



Driving into the Future: How Lumissil's Technology Keeps You Safe



In an era where self-driving cars and road safety are paramount, Driver Monitoring Systems (DMS) stand at the forefront of innovation. Designed to enhance drivers' awareness and prevent accidents before they can happen, our components use innovative technology to ensure that every journey is as safe as possible.

Driver Monitoring Systems (DMS) are sophisticated technologies designed to enhance vehicle safety by ensuring driver attentiveness and mitigating the risks associated with distracted or fatigued driving. At the core of DMS is a high-performance camera sensor that continuously sees the driver, tracking eye movements, facial expressions, and head positioning to detect signs of distraction or drowsiness. This system is supported by a network of components including an IR LED driver that improves visibility in low light conditions, capacitive sensors on the steering wheel that assess how firmly the driver is holding it, and a variety of alert systems (visual through RGB LEDs and auditory via buzzers) that warn the driver when lapses in attention are detected.

Lumissil Microsystems offers a suite of components that can be used for Driver Monitoring Systems (DMS). Our portfolio features LED drivers, microcontrollers, communication transceivers, and power management ICs, all designed for integration into applications such as DMS. These components implemented into a system, can monitor and analyze driver behavior, enhancing safety.

We recently showcased our Driver Monitoring System (DMS) demo at the Embedded 2024 trade show in Nuremberg, Germany. Our demo, detailed in Fig 1, illustrates the integration of Lumissil components within a DMS. The demonstration initializes when a driver touches

the steering wheel, activating the capacitive sensor IS32CS8977. This sensor detects the touch and signals the IS32LT3183A to send I2C commands to the IS32FL3240 controlling 10 RGB LEDs. These LEDs provide visual alerts throughout the driving period, enhancing safety and interaction. The system also includes the IS32PM3420A, a power management IC that steps down the 12V to a stable 4.5V. For communication, the IS32LT3183A utilizes the LIN protocol, connected through the IS32IO1028A LIN transceiver which handles data translation between LIN and UART from the controller board. Using advanced programming and OpenCV libraries, this board processes real-time images and displays them on an LCD. Additionally, our DMS demo utilizes the IS32LT3965, a synchronous DC-DC switching regulator, as an IR LED driver to enhance camera visibility in low light conditions. An audible alert system is also integrated, triggered by the buzzer connected to the HVO pin of the IS32LT3183A when the driver appears distracted.

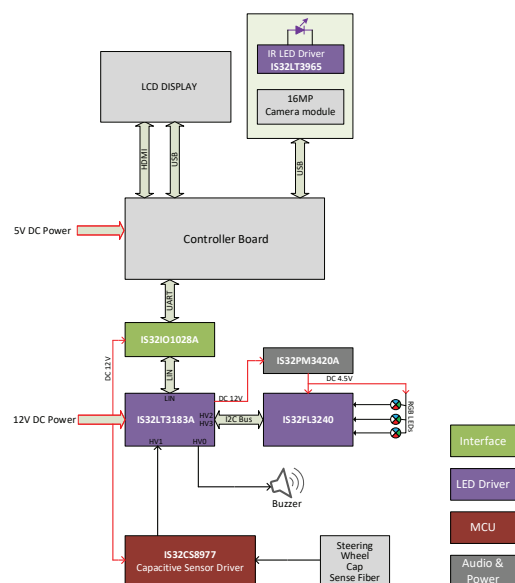


Figure 1: Lumissil Driver Monitoring System demo

LUMISSIL COMPONENTS USED IN THE DMS DEMO

IS32LT3965 (IR LED Driver): Enhances the camera's visibility in low light, ensuring accurate monitoring during night drives.

Controller Board & IS32IO1028A (LIN to UART Bus): These components form the communication backbone of our system, enabling robust data transfer between devices.

IS32LT3183A (4 Channel LIN Controller): Manages multiple vehicle subsystems simultaneously, enhancing the integration and reliability of our DMS.

IS32CS8977 (Capacitive Sensor Driver) & Steering Wheel Capacitive Sense Fabric: These sensors detect the driver's touch and grip on the steering wheel, providing real-time data on the driver's engagement.

IS32FL3240 (30 Channel LED Driver) & RGB LED: Powers visual alerts that notify the driver of detected lapses in attention, with customizable colors for different alert types.

IS32PM3420A (DC-DC Synchronous Buck): Ensures efficient power management throughout the DMS, supporting optimal performance without draining the vehicle's battery.



Complete demo for DMS. Parts you can see are: Steering wheel [has the cap sense fiber], LCD, Camera and IR LED

PARTNER WITH LUMISSIL

Lumissil is committed to advancing road safety by providing key technical components essential for developing sophisticated Driver Monitoring Systems (DMS). We invite automotive and industrial manufacturers to explore our portfolio of IC components suitable for applications requiring enhanced safety and performance. Connecting with us enables access to top-tier technologies that are fundamental in designing effective real-time monitoring solutions. For detailed information on integrating our components into your projects, or to arrange a technical demonstration showcasing the capabilities and applications of our products, please contact us at marketing@lumissil.com or visit our website at: www.lumissil.com.