Datasheet

2019 Edition

# Innodisk Selection Guide

Flash Storage, DRAM Modules, Embedded Peripherals, and Software Solutions

AmpliconBenelux.com | IT and Instrumentation for Industry

Amplicon BENELUX

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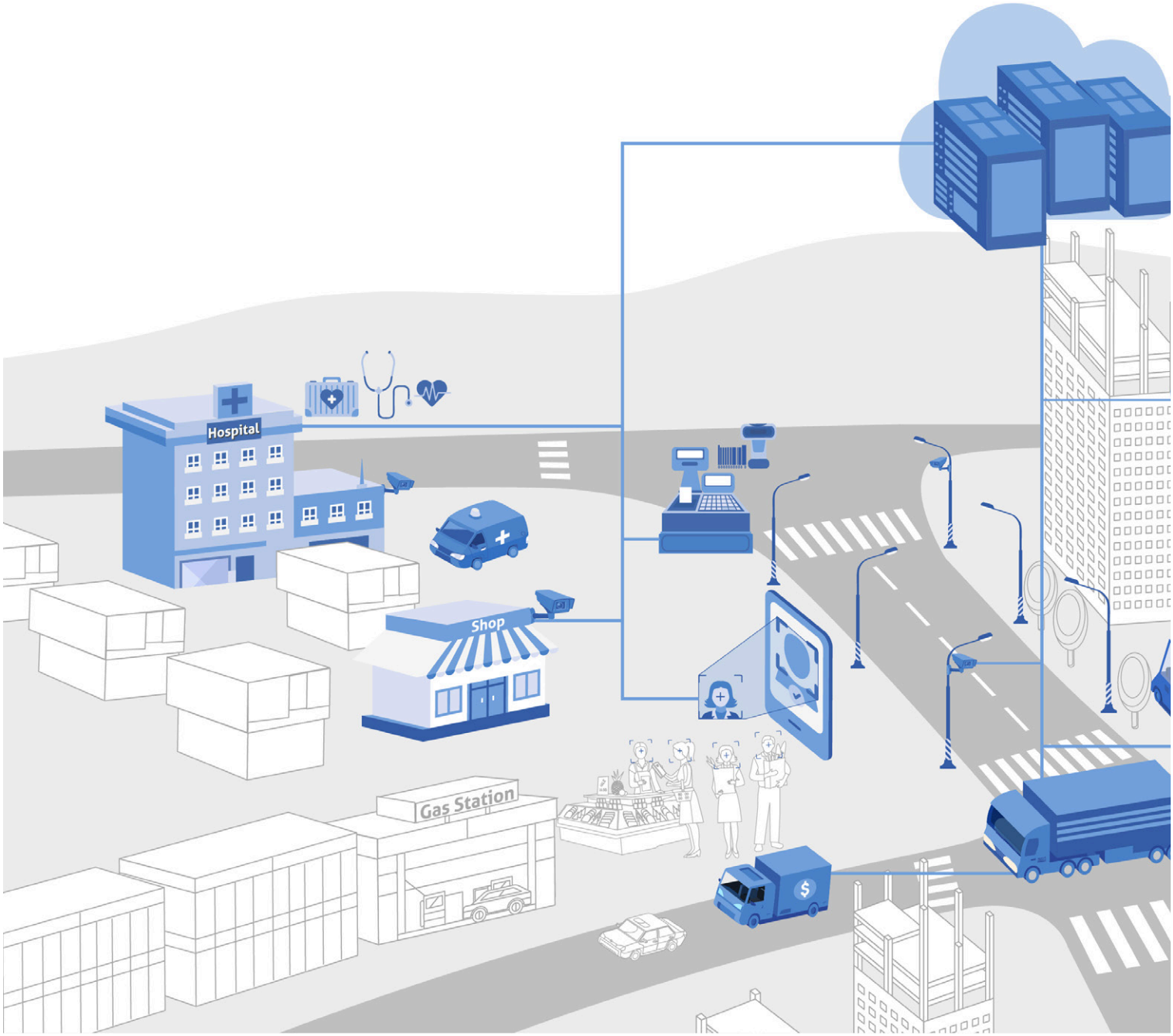
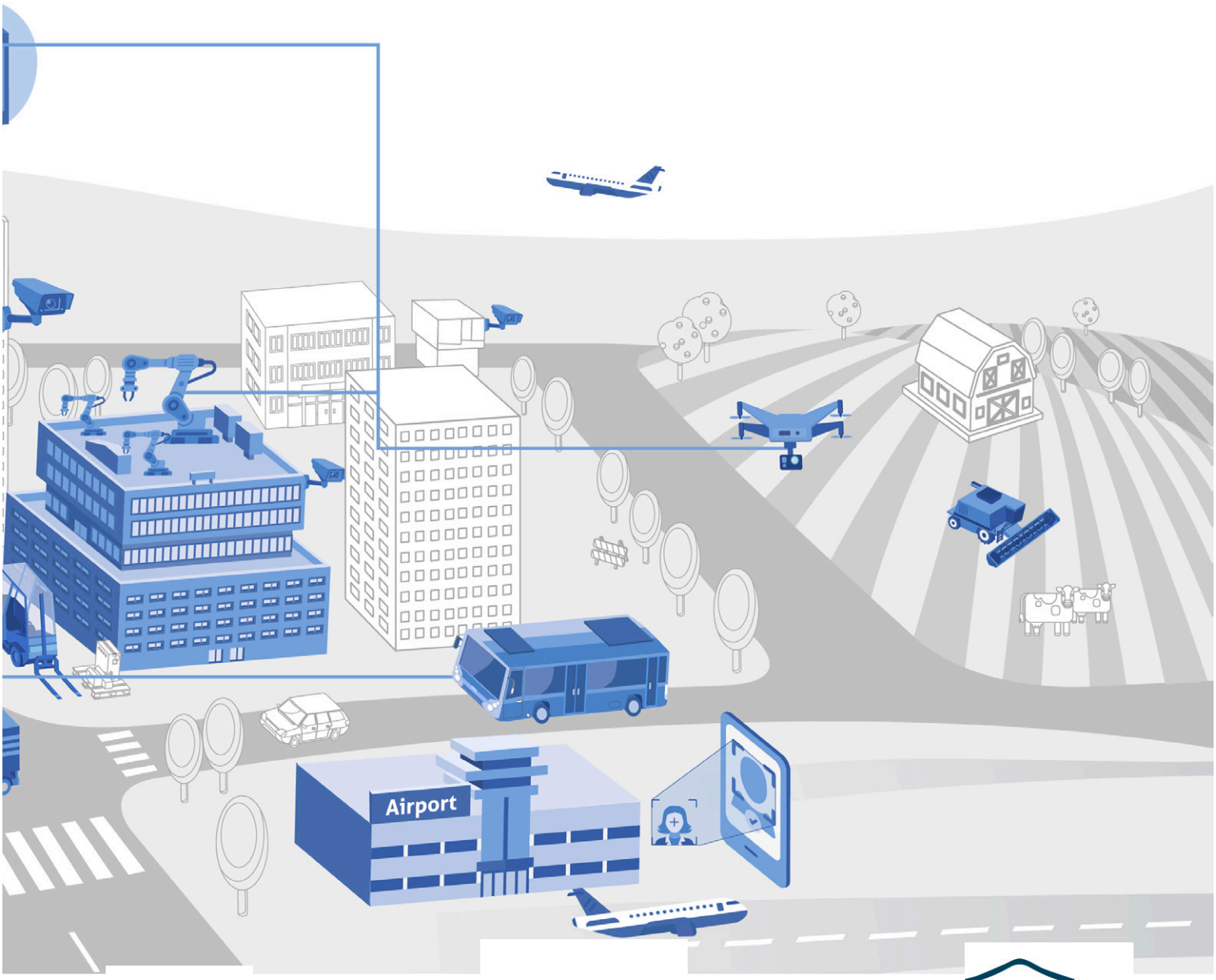


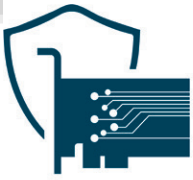

Application

# Surveillance in the AIoT Era

## Comprehensive Memory, Storage, and Communication Solutions for the Surveillance Sector

The role of surveillance and video recording is poised to play a major role in the future markets of where AI and IoT meet. AI requires more computational power, which puts a bigger toll on the IoT device. Adding on the environmental challenges of IoT applications, the requirements can be difficult to meet. However, with robust and optimized components, these challenges can be met head on.





## Storage Optimized for Video Recording

RECLine™ is the exclusive firmware algorithm for video recording that ensures steady performance without any frame-loss.

## Compact Memory that Doesn't Waver

Our Very Low Profile (VLP) and Mini DRAM modules combine small form factors with high performance to make sure data recording goes off without a hitch.

## Rugged Power and Signal Transmission

Innodisk's PoE extension cards provide ruggedness and galvanic isolation, ensuring uncompromised signal strength and power to your devices.



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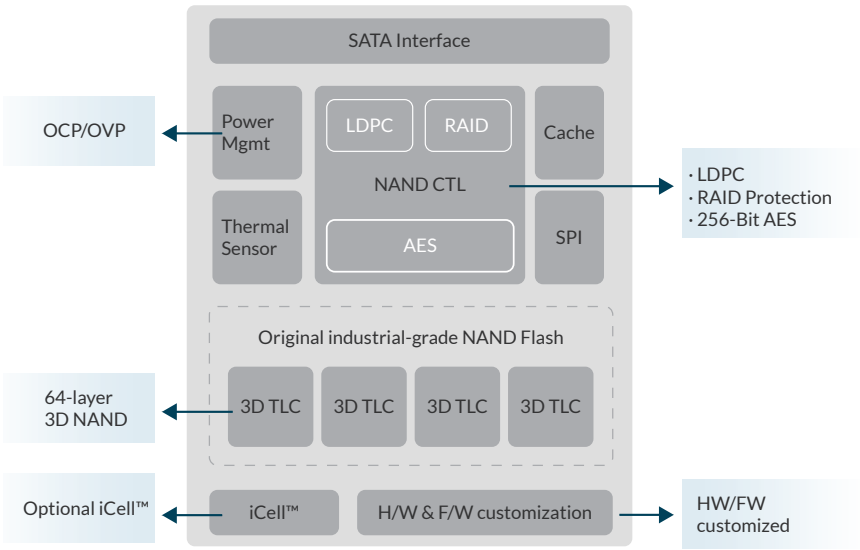
Flash

# Entering the Era of 3D NAND

## Industrial 3D TLC solution with top reliability and high endurance

3TG6-P and 3TE7 are Innodisk's latest product lines with 3D TLC NAND Flash, and are targeted at industrial applications. The series have reliable design, self-developed firmware and MLC-like characteristics. 3TG6-P series is a performance-oriented product line, and offers high speed and high capacity; In terms of boot drive and small form factors storage, the 3TE7 is the perfect choice. Both 3TG6-P & 3TE7 support various form designs, including: 2.5" SSD, M.2, SATADOM and mSATA.




### Benefits

- Reliability: Advanced LDPC ECC engine & internal RAID engine offer additional level of data protection
- Data Integrity: Unique power management & iData Guard™ to ensure data integrity under various environmental conditions
- Optimality: Extreme sequential and random performance with 3D NAND solution, no performance drop concern
- Security: 256-bit AES & End-to-End data path protection*
- Quality: Original industrial-grade NAND flash chips
- Manageability: iSMART & iCAP compatibility

Flash

# InnoREC™ Surveillance Storage Series

## Firmware Optimized for the Strict Requirements of the Surveillance Industry

InnoREC™ is Innodisk's proprietary flash feature set designed specifically for surveillance applications. Through the smart integration of firmware and hardware, the speed and steady performance required by modern surveillance solutions is fully met.

### RECLine™

RECLine™ is the exclusive firmware algorithm for video recording that ensures steady performance without any frame-loss

### iData Guard

iData Guard is our patented power cycling data management system, which helps to ensure surveillance data integrity during and after unexpected power outages

### iCell

Ensures data is flushed from volatile storage to prevent the loss of valuable surveillance data during sudden power failures

### Quick Erase

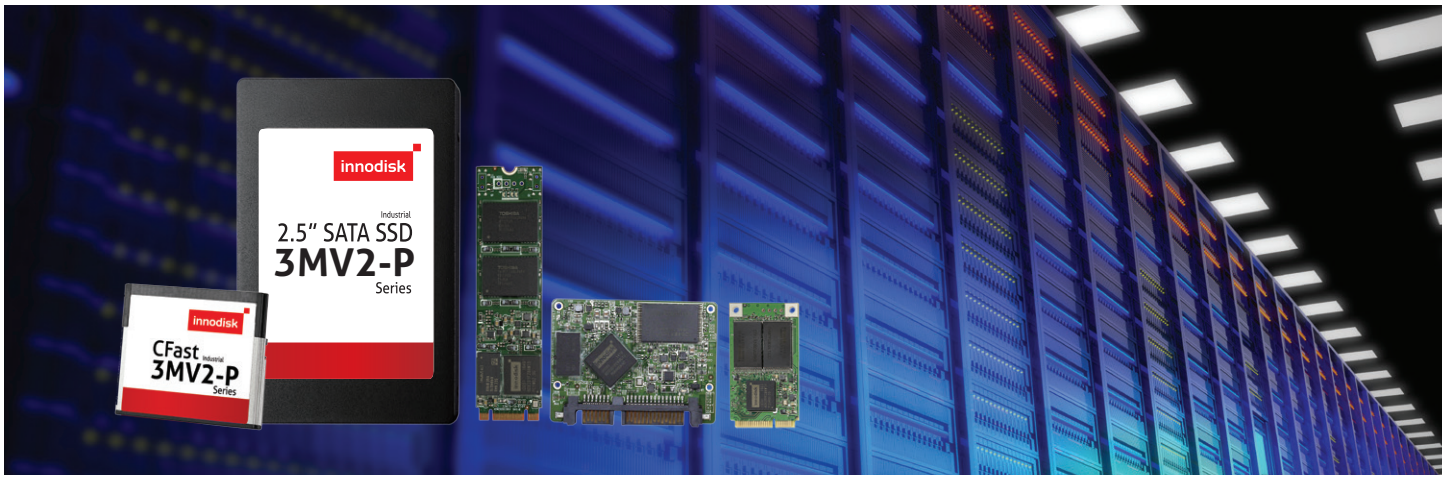
Quick Erase can delete all data within a few seconds – preventing leakage of potentially sensitive data

### Thermal Sensor

When the surveillance system threatens to overheat, an immediate warning is issued. The SSD will automatically adjust the transmission frequency to ensure continued performance and reliability

### Passive Cooling

The SSD layout is design for maximum heat dissipation – ensuring performance and enhanced data retention



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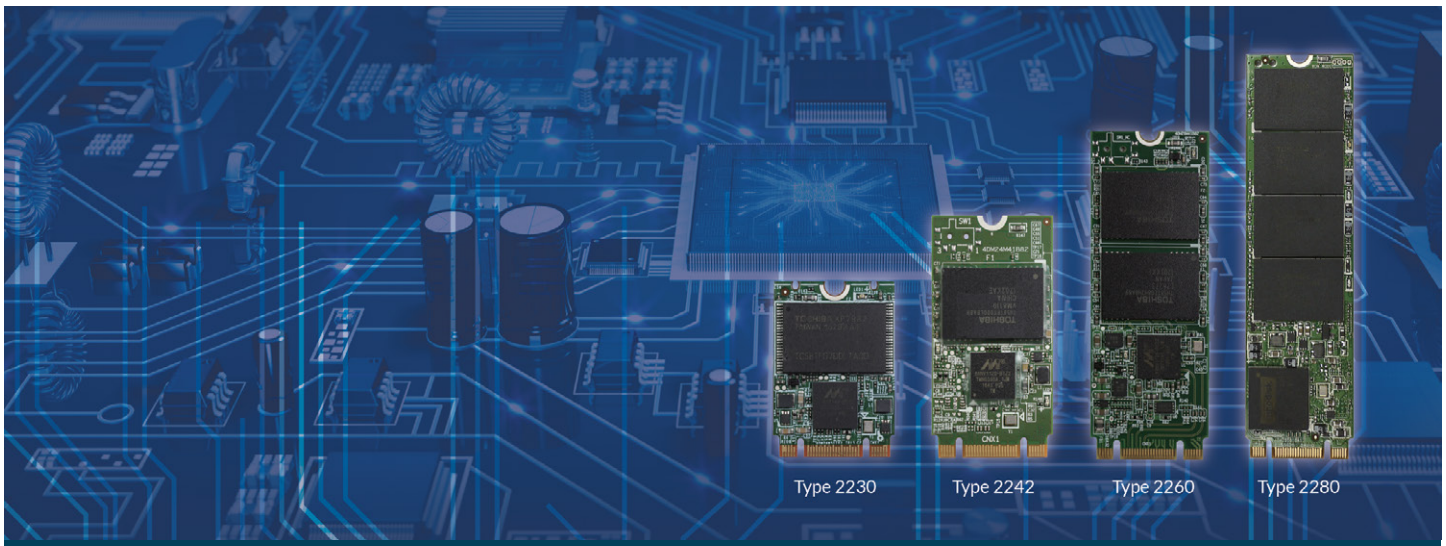



Flash

# Comprehensive M.2 solutions

## Diverse M.2 Solutions for Industrial and Embedded Storage

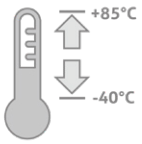
After the M.2 was announced as the next generation form factor, there has been a steady migration from the older mPCIe cards. This new form factor is instrumental for new IoT application as more and more platforms are adopting it as their main port.

To stay ahead of the curve, Innodisk has launched comprehensive M.2 solutions for both data storage and embedded expansions. This complete series includes 2230, 2242, 2260, and 2280 form factors that support both B and M key configurations, thus ensuring compatibility with the newest platforms on the market.

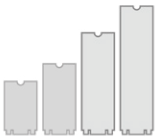
Innodisk M.2 solid state drives (SSD) are offered in a wide variety of models. The SATA III interface is a true and tested solution for standard applications, while PCIe 3.0 is the go-to for systems requiring exceptional performance. Furthermore, extensive firmware customization is also available: the M.2 SSD can be optimized for server and security environments, and it is also available with the newest 3D NAND flash.

Innodisk's comprehensive M.2 storage solutions are the perfect fit for the next generation of IoT devices.

**Wide Product Range**
- PCIe and SATA Solutions
- SLC/ iSLC/ MLC/ 3D TLC




**Industrial-Design**
- Wide Temperature -40~85°C
- High Durability



**Flexible Solutions**
- Multiple Form Factors
- Compatible with Both B and M Key

**Power Loss Protection**
- iData Guard™
- iCell™ (Optional)
- iPower Guard™



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DRAM

# The DDR4 32GB 2666 Family

## DRAM that Meets the Need of High-Capacity IoT Applications

Innodisk's new, industry-leading 32GB DRAM modules are optimized for high-end server and data center use. The modules are compatible with both the Z370 and Z390 chipsets. These high-capacity DRAM are available in a variety of form factors, including UDIMM, SODIMM, with ECC as an optional addition.

