SMART CAP

www.smartcap.com.au

Operator Fatigue Monitoring System

What is the SmartCap?

Operator/driver fatigue is responsible for significant injuries and losses in a number of industries throughout the world. The SmartCap is a fatigue measurement and monitoring tool for vehicle drivers or operators of heavy equipment that provides real-time measurements of fatigue, which can be used to dramatically reduce the occurrence of serious and minor safety incidents.

The SmartCap, a baseball cap containing sophisticated sensors concealed in the cap lining, uses an operator's brain wave (EEG) information to calculate a measure of drowsiness, which is wirelessly communicated to a display in-cab, or to any Bluetooth enabled device. This has been made possible by the development of small sensors capable of reading EEG through hair, without the need for any scalp preparation. With the look and feel of a typical baseball cap, it is expected that the SmartCap will overcome the operator acceptance problems experienced by sites that in the past have implemented camera or response based technologies.

How does the SmartCap work?

The SmartCap processes brain wave information and determines the wearer's level of alertness every second. Confirmed alertness/fatigue information is displayed to the user on a fixed or mobile Bluetooth enabled device such as a mobile phone, PDA, or on a slimline or industrial SmartCap touch screen display.

If no confirmed level of fatigue is established within any two-minute period, the display is updated letting the operator know that their fatigue level is unknown. During this time, the System continues to function and reports a confirmed level of fatigue as soon as it is established.

The accuracy of the fatigue measurements has been independently validated by Monash University and the Austin Hospital in Melbourne. The SmartCap has been medically certified to provide reassurance that it is safe to wear.

The System is also capable of determining when the cap is not in use (not being worn on the head), but still connected by Bluetooth to the display (e.g. on the seat beside the driver, or resting on the drivers lap). Within 15 seconds, the System status is changed to "cap off".

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the SmartCap is a fatigue measurement and management tool for vehicle drivers or operators of heavy equipment, and is designed to provide real-time measurements of fatigue

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Can the SmartCap be used outside the mining industry?

Yes. The Australian mining industry supported the development of the SmartCap technology as part of a continued effort to improve the safety of their employees; however it can be used in any setting where an individual can wear a baseball cap.

Examples of non-mining applications include highway truck drivers, train drivers, bus drivers, loading-dock crane operators and marine pilots.

How do I use the SmartCap?

The SmartCap is worn like a typical baseball cap. Operators are provided with their own, low-cost caps that contain basic electronics concealed in the cap lining. The core electronics are contained in a card-like package that may be inserted in a connector on the underside of the brim, or docked in the base unit for testing and recharging. Drivers keep their own cap with them (as with their hardhat), and insert a card into the brim of their cap once inside the cab.

The base unit is capable of holding and recharging up to three cards (known as SmartCap Fatigue Processors), and will be mountable either on or under the dashboard area, or in an overhead position similar to some two-way radio consoles. Three cards are kept in the truck to provide double redundancy in the event of system faults, flat batteries, or operators accidently taking the cards out of the truck after shift. Rear connectors allow connection to a back to base system, and allow in-cab diagnostics to be conducted.

Connected to this base unit is a remote display, similar in size to a typical GPS display in passenger cars. This display provides real time information to the operator, and relays visual and audio alarms if specific fatigue criteria are met. The remote display can be used without a base unit as a fatigue monitoring solution in light vehicles or other plant in which redundancy is not required.

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Hardware

SmartCap Display


SmartCap Fatigue Processor


SmartCap Base Unit

What if I have to wear a hardhat? Can I still use the SmartCap?

