2018 Edition

Innodisk Gaming Solutions

Secured Reliable Storage and Memory Designed for the Gaming Industry

innodisk

Introduction

Applications

- Lottery Ticket Machines
- Slot Machines
- Gaming Servers
- Electronic Roulette
- Multiplayer Game Stations
- Surveillance
- Video Monitoring

It is one of the largest entertainment industries; however, within the excitement of the flashing lights, spinning wheels and mesmerizing sounds of the casino world there is an uninterrupted flow of data. This seamless and silent operation is an essential part of having games run smoothly and ultimately keeping the customer satisfied.

A few key factors need to be in place for any gaming system to be successful. Two of them are reliability and security. Casinos offer their customers an opportunity to play and win. with non-stop excitement, their around the clock operations requires a reliable system that sustains the ability to attract business.

Sometimes gaming machines that drive the customers to hit it big are at risk of tampering. Since this can potentially lead to large losses, measures such as write protect are crucial when securing the data. In addition, due to the strict gaming industry regulations placed on manufacturers, high performance solutions must be taken into consideration when designing the system. A well implemented surveillance system can also assist the casino operator in both curbing illicit behavior and help create a safe gaming environment.

The Innodisk Solution

Innodisk offers a wide portfolio of flash storage products suited for the casino gaming industry. Write protect, power loss protection and monitoring software provides system security and reliability. Proprietary firmware technology enables stable surveillance performance with minimal frame loss.

Our DRAM modules deliver robust and reliable performance and are offered in a wide variety of form factors, ensuring an easy fit in even the most constrained spaces. The modules offer speeds up to 2666MT/s and are available with features such as wide temperature, conformal coating, side fill, error correcting code and Very Low-Profile (VLP).

The Innodisk embedded peripheral cards offers an easy way to expand and connect gaming and surveillance systems. Robust LAN and PoE expansion cards provide easily integral solutions.

Reliable Solutions That Play to Win.

Our Advantages

Write Protect

With the write protect feature you can easily safeguard the data stored on your flash device by triggering the read-only function. We can provide both hardware and software-based write protect solutions, allowing you to quickly and easily protect your data from any unauthorized changes.

RECLine™

The RECLine™ surveillance solution solves the inherent issues of data writing and erasure for solid state storage in surveillance setups. The optimization of the SSD firmware features ensures no interruption to data recording and secures a smooth recording performance.

Exclusive Firmware and Software Support

With dedicated firmware and software teams, we go the extra mile to customize the firmware to your specific requirements. With the addition of our proprietary software tools such as iRAID and iRAM, we can ensure a solution that is both tailor-made and user friendly.

Long-Term BOM Support

Gaming applications benefit from a fixed configuration. Our BOM-concept entails a customizable and fixed part number for Innodisk devices. This helps accommodate later changes to the system or the Innodisk devices, ensuring longevity and stability.

iSLC 3IE4 series

Innodisk iSLC series a cost-effective solution comparable to SLC

iSLC is our exclusive technology designed to ensure longer-lasting and more reliable performance than conventional MLC NAND flash. Using flash management algorithms, iSLC improves SSD endurance up to 20,000 cycles, increasing the lifespan to at least seven times longer than MLC-based solutions.

Benefits

7 Times

7 times longer lifespan than MLC

SLC Similar

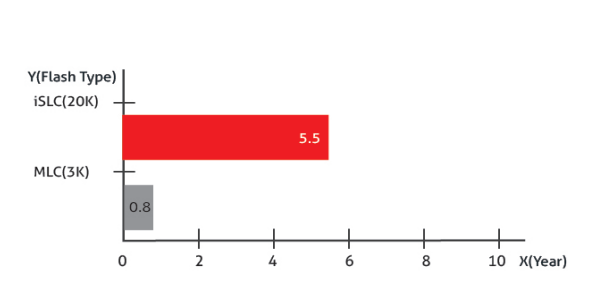
Performance similar to SLC

50 %

50% of SLC price

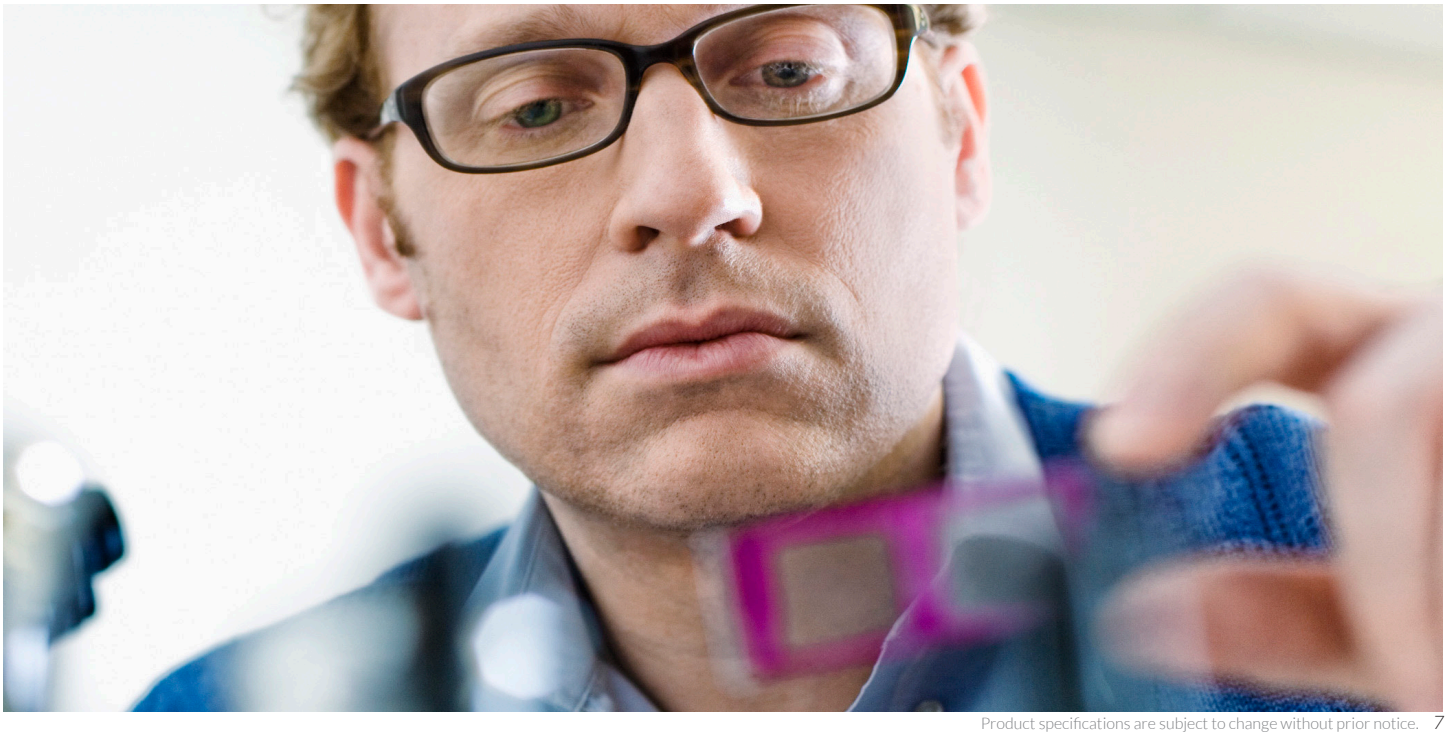
Extended Lifespan

An iSLC SSD can sustain a daily written data amount of 256 GB for over 5 years before reaching its limit.