### Features

- Developed In-house
- Anti-Sulfuration Capabilities
- 32GB High Capacity
- Original IC Industrial Grade

### Applications

- Mission Critical
- Medical
- Communication
- Server

DRAM

# Anti-Sulfuration DRAM for ALL DDR4 DRAM Modules

## Robust Modules that Bring the Needed Endurance to the Industrial Market

The Innodisk Many Anti-Sulfuration DRAM modules are designed for operators that are facing increasing difficulty with high sulfur content in their surroundings. The sulfur can cause corrosion damage to DRAM modules and lead to complete module failure, and, most detrimental to the operator, costly downtime.

These modules are protected against the high sulfur concentrations by a specialized design that shields the components, effectively sealing off the exposed parts of the module from the sulfur in the air.

### What is sulfuration?

- Sulfur reacts with silver used in DRAM modules and creates silver sulfide (Ag2S)
- This corrosion lowers conductivity and can potentially lead to module failure
- Sulfuration is most commonly encountered in areas with pollution and volcanic activity; as well as in the petrochemical, mining and energy sector

Free

**Free-of-Cost Upgrade**
- All Innodisk DDR4 modules will be upgraded without any added cost to include robust anti-sulfuration measures

**Long-term Protection**
- Decrease your TCO by investing in modules with lasting durability in hostile environments

Embedded Peripherals

# Bringing Industrial-Grade Machine Vision and Surveillance to the Forefront

## New PoE+ Expansion Cards Further Enhances Power Output and Reliability

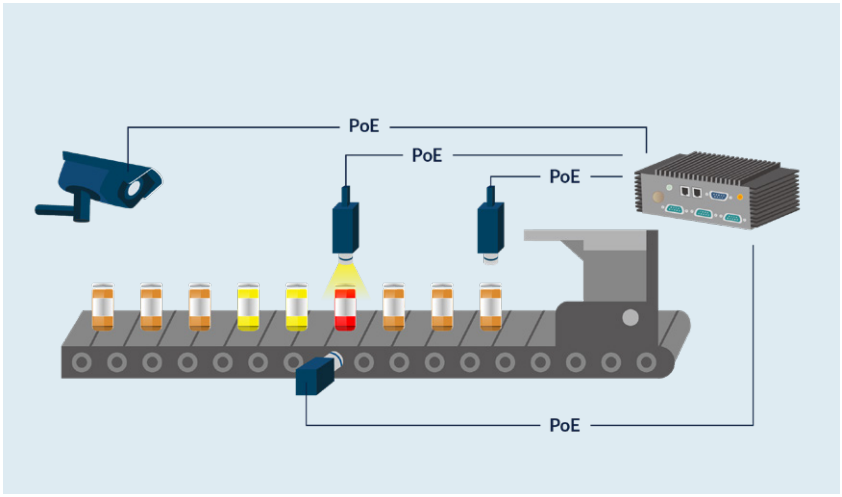
PoE+ enables reliable connection to Powered Devices (PD) such as surveillance cameras and machine vision cameras, as well as point-of-sales systems and voice-over-IP equipment.

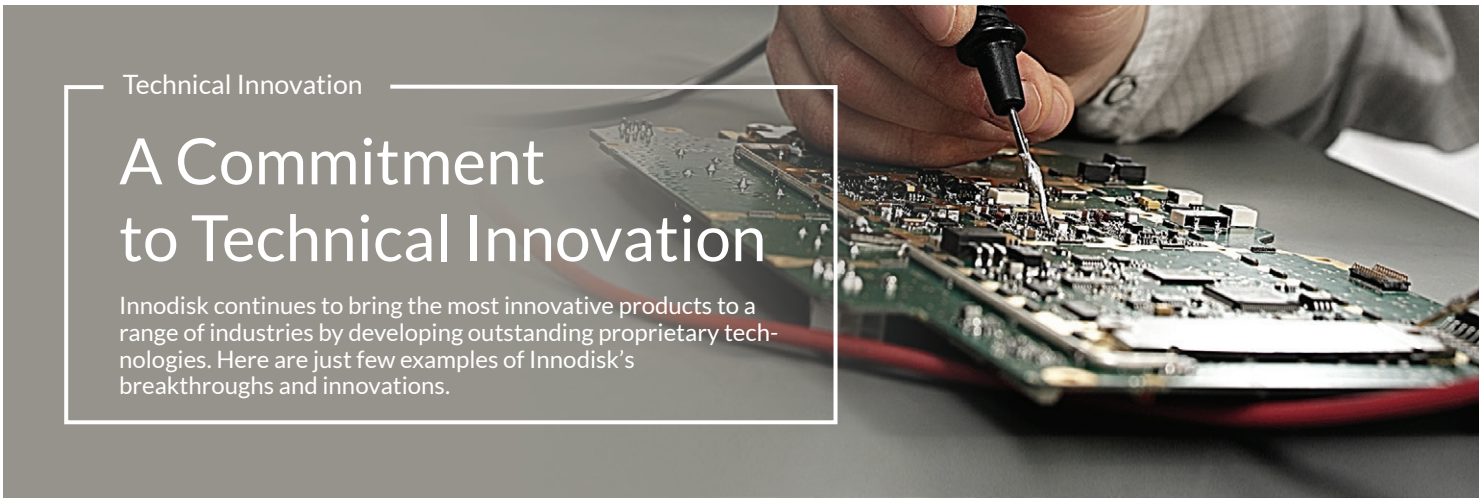
These rugged expansion cards are highly compatible, and have been extensively tested at full loading with different camera types, on different platforms and operating systems. The high compatibility with machine vision cameras makes the PoE expansion cards an integral part of quality assurance systems and also helps pave the way for deep learning applications.

Available in space-saving form factors and with flexible mounting options, the Innodisk PoE expansion cards are easily integrated into any Power Source Equipment (PSE). These expansion cards sports isolated, wide temperature design and is certified to withstand HiPOT and surge occurrences, making it the optimal choice for operation in harsh conditions.

### Wide Compatibility

- Tested and approved for small and large size surveillance cameras as well as machine vision cameras
- Compatible across on a wide array of platforms and operating systems

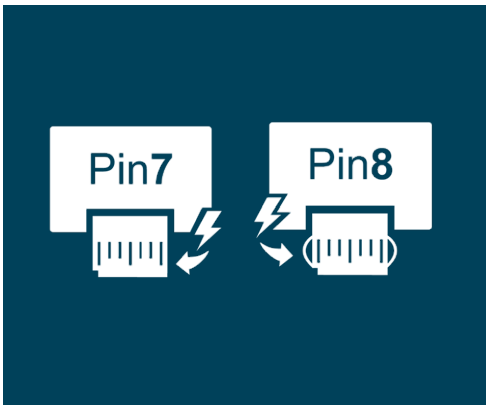




Technical Innovation

# A Commitment to Technical Innovation

Innodisk continues to bring the most innovative products to a range of industries by developing outstanding proprietary technologies. Here are just few examples of Innodisk's breakthroughs and innovations.



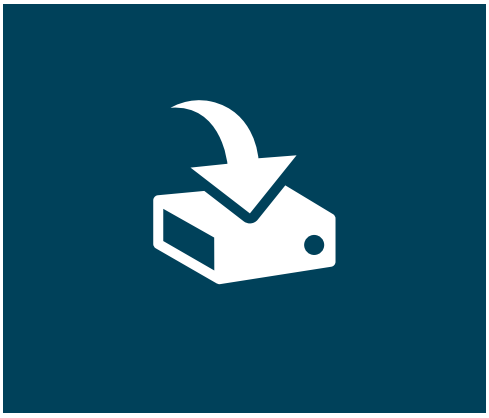

## Cable-Less Power

### Pin 7/ Pin8

Innodisk's patented Pin 7 and Pin 8 SATA power technologies take the cable-less concept to the next step by eliminating the need for power cables. Yielding a 100% cable-less, shock resistant, space saving plug-and- play storage solution that optimizes airflow and makes the best use of limited board space in embedded and rackmount server systems.

## iSMART™

iSMART is a powerful, easy-to-use SSD and DRAM health monitoring tool. It allows system integrators to track important storage and memory information, such as temperature, storage space, bad blocks, lifespan and firmware, all under one platform. With iSMART, system integrators can better manage storage usage and know exactly when to replace a device before the end of its life cycle.



## iCell™

iCell is a smart data protection technology that is built into Innodisk's SSDs. iCell is crucial for mission-critical applications, where working under extreme conditions and without backup power is unavoidable. Our iCell technology provides a mechanism to instantaneously discharge data stored in temporary volatile DRAM buffers to flash storage, to ensure the safety of data during power failures.

## Passive Cooling

SSDs may easily lose data due to overheating. Innodisk has redesigned the cable layout by using copper to separate the controller and flash. This reduces the thermal conductivity rate and enhances data retention.

## iPower Guard™

Innodisk's Power on Protection is a new circuit protection feature that is dually designed to allow uninterrupted SSD functionality in an inconsistent power supply situation, as well as provide accelerated boot-up for emergency startups or system shutdowns.

## Stable Power Control

Innodisk's stable power control is used to optimize power circuits and establish OCP/OVP mechanisms to prevent electronic components from burning out due to voltage or current surges.

## iSLC

iSLC is our exclusive technology designed to ensure longer-lasting and more reliable performance than conventional MLC NAND flash. Through the use of flash management algorithms, iSLC improves SSD endurance up to 20,000 cycles, increasing the lifespan to at least 7 times longer than MLC-based solutions.

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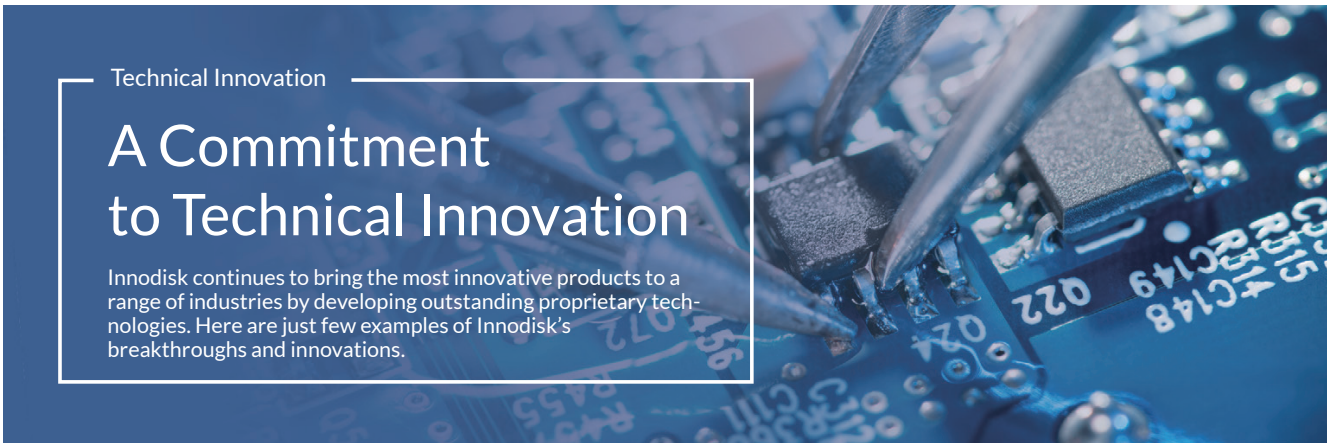

Technical Innovation

# A Commitment to Technical Innovation

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## Thermal Sensor

Innodisk's Thermal Sensor is a robust heat and workload management technology that is built into our DRAM modules and flash storage. It is a crucial solution for industrial & aerospace and defense applications, which are often susceptible to extreme heat and performance stress. Innodisk's Thermal Sensors enables thermal throttling to lower the working temperature while distributing workloads, which prevents modules from overheating, and greatly enhances system performance and stability.

## 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.

## Garbage Collection/TRIM

Innodisk's Garbage Collection/TRIM technology is used to maintain data consistency and perform continual data cleansing on SSDs. It runs as a background process, freeing up valuable controller resources while sorting good data into available blocks, and deleting bad blocks. It also significantly reduces write operations to the drive, thereby increasing the SSD's speed and lifespan. With Innodisk Garbage Collection/TRIM technology, an SSD's health and performance is optimized.

## $L^3$ Architecture

Innodisk's exclusive $L^3$ Architecture firmware, which combines Long-Life with LDPC ECC, yields a prolonged lifespan, exceptional reliability and high performance. Innodisk's exclusive industrial oriented firmware also provides a flexible customization service, making it perfect for a variety of industrial applications.

## iRetention™

iRetention is an intelligent technology created by Innodisk. This agile SSD firmware feature is able to maintain data retention in the face of NAND flash aging and high-temperature variations. With this firmware feature, SSD retention time is significantly extended compared to standard NAND flash specifications.

## InnoRobust™ Data Security

The InnoRobust™ Data Security is comprised of Security Erase, Destroy, Physical Destroy and Quick Erase. These sophisticated technologies are aimed at quickly and efficiently erasing and destroying data that is in danger of being compromised.

## AES Hardware Encryption

Advanced Encryption Standard (AES) is the standard cipher used by the US government to protect confidential data on storage devices. By integrating the encryption-engine in the SSD controller, the encryption/ decryption process is done without affecting CPU performance. The encryption key is safely stored away in the SSD and can be destroyed in less than a second, rendering all stored data useless as it cannot be decrypted.

# DRAM Solutions

## iRAM

The testing quality and strictness of iRAM easily surpasses that of similar testing software in ECC and RDIMM modules. With this exclusive Innodisk tool, any underperforming component will quickly be identified and weeded out. This takes into account every piece of IC and ECC IC status. Moreover, iRAM is a web-based diagnostic tool that not only simulates multipoint servers and workstation computing scenarios, but also detects unexpected issues where other software falls short in order to ensure the highest quality, reliability, and performance; ultimately reducing your maintenance cost.

## Conformal Coating

Innodisk conformal coating refers to the chemical materials that are applied in layers to cover components. The thickness of the coating ranges between 0.03 mm and 0.13 mm thick. Conformal coating protects against moisture, contaminants, dust and acid-or-alkaline materials, meeting IPC-A-610 standards for electronic components.

## Anti-Sulfuration

In the mining, petroleum and chemical industry, or installations in areas with volcanic activity, hydrogen sulfide gas is often a common challenge. The gas will react with the silver found in DRAM ICs, which can result in lower conductivity and eventual failure. This is effectively mitigated by covering the resistors with a sulfur resistant material, ensuring smooth operation in harsh environments.



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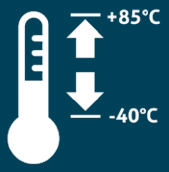
# Wide Temperature




Innodisk's wide temperature range design has extended the existing JEDEC standard range from -40°C to 85°C. Innodisk's wide temperature Flash and DRAM modules are designed for industrial, and aerospace and defense applications. Wide temperature design is vital in ensuring operation and performance reliability in extreme temperatures.

# Side Fill

Side Fill is value-added technology that can improve device reliability and extend product life. By applying resin on three sides of the DRAM IC, Side Fill can reinforce the joints between the BGA and the PCB. Tests show that when using Side Fill, DRAM IC can tolerate 1.5 times the amount of tension. If the device needs to remain operational during strong tremors or stringent thermal cycling, we highly recommend taking advantage of our Side Fill DRAM, especially so for these applications: factory automation, defense & aerospace and renewable energy.

# Heat Spreader

Adding a Heat Spreader will enhance a module's ability to quickly disperse heat in high-temperature and heavy workload environments. The Heat Spreaders are compatible with all form factors and will help ensure that temperatures stay below the critical limit which can cause module failure. By reducing the thermal stress, the Heat Spreader will also extend the lifespan of the DRAM module.



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# Different Applications

Innodisk focuses on providing reliable memory and expansion solutions for mission-critical applications. We understand the importance of quality in industrial and embedded flash, DRAM, expansion card and software products. Therefore, our solutions are all crafted to meet the individual needs of each vertical market. Our experienced in-house firmware development team delivers fast turnaround and knowledgeable support whenever customization is required.

### Embedded & Server Boot-up Solution

The Innodisk Boot-up series is designed for industrial and server applications. Due to its tiny form factors, M.2 and SATADOM® frees up a precious bay for other storage options. The SATADOM® easily fits in a 1U environment with an exclusive Cable-less design; it exemplifies true plug & play and eliminates messy cables.

### Surveillance

The number one concern for modern day surveillance applications is stable data recording. With our InnoREC™ feature set, firmware is optimized to ensure lasting and stable writing performance – ensuring zero loss of data quality. With restricted space and simultaneous read/write operations, high speed and compact memory solutions are also an imperative. Our Very Low Profile (VLP) and Mini DRAM modules combine small form factors with high performance to make sure data recording goes off without a hitch.

### Medical

Using iCAP™ your medical devices can be gathered under a single umbrella regardless of physical location. This includes flash-based solutions that are varied and easily customizable to fit the requirements of each medical application, as well as DRAM which is an essential component in every smart medical device. Furthermore, there is no need for concern about future component availability. These hardware solutions are all ensured to have long-time supply and a fixed BOM.

# New Flash Product Naming Rule

## 2.5” SATA SSD 3TE7

***Form Factor***
***SSD***
***Slim SSD***
***SATADOM***
***SATA Slim***
***mSATA***
***mini PCIeDOM***
***M.2***
***CFast***
***CF Card***
***CF Express***
***EDC***
***SD***
***microSD***
***USB***
***nanoSSD***
***OCuLinkDOM***

***Interface***

***3: Generation III***
***2: Generation II***
***1: Generation I***

***Flash Type***

***S: SLC***
We offer a series of products with SLC-based flash, boasting faster write speeds, lower power consumption and higher cell endurance. SLC-based flash is more reliable and suitable of critical applications.

***M: MLC***
The primary benefit of MLC-based flash is its lower cost per unit of storage due to the higher data density. This benefit makes MLC-based flash a perfect replacement of traditional HDD.

***I: iSLC***
iSLC is Innodisk’s exclusive firmware technology, which improves the performance and data quality and boasts a similar write performance as that of SLC-based solutions. Through the use of flash management algorithms, iSLC improves SSD endurance up to 20,000 times.

***T: TLC***
TLC-based 3D NAND flash is a new technology with a novel architecture. The more concentrated die size provides higher density and lower cost.

