KENMEC Semicon Taiwan 2024 Press Release AI gathers the innovation, KENMEC leads the trend

++ KENMEC advances AI innovation with new simulation solutions

At Semicon Taiwan 2024, KENMEC will collaborate with partners to exhibit an Automatic Material Handling System (AMHS) (Automatic Material Handling System) with AI inspection, smart logistic AI solutions, logistics fleet management solutions, and real-machine verification of its second-generation two-phase immersion- cooling solution. KENMEC will exhibit its use of the NVIDIA OmniverseNVIDIA Omniverse platformsoftwareerver with NVIDIA L40S GPUs for the first time . °

KENMEC successfully developes and debuts the M490 model of the Overhead Hoist Transfer (OHT) with the body height 490mm to transport magazines in semiconductor backend factories. Practical demonstration helps customers applying it into semiconductor factories with limited floor height. The M490 model also provides process automation solutions, optimizes production capacity, offers efficiency and space flexibility, and alleviates customer manpower demand. At the same time, KENMEC taps NVIDIA A2 Tensor Core GPUs and applies the NVIDIA Metropolis visual perception platform, using AI technology to detect OHT transportation and, load/unload and up/down running status in real time using camera sensors. It is expected to help customers to reduce maintenance staffing and predict the wear and tear of various OHT parts in advance. It will also improve OHT handling efficiency.

KENMEC's thermal solutions division will showcase practical applications of its second-generation two-phase immersion- cooling solution. In response to the expanding market demand for AI applications and the increasing deployment of high-performance data centers, KENMEC not only provides liquid- cooling solutions for customers but also plans to data center digital twin solutions on NVIDIA Omniverse, for simulating physically accurate virtual designs of customers' server rooms and data center construction projects. This assists customers in purchasing high-performance server cabinets while also offering energy-saving solutions for server room construction, achieving the benefits of "increased computing power and energy savings".

At this exhibition, using group synergies, KENMEC's subsidiary, KENTEC, will showcase its logistics fleet management solutions. These include a fleet management system and an AI intelligent driver assistance system, aiming to achieve "intelligent transportation management" and "safe driving." The fleet management system serves as a unified platform for vehicle management, integrating GPS tracking and driver management to enhance vehicle dispatch efficiency and fleet safety. It allows for realtime monitoring of vehicle status. The AI intelligent driver assistance system incorporates advanced driver assistance systems (ADAS), driver monitoring systems (DMS), and 2D/3D around view monitoring (AVM). It has also passed relevant certifications based on Taiwan's VSCC standards and regulations. This system enables smart driving, hazard prediction, and real-time abnormality alerts, assisting drivers in responding to various driving conditions. It effectively enhances driver awareness and reduces the occurrence of accidents, bolstering driving safety.

KENMEC Smart Logistics Center is composed of automation equipment such as Unit load ASRS, Mini Load SRS, Sorter, Smart Palletizer and de-palletizer, intelligent vision robotic arms, Circle RGV, unmanned forklifts, and automatic bundling machines, and is coupled with KENMEC's ecatch excellent logistics center smart platform, which provides customers with reliable logistics center solutions and implements an intelligent architecture with the motto "Flexibility, Intelligently, Reliability, Stability and Timely.,". KENMEC smart logistic centers solutions are developed on NVIDIA Isaac Sim, a reference application built on NVIDIA Omniverse, to conduct automated solution simulations, and NVIDIA cuMotion, part of NVIDIA Isaac Manipulator, which equips robotic arms with efficient motion planning capabilities. This includes the establishment of smart warehousing 3D simulation fields, automatic warehousing logic and model creation, field and equipment digital twins showcasing virtual and real integrated simulations, and the automatic generation of 3D scene technology. Has been successfully developed for more than 10 generative models integrated into independent plug-ins. Manufacturers can use generative models to import 2D plane layout diagrams to automatically generate 3D warehousing field spaces, significantly reducing 3D personnel modeling time and achieving highly efficient simulation results. For 3D simulation of automatic warehousing equipment, a warehousing equipment model was built using the OpenUSD framework, and integrated into the generated 3D field. The technology then successfully verified the simulated operation of the automatic warehousing system in a KENMEC application developed on NVIDIA Omniverse. Solutions developed on NVIDIA Omniverse brings great benefits to planning, commissioning, manufacturing and actual operations, including cost and, time savings, and help reduce heavy or inefficient work. In the planning stage, KENMEC's 2D to 3D modeling time will be greatly optimized from 278 hours to 4 minutes. If an advanced GPU such as the NVIDIA A100 Tensor Core GPU is used, this is expected to be further shortened to 1 minute . In addition, plans for different configurations of the same field can also be provided.

KENMEC's unmanned vehicle series - including an AMR (autonomous mobile robot) and AGF (automatic guided forklift) -, both adopt the NVIDIA[®] Jetson platform, NVIDIA CUDA[®], and KENMEC's self-made KM- ICB (KENMEC Intelligent Control Board) with

powerful functions and excellent performance. NVIDIA[®] Jetson Orin[™] systems-onmodules are designed for high-performance computing and AI applications, giving AMR and AGF powerful computing capabilities and diverse functions. Equipped with a powerful GPU and Arm processor, Jetson Orin can process large amounts of data and conduct navigation and positioning quickly and accurately. It also supports lidar, cameras, and ultrasonic sensors to provide comprehensive environmental awareness capabilities for accurate operation in various work scenarios. It can process data from various sensors in real time, use efficient algorithms for analysis and decision-making, and respond to environmental changes immediately to bolster operational safety and efficiency. NVIDIA CUDA® is, a software platform that enables parallel computing and, with the NVIDIA CUDA Toolkit, helps developers accelerate their applications. By integrating NVIDIA CUDA® running on NVIDIA GPUs, KENMEC's AMR and AGF have achieved major breakthroughs in operational efficiency and intelligence. NVIDIA CUDA software helps use the parallel computing power of GPUs to greatly improve the running speed of machine learning and deep learning algorithms, and achieve precise path planning and dynamic navigation. And the establishment of KENMEC's development tools and database enables KENMEC's RD team to quickly iterate and optimize algorithms, adapt to changing needs, and specifically optimize KENMEC's mechanical products. The tools and database supports various AI applications, such as object recognition, autonomous decision-making, motion control, etc., improving the intelligence level of AMR and AGF to cope with complex industrial operation requirements.

KM-ICB (KENMEC Intelligent Control Board) uses Arm core chips to provide precise motion control and chassis management for the unmanned vehicle series. KM-ICB can accurately calculate motion models to ensure stable and efficient operation of AMR and AGF in various industrial environments. KM-ICB can accurately control the vehicle chassis to achieve smooth movement and flexible steering to cope with complex road conditions and operational needs. It can connect with NVIDIA® Jetson Orin™ and NVIDIA CUDA® software to achieve efficient computing and precise control. Combining the core advantages of SLAM technology, it can accurately navigate and position in complex environments, avoid obstacles, and improve operating efficiency. It can automatically perform tasks such as handling and stacking, reducing manual intervention, and improving the level of logistics automation. It can also collect and analyze operational data in real time, continuously optimize operational paths and strategies, and improve overall operational efficiency. It is suitable for various industrial scenarios such as manufacturing, warehousing and logistics, and can flexibly respond to different work needs. KENMEC's unmanned vehicle series AMR and AGF have excellent hardware performance, powerful computing power, flexible software platform and precise motion control, becoming a powerful assistant in the field of modern logistics and industrial automation, helping enterprises improve efficiency, reduce costs, and achieve intelligent transformation.