

Nox SAS - Scoring Commentary Summary

The Nox SAS solution will be familiar to physicians and technicians experienced with the AASM rules for sleep analysis, and these guidelines can be broadly followed with a few considerations.

Nox SAS Solution Compared to Conventional PSG:

- » Nox SAS features frontal-only EEG.
- » Nox SAS uses EOG instead of mastoid (M1 & M2) references.
- » Nox SAS EMG is derived from the EOG channels on the forehead (frontalis muscle) rather than the conventional chin EMG.

Nox SAS Analysis Considerations:

- » Nox SAS sleep data can look both familiar and slightly different depending on the epoch. Feedback from the field recommends scrolling through a few studies to familiarise yourself with the sleep stage patterns of Nox SAS before staging in detail.
- » The EEG signals available for analysis are frontal only, which means no occipital or central channels. Adjust analysis habits based on this change compared to the AASM standard configuration. The most important consideration is that occipital channels are not present for sleep onset and arousal length scoring. This analysis can be performed with ease from the frontal EEG with proper consideration.

Conventional AASM - EEG

- » 8 EEG channels
- » 2 EOG channels
- » 2 EMG chin channels



Nox SAS - Frontal EEG

- » 9 channels
- » Recording EEG and EOG (incl. EMG measures)



- » Nox SAS EEG features lower amplitude and power compared to conventional PSG. The Nox Medical team has developed a frontal filter (Noxturnal 6.3.2) that amplifies waveforms in the analysis range. If not using the frontal filter, adjust your expectations for sleep staging based on amplitude (e.g. N3)¹. It is recommended to scroll through the study and familiarise yourself with the pattern of the different sleep stages.
- » Nox SAS PSG can introduce eye movement into the EEG due to the reference system. This EOG could be misinterpreted for sleep physiology if not considered in context. A standard solution is to adjust the low-frequency filter when required to reduce the EOG bleed or sway artefact. When analysing Nox SAS studies, be careful not to mistake slow eyes movements for delta waves and REMs for N2 waveforms.
- » Feedback from the field suggests Nox SAS EMG derived from EOG is not as responsive to changes in sleep stage (e.g. REM atonia). REM staging and arousals should not be based solely on the EMG. Other REM physiology should be taken into consideration. If you have difficulty staging REM, work backwards from a definitive epoch.

With these points, the scoring of Nox SAS studies is expected to have a quick adaptation period and can be scored with the same rules as the AASM Manual for the Scoring of Sleep and Associated Events (Version 3, Feb 2023). What follows is a detailed discussion of the points mentioned above and the considerations for scoring with the established AASM rules.

¹ S. Kainulainen et al., "Comparison of EEG Signal Characteristics Between Polysomnography and Self Applied Somnography Setup in a Pediatric Cohort," in IEEE Access, vol. 9, pp. 110916-110926, 2021, doi: 10.1109/ACCESS.2021.3099987.

