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handheld

Keeping Drivers Alert Behind the Wheel

Fatigue Management on Long, Lonely Stretches of Road



Early Warning Drowsiness Detection System

Studies have shown that drivers falling asleep or driving drowsy is a major cause of vehicle accidents; in fact, sleepiness can be as dangerous as inebriation. Although drowsiness whilst driving can occur at any time, this is of special concern to those who drive long distances at a stretch, when weariness can creep in without the driver's notice.

Through its specialised glasses, software and new Eagle Light product based on the **Nautiz X2** ultra-rugged handheld, Optalert offers an early-warning drowsiness detection solution to a variety of users,

including companies with field engineers who service telecommunications infrastructure in rural and remote parts of Australia.

Based on Scientific Sleep Research and Clinical Trials

During his 40 years as a clinician, Dr Murray Johns – a world-renowned authority on sleep medicine – developed a special interest in the state of drowsiness and its associated dangers for people whose very lives depend on staying awake at the appropriate time. His 40-year passion for solving the problem of drowsiness led to him developing the world's first and only technology capable of detecting drowsiness



and alertness in real-time using the 10-point Johns Drowsiness Scale (JDS) named after him.

How Does It Work?

A driver climbs into their vehicle, and puts on the lightweight, wireless glasses. The specialised glasses quickly and easily connect via Bluetooth to the Nautiz X2 unit mounted in the cab.

Optalert's drowsiness detection glasses work by measuring the velocity of the operator's eyelid movement 500 times a second using a tiny invisible LED built into the frame of the glasses. Two key measurements essentially measure how fast and how far a person opens their eyelid after they close it.

Wi-Fi and cellular communications transmit driver status information back to Optalert's cloud-based monitoring and reporting system; Optalert tags each event generated by the system in the field with GPS coordinates so that system and drowsiness information can be plotted geospatially.

The eyelid measurement from the glasses is translated into a score measured on the 10-point JDS, which the driver sees displayed in real-time on the Nautiz X2

ultra-rugged handheld. The system provides both visual and audible warnings to the user when their drowsiness levels reach certain pre-determined levels. This allows them to recognise fatigue and increasing risk, and take breaks during their journey to continue keeping drivers alert and avoid causing accidents.

Confidence in Upgrading Its Product to the Robust and Reliable Nautiz X2

Optalert switched to the rugged Nautiz X2 after first using a consumer-based, non-ruggedised handset as the hardware platform for its product. While the initial handset was small and lightweight as was required, Optalert found it did not support a key customer need: it was not robust enough for the environments in which it was being used. With the change to the Nautiz X2, users indicated that it was a "huge improvement" over the previous product, with quotes like "far exceeds" and "miles better – factor of 100s of percent".

Chris Hocking, Optalert Product Manager, also appreciated that the customised operating system and firmware provided by Handheld for the Nautiz X2 device means the Eagle Light product "automatically starts up and shuts down when the vehicle ignition is turned on and off, and it quickly connects to Optalert's





wireless glasses. This minimises physical actions required by the user, so that the driver can simply get in the vehicle, activate their glasses, and drive.”

Long-Distance Co-ordination

Chris Hocking also noted that Handheld was “a pleasure to work with, providing conscientious and timely assistance and support, and easy, long-distance collaboration between Australia and Sweden (even during a global pandemic!). These were exactly the qualities Optalert was looking for in choosing a new hardware vendor and development partner.”

Current and Future Uses in Harsh Conditions

Other beneficiaries of this technological solution are researchers investigating drowsiness levels during on-road driving experiments, and the mining industry for use in light vehicles used by mine supervisors and managers at a mine site or between sites of operation.

Both the remote Australian roads and mining environments can be very harsh, with extremes of temperature and humidity and high levels of dust and vibration. In the field, the devices can withstand temperatures below freezing at night (in high desert areas of South America), or cabin temperatures over 50°C (in East Africa).

Humidity levels likewise range from very low (desert) or very high (jungle mining environments in South East Asia). The mining environment in particular is very dirty and dusty, even inside vehicle cabins. Additionally, the Nautiz X2 weathers high vibration levels, as well as the bumps and knocks of vehicles operating on rough haul roads and corrugated dirt roads.

Safe Travels

As Optalert points out, “Accidents happen in the blink of an eye.” Its specialised glasses, software, scientifically-validated drowsiness scale, and the Nautiz X2 ultra-rugged handheld combine to ensure eyes stay open and drivers stay alert on the drive.

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