

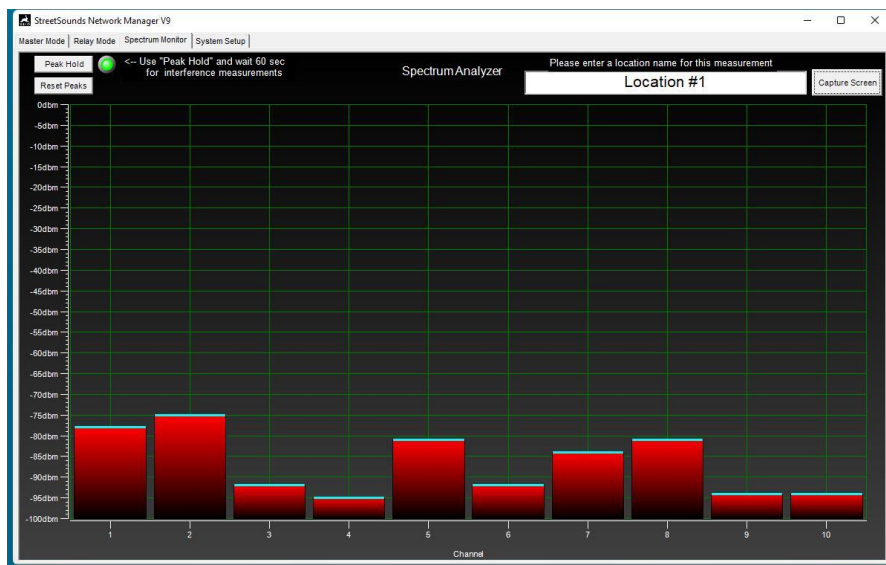


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StreetSounds®

Interference Testing Guide

V5 March 2023





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Interference Testing

Local radio interference can cause audio dropouts and control issues for the StreetSounds network. In many cases some level of interference can be tolerated due to the redundancy and diversity of the radio design. However, there can be locations that have interference that cannot be overcome by radio placement, antennas, and repeaters. It is best to do the following measurements prior to full deployment so that the level of local interference can be understood ahead of time.

Below is a photo of the test kit. It includes a “NANO” Transceiver, one antenna, and a USB cable for connecting the NANO Master to a laptop.





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Spectrum Monitor Testing

The “Spectrum Monitor” interference test is performed by using a NANO Transceiver in conjunction with the Network Management System (NMS) application running on a Windows-based laptop.

The preferred method of measurement is to place the NANO Transceiver on the dashboard of your car with the NMS laptop in the seat next to you connected by a USB cable. Tests should be run at various points up and down your desired area of coverage (every block or so) and the results captured for analysis. If the city has an “AMI” or “Smart Meter” reading system (electric or water) that operates in the 900 MHz spectrum, it will cause some level of interference. If there are banks nearby (notorious for interference) make sure to take a reading near the bank(s). After each reading, take a snapshot of the screen with your phone, or capture the NMS screen on your laptop. Make a note of your location for each shot. Send the results to AirNetix for analysis.

The following steps should be followed:

1. Create a map of your desired coverage area. Use this map to indicate where each measurement is taken by giving a name to each measurement location.
2. Attach the antenna to either of the two NANO antenna connectors on the rear panel of the NANO. It does not matter which connector is used.
3. Download and install the Network Management System (V9) on a Windows based laptop. Then start the application.
4. Click the “System Setup” tab. Click on the STARX (USB HID) button and set the Product ID to “1010” when using the NANO for testing.