Note: The above diagram is based on a test environment for a 100% sequential write. Example: Write 32GB x 10 time/day=320GB/day

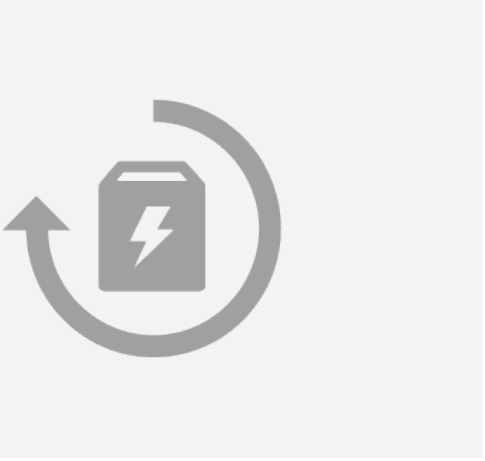
iSLC 3IE4 series

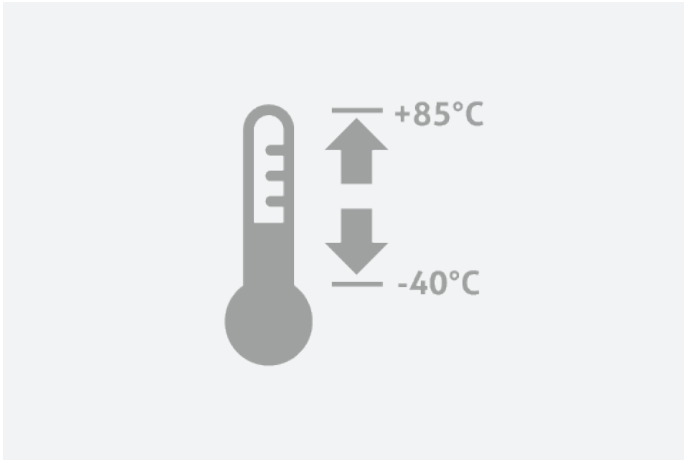


Technology

iData Guard™

Innodisk's iData Guard™ is a comprehensive data protection mechanism that functions before and after a sudden power outage to the SSD. Low-power detection terminates data writing before an abnormal power-off, while table-remapping after power-on deletes corrupt data and maintains data integrity. Innodisk's iData Guard™ provides effective power cycling management, preventing data stored in flash from degrading with use.



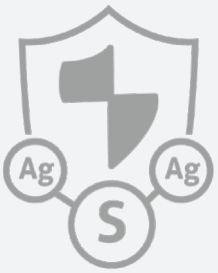


Wide Temperature DRAM

Designed for industrial systems, Innodisk's Wide Temperature DRAM modules are the best choice for applications operating in harsh conditions. Our wide temperature modules use industrial-grade SDRAM components with 30u" Gold Fingers to ensure that the memory maintains its high-quality signal, even at temperatures as low as -40°C or as high as 85°C

Anti-Sulfuration

Sulfur contamination can severely affect unprotected memory modules. The sulfur reacts with the silver found in the DRAM resistors, slowly corroding until conductivity is lost! Other than industries were sulfur is a known threat, such as mining and petrochemical facilities, sulfur corrosion can also be a slow-working and unaccounted risk factor for data centers, servers and other areas close to industrial or traffic pollution.



iOpal™

iOpal™ is Innodisk's proprietary management tool for AES self-encrypting drives (SED). The software conforms to the newest TCG Opal 2.0 standard that ensures intuitive SED management. iOpal allows the operator to easily assign ranges between users, further lowering the risk for data leaks.

SSD

Model Name	2.5" SATA SSD 3IE4	2.5" SATA SSD 3ME4	2.5" SATA SSD 3MG2-P
Key Features	1. Exclusive L^3 architecture 2. Designed with LDPC ECC engine 3. Cost-effective industrial Flash with iSLC 4. Lifespan 7 times longer than MLC	1. Exclusive L^3 architecture 2. Designed with LDPC ECC engine	1. EverGreen L^2 architecture 2. High performance 3. Support DEVSLP 4. iData Guard Protection 5. Support AES(optional)
Interface	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s
Flash Type	iSLC	MLC	MLC
Capacity	8GB~128GB	8GB~256GB	8GB-2TB
Max. Channel	2	2	4
Sequential R/W (MB/sec, max.)	530/380	530/210	520/480
Max. Power Consumption	0.8W (5V x 160mA)	0.8W (5V x 160mA)	6W (5V x 1.2mA)
Thermal Sensor	Y	Y	Y
External DRAM Buffer	N	N	Y
iData Guard	Y	Y	Y
iCell	N	N	Optional
TRIM	Y	Y	Y
ATA Security	Y	Y	Y
S.M.A.R.T	Y	Y	Y
Dimension (WxLxH/mm)	69.8 x 100.1 x 6.9	69.8 x 100.1 x 6.9	69.8 x 100.1 x 6.9 69.8 x 100.0 x 9.5 (2TB)
Environment	Vibration: 20G@7~2000Hz/Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours		
Standard Temp.OP(0°C~+70°C)	DHS25-XXXM41%C***	DES25-XXXM41%C***	DGS25-XXXD81%C***(P)
Wide Temp.OP (-40°C~+85°C)	DHS25-XXXM41%W***	DES25-XXXM41%W***	DGS25-XXXD81%W***(P)
Notes	XXX = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T, 2TB=02T) ***= flash configuration (internal control code) %=Flash		

CFast

Model Name	CFast 3MV2-P	CFast 3IE4	CFast 3ME4
Key Features	1. Exclusive RECLine™ for steady performance 2. Compliant with CFast 2.0 standard 3. Excellent IOPS performance 4. Supports hardware write protect	1. Cost-effective industrial Flash with iSLC 2. Lifespan 7 times longer than MLC 3. Excellent IOPS performance 4. Designed with LDPC ECC engine 5. Support hardware write protect	1. Exclusive L^3 architecture 2. Designed with LDPC ECC engine 3. Support hardware write protect
Interface	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s
Connector	7pin+17pin	7pin+17pin	7pin+17pin
Flash Type	MLC	iSLC	MLC
Capacity	32GB~256GB	8GB~128GB	8GB~256GB
Max. Channel	4	2	2
Sequential R/W (MB/sec, max.)	560/350	530/360	530/210
Max. Power Consumption	2.8W (3.3V x 760mA)	0.76W (3.3V x 230mA)	0.86W (3.3V x 260mA)
Thermal Sensor	Y	Y	Y
External DRAM Buffer	Y	Y	N
iData Guard	Y	N	Y
iCell	N	N	N
TRIM	Y	Y	Y
ATA Security	Y	Y	Y
S.M.A.R.T	Y	Y	Y
Dimension (WxLxH/mm)	42.8 x 36.4 x 3.6	42.8 x 36.4 x 3.6	42.8 x 36.4 x 3.6
Environment	Vibration: 20G@7~2000Hz/Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours		
Standard Temp. OP (0°C~+70°C)	DVCFA-XXXD08SC***	DHCFA-XXXM41BC***	DECFA-XXXM41BC***
Wide Temp. OP (-40°C~+85°C)	DVCFA-XXXD08SW***	DHCFA-XXXM41BW***	DECFA-XXXM41BW***
Note	xxx = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56) ***= flash configuration (internal control code) %=Flash Type		

