

Where does the noise come from? Nor1297 Noise Compass

DRAFT

Applications

- Construction site monitoring
- Harbour monitoring
- Airport monitoring
- Road/railway monitoring
- Plant monitoring



One of the greatest challenges whit unattended noise monitoring is to ensure that the monitored site really is the source being measured. What is making the noise? Is it the construction site, a nearby railway or an aircraft?

Norsonic was the first company to introduce sound recording of noise events in a sound level meter. This greatly improved the work to identify a noise event and to judge whether it should be excluded or not from the overall noise level. However, it's quite time consuming to listen through numerous sound recordings. The three-dimensional Nor1297 Noise Compass significantly reduces time spent on judging if a noise source should be a part of the overall noise calculation or not, simply by defining which direction the noise is coming from.

When used together with Norsonic's sound level meters and NorCloud, the device provides a three-dimensional vector pointing at the sound source. The system may also operate off-line and collect the data on the instruments SD card for later analyse in NorReview.

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Using NorCloud's sophisticated trigger capabilities, events may be marked with the source direction. Alarms may be selected for combinations of sound pressure levels and incident angles. Thus, sections of the measurement may be excluded (even automatic) when the source location is outside the region of interest.

Example: Provide an alarm to a user or groups of users when Leq is above 75 dB and sound is coming from the construction site.

Example: Exclude the parts of a measurement which is contaminated by railway noise from the LDEN calculation.

NorCloud provides a map where regions of interest are easily defined. Visualization of sound incident is linked to the regular data presentation. The 3D capability of device will efficiently help to determine aircraft noise from above.

Theory of operation

The Nor1297 uses an array of eight microphones to capture the three-dimensional direction of sound. The loudest (A-weighted) sound source will be detected. A difference of 3 dB required to obtain a stable result.

The Noise Compass data includes a quality indicator to help differentiate between high quality directional information and random incident sound fields. If two sources of same level are present, the quality indicator will indicate random incident sound.

Compatibility

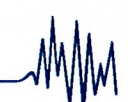
The Nor1297 requires a Nor1545 monitoring station with a Nor145 or a Nor150 as main instrumentation. The Noise Compass fits neatly below any of the Norsonic Nor1216-1218 Outdoor microphones and is compatible with the mechanical fittings designed for these devices. The system is designed to be linked to NorCloud but may also operate off-line and collect the data on the instruments SD card for later analyse in NorReview.

Requirements for operation

The Nor1297 requires free-field conditions to operate. In practice, all outdoor mounting well above ground level will satisfy this requirement, provided there are no significant reflecting surfaces behind, below or above the Noise Compass.

The system is designed for broadband sounds. Pure sinusoidal signals are not suitable for detection. Exponential time-constant weighting is performed to stabilize the output of the signal. Very short (impulsive, non-repeating) signals (< 400 milliseconds) will be indicated poorly.

Heavy rain and wind may affect the measurement due to the noise induced by rain or wind hitting the windscreen.



Specifications

Level range: X dB SPL to x dB SPL

Horizontal range: 0 – 360 degrees

Vertical range: -90 to 90 degrees

Horizontal uncertainty: ± 7.5 degrees, std. dev. typ. ± 2.0 deg

Vertical range: -90 to 90 degrees

Horizontal uncertainty: ± 7.5 degrees, std. dev. typ. ± 2.0 deg

Vertical uncertainty: ± 10 degrees, std. dev. typ. ± 4.0 deg

Ingress Protection Category: IP55

Interface: Ethernet 100 mbit/s (RJ45)

Power supply: Proprietary power over ethernet, Nor1545

Electronic compass: Yes, automatic detection of device orientation

Temperature sensor: Yes

Windscreen: Yes

Mounting: Compatible with Norsonic’s outdoor microphone mounting accessories

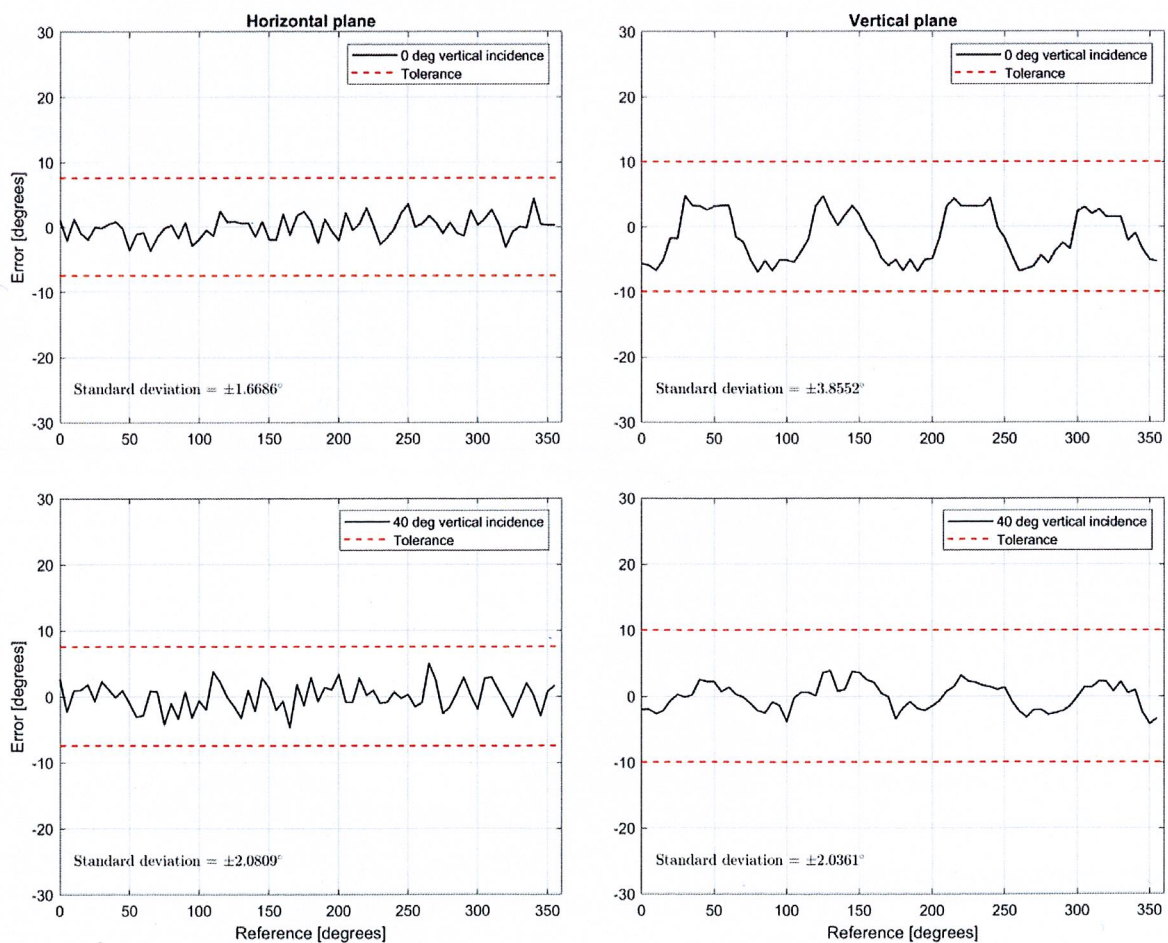


Figure 1: Typical performance and measurement uncertainty

