

# Western Digital. A Global Leader in Flash Storage Solutions

## Industrial and IoT Family Brochure



# Driving IoT and Industrial Innovation

## Western Digital

- Decades of innovation in the flash memory industry
- Full portfolio of NAND flash products for industrial and IoT applications
- Expertise in system-level architecture
- World-class fabs
- Full vertical integration of controller, firmware, assembly, and test capabilities
- Partnership with leading chipset vendors
- Lower system TCO
- Faster time to market with quick system integration
- Real-time analytics at the edge
- System performance optimization
- Reduction in network traffic
- Timely preventive maintenance features

The convergence of ubiquitous connectivity and compute capability is driving an exponential growth in connected devices and connected sensors, generating incredible volumes of data and enabling vast new types of transformative applications and business models. In addition to capturing this data locally as primary or backup storage, edge storage devices, such as Western Digital embedded storage and industrial cards, will maximize network efficiency and enable systems to analyze the data and act on the results in real-time.

## Meeting Industrial and IoT Endurance and Reliability Requirements

Leveraging 30 years of expertise in NAND flash memory and storage systems, Western Digital Industrial Grade products deliver edge storage solutions for industrial and IoT applications requiring durability, high reliability, and high intensity recording across a wide range of operational requirements. Designed and tested to withstand demanding environmental conditions, our portfolio features advanced memory management firmware, which includes power immunity, auto/manual read refresh, Error-correcting code (ECC), and wear leveling. Data (write)-intensive applications can rely on Western Digital Industrial products to capture every critical moment, log each event, and to ensure quality of service to end-users. These high endurance solutions offer extended product life cycles which can reduce total cost of ownership (TCO) per system by eliminating costly redesigns and minimizing unnecessary maintenance calls.

## Serving Industrial and IoT Applications

- Transportation
- Networking
- Digital Signage
- Industrial PC
- Medical and Agriculture
- SoM and SBC
- Factory Automation
- POS and Ultra-thin Devices
- Surveillance

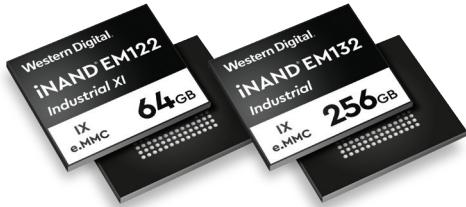


IoT



Industrial

## e.MMC Embedded Flash Drive



**iNAND IX EM122 and EM132** are based on e.MMC 5.1 standards. The EM122 is already qualified and in production for industrial designs. The EM132 is the first 256GB and 3D NAND-based e.MMC in the Industrial and IoT market.

### Features and Benefits

- Auto and manual refresh, enhanced health status, smart partitioning
- e.MMC 5.1 interface
- 8GB to 256GB in small form factor
- Wide temperature range:  
-25°C to 85°C (I) and -40°C to 85°C(XI)

## UFS Embedded Flash Drive



**iNAND® IX EU312**, the world's first industrial grades 2/3 UFS version 2.1 based on 3D NAND technology, delivers higher capacities and up to 2.5 times the performance of e.MMC-based products.

### Features and Benefits

- 16GB to 256GB in small form factor
- Fast boot, auto refresh, manual refresh, enhanced health status
- UFS 2.1 interface for high data speeds
- Wide temperature range:  
-25°C to 85°C (I) and -40°C to 85°C(XI)



## SD Cards

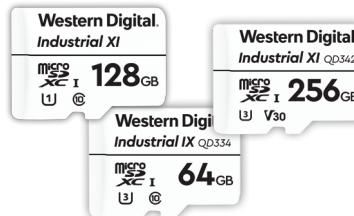


**Industrial SD Card IX LD332 and LD342** are ideal for Industrial and IoT applications that require a removable storage media like drones, drive recorder, digital signage, aviation, body and dash cams.

### Features and Benefits

- 8GB – 512GB
- High Endurance (3K P/E Cycle)
- Longevity
- BOM Locked
- Wide temperature range:  
-25°C to 85°C (I) and -40°C to 85°C(XI)

## microSD Cards



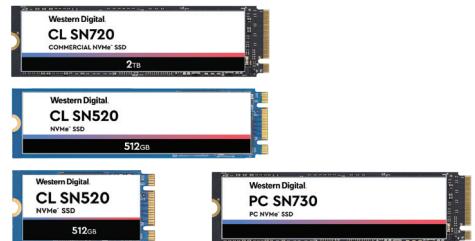
**Industrial microSD Card IX QD332, QD334 and QD342** offer industrial-grade extended temperature to support customers that not only want a removable solution but also a small form factor with extreme endurance. SLC, MLC, and TLC solutions are available.