SATADOM®





Form Factor	SATADOM-SV/SH		SATADOM-ML/MH		
Model Name	SATADOM 3IE4	SATADOM 3ME4	SATADOM 3SE3	SATADOM 3IE4	SATADOM 3ME4
Key Features	1. Cost-effective industrial Flash with iSLC 2. Exclusive L^3 architecture 3. Latest LDPC ECC engine 4. Pin 8/Pin 7 supported	1. Vertical and low profile horizontal design 2. Exclusive L^3 architecture 3. Latest LDPC ECC engine 4. High IOPS 5. Pin 8/Pin 7 supported	1. Hardware write protect supported 2. High IOPS 3. Lower power consumption 4. Pin 8/Pin 7 supported	1. Hardware write protect supported 2. Cost-effective industrial Flash with iSLC 3. Exclusive L^3 architecture 4. Latest LDPC ECC engine 5. High IOPS 6. Pin 8/Pin 7 supported	1. Hardware write protect supported 2. Exclusive L^3 architecture 3. Latest LDPC ECC engine 4. High IOPS 5. Pin 8/Pin 7 supported
Interface	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s
Flash Type	iSLC	MLC	SLC	iSLC	MLC
Capacity	8GB~64GB	8GB~128GB	4GB~64GB	16GB~128GB	32GB~256GB
Max. Channel	2	2	4	2	2
Sequential R/W (MB/sec, max.)	530/360	530/120	400/210	530/360	530/210
Max. Power Consumption	1.27W(5V x 254mA)	1.27W(5V x 254mA)	1.13W(5V x 225mA)	0.815W(5V x 163mA)	0.815W(5V x 163mA)
Thermal Sensor	Y	Y	STD: N W/T: Y	Y	Y
External DRAM Buffer	N	N	N	N	N
iData Guard	Y	Y	Y	Y	Y
iCell	N	N	N	N	N
TRIM	Y	Y	Y	Y	Y
ATA Security	Y	Y	Y	Y	Y
S.M.A.R.T	Y	Y	Y	Y	Y
Dimension (WxLxH/mm)	SV: :40.4 x 21.03 x 10.4	SV: 40.4 x 21.03 x 10.4 SH: 32.7 x 18 x 15.15	ML: 36.7 x 31.2 x 10.7	ML: 31.2 x 36.7 x 10.7 MH: 23.5 x 33.6 x 14.8	ML: 31.2 x 36.7 x 10.7 MH: 23.5 x 33.6 x 14.8
Environment	Vibration: 20G@7~2000Hz Shock: 1500G@0.5ms Storage Temperature: -55°C ~ +95°C MTBF: >3 million hours				
Standard Temp.OP(0°C~+70°C)	SV: DHSSV-XXXM41BC***#	SV: DESSV-XXXM41BC***# SH: DESSH-XXXM41BC***#	ML: DESML-XXXD08SC***#	ML: DHSML-XXXM41BC***# MH: DHSMH-XXXM41BC***#	ML: DESML-XXXM41BC***# MH: DESMH-XXXM41BC***#
Wide Temp.OP (-40°C~+85°C)	SV: DHSSV-XXXM41BW***#	SV: DESSV-XXXM41BW***# SH: DESSH-XXXM41BW***#	ML: DESML-XXXD08SW***#	ML: DHSML-XXXM41BW***# MH: DHSMH-XXXM41BW***#	ML: DESML-XXXM41BW***# MH: DESMH-XXXM41BW***#
Notes	xxx = density (04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56) ***= flash configuration (internal control code) #=power supply method(A=pin 8+ external power cable / B=Pin 7+ Pin 8 / F=Pin 7)				

CF Card

Model Name	iCF 9000	iCF 1SE	iCF 1ME
Key Features	1. High sustained data transfer speed 2. Enhanced power cycling management	High quality SLC-based solution	1. Budget friendly MLC-based solution 2. Enhanced power cycling management
Interface	PATA	PATA	PATA
Connector	50pin CF connector	50pin CF connector	50pin CF connector
Flash Type	SLC	SLC	MLC
Capacity	1GB~64GB	512MB~8GB	8GB~256GB
Max. Channel	4	2	2
Sequential R/W (MB/sec, max.)	110/100	40/30	110/110
Max. Power Consumption	1.05W (5V x 210mA)	0.75W (5V x 150mA)	1.05W (5V x 210mA)
Thermal Sensor	N	N	N
ATA Security	Y	Y	Y
S.M.A.R.T	Y	Y	Y
Dimension (WxLxH/mm)	42.8 x 36.4 x 3.3	42.8 x 36.4 x 3.3	42.8 x 36.4 x 3.3
Environment	Vibration: 20G@7~2000Hz/Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours		
Standard Temp. OP (0°C~+70°C)	DC1M-XXXD71AC***	DC1M-XXXD41AC***	DECFC-XXXD53BC***
Wide Temp. OP (-40°C~+85°C)	DC1M-XXXD71AW***	DC1M-XXXD41AW***	DECFC-XXXD53BW***
Note	PIO mode 0-6 UDMA mode 0-7	PIO mode 0-6 UDMA mode 0-4	PIO mode 0-6 UDMA mode 0-7
Notes	XXX = density (512MB=512, 1GB=01G, 02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56) ***= flash configuration (internal control code) % =Flash Type		

M.2-SATA



Model Name	M.2 (S42) 3IE4	M.2 (S42) 3ME4	M.2 (S42) 3MG2-P
Key Features	1. Type 2242-D2-B-M 2. Designed with LDPC ECC engine 3. Lifespan 7 times longer tham MLC 4. Cost-effective industrial flash with iSLC	1. Type 2242-D2-B-M 2. Exclusive L3 architecture 3. Designed with LDPC ECC Engine 4. Budget-friendly MLC-based solution	1. Type 2242-D2-B-M 2. High performance 3. Support DEVSLP 4. iData Guard Protection
Interface	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s
Flash Type	iSLC	MLC	MLC
Capacity	8GB~128GB	8GB~256GB	32GB~256GB
Max. Channel	2	2	4
Sequential R/W (MB/sec, max.)	530/380	530/210	530/340
Max. Power Consumption	1.5W (3.3V x 460mA)	1.4W (3.3V x 422mA)	1.09 W (3.3V x 330mA)
Thermal Sensor	Y	Y	Y
External DRAM Buffer	N	N	Y
iData Guard	Y	Y	Y
iCell	N	N	N
TRIM	Y	Y	Y
ATA Security	Y	Y	Y
S.M.A.R.T	Y	Y	Y
Dimension (WxLxH/mm)	22.0 x 42.0 x 3.2	22.0 x 42.0 x 3.2	22.0 x 42.0 x 3.5
Environment	Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours		
Standard Temp. OP (0°C~+70°C)	DHM24-XXXM41BC***	DEM24-XXXM41BC***	DGM24-XXX-D81%C***
Wide Temp. OP (-40°C~+85°C)	DEM23-XXXM41BW***	DEM24-XXXM41BW***	DGM24-XXX-D81%W***
Note	XXX = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56) ***= flash configuration (internal control code) %=Flash Type		