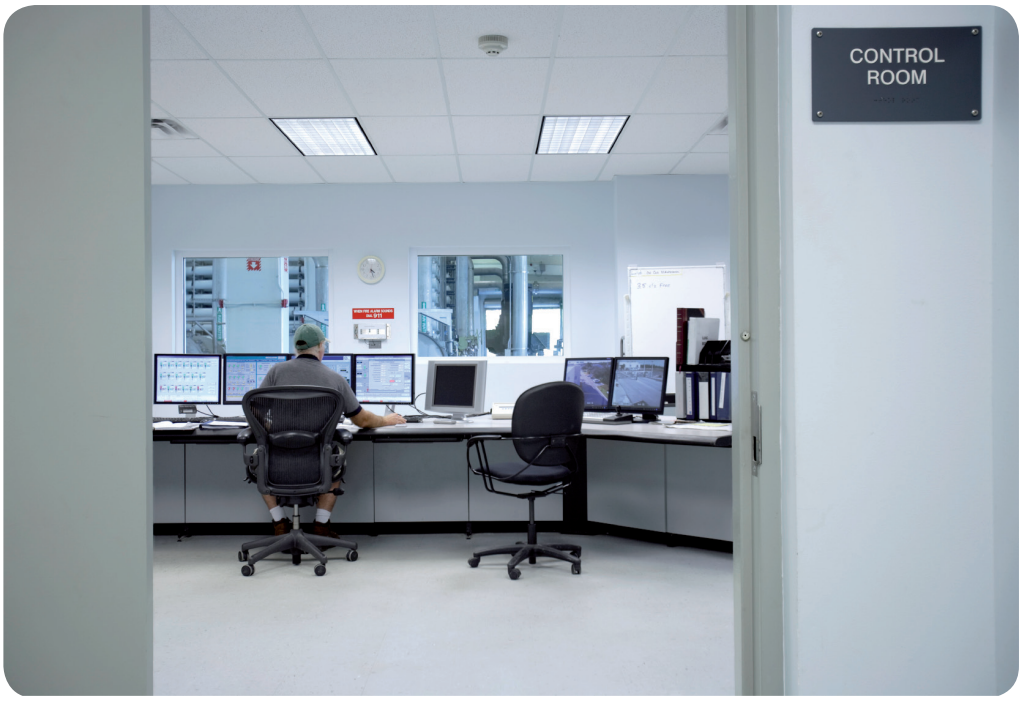
Hardhats are an important part of your personal protective equipment (PPE) and should always be used as directed. As such, you should never wear a SmartCap or any other headwear underneath your hardhat. If your operating environment allows you to work without a hardhat (e.g. inside the operators cab of an excavator or haul truck), you can certainly use the SmartCap but should always wear a hardhat whenever required.

We understand the need for real-time fatigue management for personnel that work in environments where hardhats are mandatory, and have developed a prototype hard hat that has tested well. Work is continuing on testing and recertification of this version.

Can fatigue be centrally monitored using the SmartCap?

Yes. Both the SmartCap Display and the Base Unit provide standard serial connections to most remote monitoring systems. When used in combination with the SmartCap Fatigue Manager Server, operations can effectively monitor the fatigue information of an entire fleet of SmartCap users in real-time.

The Fatigue Manager supervisor interface delivers audible and visual fatigue alarms based on site-specific criteria. It also allows review of single and multiple shift fatigue histories of individual users and also the remote customisation of various fatigue alert criterion. This system works with the in-cab equipment to provide a comprehensive fatigue monitoring solution, which complements existing fatigue management strategies.



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Is the SmartCap available?

Yes, the SmartCap system is now commercially available. Since fatigue poses risks in many settings, both on and off site, the SmartCap system has been developed with flexibility in mind, providing configurations for use in both heavy equipment and light vehicles.

At this time we are focusing on commercial sales, particularly road freight, mining and heavy industry. We are experiencing significant demand for the system, and understand that any delay can be frustrating. Please contact us with your specific needs and we will let you know how a catered solution can fit within your fatigue management framework.

Who is the vendor for the SmartCap?

The technology behind the SmartCap was developed within CRCMining, a Cooperative Research Centre established by the Australian government, supported by four universities and 13 industry partners including equipment manufacturers and mining companies. Anglo American Metallurgical Coal (previously Anglo Coal Australia) and the Australian Coal Association Research Association (ACARP) supported this work for a number of years, which led to two successful field trials at central Queensland surface mining operations, where it was used by operators in haul trucks, excavators, dozers, graders and water trucks.

CRCMining is making the SmartCap commercially available through its new subsidiary company EdanSafe Pty Ltd, a manufacturer and seller of technology solutions for the heavy industry, transport, safety and private & public health sectors, with a strong focus on internal research and development for the creation of new technologies in all aspects of workplace health and safety.

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Please note: It is requirement that all SmartCap Users fully consider the implications of implementing a new fatigue monitoring technology within their Fatigue Risk Management System. SmartCap is a decision support tool, aimed at providing additional information to operators in order for them to make better decisions. Under no circumstances does SmartCap reduce the responsibility of the user to monitor their own fatigue levels, and to act in a proper and safe manner.

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