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| Project:  WP Name: Electronics Test Report  WP Number:WP-PL-03 | Type of Test:  Inspection | Test Procedure:  Power Autopilot Analyse Results |
| Test Article:  Electronics | Part Number:  - | Serial Number:  - |
| Test Specification:  Electronics Acceptance Test | Test Equipment:  Power supply, Autopilot | |
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**Test Summary**

The AHNS autopilot system has a hardware layer integral to its operation. Without a functional hardware platform, no system control code can be tested or progress made.

The test revolves around connecting the autopilot to a bench to a power supply and ensuring all components are functioning correctly. This includes all logic devices and sensors.

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# Test Objectives

Table - Test Objectives

|  |  |
| --- | --- |
| Objective | Criteria |
| Main Power On | Main power LED illuminated. |
| Overo Power On | All power related LEDs on the Overo are illuminated. |
| Arduino Power On | All power related LEDs on the Arduino are illuminated. |
| IMU Power On | Data observed on the oscilloscope . |
| MCU Power On | Mode Indicator illuminates. |
| Compass Power On | Data observed on the oscilloscope. |
| Level Shifter Power On | Data observed on the oscilloscope. |
| Overo Communication and Function | Communication can be established with the Overo and response to commands are observed. |
| Arduino Communication and Function | Communication can be established with the Arduino and response to commands are observed. |
| IMU Communication and Function | Communication can be established with the IMU and measurements can be observed. |
| MCU Communication and Function | Communication can be established with the MCU, pulse captures and outputs all observed. |
| Compass Communication and Function | Communication can be established with the Compass and measurements can be observed. |

# Test Set-up & Equipment

The test will be conducted with the following equipment

* Lab PSU
  + Set to 5 volts
* Multimeter
  + Set to volts
* Autopilot board
  + With all modules mounted
* Heliconnect router
* Linux Laptop
  + With WiFi enabled

All testing was carried out on an antistatic mat.

# Procedure

1. Clear work area on antistatic mat.
2. Set power supply to 5 volts and ensure current limiter is set to 1 amp.
3. Remove all modules.
4. Connect power supply to autopilot and power on.
5. Ensure power LED illuminates.
6. Repeat steps (4) and (5) with all modules individually.
7. Power on system with all modules installed
8. Connect to autopilot via WiFi and establish communication
9. Verify data is assessable from all modules.
10. Verify data from modules is not corrupted

# Results

Table - Test Results

|  |  |  |
| --- | --- | --- |
| Objective | Criteria | Results |
| Main Power On | Main power LED illuminated. | **Pass** |
| Overo Power On | All power related LEDs on the Overo are illuminated. | **Pass** |
| Arduino Power On | All power related LEDs on the Arduino are illuminated. | **Pass** |
| IMU Power On | Data observed on the oscilloscope . | **Pass** |
| MCU Power On | Mode Indicator illuminates. | **Pass** |
| Compass Power On | Data observed on the oscilloscope. | **Pass** |
| Level Shifter Power On | Data observed on the oscilloscope. | **Pass** |
| Overo Communication and Function | Communication can be established with the Overo and response to commands are observed. | **Pass** |
| Arduino Communication and Function | Communication can be established with the Arduino and response to commands are observed. | **Pass** |
| IMU Communication and Function | Communication can be established with the IMU and measurements can be observed. | **Pass** |
| MCU Communication and Function | Communication can be established with the MCU, pulse captures and outputs all observed. | **Pass** |
| Compass Communication and Function | Communication can be established with the Compass and measurements can be observed. | **Pass** |

# Analysis

It was found that the entire system performed as required. All modules can be powered together and communication could be established.

It was observed that intermittently the IMU did not function correctly. It would not start up on some instances. This could be due to noise on the voltage rail and a larger decoupling capacitor should be added.

# Conclusions

The test was successful and verified the functionality and integrity of the system. The IMU intermittently failed to initialise. The current draw that was observed is as expected and it can be concluded that there are no short circuits in the system

# Recommendations

The hardware should integrated into the airframe and used further in the project.