Model Name	M.2 (S80) 3IE4	M.2 (S80) 3ME4	M.2 (S80) 3MV2-P
Key Features	1. Type 2280-D2-B-M 2. Designed with LDPC ECC engine 3. Lifespan 7 times longer tham MLC 4. Cost-effective industrial flash with iSLC	1. Type 2280-D2-B-M 2. Exclusive L^3 architecture 3. Designed with LDPC ECC Engine 4. Budget-friendly MLC-based solution	1. Exclusive RECLine™ for steady performance 2. Type 2280-D2-B-M 3. Support DEVSLP 4. iData Guard Protection
Interface	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s
Flash Type	iSLC	MLC	MLC
Capacity	8GB~128GB	8GB~256GB	32GB~1TB
Max. Channel	2	2	4
Sequential R/W (MB/sec, max.)	530/360	530/210	530/450
Max. Power Consumption	0.9 W (3.3V x 270mA)	0.9 W (3.3V x 270mA)	3.63W (3.3V x 1.1A)
Thermal Sensor	Y	Y	Y
External DRAM Buffer	N	N	Y
iData Guard	Y	Y	Y
iCell	N	N	N
TRIM	Y	Y	Y
ATA Security	Y	Y	Y
S.M.A.R.T	Y	Y	Y
Dimension (WxLxH/mm)	22.0 x 80.0 x 3.2	22.0 x 80.0 x 3.2	22.0 x 80.0 x 3.5
Environment	Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours		
Standard Temp. OP (0°C~+70°C)	DHM28-XXXM41BC***	DEM28-XXXM41BC***	DVM28-XXXD81%C***
Wide Temp. OP (-40°C~+85°C)	DHM28-XXXM41BW***	DEM28-XXXM41BW***	DVM28-XXXD81%W***
Note	XXX = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T) ***= flash configuration (internal control code) %=Flash Type		

mSATA

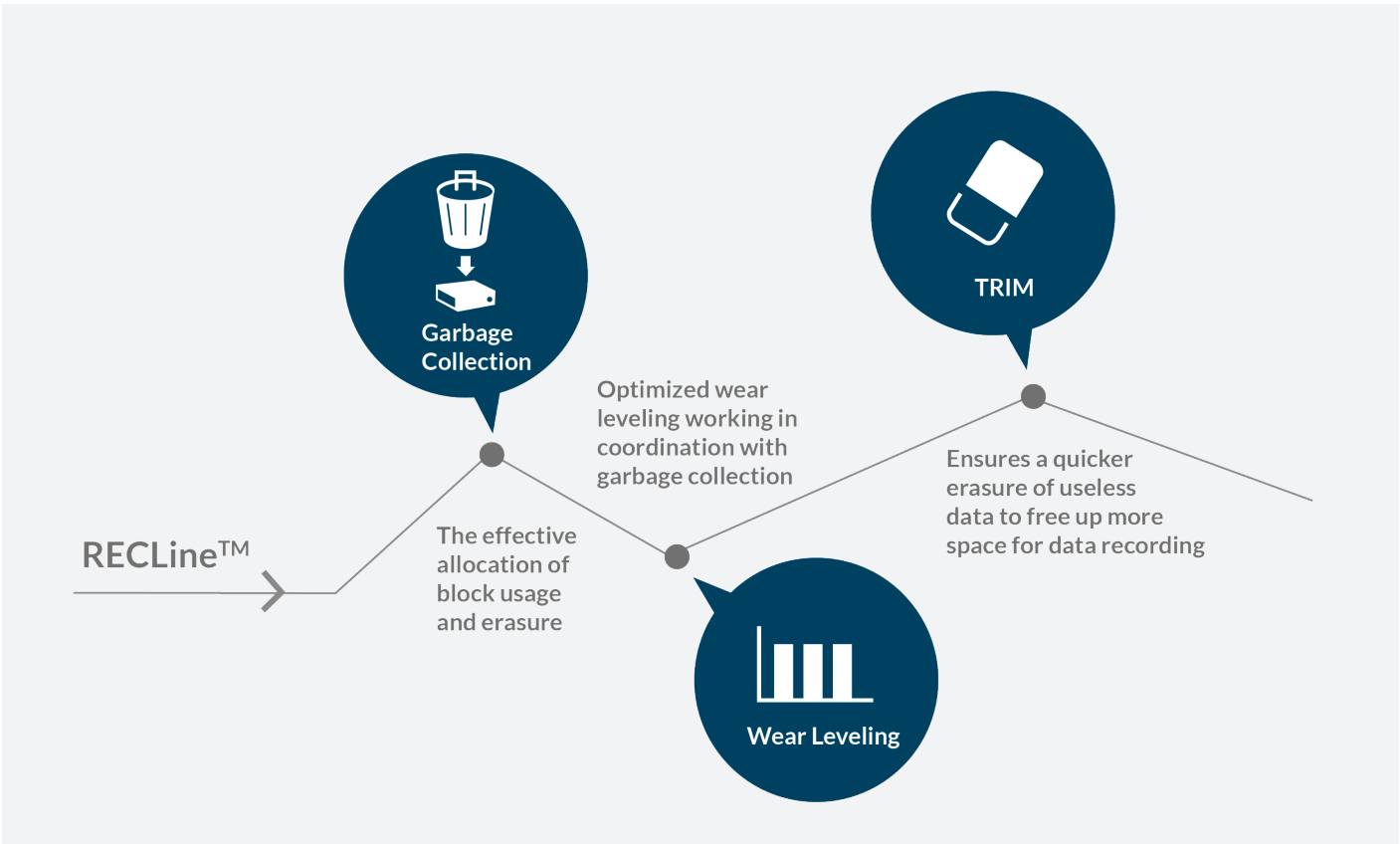


Model Name	mSATA 3IE4	mSATA 3MG2-P	mSATA 3ME4
Key Features	1. Cost-effective industrial Flash with iSLC 2. Lifespan 7 times longer than MLC 3. Performance and data quality congruent to SLC 4. Excellent data transfer speed 5. LDPC technology secures SSD reliability	1. High IOPS 2. Featuring L² architecture, the life span of the MLC SSD is maximized 3. DEVSLP supported	1. LDPC technology secures SSD reliability 2. DRAM-less, high-level data integrity
Interface	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s
Flash Type	iSLC	MLC	MLC
Capacity	8GB~128GB	8GB~512GB	8GB~256GB
Max. Channel	2	4	2
Sequential R/W (MB/sec, max.)	530/365	520/450	535/210
Max. Power Consumption	0.6W (3.3V x 200mA)	2.2 W (3.3 V x 660 mA)	0.6W (3.3V x 205mA)
Thermal Sensor	Y		
External DRAM Buffer	N	Y	N
iData Guard	Y	Y	Y
iCell	N	N	N
TRIM	Y	Y	Y
ATA Security	Y	Y	Y
S.M.A.R.T	Y	Y	Y
Dimension (WxLxH/mm)	29.8 x 50.8 x 3.7	29.85 x 50.8 x 3.6	29.8 x 50.8 x 3.7
Environment	Vibration: 20G@7~2000Hz/Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours***		
Standard Temp. OP (0°C~+70°C)	DHMSR-XXXM41BC***	DGMSR-XXXD81SC***	DEMSR-XXXM41BC***
Wide Temp. OP (-40°C~+85°C)	DHMSR-XXXM41BW***	DGMSR-XXXD81SW***	DEMSR-XXXM41BW***
Note	XXX = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12) ***= flash configuration (internal control code)%=Flash Type		