***Application & Series***

***E: Embedded***
***G: EverGreen***
***R: InnoRobust***
***V: InnoREC***
***S: Server***

***Product Series***

***G: EverGreen***
The EverGreen series is designed with an integrated external DRAM cache which significantly improves SSD random data transfer rate and extends lifespan.

***E: Embedded***
Embedded series is the best solution for the industrial embedded system because it offers reliability, high performance and long endurance. We offer complete form factors to fulfill customer and business needs , including 2.5” SSD, 1.8” SSD, SAT.ADOM, mSATA, SATA Slim, SATADOM, iCF & CFast, EDC, and SD.

***R: InnoRobust***
InnoRobust series meet all of today’s aerospace and defense application requirements. InnoRobust storage products are fully compliant with aerospace and defense standards, including MIL-STD-810G and MIL-I-46058C. InnoRobust products are fully protected against heat, dust, extreme temperatures, shock, vibration, and other environmental stresses. We also deliver industry-leading data protection technologies to keep sensitive information secure.

***V: InnoREC***
InnoREC SSDs are specifically designed for surveillance applications and boasts smart firmware algorithms that guarantees a continuous, stable data recording.

***S: Server***
The SATADOM® server boot-up devices are designed for an easy server integration, and reliable performance. The devices are certified for Windows Server 2016 Hyper V and VMware hypervisors.

# Flash Memory

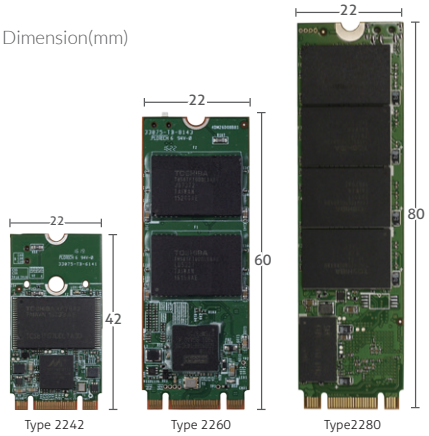
Innodisk flash memory products are designed to be highly reliable and stable, and provide longer life cycles for the embedded and industrial systems in which they are used. Innodisk offers the industry's widest selection of flash memory form factors, including standard 1.8" and 2.5" Industrial SSDs, M.2, SATADOM®—the smallest high-speed SATA storage in the industry, CompactFlash Cards, mSATA , SATA Slim, and USB Flash Drives. Our products are available in 3D NAND triple-level cell (TLC), single-level cell (SLC), and multi-level cell (MLC) flash types, as well as iSLC – our own proprietary technology that merges the best features from MLC and SLC.

# M.2

The Innodisk M.2 series pack a lot of performance into a thin, industrial grade form factor. The M.2 series includes both Non-Volatile Memory Express (NVMe) and SATA devices. The NVMe specification is designed specifically for flash devices and can deliver the fastest speeds in the industry.

## M.2 (NVMe) Highlights

- PCIe Gen III×2 and×4 solution
- True industrial-grade PCIe NVMe SSD
- Heatsink-less design
- Wide range of form factors and dimensions available, including type 2242, 2260, and 2280
- Supports industrial-grade wide temperature -40°C~85°C
- iData Guard™, iPower Guard™ and iCell™ technology for data protection and integrity during abnormal power failure
- Supports iSMART™ disk health monitoring
- Supports End-to-End Data Path Protection (ETEP)



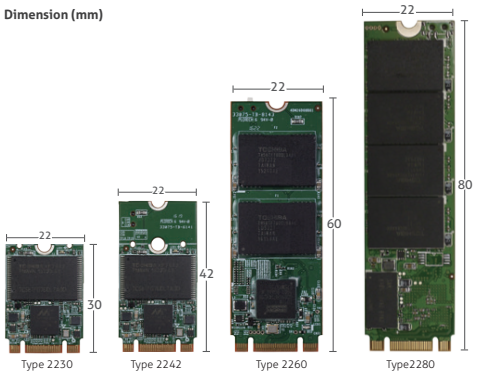
| Model Name | M.2(P42) 3ME2 | M.2 (P42) 3TE2 | M.2(P80) 3ME2 | M.2 (P80) 3TE2 | M.2(P80) 3TE4 | M.2 (P80) 3TG3-P |
|---|---|---|---|---|---|---|
| Key Features | 1. Type 2242-D2-B-M<br>2. Less controller heat<br>3. Supports NVMe 1.3<br>4. End-to-End Data Path Protection<br>5. iData Guard Data Protection | 1. Low power consumption<br>2. Less controller heat<br>3. Supports NVMe 1.3<br>4. End-to-End Data Path Protection<br>5. iData Guard Data Protection | 1. Low power consumption<br>2. Less controller heat<br>3. Supports NVMe 1.3<br>4. End-to-End Data Path Protection<br>5. iData Guard Data Protection | 1. Low power consumption<br>2. Less controller heat<br>3. Supports NVMe 1.3<br>4. End-to-End Data Path Protection<br>5. iData Guard Data Protection | 1. DRAM-less Solution<br>2. Supports NVMe 1.3<br>3. iData Guard Data Protection<br>4. End-to-End Data Path Protection | 1. Ultra-high performance<br>2. Supports NVMe 1.3<br>3. iData Guard Data Protection<br>4. End-to-End Data Path Protection |
| Interface | PCIe Gen3x2 | PCIe Gen3x2 | PCIe Gen3x2 | PCIe Gen3x2 | PCIe Gen3x4 | PCIe Gen3x4 |
| Flash Type | MLC | 3D TLC | MLC | 3D TLC | 3D TLC | 3D TLC |
| Capacity | 32GB~256GB | 64GB~512GB | 32GB~512GB | 64GB~1TB | 128GB~1TB | 128GB~2TB |
| Max. Channel | 4 | 4 | 4 | 4 | 4 | 8 |
| Sequential R/W (MB/sec, max.) | 1300/340 | 1400/700 | 1300/480 | 1400/700 | 2100/1700 | 3400/2800 |
| Max. Power Consumption | 2.9W(3.3 x 880mA) | 2.3W(3.3 x 700mA) | 3.72W(3.3 x 1125mA) | 3W(3.3 x 910mA) | 3.03W(3.3 x 920mA) | 6.27W(3.3 x 1900mA) |
| Thermal Sensor | Y | Y | Y | Y | Y | Y |
| External DRAM Buffer | N | N | N | N | N | N |
| iData Guard | Y | Y | Y | Y | Y | Y |
| iCell | N | N | Optional | Optional | N | N |
| TRIM | Y | Y | Y | Y | Y | Y |
| ATA Security | N | N | N | N | N | N |
| S.M.A.R.T | Y | Y | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | 22.0 x 42.0 x 3.5 | 22.0 x 42.0 x 3.5 | 22.0 x 80.0 x 3.5 | 22.0 x 80.0 x 3.5 | 22.0 x 80.0 x 3.5 | 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) | DEM24-XXXM61BC*** | DEM24-XXXM61EC*** | DEM28-XXXM61BC*** | DEM28-XXXM61EC*** | DEM28-XXXIB1EC*** | DGM28-XXXIA1EC*** |
| Wide Temp. OP (-40°C~+85°C) | DEM24-XXXM61BW*** | DEM24-XXXM61EW*** | DEM28-XXXM61BW*** | DEM28-XXXM61EW*** | TBD | TBD |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T, 2TB=02T )***= flash configuration (internal control code) %=Flash Type | | | | | |

## M.2 (SATA) Highlights

- Wide range of form factors and dimensions available, including type 2230, 2242, 2260, and 2280.
- iData Guard™, iPower Guard™ and iCell™ technology for data protection and intergrity in case of abnormal power failure
- Supports iSMART™ disk health monitoring

| Model Name | M.2 (S30) 3ME4 | M.2 (S60) 3ME3 |
|---|---|---|
| Key Features | 1. Type 2230-D2-B-M<br>2. Exclusive L$^3$ architecture<br>3. Designed with LDPC ECC Engine<br>4. Budget-friendly MLC-based solution | 1. Type 2260-D2-B-M<br>2. High IOPS<br>3. iData Guard Protection |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | MLC | MLC |
| Capacity | 8GB~128GB | 32GB~512GB |
| Max. Channel | 2 | 4 |
| Sequential R/W (MB/sec, max.) | 530/210 | 380/200 |
| Max. Power Consumption | 1.6W (3.3V x 505mA) | 1.3W (3.3V x 370mA) |
| Thermal Sensor | Y | STD: N, W/T: Y |
| External DRAM Buffer | N | N |
| iData Guard | Y | Y |
| iCell | N | N |
| TRIM | Y | Y |
| ATA Security | Y | Y |
| S.M.A.R.T | Y | Y |
| Dimension (WxLxH/mm) | 22.0 x 30.0 x 3.2 | 22.0 x 60.0 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) | DEM23-XXXM41BC*** | DEM26-XXXD08%C*** |
| Wide Temp. OP (-40°C~+85°C) | DEM23-XXXM41BW*** | DEM26-XXXD08%W*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12 )<br>***= flash configuration (internal control code) %=Flash Type | |

**Dimension (mm)**



| Model Name | M.2 (S42) 3TE7 | M.2 (S42) 3TG6-P | M.2 (S42) 3SE4 | M.2 (S42) 3IE4 |
|---|---|---|---|---|
| Key Features | 1. Truly industrial designed firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. Extreme seq. and random performance with 3D NAND solution<br>2. Advanced LDPC ECC engine<br>3. RAID engine offer additional level of data protection | 1. Type 2242-D2-B-M<br>2. High quality SLC-based solution<br>3. DRAM-less, high-level data integrity<br>4. LDPC technology secures SSD reliability<br>5. Excellent data transfer speed | 1. Type 2242-D2-B-M<br>2. Designed with LDPC ECC engine<br>3. Lifespan 7 times longer tham MLC<br>4. Cost-effective industrial flash with iSLC |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | 3D TLC | 3D TLC | SLC | iSLC |
| Capacity | 32GB~512GB | 128GB~512GB | 8GB~64GB | 8GB~128GB |
| Max. Channel | 4 | 4 | 2 | 2 |
| Sequential R/W (MB/sec, max.) | 560/330 | 560/510 | 520/360 | 530/380 |
| Max. Power Consumption | 1.6W (3.3V x 475mA) | 2.4W (3.3V x 739mA) | 0.6W (3.3V x 185mA) | 1.5W (3.3V x 460mA) |
| Thermal Sensor | Y | Y | Y | Y |
| External DRAM Buffer | N | Y | N | N |
| iData Guard | Y | Y | Y | Y |
| iCell | N | N | N | N |
| TRIM | Y | Y | Y | Y |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | 22.0 x 42.0 x 3.5 | 22.0 x 42.0 x 3.5 | 22.0 x 42.0 x 3.5 | 22.0 x 42.0 x 3.2 |
| Environment | Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours | | | |
| Standard Temp. OP (0°C~+70°C) | DEM24-XXXDK1EC*** | DGM24-XXXM71EC*** | DEM24-XXXM41SC*** | DHM24-XXXM41BC*** |
| Wide Temp. OP (-40°C~+85°C) | DEM24-XXXDK1EW*** | DGM24-XXXM71EW*** | DEM24-XXXM41SW*** | DHM24-XXXM41BW*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12 )<br>***= flash configuration (internal control code) %=Flash Type | | | |

| Model Name | M.2 (S42) 3ME4 | M.2 (S42) 3MG2-P | M.2 (S80) 3TG6-P | M.2 (S80) 3TE7 |
|---|---|---|---|---|
| Key Features | 1. Type 2242-D2-B-M<br>2. Exclusive L$^3$ architecture<br>3. Designed with LDPC ECC Engine<br>4. Budget-friendly MLC-based solution | 1. Type 2242-D2-B-M<br>2. High sequential/IOPS performance<br>3. Support DEVSLP<br>4. iData Guard Protection | 1. Extreme seq. and random performance with 3D NAND solution<br>2. Advanced LDPC ECC engine<br>3. RAID engine offer additional level of data protection<br>4. AES 256-key ,end to end data path protection | 1. Truly industrial designed firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | MLC | MLC | 3D TLC | 3D TLC |
| Capacity | 8GB~256GB | 32GB~256GB | 128GB~1TB | 32GB~1TB |
| Max. Channel | 2 | 4 | 4 | 4 |
| Sequential R/W (MB/sec, max.) | 530/210 | 560/360 | 560/510 | 550/370 |
| Max. Power Consumption | 1.4W (3.3V x 422mA) | 1.09 W (3.3V x 330mA) | 2.6W (3.3V x 799mA) | 2.0W (3.3V x 614mA) |
| Thermal Sensor | Y | Y | Y | Y |
| External DRAM Buffer | N | Y | Y | N |
| iData Guard | Y | Y | Y | Y |
| iCell | N | N | N | N |
| TRIM | Y | Y | Y | Y |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | 22.0 x 42.0 x 3.2 | 22.0 x 42.0 x 3.5 | 22.0 x 80.0 x 3.5 | 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) | DEM24-XXXM41BC*** | DGM24-XXX-D81%C*** | DGM28-XXXM71EC*** | DEM28-XXXDK1EC*** |
| Wide Temp. OP (-40°C~+85°C) | DEM24-XXXM41BW*** | DGM24-XXX-D81%W*** | DGM28-XXXM71EW*** | DEM28-XXXDK1EW*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T. )***= flash configuration (internal control code) %=Flash Type | | | |

| Model Name | M.2 (S80) 3SE4 | M.2 (S80) 3IE4 | M.2 (S80) 3ME4 | M.2 (S80) 3MG2-P |
|---|---|---|---|---|
| Key Features | 1. Type 2280-S2-B-M (single side)<br>2. High quality SLC-based solution<br>3. DRAM-less, high-level data integrity<br>4. LDPC technology secures SSD reliability<br>5. Excellent data transfer speed | 1. Type 2280-D2-B-M<br>2. Designed with LDPC ECC engine<br>3. Lifespan 7 times longer tham MLC<br>4. Cost-effective industrial flash with iSLC | 1. Type 2280-D2-B-M<br>2. Exclusive L$^3$ architecture<br>3. Designed with LDPC ECC Engine<br>4. Budget-friendly MLC-based solution | 1. Type 2280-D2-B-M<br>2. High sequential/IOPS performance<br>3. Support DEVSLP<br>4. iData Guard Protection |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | SLC | iSLC | MLC | MLC |
| Capacity | 8GB~64GB | 8GB~128GB | 8GB~256GB | 16GB~1TB |
| Max. Channel | 2 | 2 | 2 | 4 |
| Sequential R/W (MB/sec, max.) | 520/360 | 530/360 | 530/210 | 530/450 |
| Max. Power Consumption | 1.6W (3.3V x 500 mA) | 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 | Y |
| External DRAM Buffer | N | N | N | Y |
| iData Guard | Y | Y | Y | Y |
| iCell | N | N | N | Optional |
| TRIM | Y | Y | Y | Y |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | 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 3.2 | 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) | DEM28-XXXM41SC*** | DHM28-XXXM41BC*** | DEM28-XXXM41BC*** | DGM28-XXXD81%C*** |
| Wide Temp. OP (-40°C~+85°C) | DEM28-XXXM41SW*** | DHM28-XXXM41BW*** | DEM28-XXXM41BW*** | DGM28-XXXD81%W*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T. )***= flash configuration (internal control code) %=Flash Type | | | |

# SSD

Innodisk SSDs bring a whole new level of high performance to memory storage. Our wide selection of SSDs are designed for different applications, including industrial/embedded, enterprise server, aviation, defense, and other semi-industrial applications, such as thin clients, POS, and kiosk. Our SSDs come in 3D TLC, iSLC, SLC and MLC types, and support PATA/IDE 44 pin, SATA II (3.0Gb/s), and SATA III (6.0Gb/s).

| Model Name | 2.5"SATA SSD 3TE7 | 2.5"SATA SSD 3TG6-P | 2.5" SATA SSD 3SE4 |
|---|---|---|---|
| Key Features | 1. Truly industrial designed firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. Extreme seq. and random performance with 3D NAND solution<br>2. Advanced LDPC ECC engine<br>3. RAID engine offer additional level of data protection | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | 3D TLC | 3D TLC | SLC |
| Capacity | 32GB~1TB | 128GB~4TB | 8GB~64GB<br>*For 128GB, please check 2.5"SATA SSD 3SE3 |
| Max. Channel | 4 | 4 | 2 |
| Sequential R/W (MB/sec, max.) | 560/525 | 540 /470 | 520/360 |
| Max. Power Consumption | 3.6W (5V x 722mA) | 128GB~1TB 3.1W (5V x 620mA)<br>2TB~4TB 6W (5V x 1.2A) | 1.1W (5V x 220 mA) |
| Thermal Sensor | Y | | |
| External DRAM Buffer | N | Y | N |
| iData Guard | Y | Y | Y |
| iCell | N | Optional | N |
| TRIM | Y | Y | Y |
| ATA Security | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y |
| Dimension (WxLxH/mm) | 69.85 x 100.1 x 6.9 | 69.8 x 100.1 x 6.9 | 69.85 x 100.1 x 6.9 |
| 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) | DES25-XXXDK1EC*** | DGS25-XXXM71EC*** | DES25-XXXM41SC*** |
| Wide Temp. OP (-40°C~+85°C) | DES25-XXXDK1EW*** | DGS25-XXXM71EW*** | DES25-XXXM41SW*** |
| Notes | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T, 2TB=02T )<br>***= flash configuration (internal control code) %=Flash | | |

