

# Testing Procedures

## Distributed Fence Vibration Monitor System

Version 1.0

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# 1 Acceptance Tests

## 1.1 Purpose

The purpose of these tests is to verify conformance to the design. All tests will be performed indoors in a lab unless specified otherwise.

## 1.2 Test Requirements Matrix

| Requirments | ES-1 | ES-2 | TS-3 | TS-4 | TS-5 | TS-6 | TS-7 | TS-8 | TS-9 | TS-10 | TS-11 | TS-12 | TS-13 | TS-14 | TS-15 |
|-------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| Test Case   |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-1        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-2        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-3        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-4        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-5        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-6        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-7        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-8        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-9        |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-10       |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-11       |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-12       |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |
| TC-13       |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |

## 1.3 Required Equipment (will update with actual product names)

- a) Power Supply
- b) Oscilloscope
- c) Tektronix TCP2020
- d) Multimeter
- e) Jumper Wires

Commented [BB1]: Current probe is "Tektronix TCP2020". In this section maybe note the precision required

#### 1.4 Test Setup (MKR1310)

- a) Set the power supply to 6 volts.
- b) Connect a current probe to one of the oscilloscopes channels and put the probe around the positive lead.
- c) Connect another oscilloscope probe to pin six, the indicator pin, of the MKR1310.
- d) Degauss the current probe.
- e) Connect the power supply to the microcontroller.
- f) Run test\_2.cpp to cycle through all levels of transmission power.
- g) Measure the current draw for each of the different transmission powers 17 in total.
- h) Repeat steps a through f for the remaining microcontrollers.
- i) Verify that the measured data is what was expected, which should be different peaks for each transmission strength.

**Commented [BB2]:** Maybe make note that this is the "indicator" pin

**Commented [BB3]:** Before this step, degauss/zero the probe

**Commented [BB4]:** The test file is called test\_2.cpp. test\_power is the Matlab script

**Commented [BB5]:** Combine with step E? and make note of setting the window on the scope, etc

**Commented [BB6]:** (a peak for each transmission strength)

#### 1.5 Test Setup (Accelerometer)

- a) Set the power supply to 3.3 volts.
- b) Attach the power supply to the accelerometer.
- c) Record the measured current value.
- d) Verify that the measured data is what was expected for each sensor.

#### 1.6 Test Setup (Lithium Battery)

- a) Probe the battery leads with the multimeter.
- b) Measure both voltage and current from the battery.
- c) Verify that they are correct for each battery.

#### 1.7 Test Setup (Software)

## 2 Environmental Tests

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### 2.1 Purpose

The purpose of these tests are to ensure that the environment will not be an issue when the finish product is put into service.

### 2.2 Test Setup (Casing)

#### 2.2.1. IP6X

- a) Fill a bucket with sand.
- b) Attach module to a fence.
- c) Check the inside of the enclosure for any dust.

#### 2.2.2. IPX6

- a) Get a hose with an internal nozzle diameter of 12.5mm and a flowrate of 100 l/min.
- b) Spray the enclosure from 3m away for 3 minutes.
- c) Check the inside of the enclosure for any water.

#### 2.2.3. Heat

- a) Put in thermal chamber at 50°C(122°F)

## 3 References

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Lets do references in IEEE format. Use word's built in manager