### Features and Benefits

- Auto/manual refresh, health status, host lock
- 8GB to 256GB
- Extreme Endurance (Up to 30K P/E Cycle)
- Longevity
- BOM Locked
- Wide temperature range:  
-25°C to 85°C (I) and -40°C to 85°C(XI)



## PCIe SSD



**Western Digital CL SN720, CL SN520 and PC SN730 NVMe SSDs** are designed to Capture and analyze all of the massive amounts of data from sensors and videos from POS, smart meters, surveillance, factory automation, high performance PCs and laptops and gaming which can generate terabytes of data per day.

### Features and Benefits

- PCIe Gen3x2 and PCIe Gen3x4 NVMe
- M.2 2280 and M.2 2242 form factors
- High capacities up to 2TB
- Up to 1600 TBW endurance
- Available in both non-SED and SED version
- Temperature range: 0°C-85°C (CL series), 0°C-70°C (PC SN730)

## SATA SSD



**Western Digital PC SA530 and SanDisk X600 SATA SSDs** deliver leading-edge performance, high capacity, and enhanced endurance. In capacities of up to 1TB, the PC SA530 3D NAND SATA SSD is optimized for the demanding power management requirements of ultra-thin and small form factor products.

### Features and Benefits

- X600 – 128GB
- PC SA530 – 256GB to 1TB
- 2.5" and M.2 2280 form factors
- Sequential R/W up to 560/530 MB/s
- Random R/W up to 95K/84K IOPS