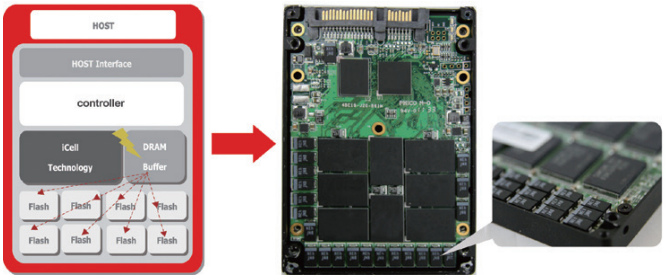
| Model Name | 2.5" SATA SSD 3SE2-P | 2.5" SATA SSD 3SR3-P | 2.5" SATA SSD 3IE4 |
|---|---|---|---|
| Key Features | 1. High IOPS performance with DRAM solution<br>2. High quality SLC-based solution<br>3. Support AES function | 1. Compliant with MIL-STD-810G<br>2. HW/SW Data Security (Quick Erase/Destroy/ Security Erase/ Write Protect)<br>3. iCell supported, 100% data protection | 1. Exclusive $L^3$ architecture<br>2. Designed with LDPC ECC engine<br>3. Cost-effective industrial Flash with iSLC<br>4. Lifespan 7 times longer than MLC |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | SLC | SLC | iSLC |
| Capacity | 8GB~512GB | 8GB~256GB | 8GB-128GB<br>*For 256GB, please check 2.5"SATA S SD 3IE3 |
| Max. Channel | 4 | 4 | 2 |
| Sequential R/W (MB/sec, max.) | 520/420 | 490/240 | 530/380 |
| Max. Power Consumption | 2.15W (5V x 430mA) | 2.65W (5V x 530mA) | 0.8W (5V x 160mA) |
| Thermal Sensor | Y | | |
| External DRAM Buffer | Y | Y | N |
| iData Guard | Y | Y | Y |
| iCell | Optional | Y | N |
| TRIM | Y | Y | Y |
| ATA Security | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y |
| Dimension (WxLxH/mm) | 69.8 x 99.8 x 9.2 | 69.8 x 99.8 x 9.2 | 69.8 x 100.1 x 6.9 |
| 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) | DES25-XXXD82SC*** | DRS25-XXXD70SC*** | DHS25-XXXM41%C*** |
| Wide Temp. OP (-40°C~+85°C) | DES25-XXXD82SW*** | DRS25-XXXD70SW*** | DHS25-XXXM41%W*** |
| Notes | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T, 2TB=02T )<br>***= flash configuration (internal control code) %=Flash | | |

| Model Name | 2.5" SATA SSD 3MG2-P | 2.5" SATA SSD 3ME4 |
|---|---|---|
| Key Features | 1. EverGreen L$^2$ architecture<br>2. High Sequential/IOPS performance<br>3. Support DEVSLP<br>4. iData Guard Protection | 1. EverGreen L$^3$ architecture<br>2. High Sequential/IOPS performance<br>3. Support DEVSLP<br>4. iData Guard Protection |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | MLC | MLC |
| Capacity | 8GB-2TB | 8GB-256GB |
| Max. Channel | 4 | 2 |
| Sequential R/W (MB/sec, max.) | 520/480 | 520/210 |
| Max. Power Consumption | 6W (5V x 1.2A) | 0.8W (5V x 160mA) |
| Thermal Sensor | Y | |
| External DRAM Buffer | Y | N |
| iData Guard | Y | Y |
| iCell | Optional | N |
| TRIM | Y | Y |
| ATA Security | Y | Y |
| S.M.A.R.T | Y | Y |
| Dimension (WxLxH/mm) | 69.8 x 100.1 x 6.9<br>69.8 x 100.0 x 9.5 (2TB) | 69.8 x 100.1 x 6.9 |
| 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) | DGS25-XXXD81%C***(P) | DES25-XXXM41%C*** |
| Wide Temp.OP(-40°C~+85°C) | DRS25-XXXD81%W***(P) | DES25-XXXM41%W*** |
| Notes | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T, 2TB=02T )<br>***= flash configuration (internal control code) %=Flash | |

| Model Name | 2,5" SATA SSD 3MR2-P | 2.5" SATA SSD 3MR3-P | 1.8 "SATA SSD 3TG6-P |
|---|---|---|---|
| Key Features | 1. Compliant with MIL-STD-810G<br>2. HW/SW Data Security (Quick Erase/ Destroy/ Security Erase/Write Protect)<br>3. High random performance<br>4. iCell supported, 100% data protection | 1. Compliant with MIL-STD-810G<br>2. HW/SW Data Security (QEraser/ Destroy/ SEraser/ Write Protect)<br>3. iCell supported, 100% data protection | 1. Extreme seq. and random performance with 3D NAND solution<br>2. Advanced LDPC ECC engine<br>3. RAID engine offer additional level of data protection<br>4. AES 256-key ,end to end data path protection |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | MLC | MLC | 3D TLC |
| Capacity | 8GB~2TB | 64GB~512GB | 32GB~1TB |
| Max. Channel | 4 | 4 | 4 |
| Sequential R/W (MB/sec, max.) | 520/450 | 490/270 | 540/470 |
| Max. Power Consumption | 6W (5V x 1.2mA) | 4.5W (5V x 900mA) | 0.8W (5V x 160mA) |
| Thermal Sensor | STD : N , W/T : Y | | Y |
| External DRAM Buffer | Y | Y | Y |
| iData Guard | Y | Y | Y |
| iCell | Y | Y | Optional |
| TRIM | Y | Y | Y |
| ATA Security | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y |
| Dimension (WxLxH/mm) | 69.8 x 99.8 x 9.2 | 69.8 x 99.8 x 9.2 | 54.0 x 78.5 x 5.0 |
| 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) | DRS25-XXXD81%C***P | DRS25-XXXD70%C*** | DGS18-XXXM71EC1***<br>DGS18-XXXM71EC2***<br>*Edition 1: 5V, Edition 2: 3.3V |
| Wide Temp.OP(-40°C~+85°C) | DRS25-XXXD81%W***P | DRS25-XXXD70%W*** | DGS18-XXXM71EW1***<br>DGS18-XXXM71EW2*** |
| Notes | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T, 2TB=02T )<br>***= flash configuration (internal control code) %=Flash | | |

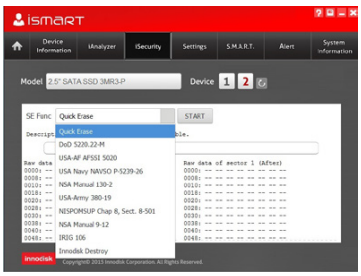
| Model Name | 1.8" SATA SSD 3SE2-P | 1.8" SATA SSD 3SE3-P | 1.8" SATA SSD 3MG3-P | Slim SSD 3ME4 | PATA 1MG3-P |
|---|---|---|---|---|---|
| Key Features | 1. High IOPS performance with DRAM solution<br>2. High quality SLC-based solution<br>3. Support AES function<br>4. iCell supported, 100% data protection | 1. High quality SLC-based solution<br>2. Enhanced power cycling management<br>3. iSMART disk health monitoring | 1. Built-in DRAM buffer<br>2. Intelligent error recovery system<br>3. Excellent data transfer speed and high IOPS performance<br>4. iData Guard for abnormal power failure | 1. 1.8' housing, 50% space saving<br>2. Exclusive $L^3$ architecture<br>3. Designed with LDPC ECC engine | 1. Built-in DRAM buffer<br>2. Intelligent error recovery system<br>3. Excellent data transfer speed<br>4. iData Guard Protection |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s | PIO Mode 0~4<br>Ultra DMA 0~5 |
| Flash Type | SLC | SLC | MLC | MLC | MLC |
| Capacity | 8GB-512GB | 8GB-512GB | 32GB~1TB | 8GB~256GB | 8GB~512GB |
| Max. Channel | 4 | 4 | 4 | 2 | 4 |
| Sequential R/W (MB/sec, max.) | 540/360 | 490/230 | 520/450 | 530/210 | 90/90 |
| Max. Power Consumption | A: 2.9W (3.3V x 880mA)*<br>B: 3.9W (5V x 780mA)* | 1.5W (5V x 300 mA) | 6W (5V x 1.2A) | 0.8W (5V x 160mA) | 2W (5V x 400mA) |
| Thermal Sensor | Y | STD : N , W/T : Y | | Y | STD : N , W/T : Y |
| External DRAM Buffer | Y | Y | Y | Y | Y |
| iData Guard | Y | Y | Y | Y | Y |
| iCell | Y | 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) | 54.0 x 78.5 x 5.0 | 54.0 x 78.5 x 5.0 | 54.0 x 78.5 x 5.0 | 69.85 x 50.0 x 9.0 | 69.85 x 99.85 x 9.2 |
| 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) | DES18-XXXD82SCA**(P)<br>DES18-XXXD82SCB**(P)<br>*Edition A: 3.3V ; Edition B:5V | DES18-XXXD70SC*** | DGS18-XXXD81%C*** | DEMLM-XXXM41%C*** | DGP25-XXXD70%C*** |
| Wide Temp.OP (-40°C~+85°C) | DES18-XXXD82SWA**(P)<br>DES18-XXXD82SWB**(P) | DES18-XXXD70SW*** | DGS18-XXXD81%W*** | DEMLM-XXXM41%W*** | N/A |
| Notes | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12, 1TB=01T, 2TB=02T )<br>***= flash configuration (internal control code) %=Flash | | | | |

# What is iCell?



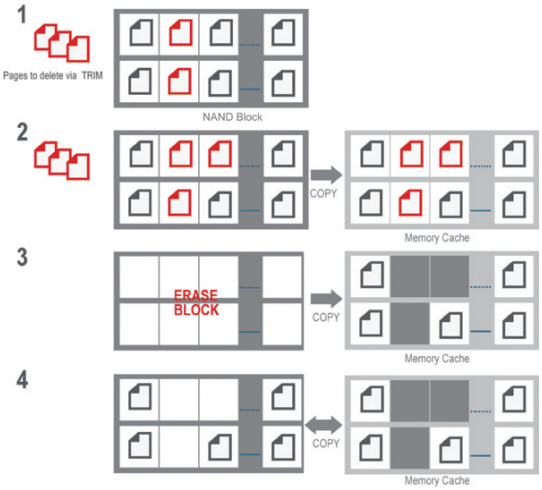

iCell Technology gives the SSD a power boost in the event of an abnormal power failure and ensures reliable and accurate data transfer from DRAM cache to NAND flash.

# What is iSecurity?




The iSecurity function under iSMART allows the user to easily operate the data erase command. The user may select the data erase function, monitor erase progress and also compare data before and after the erasure.

# What is TRIM?




SSDs are made up of millions of NAND flash cells. They can be written into groups called pages (generally 4KB in size) but can only be erased in larger groups called blocks (generally 128 pages or 512KB). The addresses of the deleted files are sent along with the TRIM command to the SSD's controller so the drive can function optimally. The TRIM commands allows the SSD to delete data more expediently, thus increasing overall performance. The TRIM command is generally sent from the OS when the system is idle. This cleans up invalid data from the blocks so the drive can perform like new.

# SATADOM®

Innodisk's Serial ATA Disk on Module (SATADOM®) is the world's smallest form factor with exclusive built-in Pin 7 and Pin 8 VCC, which simplifies motherboard design. Since it has no external cables, it is more robust and enhances the disk functions of various industrial and enterprise applications. Innodisk's SATADOM® also supports the SATA II and SATA III interface with faster data transfer rates and is available in capacities ranging from 512MB up to 256GB.

## SATADOM-SL 3ME4

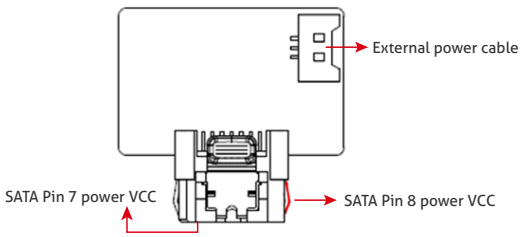
Innodisk, the service-driven flash and DRAM module provider, features the innovative SATADOM® patented Pin8 and Pin7 cable-less SATA power combined with exclusive L3 architecture, prolonging the lifespan of SATADOM-SL 3ME4 with exceptional performance and reliability. SATADOM-SL 3ME4 is the best storage design for industrial computers and server boot drives. SATADOM-SL 3ME won the Taiwan Excellence Award 2017 in the highly competitive category of "Computer Hardware and Peripheral Equipment."

**3ME4 series**
- High performance
- LDPC
- Low WAI
- SMART supported
- Original MLC designed

**SATADOM-SL**
- Tiny size
- Cable-less (Pin8 /Pin7 supported)
- OS boot drive
- Durable

## Flexible power supply design

- External power cable
- SATA Pin 8 VCC
- SATA Pin 7 VCC



| Form Factor | SATADOM-SV/SH | | | |
|---|---|---|---|---|
| Model Name | **SATADOM 3TE7** | **SATADOM 3SE4** | **SATADOM 3IE4** | **SATADOM 3ME4** |
| Key Features | 1. Industrial-grade firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed | 1. Cost-effective industrial Flash with iSLC<br>2. Exclusive $L^3$ architecture<br>3. Latest LDPC ECC engine<br>4. Pin 8/Pin 7 supported | 1. Vertical and low profile horizontal design<br>2. Exclusive $L^3$ architecture<br>3. Latest LDPC ECC engine<br>4. High IOPS<br>5. Pin 8/Pin 7 supported |
| Interface | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s |
| Flash Type | 3D TLC | SLC | iSLC | MLC |
| Capacity | 32GB~256GB | 8GB~32GB | 8GB~64GB | 8GB~128GB |
| Max. Channel | 2 | 2 | 2 | 2 |
| Sequential R/W (MB/sec, max.) | 510/300 | 520/260 | 530/350 | 530/120 |
| Max. Power Consumption | 1.55W (5V x 309mA) | 1.58W (5V x 315mA) | 0.95W (5V x 189mA) | 1.27W (5V x 254mA) |
| Thermal Sensor | Y | Y | Y | Y |
| External DRAM Buffer | N | N | N | N |
| iData Guard | Y | Y | Y | Y |
| iCell | N | N | N | N |
| TRIM | Y | Y | Y | Y |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | SV: 40.4 x 21.03 x 10.4 mm<br>SH: 32.7 x 18 x 14.15 mm | SV: 40.4 x 21.03 x 10.4 mm<br>SH: 32.7 x 18 x 14.15 mm | SV:40.4 x 21.03 x 10.4 | SV: 40.4 x 21.03 x 10.4<br>SH: 32.7 x 18 x 15.15 |
| 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: DESSV-XXXDK1EC***#<br>SH: DESSH-XXXDK1EC***# | SV: DESSV-XXXM41SC***#<br>SH: DESSH-XXXM41SC***# | SV: DHSSV-XXXM41BC***# | SV: DESSV-XXXM41BC***#<br>SH: DESSH-XXXM41BC***# |
| Wide Temp.OP (-40°C~+85°C) | SV: DESSV-XXXDK1EW***#<br>SH: DESSH-XXXDK1EW***# | SV: DESSV-XXXM41SW***#<br>SH: DESSH-XXXM41SW***# | SV: DHSSV-XXXM41BW***# | SV: DESSV-XXXM41BW***#<br>SH: DESSH-XXXM41BW***# |
| Notes | xxx = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12)<br>***= flash configuration (internal control code) #=power supply method(A=pin 8+ external power cable / B=Pin 7+ Pin 8 )<br>*For SLC 01GB~4GB, please check FF 3SE or 3SE3 | | | |

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| Form Factor | SATADOM-SL/SH Type D | | | |
|---|---|---|---|---|
| Model Name | **SATADOM 3TE7** | **SATADOM 3SE4** | **SATADOM 3IE4** | **SATADOM 3ME4** |
| Key Features | 1. Industrial-grade firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed | 1. Below 1U best boot solution.<br>2. Cost-effective industrial Flash with iSLC<br>3. Exclusive $L^3$ architecture<br>4. Latest LDPC ECC engine<br>5. Pin 8/Pin 7 supported | 1. Below 1U best boot solution.<br>2. Exclusive $L^3$ architecture<br>3. Latest LDPC ECC engine<br>4. High IOPS<br>5. Pin 8/Pin 7 supported |
| Interface | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s |
| Flash Type | 3D TLC | SLC | iSLC | MLC |
| Capacity | 32GB~256GB | 8GB~32GB | 8GB~64GB | 8GB~128GB |
| Max. Channel | 2 | 2 | 2 | 2 |
| Sequential R/W (MB/sec, max.) | 510/300 | 520/260 | 530/350 | 530/120 |
| Max. Power Consumption | 1.5W (5V x 300mA) | 0.95W (5V x 186mA) | 1.02W (5V x 204mA) | 1.02W (5V x 204mA) |
| Thermal Sensor | Y | Y | Y | Y |
| External DRAM Buffer | N | N | N | N |
| iData Guard | Y | Y | Y | Y |
| iCell | N | N | N | N |
| TRIM | Y | Y | Y | Y |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | SL: 29.6 x 33.06 x 10.5<br>SH(D):30 x 20.79 x 15.20 | SL: 29.6 x 33.06 x 10.5<br>SH(D):30 x 20.79 x 15.15 | SL: 29.6 x 33.06 x 10.5 | SL: 29.6 x 33.06 x 10.5<br>SH(D): 30 x 20.79 x 15.15 |
| 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) | SL: DESSL-XXXDK1EC***#<br>SH(D): DESSF-XXXDK1EC***# | SL: DESSL-XXXM41SC***#<br>SH(D): DESSF-XXXM41SC***# | SL: DHSSL-XXXM41BC***# | SL: DESSL-XXXM41BC***#<br>SH(D): DESSF-XXXM41BC***# |
| Wide Temp.OP (-40°C~+85°C) | SL: DESSL-XXXDK1EW***#<br>SH(D): DESSF-XXXDK1EW***# | SL: DESSL-XXXM41SW***#<br>SH(D): DESSF-XXXM41SW***# | SL: DHSSL-XXXM41BW***# | SL: DESSL-XXXM41BW***#<br>SH(D): DESSF-XXXM41BW***# |
| Notes | xxx = density ( 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12)<br>***= flash configuration (internal control code) #=power supply method(A=pin 8+ external power cable / B=Pin 7+ Pin 8 )<br>*For SLC 01GB~4GB, please check FF 3SE or 3SE3 | | | |

| Form Factor | SATADOM-ML/MH | | | | |
|---|---|---|---|---|---|
| Model Name | **SATADOM 3SE4** | **SATADOM 3IE4** | **SATADOM 3ME4** | **SATADOM 3TG6-P** | **SATADOM 3MG2-P** |
| Key Features | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed | 1. Hardware write protect supported<br>2. Cost-effective industrial Flash with iSLC<br>3. Exclusive $L^3$ architecture<br>4. Latest LDPC ECC engine<br>5. High IOPS<br>6. Pin 8/Pin 7 supported | 1. Hardware write protect supported<br>2. Exclusive $L^3$ architecture<br>3. Latest LDPC ECC engine<br>4. High IOPS<br>5. Pin 8/Pin 7 supported | 1. Extreme seq. and random performance with 3D NAND solution<br>2. Advanced LDPC ECC engine<br>3. RAID engine offers addi tional level of data protection<br>4. AES 256-bit key, end-to-end data path protection | 1. Hardware write protect supported<br>2. High IOPS<br>3. Write protect<br>4. High performance SATADOM |
| Interface | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s |
| Flash Type | SLC | iSLC | MLC | 3D TLC | MLC |
| Capacity | 8GB~64GB | 16GB~128GB | 32GB~256GB | 128GB~256GB | 32GB~256GB |
| Max. Channel | 2 | 2 | 2 | 4 | 4 |
| Sequential R/W (MB/sec, max.) | 520/360 | 530/360 | 530/210 | 560/290 | 560/180 |
| Max. Power Consumption | 1.58W (5V x 315mA) | 0.815W (5V x 163mA) | 0.815W (5V x 163mA) | 2.14W (5V x 428mA) | 2.68W (5V x 535mA) |
| Thermal Sensor | Y | Y | Y | Y | Y |
| External DRAM Buffer | N | N | N | Y | Y |
| 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) | ML: 36.7 x 31.2 x 10.7 | ML: 31.2 x 36.7 x 10.7<br>MH: 23.5 x 33.6 x 14.8 | ML: 31.2 x 36.7 x 10.7<br>MH: 23.5 x 33.6 x 14.8 | ML: 37.17 x 31.5 x 12.6 | ML: 37.17 x 31.5 x 12.6 |
| 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) | ML: DESML-XXXM41SC***# | ML: DHSML-XXX-M41BC***#<br>MH: DHSMH-XXX-M41BC***# | ML: DESML-XXX-M41BC***#<br>MH: DESMH-XXX-M41BC***# | ML: DGSML-XXXM71EC***# | ML: DGSML-XXXD81BC***# |
| Wide Temp.OP (-40°C~+85°C) | ML: DESML-XXXM-41SW***# | ML: DHSML-XXX-M41BW***#<br>MH: DHSMH-XXX-M41BW***# | ML: DESML-XXX-M41BW***#<br>MH: DESMH-XXX-M41BW***# | ML: DGSML-XXXM71EW***# | ML: DGSML-XXXD-81BW***# |
| Notes | xxx = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12)<br>***= flash configuration (internal control code) #=power supply method(A=pin 8+ external power cable / B=Pin 7+ Pin 8 )<br>*For SLC 4GB, please check FF 3SE or 3SE3 | | | | |