USB

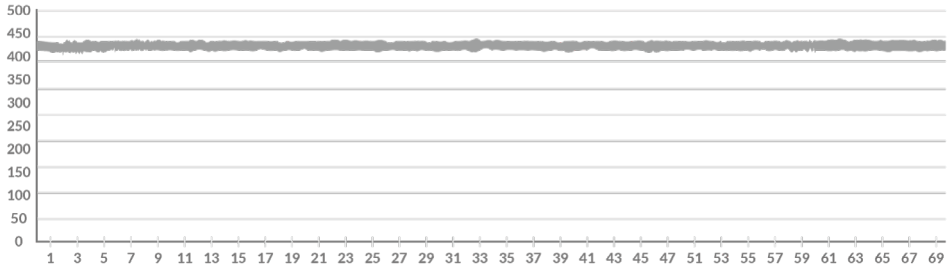
Model Name	USB Drive 3ME	USB Drive 2ME
Key Features	1. Metal housing to enhance ESD protection 2. 30µ golden finger for highly reliable data transfer quality	1. Metal housing to enhance ESD protection 2. 30µ golden finger for highly reliable data transfer quality 3. Support Hardware write protect
Interface	USB 3.0	USB 2.0
Connector	Type A	Type A
Flash Type	MLC	MLC
Capacity	8GB~64GB	8GB~64GB
Max. Channel	1	1
Sequential R/W (MB/sec, max.)	100/50	25/17
Max. Power Consumption	0.70 W (5VX140)	0.85W (5V x 170mA)
Dimension (WxLxH/mm)	16.5 x 45.8 x 7.4	16.5 x 45.8 x 7.4
Environment	Standard: N / Wide Temperature: Y	
Standard Temp. OP (0°C~+70°C)	DEUA1-XXXI61BC***	DEUA1-XXXI72BC2**
Wide Temp. OP (-40°C~+85°C)	DEUA1-XXXI61BW***	DEUA1-XXXI72BW2**
Notes	XXX = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12) ***= flash configuration (internal control code)	

RECLine™ - Absolute Data Recording Stability



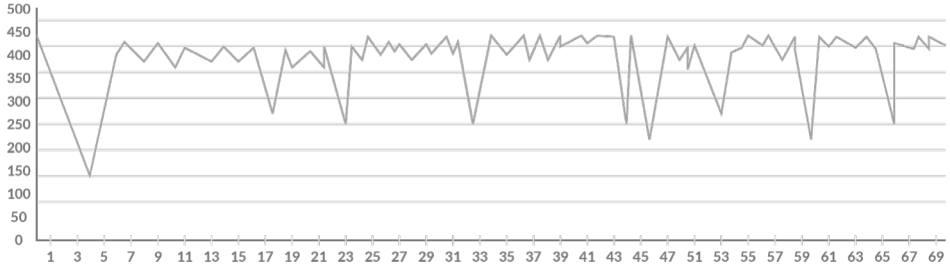
RECLine™ is our comprehensive solution for surveillance applications. It surpasses the inherent issues of data writing and erasure for solid state storage. The optimization of these SSD firmware features safeguards against any interruption to data recording and ensures a smooth recording performance.

w/RECLine™



Steady sustained write performance @ 430MB/s

w/o RECLine™



Unstable sustained write performance

Steady sustained write performance @430MB/s with 2.5" SATA SSD 3MV2-P 1TB

DRAM Products



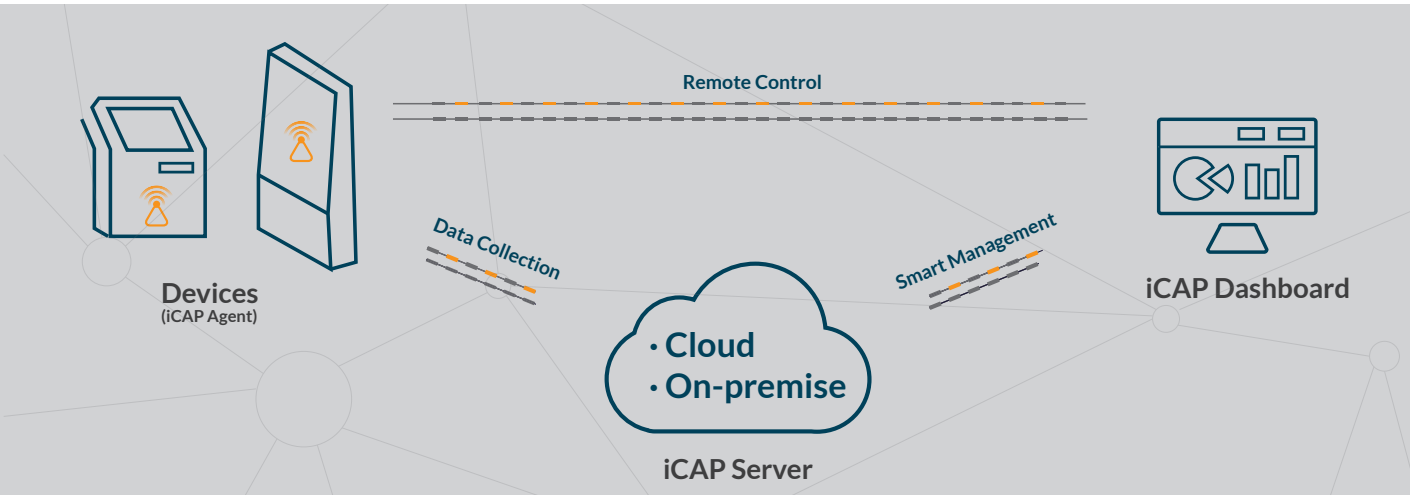

Series	Standard Solution	Unbuffered w/ECC Solution	Standard Solution	Unbuffered w/ECC Solution
Module Type	DDR4 UDIMM	DDR4 UDIMM	DDR4 SODIMM	DDR4 SODIMM
Data Rate	2133MT/s~2666MT/s	2133MT/s~2666MT/s	2133MT/s~2666MT/s	2133MT/s~2666MT/s
Capacity	4GB/8GB/16GB	4GB/8GB/16GB	2GB/4GB/8GB/16GB	4GB/8GB/16GB
Function	Non-ECC Unbuffered Memory	With ECC Unbuffered Memory	Non-ECC Unbuffered Memory	With ECC Unbuffered Memory
Pin Number	288pin	288pin	260pin	260pin
Width	64Bits	72Bits	64Bits	72Bits
Voltage	1.2V	1.2V	1.2V	1.2V
PCB Height	1.23 Inches	1.23 Inches	1.18 Inches	1.18 Inches
Operating Temperature	0 ~ 85°C	0 ~ 85°C	0 ~ 85°C	0 ~ 85°C
Value-Added Service	Conformal Coating /Side fill			




