate the Flutter App and the ESP chip, we will be testing if the BLE is sending the correct values



System Testing

- We will be using both the built-in ESP-IDF and Flutter testing for system testing.
- This is because inputs are coming from both the ESP32S3 and the Flutter Application

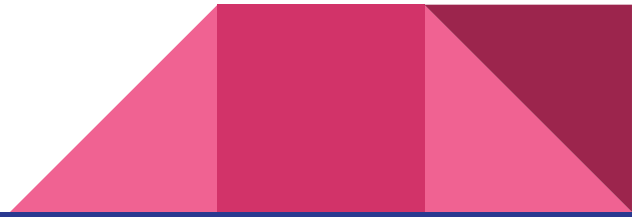


Regression Testing

- Check dependencies or functions needed to implement new additions to flutter application
- See control flow of functions needed by new additions
- Check new changes to app functionality and how they affect program output
- Test new additions by each new code individually without dependencies
- Partially test new flutter app code as new additions are built
- Ensure all bits from the Arinc429 are correctly converted to receive the correct information
- Incorrect output information on the app could mislead field engineers
- Check BLE is still working to send data on microcontroller and receive data on flutter application

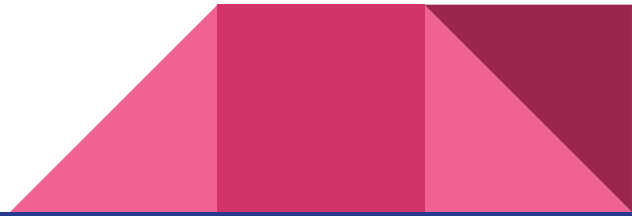
Acceptance Testing

- Demonstrate functionality in development environments to the client
- Will show testing on ESP32 over BLE to an Android phone



Security Testing

- BLE Security
  - Protecting the information being transmitted
  - Protecting access of BLE connection
  - Ensuring received information is vetted



Results

- No results at this time