The screenshot shows the 'StreetSounds Network Manager V9' interface. The 'System Setup' tab is active. The 'Configuration Database' table is as follows:

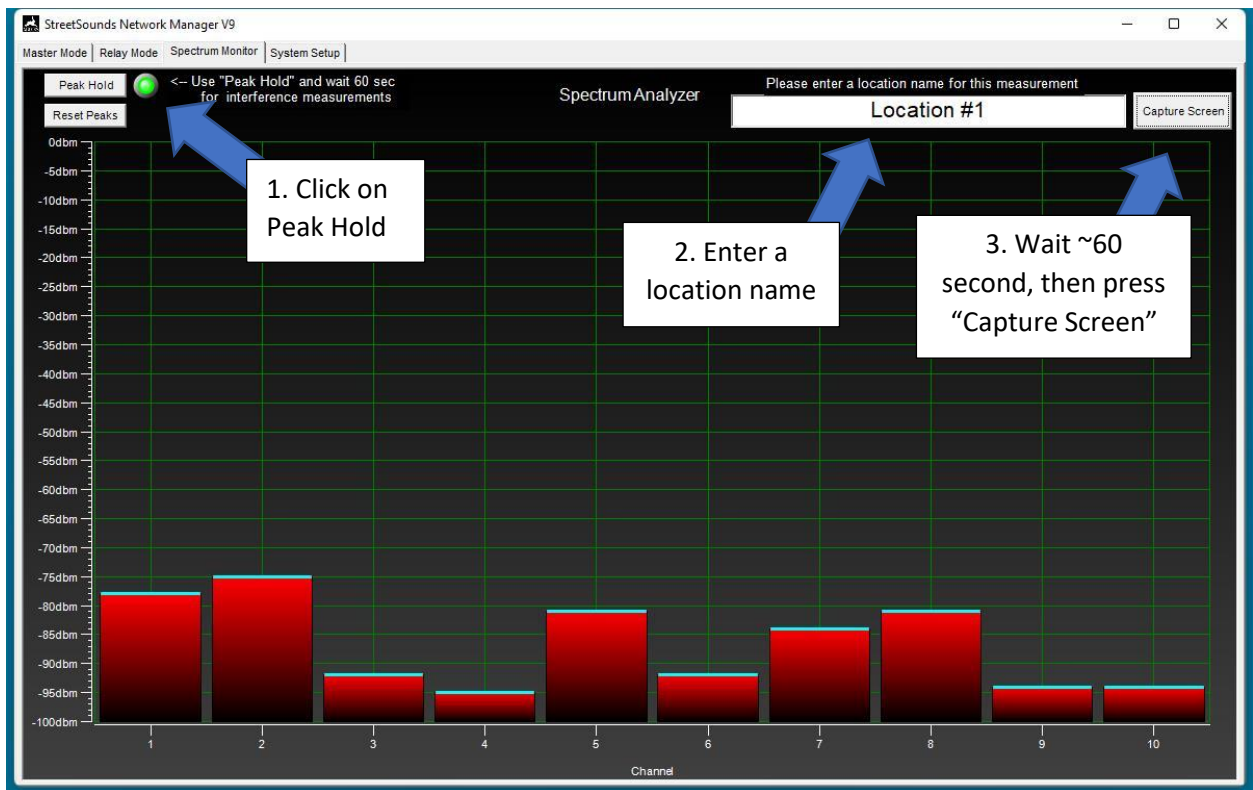
| Alarm | GUID | Location/Description | Z1 | Z2 | Z3 | Z4 | Z5 | Z6 | Gen 1 |
|-------|---------------------|----------------------|----|----|----|----|----|----|-------|
| | 2D00-2200-1750-5636 | Unregistered Node 2 | | | | | | | |
| | 2D00-1B00-1750-5636 | Unregistered Node 3 | | | | | | | |
| | 2E00-1A00-1750-5636 | Unregistered Node 1 | | | | | | | |
| | 2900-2600-1351-3834 | RAMP220 Test | | | | | | | |
| | 3300-3200-0B51-3831 | RAMP270 Test | | | | | | | |
| | 2E00-2000-1750-5636 | RAMP270 PCBA Test | | | | | | | |
| | 1E00-3200-0F50-5631 | Unregistered Node 1 | | | | | | | |
| | 2500-1900-0951-3930 | NANO #2 | | | | | | | |

The 'USB Setup' section is highlighted, showing 'STARX (USB HID)' selected with Vendor ID 29F5 and Product ID 1010. Other sections include Thermal Protection, High/Low Temp Limits, and Local Firmware Upgrade.