Series	Standard Solution	Unbuffered w/ECC Solution	Unbuffered w/ECC Solution	Standard Solution
Module Type	DDR3 UDIMM	DDR3 UDIMM	DDR3 SODIMM	DDR3 SODIMM
Data Rate	1066MT/s~1866MT/s	1066MT/s~1866MT/s	1066MT/s~1866MT/s	1066MT/s~1866MT/s
Capacity	2GB/4GB/8GB/16GB	2GB/4GB/8GB/16GB	2GB/4GB/8GB/16GB	2GB/4GB/8GB/16GB
Function	Non-ECC Unbuffered Memory	With ECC Unbuffered Memory	With ECC Unbuffered Memory	Non-ECC Unbuffered Memory
Pin Number	240pin	240pin	204pin	204pin
Width	64Bits	72Bits	72Bits	64Bits
Voltage	1.5V/1.35V	1.5V/1.35V	1.2V	1.5V/1.35V
PCB Height	1.18 Inches	1.18 Inches	1.18 Inches	1.18 Inches
Operating Temperature	0 ~ 85°C	0 ~ 85°C	0 ~ 85°C	0 ~ 85°C
Value-Added Service	Conformal Coating /Side fill			

Innodisk Cloud Administration Platform iCAP™

iCAP™ is a browser-accessed management platform that allows you to monitor the status of solid state drives (SSD), memory and other components in edge devices. It does this by gathering data from all connected devices and storing it on a central server, either on the cloud or on a company intranet. From here the data is easily accessible from your cell phone, pad or laptop with online access.



iCAP Key Features

Efficient Prediction

- Keep track of remaining lifespan of devices and SSDs
- Perform maintenance and swap worn-out devices in a timely manner to avoid abrupt downtime

Smart Management

Manage all connected device through an intuitive and user-friendly interface and customizable widgets

Remote Maintenance

- iCAP is browser-based and accessible through any connected computer, laptop or handheld device
- Easily initiated remote system recovery in case of crash or malfunction

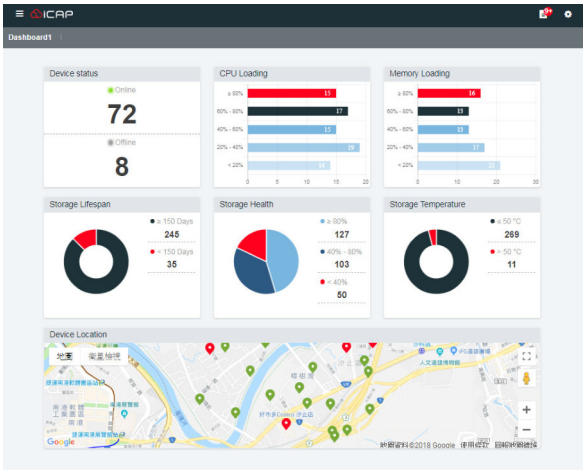
Advantages

Quick Deployment

Enabling the customer to easily implement their cloud management system through a client agent and system image.

Easily Customized

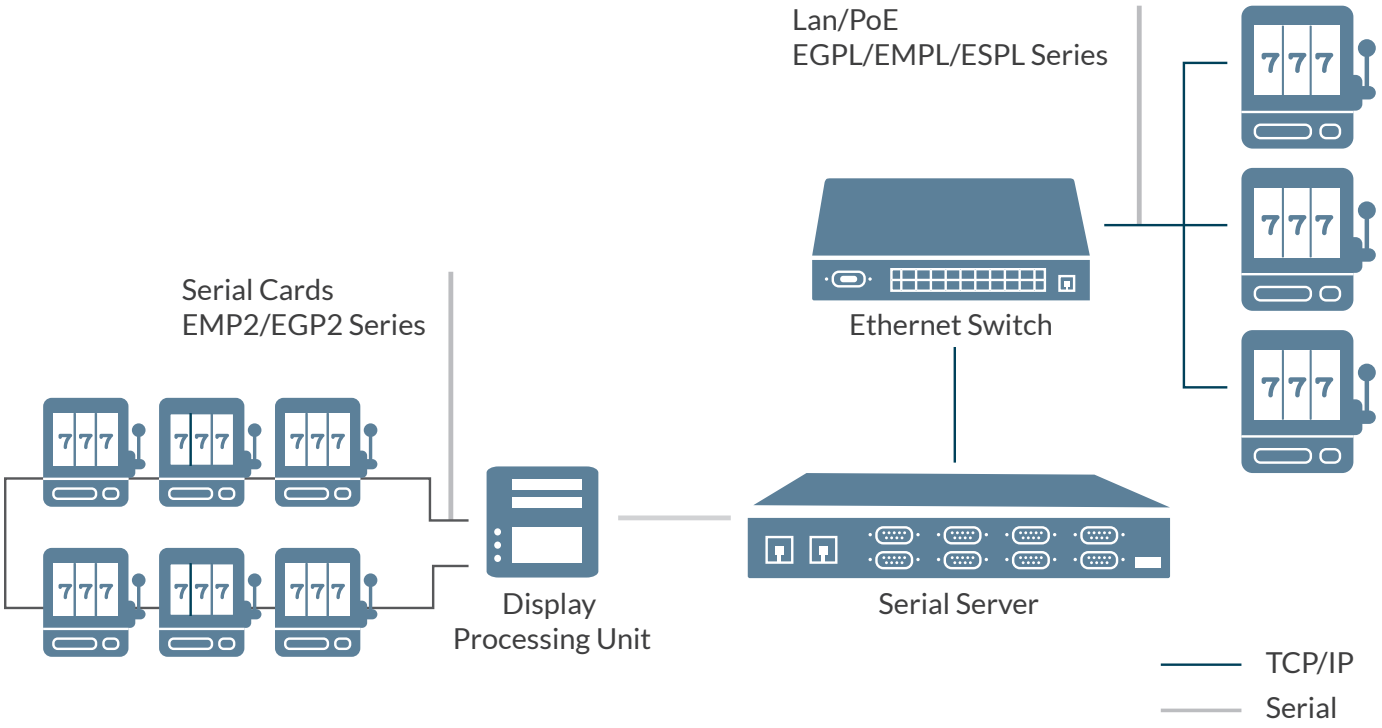
Ensures a smooth integration of I/O card and sensors into your cloud management system. Information is made clearer and more readily available.