| Form Factor | SATADOM-SH Type C | | SATADOM-MV | |
|---|---|---|---|---|
| Model Name | **SATADOM 3SE4** | **SATADOM 3ME4** | **SATADOM 3IE4** | **SATADOM 3ME4** |
| Key Features | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed | 1. Low profile horizontal design<br>2. Exclusive $L^3$ architecture<br>3. Latest LDPC ECC engine<br>4. High IOPS<br>5. Pin 8/Pin 7 supported | 1. Hardware write protect supported<br>2. Cost-effective industrial Flash with iSLC<br>3. Exclusive $L^3$ architecture<br>4. Latest LDPC ECC engine<br>5. High IOPS<br>6. Pin 8/Pin 7 supported | 1. Hardware write protect supported<br>2. Exclusive $L^3$ architecture<br>3. Latest LDPC ECC engine<br>4. High IOPS<br>5. Pin 8/Pin 7 supported |
| Interface | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s | SATA III 6Gb/s |
| Flash Type | SLC | MLC | iSLC | MLC |
| Capacity | 8GB~32GB | 8GB~128GB | 8GB~64GB | 8GB~128GB |
| Max. Channel | 2 | 2 | 2 | 2 |
| Sequential R/W (MB/sec, max.) | 520/260 | 530/120 | 530/340 | 530/210 |
| Max. Power Consumption | 1.49W (5V x 297mA) | 1.02W (5V x 204mA) | 1.72W (5V x 343mA) | 1.08W (5V x 216mA) |
| Thermal Sensor | Y | Y | Y | Y |
| External DRAM Buffer | N | N | N | N |
| iData Guard | Y | Y | Y | Y |
| iCell | N | N | N | N |
| TRIM | Y | Y | Y | Y |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | 32.7 x 18 x 14.5 | 32.7 x 18 x 14.5 | 41.55 x 25.26 x 10.4 | 41.55 x 25.26 x 10.4 |
| 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) | DESSC-XXXM41SC***# | DESSC-XXXM41BC***# | DHSMV-XXXM41BC***# | DESMV-XXXM41BC***# |
| Wide Temp.OP (-40°C~+85°C) | DESSC-XXXM41SW***# | DESSC-XXXM41BW***# | DHSMV-XXXM41BW***# | DESMV-XXXM41BW***# |
| Notes | xxx = density ( 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12)<br>***= flash configuration (internal control code) #=power supply method(A=pin 8+ external power cable / B=Pin 7+ Pin 8 )<br>*For SLC 01GB~4GB, please check FF 3SE or 3SE3 | | | |

# SATA Slim

The Innodisk SATA Slim is compliant with the JEDEC SFF-8156 standard form factor and ATA protocol. It does not require drivers, and can be configured as a boot device or a data storage device. It is also suitable for portable/hand-held devices, thin clients, and industrial applications that require the effective reduction of operation system boot time and power consumption. With a 7+15 pin SATA interface, the Innodisk SATA Slim supports most platforms with a standard SATA port.

| Model Name | **SATA Slim 3TE7** | **SATA Slim 3TG6-P** | **SATA Slim 3SE4** |
|---|---|---|---|
| Key Features | 1. Industrial-grade firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. Extreme seq. and random performance with 3D NAND solution<br>2. Advanced LDPC ECC engine<br>3. RAID engine offers additional level of data protection | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | 3D TLC | 3D TLC | SLC |
| Capacity | 32GB~1TB | 128GB~1TB | 8GB~64GB<br>*For 128GB, please check SATA Slim 3SE3 |
| Max. Channel | 4 | 4 | 2 |
| Sequential R/W (MB/sec, max.) | 560/525 | 540/470 | 530/360 |
| Max. Power Consumption | 0.8W (5V x 160mA) | 3.1W (5V x 620mA) | 1.1 W (5V x 220mA) |
| Thermal Sensor | Y | Y | 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) | 54.0 x 39.0 x 4.0 | 54.0 x 39.0 x 4.0 | 54.0 x 39.0 x 4.0 |
| Environment | Vibration: 20G@7~2000Hz/Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million | | |
| Standard Temp.OP (0°C~+70°C) | DESLM-XXXDK1EC*** | DGSLM-XXXM71EC*** | DESLM-XXXM41SC*** |
| Wide Temp.OP (-40°C~+85°C) | DESLM-XXXDK1EW*** | DGSLM-XXXM71EW*** | DESLM-XXXM41SW*** |
| Notes | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12 )<br>***= flash configuration (internal control code) %=Flash Type | | |

| Model Name | SATA Slim 3IE4 | SATA Slim 3ME4 | SATA Slim 3MG2-P |
|---|---|---|---|
| Key Features | 1. Exclusive L$^3$ architecture<br>2. Designed with LDPC ECC engine<br>3. Cost-effective industrial Flash with iSLC | 1. Exclusive L$^3$ architecture<br>2. Designed with LDPC ECC engine<br>3. Compatible with JEDEC MO-297 | 1. EverGreen L$^2$ architecture<br>2. High Sequential/IOPS performance<br>3. Support DEVSLP<br>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~128GB | 8GB~256GB |
| Max. Channel | 2 | 2 | 4 |
| Sequential R/W (MB/sec, max.) | 530/360 | 530/210 | 520/290 |
| Max. Power Consumption | 0.8W (5V x 160mA) | 0.8W (5V x 160mA) | 2.6W (5V x 520mA) |
| Thermal Sensor | Y | Y | STD : N, W/T : 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) | 54.0 x 39.0 x 4.0 | 54.0 x 39.0 x 4.0 | 54.0 x 39.0 x 4.0 |
| Environment | Vibration: 20G@7~2000Hz/Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million | | |
| Standard Temp.OP (0°C~+70°C) | DHSLM-XXXM41%C*** | DESLM-XXXM41%C*** | DGSLM-XXXD81%C*** |
| Wide Temp.OP (-40°C~+85°C) | DHSLM-XXXM41%W*** | DESLM-XXXM41%W*** | DGSLM-XXXD81%W*** |
| Notes | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12 )<br>***= flash configuration (internal control code) %=Flash Type | | |

# mSATA

mSATA, which is compliant with the JEDEC MO300/MO300B standard, was announced by the Serial ATA International Organization on September 21, 2009. Applications include netbooks, portable devices and other devices that require a smaller solid-state drive. The connector is similar in appearance to a PCI Express Mini Card interface and is electrically compatible; however, the data signals need a connection to the SATA host controller instead of the PCI-express host controller. Innodisk's mSATA supports high-performance data transfer rates of 1.5 Gb/s, 3.0 Gb/s and 6.0 Gb/s.

| Model Name | mSATA 3TE7 | mSATA 3TG6-P |
|---|---|---|
| Key Features | 1. Industrial-grade firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. Extreme seq. and random performance with 3D NAND solution<br>2. Advanced LDPC ECC engine<br>3. RAID engine offers additional level of data protection |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | 3D TLC | 3D TLC |
| Capacity | 32GB~1TB | 128GB~1TB |
| Max. Channel | 4 | 4 |
| Sequential R/W (MB/sec, max.) | 560/525 | 560/510 |
| Max. Power Consumption | 2.2 W (3.3V x 674mA) | 2.8 W (3.3V x 850 mA ) |
| Thermal Sensor | Y | Y |
| External DRAM Buffer | N | Y |
| iData Guard | Y | Y |
| iCell | N | N |
| TRIM | Y | Y |
| ATA Security | Y | Y |
| S.M.A.R.T | Y | Y |
| Dimension (WxLxH/mm) | 29.8 x 50.8 x 3.7 | 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) | DEMSR-XXXDK1EC*** | DGMSR-XXXM71EC*** |
| Wide Temp. OP (-40°C~+85°C) | DEMSR-XXXDK1EW*** | DGMSR-XXXM71EW*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G) ***= flash configuration (internal control code)%=Flash Type | |

| Model Name | mSATA 3SE4 | mSATA 3SE-P | mSATA 3IE4 | mSATA 3MG2-P | mSATA 3ME4 |
|---|---|---|---|---|---|
| Key Features | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed | 1. Excellent data transfer speed and IOPS<br>2. Support TRIM command<br>3. Built-in DRAM buffer | 1. Cost-effective industrial Flash with iSLC<br>2. Lifespan 7 times longer than MLC<br>3. Performance and data quality congruent to SLC<br>4. Excellent data transfer speed<br>5. LDPC technology secures SSD reliability | 1. High IOPS by on-board DRAM design<br>2. Featuring L² architecture, expanding the lifespan<br>3. DEVSLP supported | 1. LDPC technology secures SSD reliability<br>2. DRAM-less, high-level data integrity |
| 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 | SLC | SLC | iSLC | MLC | MLC |
| Capacity | 8GB~64GB<br>*For 4GB/ 128GB, please check mSATA 3SE3 | 8GB~64GB | 8GB~128GB | 8GB~512GB | 8GB~256GB<br>*For 512 GB, please check mSATA 3ME3 |
| Max. Channel | 2 | 4 | 2 | 4 | 2 |
| Sequential R/W (MB/sec, max.) | 525/350 | 490/260 | 530/365 | 520/450 | 535/210 |
| Max. Power Consumption | 1.32W(3.3V x 400mA) | 1.2 W(3.3V x 360mA) | 0.6W(3.3V x 200mA) | 2.2 W(3.3 V x 660 mA) | 0.6W (3.3V x 205mA) |
| Thermal Sensor | Y | STD : N, W/T : Y | Y | Y | Y |
| External DRAM Buffer | N | Y | N | Y | 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) | 29.8 x 50.8 x 3.7 | 29.8 x 50.8 x 3.7 | 29.8 x 50.8 x 3.7 | 29.8 x 50.8 x 3.7 | 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) | DEMSR-XXXM41SC*** | DEMSR-XXXD67SC*** | DHMSR-XXXM41BC*** | DGMSR-XXXD81SC*** | DEMSR-XXXM41BC*** |
| Wide Temp. OP (-40°C~+85°C) | DEMSR-XXXM41SW*** | DEMSR-XXXD67SW*** | DHMSR-XXXM41BW*** | DGMSR-XXXD81SW*** | DEMSR-XXXM41BW*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G) ***= flash configuration (internal control code)%=Flash Type | | | | |

| Model Name | mSATA mini 3TE7 | mSATA mini 3SE4 | mSATA mini 3IE4 | mSATA mini 3ME4 |
|---|---|---|---|---|
| Key Features | 1. Truly industrial designed firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed | 1. Cost-effective industrial Flash with iSLC<br>2. Lifespan 7 times longer than MLC<br>3. Performance and data quality congruent to SLC<br>4. Excellent data transfer speed<br>5. LDPC technology secures SSD reliability | 1. LDPC technology secures SSD reliability<br>2. DRAM-less, high-level data integrity |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Flash Type | 3D TLC | SLC | iSLC | MLC |
| Capacity | 32GB~512GB | 8GB~64GB<br>*For 4GB, please check mSATA mini 3SE3 | 8GB~64GB | 8GB~128GB |
| Max. Channel | 4 | 2 | 2 | 2 |
| Sequential R/W (MB/sec, max.) | 560/520 | 525/360 | 530/340 | 430/125 |
| Max. Power Consumption | 0.6W (3.3V x 190mA) | 1.3W (3.3 V x 400mA) | 0.6W (3.3V x 200mA) | 0.6W (3.3V x 190mA) |
| Thermal Sensor | Y | Y | Y | Y |
| External DRAM Buffer | N | N | N | N |
| iData Guard | Y | Y | Y | Y |
| iCell | N | N | N | N |
| TRIM | Y | Y | Y | Y |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | 30 x 26.8 x 3.6 | 30 x 26.8 x 3.4 | 30 x 26.8 x 3.4 | 30 x 26.8 x 3.4 |
| 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) | DEMSM-XXXDK1EC*** | DEMSM-XXXM41SC*** | DHMSM-XXXM41BC*** | DEMSM-XXXM41BC*** |
| Wide Temp. OP (-40°C~+85°C) | DEMSM-XXXDK1EW*** | DEMSM-XXXM41SW*** | DHMSM-XXXM41BW** | DEMSM-XXXM41BW*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G) ***= flash configuration (internal control code)%=Flash Type | | | |

# SD/micro SD

Innodisk SD and microSD cards are single-level flash devices built for rugged applications in the embedded field. As an industrial-grade SD/microSD card, these cards deliver outstanding performance of up to 54MB per second as well as excellent endurance and reliability, especially compared to other cards used in the mobile market. The Innodisk SD and microSD cards are compatible with SD 2.0 /SD 3.0 standards and support SDHC Class 10(UHS-I). They also feature SMART technology, which monitors the reliability of these SD cards.

| Model Name | Industrial micro SD Card | Micro SD 3SE3 | MicroSD 3ME2 | MicroSD 3IE2 | Industrial SD Card | Industrial SD Card 3ME3 |
|---|---|---|---|---|---|---|
| Key Features | Enhanced power cycling management | Power cycling enhancement | 1. Support Class 10 with UHS-I<br>2. High performance<br>3. SPI mode supported | 1. Support Class 10 with UHS-I<br>2. High performance<br>3. SPI mode supported | 1. Designed for industrial applications<br>2. High reliability<br>3. Customizeable<br>4. Power fail mangement<br>5. AES (Optional) | 1. High performance<br>2. Power fail management<br>3. BCH ECC implement |
| Interface | SD 1.01/2.0 | SD 3.0 | SD 3.0 | SD 3.0 | SD 3.0 | SD 3.0 |
| Flash Type | SLC | SLC | MLC | iSLC | SLC/iSLC/MLC | MLC |
| Capacity | 1GB~4GB | 4GB~8GB | 8GB~64GB | 4GB~32GB | SLC: 128MB~32GB<br>iSLC: 8GB~64GB<br>MLC: 8GB~128GB | 8GB~128GB |
| Max. Channel | 1 | 1 | 1 | 1 | 1 | 1 |
| Sequential R/W (MB/sec, max.) | 23/20 | 30/23 | 75/31 | 79/45 | SLC: 23/21<br>iSLC: 61/36<br>MLC: 54/18 | 80/46 |
| Max. Power Consumption | 0.17W<br>( 3.3V x 50mA) | 1.2W (3.3V x 387mA) | 0.7W (3.3V x 219mA) | 0.7W<br>(3.3V x 219mA ) | 0.22W (3.3V x 69mA )(SLC)<br>0.34W (3.3V x 105mA )(MLC) | 0.56W (3.6V x 158mA) |
| S.M.A.R.T | Y | Y | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | 11.0 x 15.0 x 1.0 | 11.0 x 15.0 x 1.0 | 11.0 x 15.0 x 1.0 | 11.0 x 15.0 x 1.0 | 24.0 x 32.0 x 2.1 | 24.0 x 32.0 x 2.1 |
| Environment | Vibration: 20G@7~2000Hz/Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours | | | | | |
| Standard Temp. OP (-25°C~+85°C) | DS2M-XXXI81AC*** | DESDM-XXXS02AE*** | DESDM-XXXE21SEASK | DHSDM-XXXE21SEASK | DESDC-XXXY81%C***<br>DHSDC-XXXY81%C***(iSLC) | DESDC-XXXS02BC*** |
| Wide emp. OP (-40°C~+85°C) | DS2M-XXXI81AW*** | DESDM-XXXS02AW*** | NA | NA | DESDC-XXXY81%W***<br>DHSDC-XXXY81%W***(iSLC) | DESDC-XXXS02BW*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G)*** = flash configuration (internal control code) %=Flash Type | | | | | |

# CF Card

Innodisk's Industrial CompactFlash Memory Card (iCF) complies with the PCMCIA* ATA standard. Designed to replace traditional rotating disk drives, Innodisk iCFs are embedded solid-state data storage systems that are designed for mobile computing and the industrial work place.

| Model Name | iCF 9000 | iCF 1SE | iCF 1ME |
|---|---|---|---|
| Key Features | 1. High sustained data transfer speed<br>2. Enhanced power cycling management | High quality SLC-based solution | 1. Budget friendly MLC-based solution<br>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 | 0.95W (5V x 190mA)<br>0.63W (3.3V x 190mA) | 0.75W (5V x 150mA)<br>0.5W (3.3V x 150mA) | 0.76W (5V x 155mA)<br>0.52W (3.3V x 155 mA) |
| 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<br>UDMA mode 0-7 | PIO mode 0-6<br>UDMA mode 0-4 | PIO mode 0-6<br>UDMA mode 0-7 |
| Notes | XXX = density (512MB=512, 01GB=01G, 02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56)<br>***= flash configuration (internal control code) % =Flash Type | | |

# CFast

The Innodisk CFast is a small form factor card standard with high data storage capacity. It is suitable for semi-industrial applications. Compliant with the CFast 2.0 standard, it is designed with a 7+17 pin connector and is SATA compatible. The Innodisk CFast offers data transfer rates of sequential read up to 560 MB/sec and of sequential write up to 520MB/sec.