Industrial Embedded Flash Drives				
	iNAND® IX EM132	iNAND® IX EM122	iNAND® IX EU312	
<b>Interface</b>	e.MMC 5.1	e.MMC 5.1	UFS 2.1	
<b>Capacity<sup>1</sup></b>	16GB-256GB <sup>1</sup>	8GB-64GB <sup>1</sup>	16GB-256GB <sup>1</sup>	
<b>Operating Temperature</b>	-25°C - 85°C (I) -40°C-85°C (XI) 32GB - 256GB	-25°C - 85°C (I) -40°C - 85°C (XI)	-25°C - 85°C (I) -40°C - 85°C (XI)	
<b>NAND Flash Technology</b>	3D TLC	2D MLC	3D TLC	
<b>Ordering Information</b>	SDINBDA6-XXXG-I1/XI1	SDINBDG4-XXXG-I2/XI2	SDINDDH6-XXXG-I/XI	
Industrial SD Cards				
	Industrial IX LD342	Industrial IX LD332	Industrial IX LD332	
<b>Interface</b>	SDA 6.0	UHS-1 104	UHS-1 104	
<b>Capacity<sup>1</sup></b>	16GB to 512GB	8GB to 64GB	8GB to 64GB	
<b>Operating Temperature</b>	-25°C - 85°C	-25°C - 85°C (I) -40°C - 85°C (XI)	-25°C - 85°C (I) -40°C - 85°C (XI)	
<b>NAND flash technology</b>	3D TLC	2D MLC	2D MLC	
<b>Speed Class</b>	C10, U1, U3, V10, V30	C10	C10	
<b>Performance R/W<sup>2</sup></b>	Up to 100/50 MB/s	Up to 80/50 MB/s	Up to 80/50 MB/s	
<b>Ordering Information</b>	SDSDAF4-XXXG-I	SDSDAF3-XXXG-I/XI	SDSDAF3-XXXG-I/XI	
Industrial microSD Cards				
	Industrial IX QD342	Industrial IX QD332	Industrial IX QD334	
<b>Interface</b>	SDA 6.0	UHS-1 104	UHS-1 104	
<b>Capacity<sup>1</sup></b>	16GB to 256GB	8GB to 128GB	8GB to 64GB	
<b>Operating Temperature</b>	-25°C - 85°C	-25°C - 85°C (I) -40°C - 85°C (XI)	-40°C - 85°C (XI)	
<b>NAND flash technology</b>	3D TLC	2D MLC	2D SLC	
<b>Speed Class</b>	C10, U1, U3, V10, V30	C10, U1	C10, U3	
<b>Performance R/W<sup>2</sup></b>	Up to 100/50 MB/s	Up to 80/50 MB/s	Up to 90/50 MB/s	
<b>Ordering Information</b>	SDSDQAF4-XXXG-I	SDSDQAF3-XXXG-I/XI	SDSDQED-XXXG-XI	
Solid State Drives (PCIe/NVMe)				
	Commercial CL SN720	Commercial CL SN520	Commercial CL SN520	Commercial PC SN730
<b>Interface</b>	PCIe Gen3x4 NVMe 1.3	PCIe Gen3x2 NVMe 1.3	PCIe Gen3x2 NVMe 1.3	PCIe Gen3x4 NVMe 1.3
<b>Form factor</b>	M.2 2280	M.2 2242	M.2 2280	M.2 2280
<b>Capacity<sup>1</sup></b>	256GB to 2TB	128GB to 512TB	128GB to 512TB	256GB to 1TB
<b>Operating Temperature</b>	0°C - 85°C	0°C - 85°C	0°C - 85°C	0°C - 70°C
<b>NAND flash technology</b>	3D TLC	3D TLC	3D TLC	3D TLC
<b>Performance R/W<sup>2</sup></b>	Up to 3,470/3,000 MB/s	Up to 1,700/1,450 MB/s	Up to 1,700/1,450 MB/s	Up to 3,400/3,100 MB/s
<b>Endurance<sup>3</sup></b>	Up to 1600 TBW	Up to 400 TBW	Up to 400 TBW	Up to 400 TBW
<b>Ordering Information</b>				
<b>128GB</b>		SDAPMUW-128G-1022	SDAPNUW-128G-1022	
<b>256GB</b>	SDAQNTW-256G-1022	SDAPMUW-256G-1022	SDAPNUW-256G-1022	SDBPNTY-256G (Non-SED) SDBQNTY-256G (SED)
<b>512GB</b>	SDAQNTW-512G-1022	SDAPMUW-512G-1022	SDAPNUW-512G-1022	SDBPNTY-512G (Non-SED) SDBQNTY-512G (SED)
<b>1TB</b>	SDAQNTW-1TOO-1022			SDBPNTY-1TOO (Non-SED) SDBQNTY-1TOO (SED)
<b>2TB</b>	SDAQNTX-2TOO-1022			
SATA Drives for Industrial and IoT Applications				
	Commercial X600	Commercial PC SA530	Commercial PC SA530	
<b>Interface</b>	SATA III (Rev 3.2)	SATA III (Rev 3.2)	SATA III (Rev 3.2)	
<b>Form factor</b>	2.5"/7 mm and M.2 2280	2.5"/7 mm and M.2 2280	2.5"/7 mm and M.2 2280	
<b>Capacity<sup>1</sup></b>	128GB	256GB to 1TB	256GB to 1TB	
<b>Operating Temperature</b>	0°C - 85°C	0°C - 70°C	0°C - 70°C	
<b>NAND flash technology</b>	3D TLC	3D TLC	3D TLC	
<b>Performance R/W<sup>2</sup></b>	Up to 560/530 MB/s	Up to 560/530 MB/s	Up to 560/530 MB/s	
<b>Endurance<sup>3</sup></b>	Up to 500 TBW	Up to 400 TBW	Up to 400 TBW	
<b>2.5"/7 mm non-SED</b>	SD9SB8WXXXG/1Too(1TB)/2Too (2TB)	SDASB8Y-XXXG/1Too (1TB)	SDASB8Y-XXXG/1Too (1TB)	
<b>2.5"/7 mm SED</b>	SD9TB8WXXXG/1Too(1TB)/2Too (2TB)	SDATB8Y-XXXG/1Too (1TB)	SDATB8Y-XXXG/1Too (1TB)	
<b>M.2 2280 non-SED</b>	SD9SN8WXXXG/1Too(1TB)/2Too(2TB)	SDASN8Y-XXXG/1Too(1TB)	SDASN8Y-XXXG/1Too(1TB)	
<b>M.2 2280 SED</b>	SD9TN8WXXXG/1Too(1TB)/2Too(2TB)	SDATN8Y-XXXG/1Too(1TB)	SDATN8Y-XXXG/1Too(1TB)	

<sup>1</sup> 1 gigabyte (GB) = 1 billion bytes. Actual user capacity less.

<sup>2</sup> Based on internal testing; performance may be lower depending on host device, usage and other factors. 1MB=1,000,000 bytes.

<sup>3</sup> TBW (terabytes written) values calculated using JEDEC client workload (JESD219) and vary by product capacity.

## Western Digital

### Contact Information

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