

Industry 4.0 and Industrial Storage



The fourth wave of the Industrial Revolution, known as Industry 4.0, connects industrial devices and allows companies to utilize networked data from IoT devices, Industrial Internet of Things (IIoT) devices, and computer-controlled systems. Applying artificial intelligence (AI) and machine learning (ML) to this data helps create fully automated smart factories, smart cities, and more.

As a result, semiconductor content in Industrial and IoT applications continues to grow, with storage being one of the fastest-growing segments. This growth in storage is driven largely by edge computing, increased number of sensors, increased computing power, artificial intelligence databases requiring large amounts of data processing, machine learning algorithms for real-time data processing and real-time insights. Big data analytics in the cloud are helping manufacturers in several areas like market trends, long term demand planning, regions of growth, yield analysis, etc. Edge computing is improving factories with real-time data analytics and actions that are directly resulting in increased efficiency and less downtime.

"Industry 4.0 is all about being digitally enabled and data-driven," said Ryan Martin, principal analyst, ABI Research. This means bringing together new technologies and compute services across edge and cloud assets to drive productivity, create new business models, and innovate faster. These technologies include everything from advanced analytics and AI to augmented reality, digital twins, and industrial IoT (IIoT) platforms, and together serve the core needs of the manufacturing sector."

e.MMC has been a popular interface in the industrial segment, providing for large capacity and reliable data storage solutions. Many mainstream SOCs today support this interface. Capacity requirements for e.MMC range from low to high based on the application. Many Industrial and IoT designs start from a system on module (SoM) or single-board computer (SBC) for faster time to market and ease of design. These SoMs and SBCs normally use e.MMC for the operating system storage and the end application can change the capacity of the storage based on their needs.



Western Digital Industrial iNAND®

Western Digital iNAND IX EM132 EFD is the company's first 3D NAND e.MMC product built with Western Digital's high-reliability 64-Layer 3D NAND technology for Industrial and IoT devices. It extends the life of e.MMC beyond 2D NAND and provides increased capacity for industrial and consumer applications powered by advanced operating systems, sensor fusion and machine learning. It also encompasses a rich feature set designed for intensive industrial workloads. These features include:

- Advanced health monitoring
- Thermal management
- Smart partitioning
- Auto and manual read refresh
- Robust power management
- Data retention exceeding JEDEC standards

A Strong Ecosystem and Partners

Western Digital collaborates with ecosystem partners such as NXP to enable solutions for Industrial & IoT markets. Platforms such as the i.MX 8M EVK compute module delivers high performance with power efficiency, multimedia, and connectivity to accelerate the design and implementation of Industrial & IoT devices. Here are some examples of IoT applications that can be easily using the i.MX 8M EVK:

- Appliance system controls
- Displays
- IP camera video surveillance
- Wireless smart lighting
- Medical monitoring units

This collaboration has resulted in Western Digital being named a partner of NXP. Western Digital e.MMC Industrial products are qualified on a number of NXP i.MX compute modules, and the iNAND IX EM132 will be compatible with Industrial Grade e.MMC current generation products that are currently used in multiple NXP i.MX8 eval kits and reference designs.

Summary

Western Digital's portfolio of industrial-grade storage solutions offers the high endurance and low power needed for Industry 4.0 smart factory environments and IoT devices. iNAND® IX EM132 EFD is Western Digital's first e.MMC EFD built specifically for Industrial and IoT devices with the company's high-reliability 64-layer 3D NAND technology. Collaborating with partners such as NXP helps enable comprehensive products and applications to meet the need for demanding industrial, smart and advanced manufacturing environments.

Western Digital.

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