| Model Name | CFast 3TE7 | CFast 3SE4 |
|---|---|---|
| Key Features | 1. Industrial-grade firmware with 3D NAND<br>2. Advanced LDPC ECC engine<br>3. Internal RAID Technology<br>4. DRAM-less, high-level data integrity<br>5. Excellent data transfer speed | 1. High quality SLC-based solution<br>2. DRAM-less, high-level data integrity<br>3. LDPC technology secures SSD reliability<br>4. Excellent data transfer speed |
| Interface | SATA III 6.0Gb/s | SATA III 6.0Gb/s |
| Connector | 7pin+17pin | 7pin+17pin |
| Flash Type | 3D TLC | SLC |
| Capacity | 32GB~512GB | 8GB~64GB |
| Max. Channel | 4 | 2 |
| Sequential R/W (MB/sec, max.) | 560/330 | 530/360 |
| Max. Power Consumption | 1.81W (3.3V x 550mA) | 1.59W (3.3V x 480mA) |
| Thermal Sensor | Y | Y |
| External DRAM Buffer | N | N |
| iData Guard | Y | Y |
| iCell | N | N |
| TRIM | Y | Y |
| ATA Security | Y | Y |
| S.M.A.R.T | Y | Y |
| Dimension (WxLxH/mm) | 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) | DECFA-XXXDK1EC*** | DHCFA-XXXM41SC*** |
| Wide Temp. OP (-40°C~+85°C) | DECFA-XXXDK1EW*** | DECFA-XXXM41SW*** |
| Note | xxx = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12)<br>***= flash configuration (internal control code) %=Flash Type | |

| Model Name | CFast 3IE4 | CFast 3ME4 | CFast 3MG2-P |
|---|---|---|---|
| Key Features | 1. Cost-effective industrial Flash with iSLC<br>2. Lifespan 7 times longer than MLC<br>3. Excellent IOPS performance<br>4. Designed with LDPC ECC engine<br>5. Support hardware write protect | 1.Exclusive $L^3$ architecture<br>2. Designed with LDPC ECC engine<br>3. Excellent IOPS performance<br>4.Support hardware write protect | 1. Compliant with CFast 2.0 satndard<br>2. EverGreen $L^2$ architecture<br>3. High Sequential/IOPS performance<br>4. Support DEVSLP<br>5. iData Guard Protection |
| 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 | iSLC | MLC | MLC |
| Capacity | 8GB~128GB | 8GB~256GB | 32GB~256GB |
| Max. Channel | 2 | 2 | 4 |
| Sequential R/W (MB/sec, max.) | 530/360 | 530/210 | 560/350 |
| Max. Power Consumption | 0.76W (3.3V x 230mA) | 0.86W (3.3V x 260mA) | 2.51W (3.3V x 760mA) |
| 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) | 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) | DHCFA-XXXM41BC*** | DECFA-XXXM41BC*** | DGCFA-XXXD81BC*** |
| Wide Temp. OP (-40°C~+85°C) | DHCFA-XXXM41BW*** | DECFA-XXXM41BW*** | DGCFA-XXXD81BW*** |
| Note | xxx = density (08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56 )<br>***= flash configuration (internal control code) %=Flash Type | | |

# Mini PCIeDOM

The Innodisk Mini PCIeDOM is a Flash based disk module with standard Mini PCIe form factor, and PCI Express Gen.1 interface. It is suitable for board maker or SI to design in the product as a boot drive or a storage device. Meanwhile, it supports multiple operating systems with no driver needed, including Windows XP, Windows 7, and Linux based OS.

| Model Name | Mini PCIeDOM 1SE | Mini PCIeDOM 1ME3 |
|---|---|---|
| Key Features | 1. Standard Mini PCIe form factor<br>2. Driver-less<br>3. PCIe Gen.1x1 | 1. Standard Mini PCIe form factor<br>2. Driver-less<br>3. PCIe Gen.1x1 |
| Interface | PCI Express Gen.1x1 | PCI Express Gen.1x1 |
| Flash Type | SLC | MLC |
| Capacity | 4GB~64GB | 16GB~256GB |
| Max. Channel | 4 | 2 |
| Sequential R/W (MB/sec, max.) | 85/85 | 130/100 |
| Max. Power Consumption | 2.3 W (3.3V x 700mA) | 2 W (3.3V x 620mA) |
| Thermal Sensor | STD : N, W/T : Y | |
| External DRAM Buffer | N | N |
| iData Guard | Y | Y |
| iCell | N | N |
| TRIM | N | N |
| ATA Security | Y | Y |
| S.M.A.R.T | Y | Y |
| Dimension (WxLxH/mm) | 30.0 x 50.95 x 5.0 | 30.0 x 50.9 x 5.0 |
| Environment | Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours | |
| Standard Temp. OP (0°C~+70°C) | DEEDM-XXXJ30AC*** | DEEDM-XXXD09BC*** |
| Wide Temp. OP (-40°C~+85°C) | DEEDM-XXXJ30AW*** | DEEDM-XXXD09BW*** |
| Note | XXX = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12 )<br>***= flash configuration (internal control code) %=Flash Type | |

# EDC

The Innodisk Embedded Disk Card (EDC) complies with PCMCIA* ATA standards and fits into all platforms with an IDE connector. The Innodisk Embedded Disk Card comes in capacities ranging from 512MB to 256GB and is available in 40-pin and 44-pin connector packages.

| Model Name | EDC 1SE Vertical Type | EDC 1SE Horizontal Type | EDC 1ME Vertical Type | EDC 1ME Horizontal Type |
|---|---|---|---|---|
| Key Features | 1. Dust prevention<br>2. High quality SLC-based solution | 1. High quality SLC-based solution<br>2. Supported mounting hole | 1. Budget- friendly MLC-based solution<br>2. High performacne PATA solution | 1. Budget- friendly MLC-based solution<br>2. High performacne PATA solution |
| Connector | 40/44 pin | 40/44 pin | 44 pin | 44 pin |
| Interface | PATA | PATA | PATA | PATA |
| Flash Type | SLC | SLC | MLC | MLC |
| Capacity | 512MB~4GB | 512MB~8GB | 8GB~128GB | 8GB~256GB |
| Max. Channel | 2 | 2 | 2 | 2 |
| Sequential R/W (MB/sec, max.) | 40/28 | 40/28 | 110/75 | 110/75 |
| Max. Power Consumption | 0.75W (5V x 150mA)<br>0.5W (3.3V x 150mA) | 0.75W (5V x 150mA)<br>0.5W (3.3V x 150mA) | 1.05W (5V x 150mA)<br>0.69W (3.3V x 150mA) | 1.05W (5V x 150mA)<br>0.69W (3.3V x 150mA) |
| Thermal Sensor | N | N | N | N |
| External DRAM Buffer | N | N | N | N |
| ATA Security | Y | Y | Y | Y |
| S.M.A.R.T | Y | Y | Y | Y |
| Dimension (WxLxH/mm) | 40 pin: 60.2 x 27.3 x 6.4<br>44 pin: 50.3 x 27.3 x 5.8 | 40 pin (A,B type): 55 x 32.4 x 12.9<br>40 pin (C,D type): 55 x 32.4 x 14.6<br>40 pin (E,F type): 55 x 32.4 x 18.3<br>44 pin (A,B type): 48 x 32.6 x 6.7<br>44 pin (C,D type): 48 x 32.6 x 12.8<br>44 pin (E,F type): 48 x 32.6 x 12.9 | 50.3 x 27.3 x 7.5 | A,B type: 48 x 32.6 x 7.3 |
| 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) | 40PIN DE0H-XXXD41AC***<br>44PIN DE4H-XXXD41AC*** | 40PIN DE0P%-XXXD41AC***<br>44PIN DE4P%-XXXD41AC*** | DEE4H-XXXD53BC*** | DEE4%-XXXD53BC*** |
| Wide Temp. OP (-40°C~+85°C) | 40PIN DE0H-XXXD41AW***<br>44PIN DE4H-XXXD41AW*** | 40PIN DE0P%-XXXD41AW***<br>44PIN DE4P%-XXXD41AW*** | DEE4H-XXXD53BW*** | DEE4%-XXXD53BW*** |
| Note | xxx = density (512MB=512, 01GB=01G, 02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A2, 256GB=B56)<br>***= flash configuration (internal control code), %=Horizonyal type(A,B,C,D,E,F) | | | |

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# USB

The Innodisk industrial-grade USB series is built using SLC NAND flash and features an attractive small form factor. It provides high-capacity flash memory storage while delivering faster data transmission with high reliability. It also complies with the high-speed USB 3.0 interface and is backward compatible with USB 1.1. The Innodisk USB series has a variety of special features, from plastic and metal housing to secure mounting holes to EDC choices.

| Model Name | USB Drive 3SE | USB Drive 3ME | USB Drive 2SE |
|---|---|---|---|
| Key Features | 1. Metal housing to enhance ESD protection<br>2. 30µ golden finger for highly reliable data transfer quality | | 1. Metal housing to enhance ESD protection<br>2. 30µ golden finger for highly reliable data transfer quality |
| Interface | USB 3.0 | | USB 2.0 |
| Connector | Type A | | Type A |
| Flash Type | SLC | MLC | SLC |
| Capacity | 4GB~32GB | 8GB~64GB | 512MB~16GB |
| Max. Channel | 1 | 1 | 1 |
| Sequential R/W (MB/sec, max.) | 100/85 | 100/50 | 28/24 |
| Max. Power Consumption | 0.70W (5V x 140mA) | | 0.85W (5V x 170mA) |
| Dimension (WxLxH/mm) | 16.5 x 45.8 x 7.6 | | 16.5 x 45.8 x 7.4 |
| 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) | DEUA1-XXXI61SC*** | DEUA1-XXXI61BC*** | DEUA1-XXXI72AC*** |
| Wide Temp.OP(-40°C~+85°C) | DEUA1-XXXI61SW*** | DEUA1-XXXI61BW*** | DEUA1-XXXI72AW*** |
| Notes | XXX = density (512MB=512, 01GB=01G, 02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, 512GB=C12 )<br>***= flash configuration (internal control code) | | |

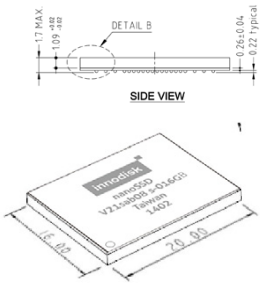
| Model Name | USB EDC Vertical 3SE | USB EDC Vertical 3ME | USB EDC Horizontal 2SE | USB EDC Horizontal 2ME | USB EDC Vertical 2SE | USB EDC Vertical 2ME |
|---|---|---|---|---|---|---|
| Key Features | 1. High performance with USB 3.0 interface<br>2. Low power consumption<br>3. Wear-Leveling supported | | 1. Supported mounting hole<br>2. 2.0/2.54 pin pitch | | 1. Very low profile<br>2. Low power consumption | |
| Interface | USB 3.0 | | USB 2.0 | | USB 2.0 | |
| Connector | Standard, 20pin, 2.00mm | | Standard 9pin, 2.54mm<br>Low profile 9pin, 2.00mm | | Standard, 9pin, 2.54mm | |
| Flash Type | SLC | MLC | SLC | MLC | SLC | MLC |
| Capacity | 4GB~32GB | 8GB~64GB | 512MB~32GB | 8GB~128GB | 512MB~16GB | 8GB~64GB |
| Max. Channel | 1 | 1 | 1 | 1 | 1 | 1 |
| Sequential R/W (MB/sec, max.) | 110/85 | 100/50 | 28/24 | 27/18 | 28/24 | 26/18 |
| Max. Power Consumption | 0.79W (5V x 158mA) | | 0.85W (5V x 170mA) | | 0.85W (5V x 170mA) | |
| Dimension (WxLxH/mm) | 24.0 x 22.0 x 5.0 | | 26.6 x 36.9 x 9.6 (Pin Pitch2.54)<br>26.6 x 36.9 x 6.6 (Pin Pitch2.00) | | 15.2 x 34.1 x 6.4 | |
| 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) | DEUV1-XXXI61SC*** | DEUV1-XXXI61BC*** | DEUH1-XXXI72AC***<br>DEUH2-XXXI72AC*** | DEUH1-XXXI72BC***<br>DEUH2-XXXI72BC*** | DEUV1-XXXI72AC*** | DEUV1-XXXI72BC*** |
| Wide Temp.OP (-40°C~+85°C) | DEUV1-XXXI61SW*** | DEUV1-XXXI61BW*** | DEUH1-XXXI72AW***<br>DEUH2-XXXI72AW*** | DEUH1-XXXI72BW***<br>DEUH2-XXXI72BW*** | DEUV1-XXXI72AW*** | DEUV1-XXXI72BW*** |
| Notes | XXX = density (512MB=512, 01GB=01G, 02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28, 256GB=B56, )<br>***= flash configuration (internal control code) | | | | | |

# nanoSSD

The Innodisk nanoSSD is an integrated SATA storage device. It combines Innodisk's ID106/ID108 NAND flash controller and latest NAND flash in a JEDEC MO-276(SATA µSSD) form factor with one single ball grid array (BGA) package, giving the nanoSSD a compact size and making it very easy to design in. The Innodisk nanoSSD , supporting SATA III 6.0Gbp/s , offers excellent high data transfer rates, along with lower power consumption. It is an ideal solution for any kind of limited-space application.

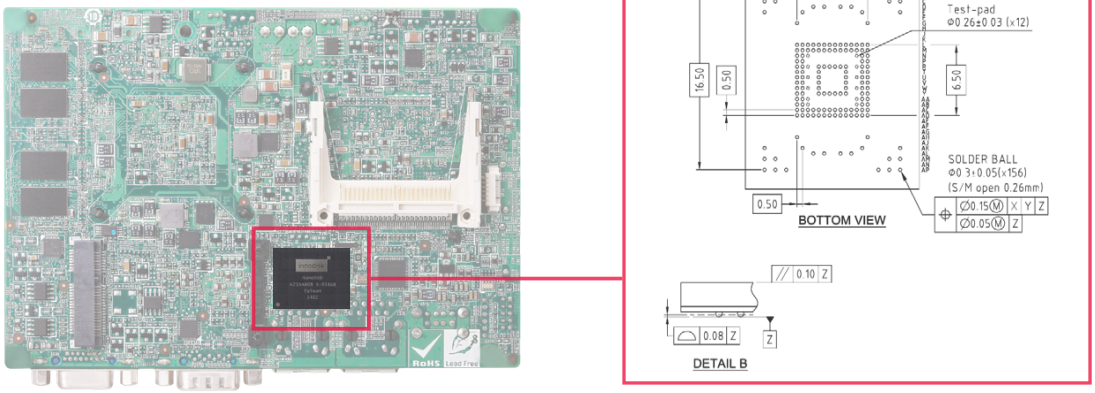
## Features

- Integrated NAND Flash controller with Flash in a single chip
- Compliant with JEDEC MO-276 (SATA µSSD) specifications
- SATA III interface with BGA package
- Intelligent Flash management & real time garbage collection

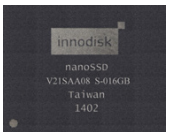


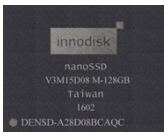

## Benefits of nanoSSD

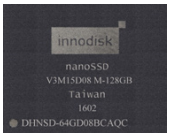
- Chip type, easy to design in without mechanical interference
- SATA interface, highly compatible with x86 system
- Excellent data transfer rates
- Fully compliant with industrial standards
- Suitable for ultra-thin or compact systems
- Zero peripheral circuits




The Innodisk nanoSSD mechanical drawing




| Model Name | nanoSSD 3SE | nanoSSD 3IE3 | nanoSSD 3ME3 |
|---|---|---|---|
| Key Features | 1. Using BGA package to make controller and flash as single chip<br>2. Adopt SATA III interface,well Compatibility<br>3. Complaint with JEDEC MO-276 SPEC | | |
| Interface | SATA III 6.0Gb/s | | |
| Flash Type | SLC | iSLC | MLC |
| Capacity | 2GB~16GB | 16GB~64GB | 16GB~128GB |
| Max. Channel | 4 | | |
| Sequential R/W (MB/sec, max.) | 410/195 | 440/260 | 410/140 |
| Max. Power Consumption | 2.5W | 2.3W | |
| Thermal Sensor | N | N | |
| External DRAM Buffer | N | N | |
| iData Guard | Y | Y | |
| iCell | N | N | |
| TRIM | N | Y | |
| ATA Security | Y | Y | |
| S.M.A.R.T | Y | Y | |
| Dimension (WxLxH/mm) | 16.0 x 20.0 x 1.7 | | |
| Environment | Shock: 1500G@0.5ms/Storage Temperature: -55°C ~ +95°C/MTBF: >3 million hours | | |
| Standard Temp. OP (0°C~+70°C) | DENSD-XXXD06SC*** | DHNSD-XXXD08BC*** | DENSD-XXXD08BC*** |
| Wide Temp. OP (-40°C~+85°C) | DENSD-XXXD06SW*** | DHNSD-XXXD08BW*** | DENSD-XXXD08BW*** |
| Note | xxx = density (02GB=02G, 04GB=04G, 08GB=08G, 16GB=16G, 32GB=32G, 64GB=64G, 128GB=A28)<br>***= flash configuration (internal control code) | | |

# Software Solutions

With our newest Innodisk Cloud Administration Platform (iCAP™) we offer complete storage monitoring services for IoT applications. In addition, our extensive software portfolio is designed to meet the growing needs of edge integration in the embedded and industrial market.

Software portfolio:

Cloud Solutions
- iCAP™ – Cloud Administration Platform

Edge Solutions
- iSMART™ –Flash Device Management
- iTracker™ –SD Card and USB Management
- iCover™ – System Recovery
- iOpal™ – Self-Encrypting Drive Management



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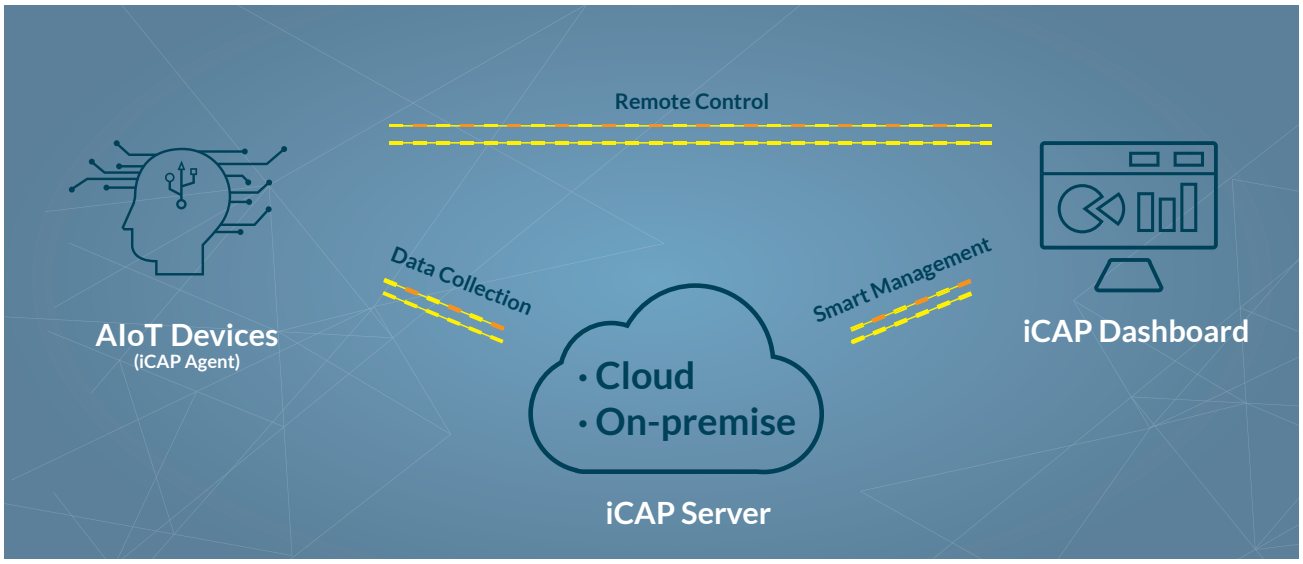
# Cloud Solutions

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.