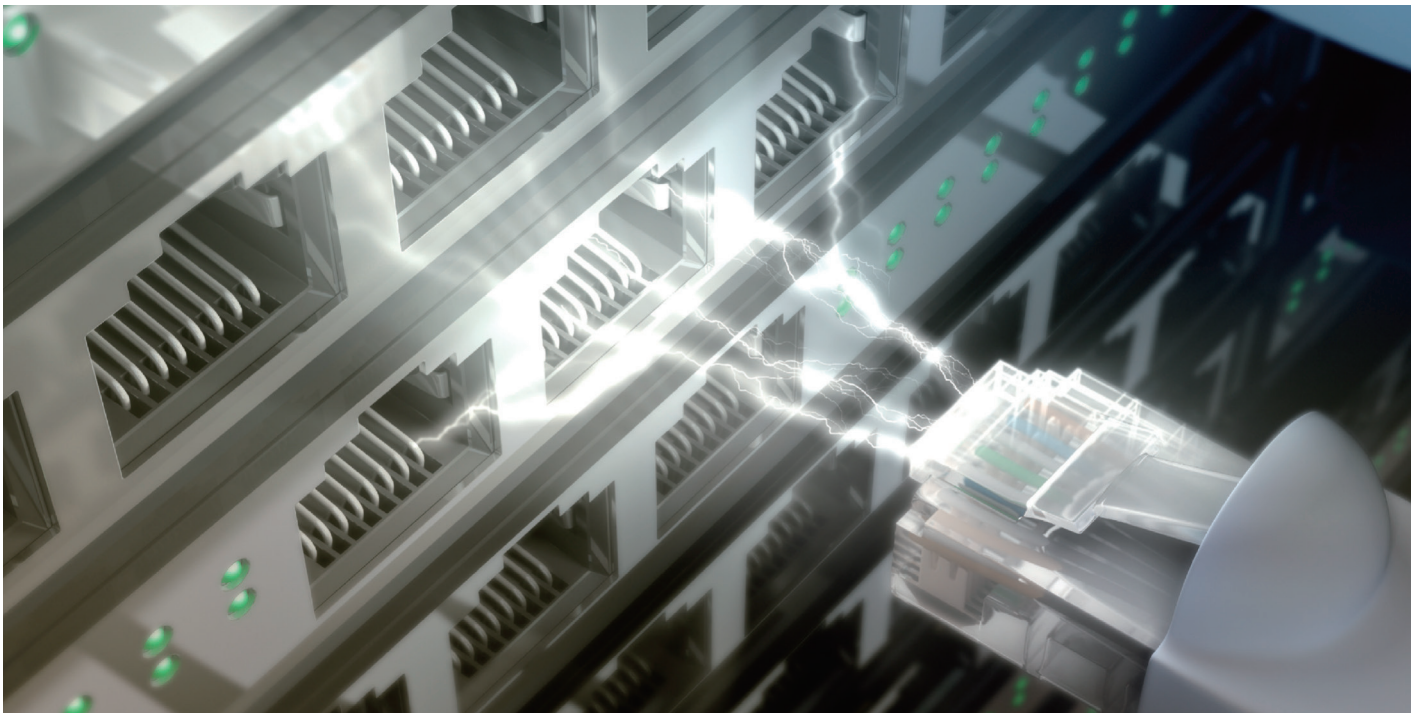


Casino Gaming Application

As the gaming industry enjoys their economic growth, the increase in devices and gaming technology continues to evolve. The need for LAN and Serial ports have become a necessity to enhance the gaming environment. Serial or Ethernet-supported networks increase the technical sophistication of the facility's communication system.

Nowadays, newer and more advanced machines are equipped with Ethernet connection ports. The Ethernet-supported network needs a rugged expansion LAN card to provide reliable Ethernet communications between the facility's server and the gaming machines. Just as important, serial cards are utilized for the point to point communications of the networking system. Therefore, with game devices migrating towards Ethernet-supported network, such as serial servers, LAN cards and serial cards are integral to these devices.



