Tata Elxsi and Green Hills Software Introduce the Latest in Production-Ready AUTOSAR-Compliant Platforms for Safe and Secure Driver Monitoring Systems

**Flexible classification technology with AUTOSAR Adaptive standards-based computing,
all based on the INTEGRITY certified safe and secure run-time foundation**

BANGALORE and SANTA BARBARA, California — November 2, 2021 — Tata Elxsi, a global leader in design and technology services, and Green Hills Software, the worldwide leader in embedded safety and security, today announced their collaboration for a Driver Monitoring System (DMS) platform that combines advanced DMS software (V.O.E.O.S.Y.S)[1] and AUTOSAR Adaptive from Tata Elxsi integrated with the safe and secure INTEGRITY® real-time operating system (RTOS) from Green Hills Software optimized to run on the latest families of automotive-grade microprocessors. This flexible and standards-based DMS platform enables OEMs and Tier 1 suppliers to reduce the time, cost, and complexity of developing and deploying their DMS-compliant ADAS systems while meeting mandatory global safety and security requirements.

A Driver Monitoring System helps address the growing safety risks caused by distracted and drowsy drivers and also provides the essential assurance that a driver is ready to assume control from an autonomous driving system.

- The Euro New Car Assessment Programme (NCAP) already requires DMS for five-star safety ratings, while the European General Safety Regulation has mandated DMS technology for all new cars, vans, trucks and buses starting in CY2024
- National Highway Traffic Safety Administration (NHTSA) recommends the use of DMS as an effective means for driver engagement in Level 2 vehicles, and the US Congress is pushing for DMS in all new US cars within six (6) years
- NHTSA estimates that distracted driving is responsible for more than 3,100 deaths per year[2] in the US alone

Global vehicle manufacturers and their suppliers are adding an increasing number of DMS features, both to satisfy regulatory requirements and to enhance buyers' user experience and safety. But these manufacturers and suppliers face clear challenges with managing the complexity of not only the DMS software and hardware platforms but also the specific requirements for safety, security, performance, cost, and time to market.

"It is a great pleasure for us to continue our collaboration with Green Hills, which is the market leader in deploying the safety critical INTEGRITY RTOS and associated toolsets for global automakers," said **Shaju**

S, Vice President and Head of Transportation, Tata Elxsi. "Most OEMs and Tier 1s are now looking at AUTOSAR Adaptive platforms for domain controllers that are safe, secure and scalable. This combined Driver Monitoring System solution with Green Hills is in line with the most recent auto industry requirements and will undoubtedly enable us to provide customers with industry-ready capabilities."

"Green Hills is pleased to be working with a proven leader for AUTOSAR and DMS solutions like Tata Elxsi," states **Dan Mender, VP of Business Development, Green Hills Software**, "With this production-focused complete DMS platform solution, OEMs and Tier 1s can now deploy mature, high performance, safe and secure DMS capabilities with the highest confidence and fastest time to market on the widest range of automotive processors."

The integrated AUTOSAR Adaptive-based DMS from Tata Elxsi and Green Hills Software delivers intelligent determination of a driver's readiness and state of attentiveness and runs on the safe, secure INTEGRITY-based high-performance platform that is already proven in millions of vehicles today.

- Tata Elxsi's DMS software detects distracted and drowsy drivers by means of its hybrid vision pipeline architecture that intelligently combines vehicle data (direction, speed) with the driver's eye gaze direction, head orientation and facial expression.
- The base hardware platform has been validated on many camera types such as IR, NIR, HDR, webcam, monochrome and custom-made camera modules.
- Tata Elxsi's functional safety compliant AUTOSAR Adaptive stack is based on 19.11 and comes with a feature rich configuration tool.
- Utilizing the platform's flexibility, future software refinements can include OTA updates and cloud connectivity for event recording.
- Green Hills Software provides the safe, secure and deterministic run-time foundation for the DMS software, powered by the INTEGRITY RTOS, pre-certified to ISO 26262 ASIL D and ready for cybersecurity standard ISO 21434. INTEGRITY securely separates critical software components and guarantees system resources to the AUTOSAR Adaptive components running as native INTEGRITY tasks, even when faced with malicious or unintended events.
- The MULTI® debugger with its TimeMachine® trace analysis tools are purpose-built to find even the most difficult and time-consuming bugs, while enabling rapid system optimization, saving DMS development teams significant time in their sprint to production.

Availability
The first release of the INTEGRITY-based Driver Monitoring System from Tata Elxsi and Green Hills Software is available to early-access customers today and runs on the Renesas R-Car. The DMS is portable to other leading automotive processors such as those from NXP, Texas Instruments and Qualcomm.

(1) V.O.E.O.S.Y.S – Vehicle Operator Environment Observation System.
(2) See National Highway Traffic Safety Administration, *Overview of Motor Vehicle Crashes in 2019*, U.S. Department of Transportation, https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813060 (Dec. 2020).

About Tata Elxsi

Incorporated in 1989, Tata Elxsi is amongst the world's leading providers of design and technology services across industries including Automotive, Media, Communications, Healthcare and Transportation. Tata Elxsi provides integrated services – from research and strategy, to electronics and mechanical design, software development, validation and deployment, and is supported by a network of design studios, global development centers and offices worldwide. We combine deep domain expertise with over 30 years of technology and product development experience that enable brands to differentiate and win. Tata Elxsi is helping customers reimagine their products and services through design thinking and application of digital technologies such as IoT (Internet of Things), Cloud, Mobility, Virtual Reality and Artificial Intelligence.

About Green Hills Software

Founded in 1982, Green Hills Software is the worldwide leader in embedded safety and security. In 2008, the Green Hills INTEGRITY-178 RTOS was the first and only operating system to be certified by NIAP (National Information Assurance Partnership comprised of NSA & NIST) to EAL 6+, High Robustness, the highest level of security ever achieved for any software product. Our open architecture integrated development solutions address deeply embedded, absolute security and high-reliability applications for the military/avionics, medical, industrial, automotive, networking, consumer and other markets that demand industry-certified solutions. Green Hills Software is headquartered in Santa Barbara, CA, with European headquarters in the United Kingdom. Visit Green Hills Software at https://www.ghs.com.

Green Hills, the Green Hills logo, INTEGRITY, MULTI and TimeMachine are trademarks or registered trademarks of Green Hills Software in the U.S. and/or internationally. All other trademarks are the property of their respective owners.

Media Contact for Tata Elxsi	Media Contact for Green Hills Software
Tata Elxsi	Green Hills Software
Hari Balan	Christopher Smith
Phone: +91 80 2297 9123	Phone: +1-805-965-6044
E-mail: media@tataelxsi.com	E-mail: media@ghs.com