## System Architecture



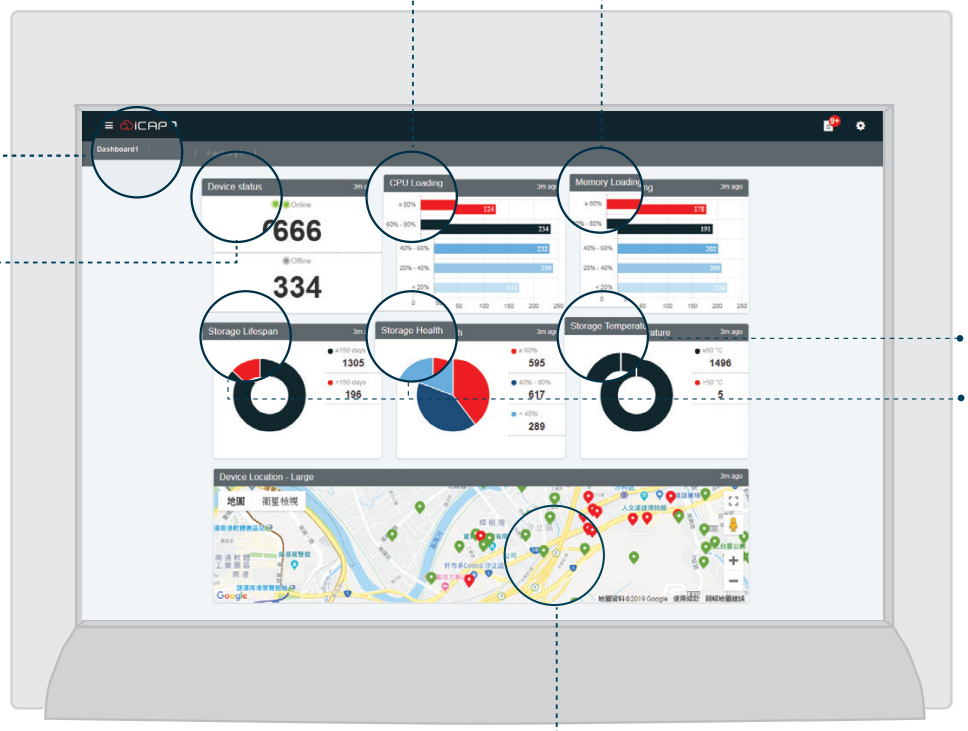

## iCAP Dashboard Management Interface

The web page allows multiple dashboards that enable the user to easily manage connected devices through supported browsers

Keep tabs on current CPU and Memory loading

Effectively monitor remote device status

User-friendly monitoring function allowing the user to manage and analyze storage information lifespan in detail




Customizable widgets including gauges, Google Maps, and various tables presenting device data

## iCAP Advantage

Windows

Linux

### Extensive Compatibility
The iCAP agent is supported on both Windows and Linux platforms and can be seamlessly accessed through long list of supported web browser.

### Flexible Dashboard
User can freely alter the dashboard through a dynamic UI and device grouping and choose the parameters and widgets relevant to their application.

### System Backup & Recovery
iCAP integrates Innodisk's proprietary iCover tool that allows for remotely initialized system backup and recovery

### Effective Event Tracker
The event notification tracker will log all changes and keep the user up to speed, enabling a swift resolution to any issues that might occur.

### Comprehensive Indexing
The index table accessible through the dashboard allows you to quickly get more details on device status

### 3rd Party Support
iCAP can also monitor devices of other brands as long as the it runs Innodisk storage components

## System Requirements

### Web Service
Web browsers that supports HTML5, CSS3, JavaScript:
Microsoft Internet Explorer 10+ | Google Chrome:9.0+ | Firefox:15.0+ | Safari:5.1+

### Server
Hardware Minimum Requirements:
IntelR Core™ i3 2.3 Ghz CPU or above | 4 GB RAM | 20 GB root partition for the system | 100 GB data storage
Operating System:
Ubuntu 14.04+ | Docker 17.03+

### Agent
Hardware:
Bundled with Innodisk Storage products
Operating System:
Windows 10/8.1/7/XP kernel 32/64-bits | Ubuntu 16.04 64-bits | Debian 8 64-bits | Others by request



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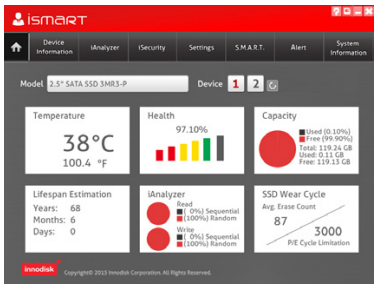
# Edge Solutions

## iSMART

**Easy-to-use tool to access SMART information.**

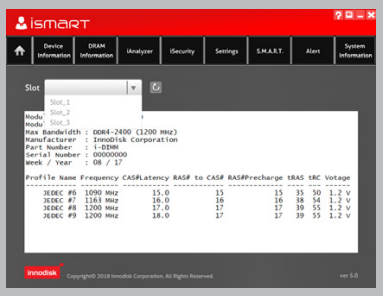
The iSMART tool monitors the health and lifespan of Innodisk's SSDs and DRAM while also providing details on usage patterns. Alerts are easily configured to issue warnings before any critical errors can occur. With iSMART, the user is able to properly integrate Innodisk's SSDs and DRAM into their solutions by carefully monitoring behavior and lifespan during development, integration, and mass production.

### Smart Dashboard



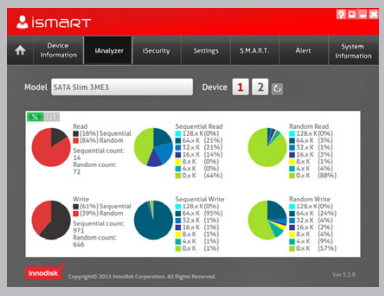

The Dashboard's home provides a quick snapshot of each installed device in the system. This page offers accurate data information regarding Temperature, Health, Capacity, Lifespan, iAnalyzer, and Notifications. Further device information such as S/N, firmware version, interface, etc. is also available.

### DRAM Information



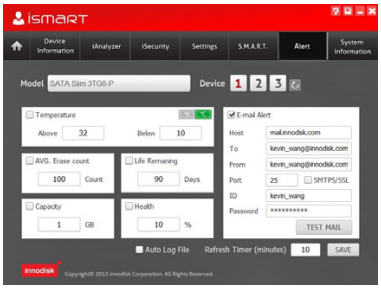

No need to physically access the DRAM module to ascertain device info. The DRAM will provide all information to iSMART, making it easily available to the user. The feature will show P/N, data transfer rate, capacity, data code, etc.

### iAnalyzer



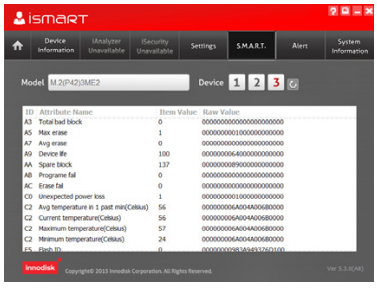

When activated, the iAnalyzer tab displays the read/write behaviors of the SSD in real time. This allows the user to understand their application usage of the SSD. Sequential and Random I/Os are easily broken down into percentages making them easy to read.

### Alert



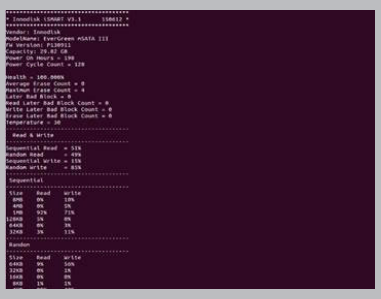

The Alert tab helps the user set trigger points with Temperature, Health percentage, Remaining Capacity or Life Remaining. If these trigger points exceed their boundaries, the iSMART utility can send a warning and email to the user notifying them that something may fail.

### PCIe NVMe Support




iSMART supports logging for PCIe NVMe devices. The user can easily check the PCIe storage device health status.

### iSMART for Linux



The iSMART Linux version provides every storage device's SMART values by vender command, and also fully supports the iAnalyzer function.

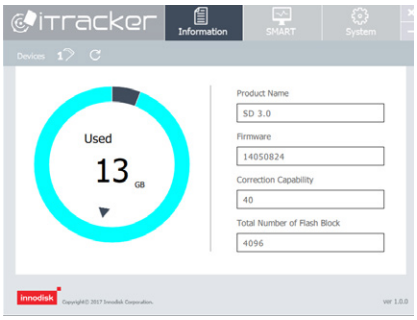
# iTracker

## Easy access to USB and SD SMART information

iTracker is Innodisk's dedicated software tool for SD 3.0 cards and USB products. It offers a customizable approach to accessing flash card SMART values. Compatibility with both Windows and Linux systems and an intuitive user interface ensures an easy system integration and user experience.

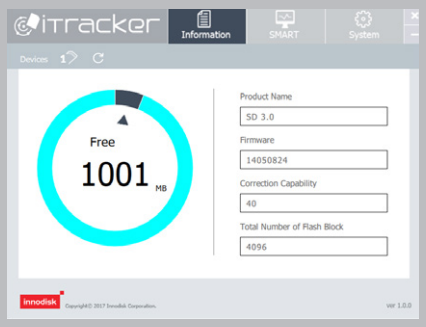
Features:
- Dedicated Innodisk Industrial SD Card and USB Management Software
- Intuitive visualized SMART information
- Flexible widgets for customized requirements
- Support for both Windows & Linux systems

### SD Information



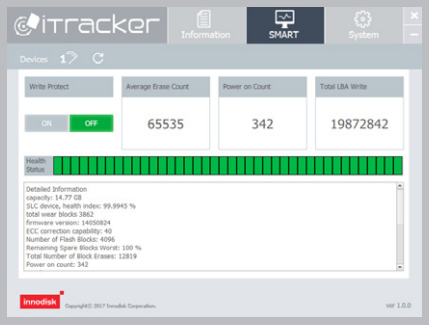

- iTracker enables easy access to SD card and USB series information
- SD 3.0 (Hyperstone)
  - Product name
  - FW version
  - Correction capability for flash
  - Total number of flash block
- SD 3ME3 (SM2702)
  - Product name
  - Bus width
  - Speed class
  - Speed grade

### USB Information




- USB series product (SM3268)
  - Product name
  - Manufacture
  - Serial number
  - Firmware version
  - Package version
  - P/E cycles

### SMART




- The iTracker SMART page shows more details about device health status and helps the user predict remaining lifespan
- Write protect feature can also easily be enabled and disabled

### System Page

- iTracker system page enables the user to easily check system information



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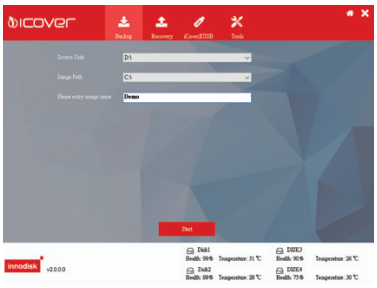
## Reliable one-key backup and recovery

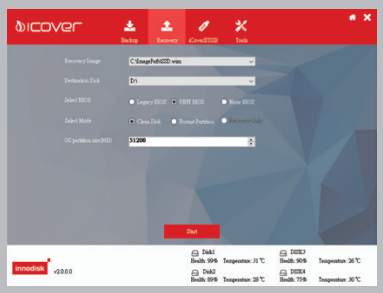
iCover is an easy-to-use, highly-customized backup and recovery software tool designed for industrial computers. iCover will not only recover the operation system, but also all of the applications, drivers and personal data by using the recovery image. It is fully compatible with Microsoft Windows and Linux operating systems. Even if the system should become unresponsive, this quick recovery tool will restore it to its original state.

### Backup



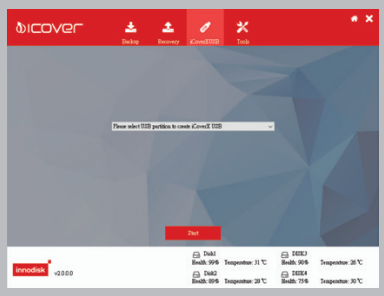
iCover allows the user to run any backup from any specific point in time

### Recovery



The recovery function allows for unstable systems to quickly return to a status of working operability thus reducing downtime to a minimum

### iCoverXUSB



iCover allows you to create an image file to load onto your own iCover USB Dongle

### Tools

iCover gives you access to a basic command line tool and plans for iBuilder for OS building and FnKey recovery are also in the works

## Advantage

### Remote Backup and Recovery

Support SMB/CIFS protocol to backup and recover system image

### UEFI BIOS Support

Supports legacy/ UEFI BIOS recovery

## System Requirements

| Items | iCover |
|---|---|
| Processor | 1GHz or faster |
| RAM | 2GB |
| Supported Devices | Innodisk Storage Devices |
| OS Support | Windows: Windows XP/7/8.1/10 I Windows Embedded Series<br>Linux: Ubuntu/Yotco/CentOS |
| File System | Windows: NTFS/FAT32<br>Linux: Ext4/Ext3/Ext2 |

# iOpal

## TCG Opal-Compliant Software

The TCG defined standard for self-encrypting drives (SED) emphasizes data security and ease of use. Innodisk's software conforms to this standard and can provide a simple and intuitive way to handle SED management. The software allows the user to easily define different ranges for different users – allowing for a system where data is shared on a strictly need-to-know basis.

## Advantages

### User-friendly

Gives an intuitive user interface to the TCG Opal 2.0 specifications and SED management while supporting up to 5 devices simultaneously.

### Multi-function

iOpal's data storage management features are designed to enhance data security and communication with the host system.

### High compatibility:

iOpal is available in both Windows and Linux versions for a much broader applicability

| Form Factor | |
|---|---|
| 3MG2-P with AES | 2.5" SSD, M.2(S42,S80), mSATA, SATA Slim |
| 3SE2-P with AES | 2.5" SSD, 1.8" SSD |

**Supported OS List**

Windows 7 / Windows 10 / Linux Ubuntu / Linux Fedora

# DRAM

## DRAM Modules

Innodisk's industrial-grade DRAM series features high-quality memory modules that have been specifically designed and developed for industrial computers and similar applications. Our specialized SPD team is ready to provide system designers with a complete turn-key solution for any engineering requirements.

Innodisk's DRAM modules are categorized to meet different systems' needs, and supports DDR4, DDR3, DDR2, DDR, and SDRAM. Our DRAM modules are available in 4 product lines: Embedded, Server, Wide Temperature, and Special Customized.

Innodisk's comprehensive range of DRAM modules includes: Unbuffered DIMM, Unbuffered SO-DIMM, Unbuffered ECC DIMM, Unbuffered ECC SO-DIMM, Mini DIMM, and registered DIMM, conformal coated DRAM, and side filled DRAM.



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# Product Overview - Applications

| | | | Gaming | Medical | Retail | Automation | Surveillance | Networking | In-Vehicle | Digital Signage | Mission Critical |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Embedded | DDR1 | UDIMM | | | | | | | | | |
| | | SODIMM | ● | | | ● | ● | ● | ● | ● | |
| | DDR2 | UDIMM | | ● | ● | ● | | ● | ● | | |
| | | UDIMM VLP | | ● | | | | | | | |
| | | SODIMM | ● | | ● | ● | ● | | ● | ● | |
| | DDR3 | UDIMM | ● | ● | ● | ● | | ● | ● | ● | |
| | | UDIMM VLP | | | | | ● | | | | |
| | | SODIMM | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | SODIMM VLP | | | | | ● | ● | | | |
| | DDR4 | UDIMM | ● | ● | ● | ● | ● | ● | ● | | ● |
| | | UDIMM VLP | | ● | | | ● | ● | | | |
| | | SODIMM | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | SODIMM VLP | | ● | | | ● | | | | ● |
| Server | DDR2 | ECC UDIMM | | | | | | | | | |
| | DDR3 | ECC UDIMM | | ● | | | ● | ● | | | |
| | | ECC UDIMM VLP | | | | | ● | | | | |
| | | ECC SODIMM | | ● | | | | ● | ● | | |
| | | ECC SODIMM ULP | | | | | ● | | | | |
| | | RDIMM | | ● | | | | ● | | | ● |
| | | RDIMM VLP | | | | | | ● | | | ● |
| | | Mini RDIMM | | | | | | | | | |
| | | Mini RDIMM VLP | | | | | | | | | |
| | | Mini ECC ULP | | | | | ● | | | | |
| | DDR4 | ECC UDIMM | | ● | | | ● | ● | | | |
| | | ECC UDIMM VLP | | ● | | | ● | ● | | ● | |
| | | ECC SODIMM | | ● | | | | ● | ● | | |
| | | ECC SODIMM VLP | | ● | | | ● | | ● | | |
| | | RDIMM | | ● | | ● | | ● | | | |
| | | RDIMM VLP | | | | | | ● | | | |
| | | Mini ECC VLP | | | | | ● | | | | |
| | | Mini RDIMM VLP | | | | | | | | | |
| Wide Temperature | DDR2 | SODIMM | | | | ● | | | | | |
| | DDR3 | UDIMM | | ● | | | | | ● | | |
| | | ECC UDIMM | | ● | | | | | | | |
| | | SODIMM | ● | ● | | ● | | ● | ● | ● | ● |
| | | ECC SODIMM | ● | ● | | | | | | | ● |
| | DDR4 | UDIMM | | ● | | | | | | | |
| | | UDIMM VLP | | | | | | | | | |
| | | ECC UDIMM | | ● | | | | | | | |
| | | SODIMM | ● | ● | | ● | | ● | ● | ● | ● |
| | | ECC SODIMM | ● | ● | | | | | | | ● |
| | | RDIMM | | | | | | | | | |
| | | RDIMM VLP | | | | | | | | | |
| Customization | DDR3 | XR-DIMM | | | | | | | | | |
| | | ECC XR-DIMM | | | | | | | | | ● |
| | DDR4 | ECC XR-DIMM | | | | | | | | | ● |

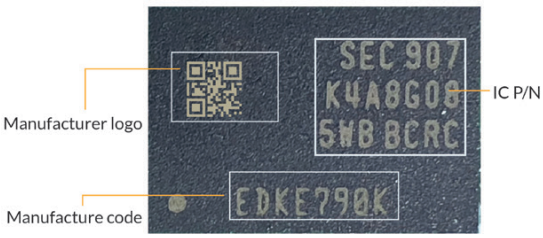
# IC Grade

## IC Hierarchy

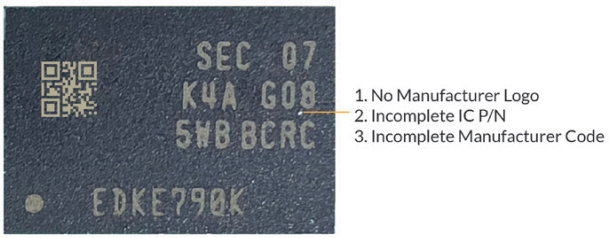
| | |
|---|---|
| Original IC | **Original IC (Innodisk)**<br>- Fully tested by major IC suppliers |
| eTT | **Effectively Tested DRAM**<br>- Effectively tested but test patterns can vary by suppliers<br>- Logo unmarked or only marked with partial IC part number |
| uTT | **Untested DRAM**<br>- Untested<br>- Logo unmarked |
| Low Grade | **Low Grade**<br>- DRAM IC with unknown quality confirmed as not having full data sheet parts |

## Distinguishing Original from Lower Grade IC

**Original IC**




**Lower Grade IC**




## Why do we only use “Original IC”?

### 1. Top Quality

Environmental and Application Challenges: The areas Innodisk operates in are industrial in nature. These areas give rise to harsh environments and a demand for long-lasting devices, which are the principal challenges we face.

