The BYTE

Sensor Pack Testing Procedure

Instructions for manually testing the sensor pack and adjusting the preload force.
[For production quantities an automated testing procedure will be developed]

The sensor pack should be adjusted for optimum performance and thoroughly tested before final assembly into the silicone enclosure and sealing against moisture ingress.

Required Equipment:

- Jumper Wires
- Bench Power Supply
- Multimeter
- RJ-45 Breakout board
  Example part: https://www.amazon.com/gp/product/B0156JXSF8

Setup:

1. Set power supply to 3.3V
2. Configure multimeter for resistance measurement
3. Attach RJ-45 breakout board to the unit under test

Procedure:

1. Confirm the cable latch is functional and properly engaged
    a. Visually inspect
    b. Lightly pull and wiggle the cable to ensure a good connection
2. Test the haptic actuator
    a. Measure the resistance between pins 7 and 8
        i. The resistance should be approximately 50 ohms
    b. Using jumper wires briefly connect the power supply (3.3V) to pins 7 and 8
        i. Confirm the haptic actuator vibrates, and remains securely adhered.
3. Test the bite force sensor
    a. Measure the resistance between pins 1 and 2
        i. The resistance should be >= 10k ohms
    b. Squeeze the bite force sensor between the thumb and forefinger while monitoring the resistance.
        i. Confirm the resistance varies smoothly in response to squeeze pressure
        ii. The resistance should be approximately 500 ohms when squeezed firmly
4. Initial nav-button sensor test
    a. Lightly tighten the preload screw (finger tight)

b. Test upper right quadrant
    i. Measure unloaded resistance between pins 6 and 7
    ii. Confirm the resistance is between 30k and 100k ohms
    iii. Press the upper left of the nav-button while monitoring the resistance
    iv. Confirm the resistance decreases smoothly with the applied pressure
    v. The resistance should be approximately 500 ohms while squeezed firmly
c. Test upper left quadrant
    i. Measure unloaded resistance between pins 5 and 7
    ii. Confirm the resistance is between 30k and 100k ohms
    iii. Press the upper left of the nav-button while monitoring the resistance
    iv. Confirm the resistance decreases smoothly with the applied pressure
    v. The resistance should be approximately 500 ohms while squeezed firmly
d. Test lower right quadrant
    i. Measure unloaded resistance between pins 4 and 7
    ii. Confirm the resistance is between 30k and 100k ohms
    iii. Press the upper left of the nav-button while monitoring the resistance
    iv. Confirm the resistance decreases smoothly with the applied pressure
    v. The resistance should be approximately 500 ohms while squeezed firmly
e. Test lower left quadrant
    i. Measure unloaded resistance between pins 3 and 7
    ii. Confirm the resistance is between 30k and 100k ohms
    iii. Press the upper left of the nav-button while monitoring the resistance
    iv. Confirm the resistance decreases smoothly with the applied pressure
    v. The resistance should be approximately 500 ohms while squeezed firmly
f. Confirm that all four sensor zones respond similarly and there are no outliers

5. Adjust nav-sensor preload force
    a. Remove the preload screw and apply a small drop of red threadlock near the tip
    b. Re-install the preload screw and lightly tighten (finger tight)
    c. Attach the multimeter to pins 3 and 6
    d. While monitoring the resistance adjust the screw until the multimeter shows approximately 60k ohms.