

Description: Technical report on MD Tunnel – Updated 28/11/2018
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Document Owner MD

1. Overview

The new MD-NEST (Night Environment Simulation Tunnel) from Moshon Data is designed to help engineers develop and test ADAS systems to the official Euro NCAP tests protocol as though it were at night and in darkness.

For the tunnel to be a viable proposition as a suitable night environment, it is necessary for Moshon Data to do some basic tests to prove suitability as an effective night-time environment simulation during daytime.

The first results obtained towards this are very positive indeed.

181128: The results shown below have since been updated to show light readings taken on 23rd January 2018



2. Tests conducted

2.1. GPS coverage

GPS coverage will be a crucial factor in ensuring ADAS and other tests can be conducted reliably and accurately by different kinds of test equipment inside the MD-NEST as though they are at night and in the open sky.

2.2. Lux or luminance inside the tunnel

A level of light confidence is required to show that testing in the dark can be consistently maintained throughout each test conducted inside the tunnel. It is therefore important for us to prove that the level of light inside the tunnel is comparable to an actual night-time event, and consistent as a benchmark standard of darkness.

3. Test process

3.1. GPS coverage test method

An OxTS RT1003 (with GPS+GLONASS enabled) was used inside the tunnel attached to a rucksack, this was then placed inside the tunnel in the centre logging data over a period of 24 mins.

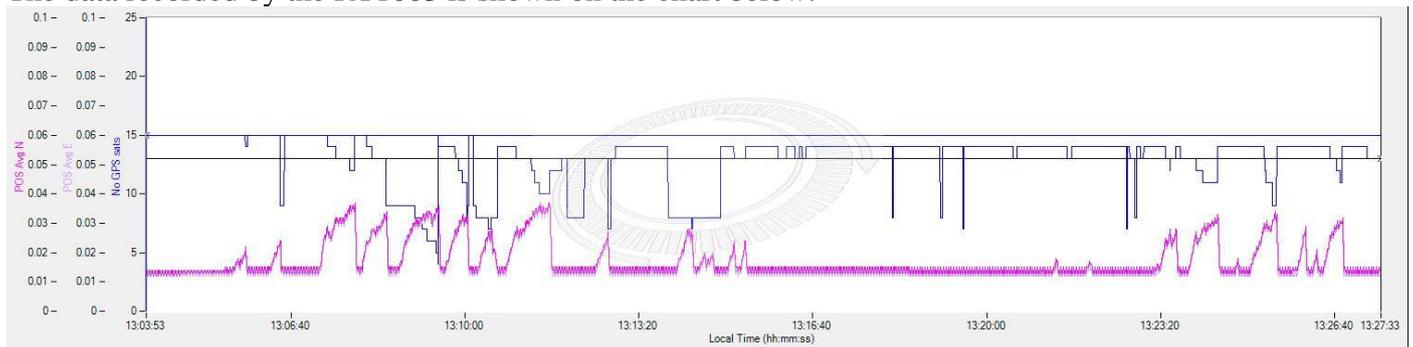
3.2. Lux/luminance test method

A standard Lux light meter was used to record the Lux rating inside the tunnel. This meter measures the luminous flux per unit area and will provide a level of confidence to an engineer that the environmental test conditions are at a similar level of darkness to an actual night-time situation.

4. Results

4.1. GPS results

The data recorded by the RT1003 is shown on the chart below:



Here you can see that the RT1003 attained and maintained 'RTK Integer' at all times while inside the MD tunnel. The system was positioned at the centre for a period of 24 minutes during which time RTK position accuracy averaged 0.0197 m CEP and did not rise above > 0.036 m CEP at any time during the 24-minute period.

The average number of satellites in the 24-minute period was 13. Of this, the minimum number of satellites seen at any time was never less than '4' and when at 4, only lasted for < 1s; The maximum number of satellites seen was 15.

The data was recorded in the Memmingen region of Germany on the 26th June 2017.

4.2. Lux results

The lux rating came out at < 5 lux which is approximately the same as a twilight/deep twilight night environment.

181128: The luminance rating has since been taken again on the 23rd January 2018 during a controlled test session conducted by Moshon Data and is shown to be < 0.8 lux ambient luminance.

5. Conclusion

GPS coverage is a test conducted here to prove that a potentially disruptive test environment is actually a viable test environment.

It's important to note as well that a good, warmed up, dynamic inertial+GNSS system will easily be able to improve on any GPS shortcomings - even if the results were proved to be poor... However, they were not poor...! During our test, the RT1003 maintained RTK integer throughout the entire 24-minute period and results were much better than expected. We believe that with the level of satellites averaging at 13 on the RT1003, the MD tunnel is a very viable proposition as an environment in which to test - even if the system used was GPS+GLONASS only without any inertial integration.

Regarding the light, the Lux rating was found to be < 5 lux. *181128: Now shown to be < 0.8 lux*

We look forward to receiving feedback from engineers as to their test requirements and suitability of the NEST as a night time test environment during the day.

/Moshon Data

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