# netClé 1.0 Hardware Testing Procedures

This document describes the testing procedures to be used after a new board is burned. These are designed to test that the board is functioning correctly.

## Load Test Software

Bring up the sensact/arduino/Test Code/SensActTesting sketch in the arduino IDE and load it.

Make sure this is the version with the following line in the header:

Update: For V4.1 Hardware.

Open the serial connection and enter ‘h’ (the help command). You should see:

Help

'o' + 'a' or 'b. Turns on an output port.

'o0' (o + zero) Turns all outputs off.

'l' + 'r', 'g' or 'b'. Sets the color of the LED.

'l0' Turns the LED off.

'b' Sounds the buzzer.

'r' Reads the value of all input pins.

repeating until another command is entered.

Output is lines of 6 digits, giving the values for the 6 inputs.

'g' Reads I2C Gyroscope.

'L' Blinks lights on the light box.

This is an alternate way to test the I2C connection

't' Runs the TV IR. On/Off cycling every 1/4 second for two seconds.

Watch with a cell phone camera or with a multi-tester.

This verifies that the test software is loaded.

## Testing the LED

Test the LED colors.

‘lg’ should turn it green

‘lr’ should turn it red

‘lb’ should turn it blue.

If you do not get the colors expected one or more of your LED connections are bad or the LED is defective.

## Testing Input Lines

Plug a joy stick into the jack labelled ‘INPUT-1’

Enter the command ‘r’.

The value of all six inputs will be displayed repeatedly with INPUT-1 on the left.

The value produced by a centered joystick should be somewhere between 350 and 450.

For example, if the joystick is plugged into INPUT-1 you should see something like:

0356 0377 0000 0000 0000 0000

As you move the joystick on one axis (which will depend on how it was wired) a value should go from near 0 at one extreme to over 800 at the other. Test both axis.

Now connect the joystick to INPUT-2. You should values similar to this:

0000 0000 0387 0356 0000 0000

Test both axis as for INPUT-1.

Repeat with INPUT-3.

Ports with nothing connected to them should show exactly 0000 and nothing else.

## Testing the pull down resistors

Plug a simple switch into each input using a TASH switch adapter.

A TASH switch adapter connects one of the connections on a TASH switch to VCC on the Senact port and connects the other to one of the two input lines on the port. DO NOT plug a TASH switch directly input a Sensact port. This will short ground and VCC and may damage the board or the Leonardo.

Note that the TASH switch adapter for V3 connected the switch to ground, and not VCC. This will not work for V4.1.

Follow the procedure for testing input lines above.

The value reported should be near 0 when the switch is open and near 1000 when it is closed. If the value of the open switch is not near zero there may be a connection problem with the corresponding pull-down resistor.

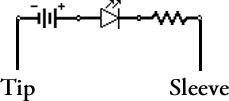
All open switches and unconnected inputs should show values of exactly 0000.

## Buzzer test

The command ‘b’ should sound the buzzer.

## Output (relay) Test

For this test you need a circuit similar to the one used for the testing power to the input jacks, but with an independent power supply. The circuit should look like this:



For power I generally take 5V power from an Arduino, but any low voltage supply should do.

Hook the circuit up to relay jack ‘OUTPUT-A’ and type the command ‘oa’. The LED should light. Plug into jack ‘OUTPUT-B’ and type the command ‘ob’. The LED should light.

## Gyro Test

Plug a gyro chip into the I2C port.

Then enter the ‘g’ command.

This will initialize the gyro correctly on the I2C port.

The reported Gyro values will be displayed. You can manipulate the gyro, re-enter the ‘g’ command and see if the accelerometer values change as expected. It should be easy to test the ‘Accel X’ and ‘Accel Y’ values and to see that the other values are at least reasonable.

The Lightbox Test – below – also tests the I2C connection and is much easier to run.

## Lightbox Test

Connect a light box to the I2C output.

Then enter the ‘L’ command.

Each light should shine for about 1/4 second.

This test can be used instead of the gyro test, to test the I2C connection.

## IR LED Test

Using a smartphone camera point it directly at the IR LED and enter the ‘t’ command.

With most smartphone camera’s (except the better ones!) you will be able to see the LED flash on and off several times.

This shows that the LED is connected correctly. The test code switches the LED on and off rapidly for a short time. The test is design to last long enough to generate a visible signal without driving the LED too hard and burning it out.