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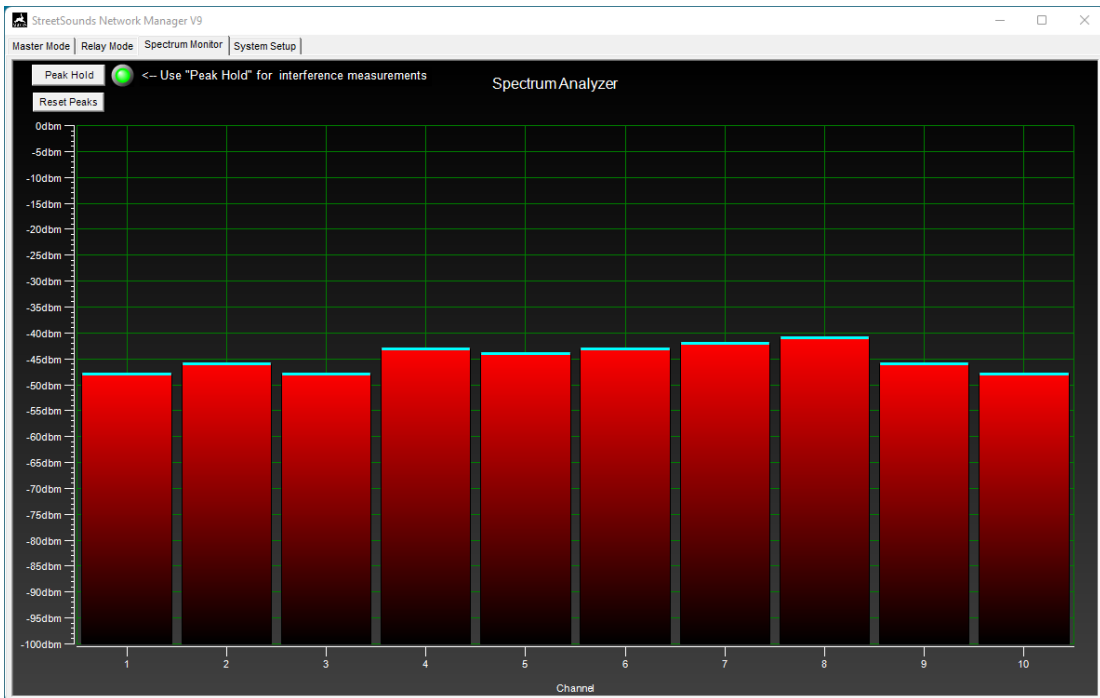
5. Connect the NANO Transceiver to the USB port of your laptop using the long USB cable.
6. Place the NANO Transceiver on the dashboard of your car.
7. Place the laptop in the seat next to you.
8. Click on the “Spectrum Monitor” tab at the top of the NMS application.
9. The NMS will change to the Spectrum Monitor screen (see below).
10. In the Spectrum Monitor window, click on the “Peak Hold” button at the top of the graph. This will allow the Spectrum Monitor to capture short peaks of interference and will give us a worst-case view of what is in the area.
11. Enter a name that represents the location of this measurement (i.e. N Main @ 2nd St.).
12. Wait ~60 seconds, then press Capture Screen. The measurement will be stored automatically on the desktop of your laptop in a folder names “StreetSounds Interference Measurements.
13. Repeat this process for other locations along the coverage area. It is a good idea to click on “Reset Peaks” before each measurements to make sure you are started a fresh measurement.
14. The screen below shows an acceptably low level of interference.





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15. The screen below shows an abnormally high level of interference. This will cause problems.



Once the entire coverage area has been measured, email the measurement folder and map to AirNetix for review.