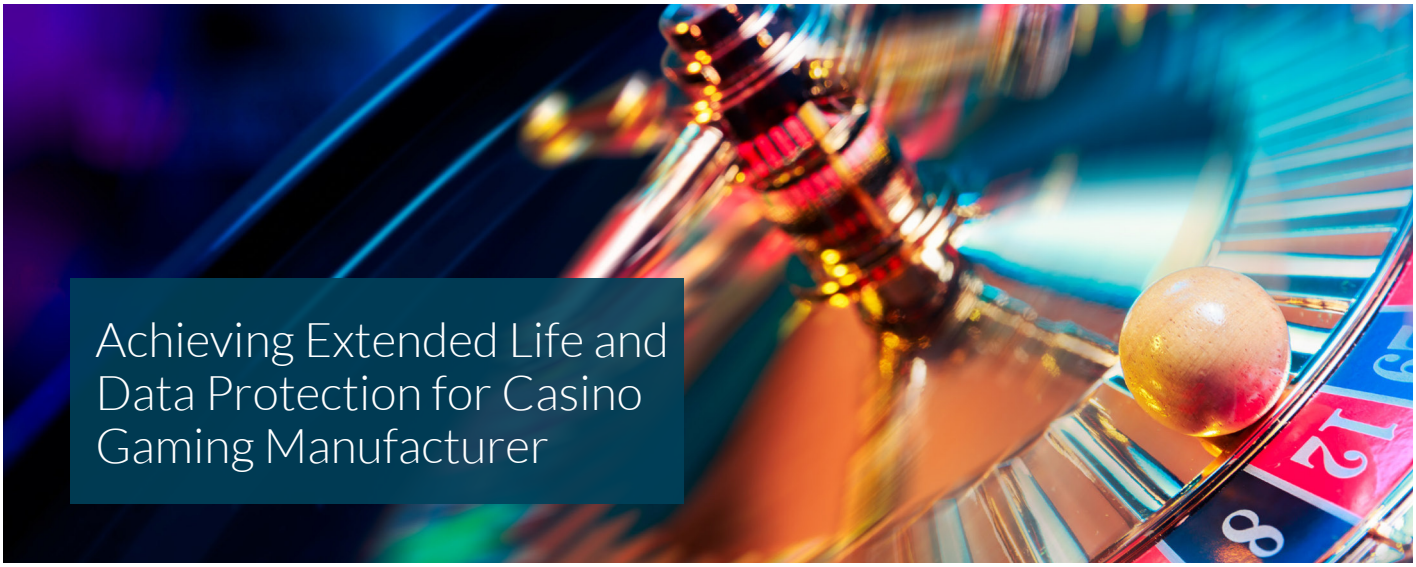


Embedded Peripheral Modules

Model Name	EMPL-G201	EGPL-G202	EMPL-G2P1
Module Type	mPCIe to dual GbE LAN module	M.2 to dual isolated GbE LAN Module	mPCIe to dual Isolated PoE Module
Key Features	1. Dual isolated GbE LAN ports 2. Complies with EN61000-4-5 2kV Surge protection 3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection 4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 5. Flexible daughter board with cable to fit into different system 6. Supports mounting terminal or bracket for daughter board 7. Optional Industrial Temperature (-40°C to +85°C) support	1. Dual isolated GbE LAN ports 2. Complies with EN61000-4-5 2kV Surge protection 3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection 4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 5. Flexible and small daughter board with cable to fit into different system 6. Optional terminal mounting hole or bracket for daughter board 7. Industrial temperature -40 °C to 85 °C	1. Supports dual isolated GbE LAN ports 2. Two independent PSE channels 3. Supports 12V~24V power input via 4pin header or DC-Jack 4. Complies with IEEE 802.3af, up to 15.4W at 48V per PoE port. 5. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 1.7KV HiPOT protection 6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 7. Industrial temperature -40 °C to 85 °C
Form-Factor	mPCIe	M.2 2242	mPCIe
Input I/F	PCI Express 2.1	PCI Express 2.1 x 1	PCI Express 2.1
Input Connector	mPCIe	M.2 B-M	mPCIe
Output I/F	GbE LAN x 2	GbE LAN x 2	PoE x 2
Output Connector	RJ45 x 2	RJ45 x 2	RJ45 x 2
Dimension (WxLxH/mm)	30 x 50.9 x 6.1	22 x 42 x 9.15	30 x 50.9 x 7.6
Operating Temperature	STD temp: 0°~70°C Wide temp: -40°~85°C	STD temp: 0°~70°C Wide temp: -40°~85°C	STD temp: 0°~70°C Wide temp: -40°~85°C
Order Infomation	EMPL-G201-C1 EMPL-G201-W1 EMPL-G201-C2 (with bracket) EMPL-G201-W2 (with bracket)	EGPL-G202-C1 EGPL-G202-W1 EGPL-G202-C2 (with bracket) EGPL-G202-W2 (with bracket)	EMPL-G2P1-C1 (Mounting hole, 4pin header) EMPL-G2P1-W1 (Mounting hole, 4pin header) EMPL-G2P1-C2 (Bracket, 4pin header) EMPL-G2P1-W2(Bracket, 4pin header) EMPL-G2P1-C3 (Mounting hole, DC Jack) EMPL-G2P1-W3 (Mounting hole, DC Jack) EMPL-G2P1-C4 (Bracket, DC Jack) EMPL-G2P1-W4(Bracket, DC Jack)

Model Name	ESPL-G4P1	EMP2-X404	EGP2-X401
Module Type	PCIe to four isolated PoE/PoE+ Module	mPCIe to four RS-232/422/485 Module	M.2 to four RS-232/422/485 Module
Key Features	1. Supports four isolated GbE LAN ports 2. Four independent PSE channels 3. Complies with IEEE 802.3af, up to 15.4W at 48V per PoE port 4. Complies with IEEE 802.3at, up to 25.5W at 54V per PoE port 5. Supports 12V~24V power input via 6pin PCIE-ATX 6. Supplies total power up to 75W 7. Complies with EN61000-4-5 2kV Surge protection 8. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection	1. PCIe 2.0 compliant. RS-232/422/485 mode configurable by software 2. Up to 25 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs 3. Full RS-232 functions with DB9 connector 4. Termination resistor enabled/disabled by DIP switch 5. RI/5V/12V output switched by Jumper 6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 7. Industrial temperature -40 °C to 85 °C	1. PCIe 2.0 compliant. RS-232/422/485 mode configurable by software 2. Up to 25 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs 3. Alternative vertical or horizontal connector 4. Full RS-232 functions with DB9 connector 5. Termination resistor enabled/disabled by DIP switch 6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 7. Industrial temperature -40 oC to 85 oC
Form-Factor	Standard PCIe	mPCIe	M.2 2242
Input I/F	PCI Express 2.1 x 4	PCI Express 2.0	PCI Express 2.0 x 1
Input Connector	PCIe x4	mPCIe	M.2 B-M
Output I/F	PoE/PoE+ x 4	RS-232/422/485 x 4	RS-232/422/485 x 4
Output Connector	RJ45 x 4	DB-9 x 4	DB-9 x 4
Dimension (WxLxH/mm)	169.55 x 111.15 x 19.6	30 x 50.9 x 6.1	Vertical : 22 x 42 x 6.45 Horizontal : 22 x 42 x 7.65
Operating Temperature	STD temp: 0°~70°C Wide temp: -40°~85°C	Wide temp: -40°~85°C	Wide temp : -40°~85°C
Order Infomation	ESPL-G4P1-C1 ESPL-G4P1-W1	EMP2-X404-W1	EGP2-x401-W1 (Vertical connector) EGP2-x401-W2 (Horizontal connector)

Successful Story



Achieving Extended Life and Data Protection for Casino Gaming Manufacturer

Situation

A major gaming machine manufacturing company wanted to increase performance and longevity, as well as the data security of their systems based upon the needs of their end users. To meet these demands, they had to upgrade their in-house gaming system. The new system would have to be designed to handle a heavy logging workload, and the end user also expressed concerns regarding data tampering.
For these reasons, it was crucial for the storage device to maintain large amounts of write operations over extended periods of time. Because the system's life span would increase, ultimately this would require long term product warranty. Because the gaming industry's certification process is extensive and costly, it is important to provide a solution that won't accelerate the customer's product replacement needs.

Challenges

1. Sustained and heavy logging workload: The machines would handle large data amounts, risking early SSD breakdown
2. Compromised Data: Gaming data falling into the wrong hands presents a large threat to business
3. Warranty concerns: With heavy workloads, the storage solution needed a robust warranty offer

Solutions

1. High-endurance SSD: Long-lasting NAND flash with supporting firmware to enhance SSD endurance
2. Data Security Optimization: Firmware and additional features to protect sensitive data from tampering
3. 5-year Warranty: Extended warranty for all storage devices

Our Roadmap to Success

Firmware Optimized for Data Security

• Write Protect – Only allows data to be read from storage – triggered through switch on SSD
• Partition – Sections off and hides the most sensitive data
• Secure Boot – A system of checks of vendor unique string, and software and hardware serial numbers before allowing system start

High-Endurance SSD

• 128GB 2.5" 3IE4 – Increased lifespan with iSLC NAND Flash
· LDPC error correction

Result

The client found that the SSD delivered on the longevity and performance demands required by their system and could easily alleviate the data security concerns of the end customer. The Innodisk team members provided a smooth transition for the client's upgrade, a cost effective SSD solution, and established a strong foundation for future cooperation.

ABOUT US

Innodisk is a service-driven provider of flash memory, DRAM modules and embedded peripherals for industrial and enterprise applications. With satisfied customers across the embedded, aerospace and defense, cloud storage markets and more, we have set ourselves apart with a commitment to dependable products and unparalleled service. This has resulted in products, including embedded peripherals, designed to supplement existing industrial solutions and high IOPS flash arrays for industrial and enterprise applications. The expanded business lines are leading our next steps in being a comprehensive solution and service provider in the industrial storage industry.

Founded in 2005 and headquartered in Taipei, Taiwan, Innodisk services clients globally with engineering experts and sales teams in China, Europe, Japan, and the United States. With abundant experience and an unrivaled knowledge of the memory industry, Innodisk develops products with excellent quality, remarkable performance and the highest reliability.

For more information about Innodisk, please visit http://www.innodisk.com.

Our Advantages

Technical Aptitude by Design

Our advantage lies in our portfolio of hardware, software and firmware technology and how we arrange these basic building blocks into new works of innovation.

Deeply Rooted in the Market

The awareness of the pit falls and opportunities of vertical markets allow us to view the full picture when crafting the optimal solution.

We Are in It Together

To reach the optimal solution, working together with our partner from day one is paramount. The best possible outcome can be managed by developing solutions jointly.

Our Vision

Absolute Integration™

Absolute Integration™ is our envisioned path that moves toward a more interconnected world.

"To us, integration is not merely the combination of hardware, software and firmware; it is a philosophy that assimilates all relevant elements to create an optimal solution."

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www.innodisk.com