Innodisk uses original IC, not just for the quality guarantees, but also for the international expertise and experience of the manufacturer. Together, the original IC manufacturer and Innodisk offer the customer the most thorough dual guarantee that ensures that you are equipped to face any challenges in your way.

Technology and market development: IoT, AI and AIoT are already solid trends that are actively pursued by the actors in the industrial and embedded markets. High-quality original ICs are necessary to meet the needs of heavy workloads and the high-performance requirements seen in these applications.

### 2. Original Manufacturer Report

Any device operating under long periods of time will be susceptible to break down and damage. Original man can not only help recycle faulty products and repair damaged ICs, but also provides a complete repair report. This will allow the customer to better understand the reason behind the malfunction and take the necessary steps to avoid future occurrences. However, the original manufacturer will not acknowledge lower grade ICs (as these are third party) and will neither provide a repair report.



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# Embedded

## Embedded UDIMM

UDIMM modules are DRAM modules meant to be used as standard products for general embedded applications. These modules are compliant with JEDEC standards and available in DDR1, DDR2, DDR3, and DDR4.

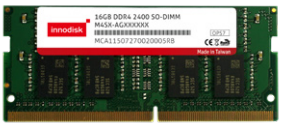
| Series | Standard Solution | |
|---|---|---|
| Module Type | DDR4 UDIMM | DDR3 UDIMM |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s |
| Capacity | 2GB/4GB/8GB/16GB/32GB* | 2GB/4GB/8GB |
| Function | Non-ECC Unbuffered Memory | |
| Pin Number | 288pin | 240pin |
| Width | 64Bits | 64Bits |
| Voltage | 1.2V | 1.5V/1.35V |
| PCB Height | 1.23 Inches | 1.18 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C |
| Anti-Sulfuration | √ | – |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

32GB*: The schedule for the 32GB solution by 2Gbx8 IC is dependent on supplier status

| Series | Standard Solution | |
|---|---|---|
| Module Type | DDR2 UDIMM | DDR UDIMM |
| Data Rate | 533 MT/s, 667 MT/s, 800 MT/s | 333 MT/s, 400 MT/s |
| Capacity | 1GB/2GB/4GB | 512MB/1GB |
| Function | Non-ECC Unbuffered Memory | |
| Pin Number | 240pin | 184pin |
| Width | 64Bits | 64Bits |
| Voltage | 1.8V | 2.6V |
| PCB Height | 1.18 Inches | 1.16 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 70°C |
| Anti-Sulfuration | – | – |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

# Embedded SODIMM

Small-outline DIMMs (SODIMM) modules are general DRAM modules meant to be usesd as standard products for embedded applications with limited space. These modules are compliant with JEDEC standards and help in eliminating the need for changing designs due to limited space.



| Series | Standard Solution | | |
|---|---|---|---|
| Module Type | DDR4 SODIMM | DDR3 SODIMM | DDR2 SODIMM |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s | 533 MT/s, 667 MT/s, 800 MT/s |
| Capacity | 2GB/4GB/8GB/16GB/32GB* | 1GB/2GB/4GB/8GB | 512MB/1GB/2GB/4GB |
| Function | Non-ECC Unbuffered Memory | | |
| Pin Number | 260pin | 204pin | 200pin |
| Width | 64Bits | 64Bits | 64Bits |
| Voltage | 1.2V | 1.5V/1.35V | 1.8V |
| PCB Height | 1.18 Inches | 1.18 Inches | 1.18 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C | 0 ~ 85°C |
| Anti-Sulfuration | √ | – | – |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

32GB*: The schedule for the 32GB solution by 2Gbx8 IC is dependent on supplier status

| Series | Standard Solution | |
|---|---|---|
| Module Type | DDR SODIMM | SDRAM SODIMM |
| Data Rate | 333 MT/s, 400 MT/s | 100 MT/s, 133 MT/s |
| Capacity | 256MB/512MB/1GB | 128MB/256MB/512MB |
| Function | Non-ECC Unbuffered Memory | |
| Pin Number | 200pin | 144pin |
| Width | 64Bits | 64Bits |
| Voltage | 2.6V | 3.3V |
| PCB Height | 1.25 Inches | 1.25 Inches |
| Operating Temperature | 0 ~ 70°C | 0 ~ 70°C |
| Anti-Sulfuration | – | – |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

# Server

## Registered DIMM

Registered DIMM modules are designed to ensure data integrity at both the device and system level of the server. In addition, all Innodisk Registered DIMM modules are tested by our exclusive iRAM testing software to ensure stable performance.

| Series | Server Solution | |
|---|---|---|
| Module Type | DDR4 RDIMM | DDR3 RDIMM |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s |
| Capacity | 4GB/8GB/16GB/32GB** | 2GB/4GB/8GB |
| Function | Registered Memory with ECC | |
| Pin Number | 288pin | 240pin |
| Width | 72Bits | 72Bits |
| Voltage | 1.2V | 1.5V/1.35V |
| PCB Height | 1.23 Inches | 1.18 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ |
| Anti-Sulfuration | √ (**With exception of the 32GB module) | – |

# Wide Temperature

## Wide Temperature Unbuffered DIMM

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.

| Series | Wide Temperature Solution | |
|---|---|---|
| Module Type | DDR4 WT UDIMM | DDR3 WT UDIMM |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s |
| Capacity | 4GB/8GB/16GB/32GB* | 2GB/4GB/8GB |
| Function | Non-ECC Unbuffered Memory | |
| Pin Number | 288pin | 240pin |
| Width | 64Bits | 64Bits |
| Voltage | 1.2V | 1.5V/1.35V |
| PCB Height | 1.23 Inches | 1.18 Inches |
| Operating Temperature | -40 ~ 85°C | -40 ~ 85°C |
| Golden finger 30μ" | √ | √ |
| Anti-Sulfuration | √ | – |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

32GB*: The schedule for the 32GB solution by 2Gbx8 IC is dependent on supplier status

| Series | Wide Temperature Solution | | |
|---|---|---|---|
| Module Type | DDR4 WT SODIMM | DDR3 WT SODIMM | DDR2 WT SODIMM |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s | 533 MT/s, 667 MT/s, 800 MT/s |
| Capacity | 4GB/8GB/16GB/32GB* | 2GB/4GB/8GB | 1GB/2GB |
| Function | Non-ECC Unbuffered Memory | | |
| Pin Number | 260pin | 204pin | 200pin |
| Width | 64Bits | 64Bits | 64Bits |
| Voltage | 1.2V | 1.5V/1.35V | 1.8V |
| PCB Height | 1.18 Inches | 1.18 Inches | 1.18 Inches |
| Operating Temperature | -40 ~ 85°C | -40 ~ 85°C | -40 ~ 85°C |
| Golden finger 30μ" | √ | √ | √ |
| Anti-Sulfuration | √ | – | – |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

32GB*: The schedule for the 32GB solution by 2Gbx8 IC is dependent on supplier status

## Wide Temperature Unbuffered DIMM with ECC

Wide Temperature ECC DIMMs are designed for both industrial systems and servers, Innodisk's Wide Temperature DRAM modules are best suited for applications that must work in extreme temperatures. With the ECC function, the Wide Temperature DIMMs also ensure that data is corrected when corrupted data bits are found during data retrieval.

| Series | Wide Temperature Solution | | | |
|---|---|---|---|---|
| Module Type | DDR4 WT ECC UDIMM | DDR4 WT ECC SODIMM | DDR3 WT ECC UDIMM | DDR3 WT ECC SODIMM |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 2133 MT/s, 2400 MT/s, 2666 MT/s | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s |
| Capacity | 4GB/8GB/16GB/32GB* | 4GB/8GB/16GB/32GB* | 2GB/4GB/8GB | 2GB/4GB/8GB |
| Function | ECC Unbuffered Memory | | | |
| Pin Number | 288pin | 260pin | 240pin | 204pin |
| Width | 72Bits | 72Bits | 72Bits | 72Bits |
| Voltage | 1.2V | 1.2V | 1.5V/1.35V | 1.5V/1.35V |
| PCB Height | 1.23 Inches | 1.18 Inches | 1.18 Inches | 1.18 Inches |
| Operating Temperature | -40 ~ 85°C | -40 ~ 85°C | -40 ~ 85°C | -40 ~ 85°C |
| Golden finger 30μ" | √ | √ | √ | √ |
| Anti-Sulfuration | √ | √ | – | – |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | | |

32GB*: The schedule for the 32GB solution by 2Gbx8 IC is dependent on supplier status

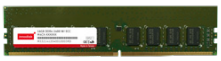
## Wide Temperature Registered DIMM

Designed for industrial systems, Innodisk's Wide Temperature DRAM modules are best suited for applications that must work in extreme temperatures. These modules use industrial-grade SDRAM components with 30u" gold finger to ensure that the memory maintains its high-quality signal, even at temperatures as low as -40°C or as high as 85°C.

| Series | Wide Temperature Solution | |
|---|---|---|
| Module Type | DDR4 WT RDIMM | DDR4 WT RDIMM VLP |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 2133 MT/s, 2400 MT/s, 2666 MT/s |
| Capacity | 4GB/8GB/16GB/32GB*<br>32GB* is only for 2133MT/s and 2400MT/s | 4GB*/8GB/16GB<br>4GB* is only for 2133MT/s and 2400MT/s |
| Function | Registered Memory with ECC | |
| Pin Number | 288pin | 288pin |
| Width | 72Bits | 72Bits |
| Voltage | 1.2V | 1.2V |
| PCB Height | 1.23 Inches | 0.738 Inches |
| Operating Temperature | -40 ~ 85°C | -40 ~ 85°C |
| Golden finger 30μ" | √ | √ |
| Anti-Sulfuration | √ | √ |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

# ECC DIMM

ECC modules are designed to detect and correct single-bit errors that occur during data storage and transmission. ECC modules use Hamming Code or Triple Modular Redundancy for error detection and correction, and manage error corrections on their own, without requesting that the data source resend original data.



| Series | ECC Unbuffered DIMM Solution | | |
|---|---|---|---|
| Module Type | DDR4 ECC UDIMM | DDR4 ECC SODIMM | DDR4 ECC UDIMM VLP |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 2133 MT/s, 2400 MT/s, 2666 MT/s | 2133 MT/s, 2400 MT/s, 2666 MT/s |
| Capacity | 4GB/8GB/16GB/32GB* | 4GB/8GB/16GB/32GB* | 4GB/8GB/16GB |
| Function | ECC Unbuffered Memory | | |
| Pin Number | 288pin | 260pin | 288pin |
| Width | 72Bits | 72Bits | 72Bits |
| Voltage | 1.2V | 1.2V | 1.2V |
| PCB Height | 1.23 Inches | 1.18 Inches | 0.738 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ | √ |
| Anti-Sulfuration | √ | √ | √ |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

32GB*: The schedule for the 32GB solution by 2Gbx8 IC is dependent on supplier status

| Series | ECC Unbuffered DIMM Solution | | |
|---|---|---|---|
| Module Type | DDR4 ECC SODIMM VLP | DDR3 ECC UDIMM | DDR3 ECC SODIMM |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 1066 MT/s, 1333 MT/s,<br>1600 MT/s, 1866 MT/s | 1066 MT/s, 1333 MT/s,<br>1600 MT/s, 1866 MT/s |
| Capacity | 4GB/8GB | 2GB/4GB/8GB | 2GB/4GB/8GB |
| Function | ECC Unbuffered Memory | | |
| Pin Number | 260pin | 240pin | 204pin |
| Width | 72Bits | 72Bits | 72Bits |
| Voltage | 1.2V | 1.5V/1.35V | 1.5V/1.35V |
| PCB Height | 0.7 Inches | 1.18 Inches | 1.18 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ | √ |
| Anti-Sulfuration | √ | — | — |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

| Series | ECC Unbuffered Memory Solution | | |
|---|---|---|---|
| Module Type | DDR3 ECC UDIMM VLP | DDR3 ECC SODIMM ULP | DDR2 ECC UDIMM |
| Data Rate | 1333 MT/s, 1600 MT/s, 1866 MT/s | 1333 MT/s, 1600 MT/s | 667 MT/s, 800 MT/s |
| Capacity | 2GB/4GB/8GB | 2GB/4GB | 1GB/2GB |
| Function | ECC Unbuffered Memory | | |
| Pin Number | 240pin | 204pin | 240pin |
| Width | 72Bits | 72Bits | 72Bits |
| Voltage | 1.5V/1.35V | 1.5V/1.35V | 1.8V |
| PCB Height | 0.738 Inches | 0.709 Inches | 1.18 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ | √ |
| Anti-Sulfuration | — | — | — |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

# Very Low-Profile (VLP) DIMM and Ultra Low-Profile (ULP) DIMM

**Very Low-Profile (VLP) DIMM** modules and **Ultra Low-Profile (ULP) DIMM** modules are specialized for use in 1U systems, such as blade server data centers, where the system height is lower than 1.18 inches. The design of these modules improves air flow inside a compact system and reduces thermal impact.

| Series | Very Low-Profile (VLP) Solution | | |
|---|---|---|---|
| Module Type | DDR4 UDIMM VLP | DDR4 ECC UDIMM VLP | DDR4 SODIMM VLP |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 2133 MT/s, 2400 MT/s, 2666 MT/s | 2133 MT/s, 2400 MT/s, 2666 MT/s |
| Capacity | 4GB/8GB/16GB | 4GB/8GB/16GB | 4GB/8GB |
| Function | Non-ECC Unbuffered Memory | ECC Unbuffered Memory | Non-ECC Unbuffered Memory |
| Pin Number | 288pin | 288pin | 260pin |
| Width | 64Bits | 72Bits | 64Bits |
| Voltage | 1.2V | 1.2V | 1.2V |
| PCB Height | 0.738 Inches | 0.738 Inches | 0.7 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | — | √ | — |
| Anti-Sulfuration | √ | √ | √ |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

| Series | Very Low-Profile (VLP) Solution | |
|---|---|---|
| Module Type | DDR4 ECC SODIMM VLP | DDR4 RDIMM VLP |
| Data Rate | 2133 MT/s, 2400 MT/s, 2666 MT/s | 2133 MT/s, 2400 MT/s, 2666 MT/s |
| Capacity | 4GB/8GB | 4GB/8GB/16GB |
| Function | ECC Unbuffered Memory | Registered Memory with ECC |
| Pin Number | 260pin | 288pin |
| Width | 72Bits | 72Bits |
| Voltage | 1.2V | 1.2V |
| PCB Height | 0.7 Inches | 0.738 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ |
| Anti-Sulfuration | √ | √ |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

| Series | Very Low-Profile (VLP) Solution | | |
|---|---|---|---|
| Module Type | DDR3 UDIMM VLP | DDR3 ECC UDIMM VLP | DDR3 SODIMM VLP |
| Data Rate | 1066 MT/s, 1333 MT/s, 1600 MT/s, 1866 MT/s | 1333 MT/s, 1600 MT/s, 1866 MT/s | 1333 MT/s, 1600 MT/s, 1866 MT/s |
| Capacity | 2GB/4GB/8GB | 2GB/4GB/8GB | 2GB/4GB/ 8GB |
| Function | Non-ECC Unbuffered Memory | ECC Unbuffered Memory | Non-ECC Unbuffered Memory |
| Pin Number | 240pin | 240pin | 204pin |
| Width | 64Bits | 72Bits | 64Bits |
| Voltage | 1.5V/1.35V | 1.5V/1.35V | 1.5V/1.35V |
| PCB Height | 0.738 Inches | 0.738 Inches | 1.0 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | — | √ | — |
| Anti-Sulfuration | — | — | — |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

| Series | Ultra Low-Profile (ULP) Solution | Very Low-Profile (VLP) Solution |
|---|---|---|
| Module Type | DDR3 ECC SODIMM ULP | DDR3 RDIMM VLP |
| Data Rate | 1333 MT/s, 1600 MT/s | 1333 MT/s, 1600 MT/s, 1866 MT/s |
| Capacity | 2GB/4GB | 4GB/8GB |
| Function | ECC Unbuffered Memory | Registered Memory with ECC |
| Pin Number | 204pin | 240pin |
| Width | 72Bits | 72Bits |
| Voltage | 1.5V/1.35V | 1.5V/1.35V |
| PCB Height | 0.709 Inches | 0.738 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ |
| Anti-Sulfuration | — | — |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

# Mini DIMM

All Mini DIMMs offer high speed, high density, high performance for telecommunication and cloud systems. The 0.72 inch ULP Mini DIMM modules are specifically designed for networking applications. They are compliant with JEDEC standards and are designed to improve airflow and thermal resistance. With the ECC function, the Mini DIMMs also ensure that data is corrected when corrupted data bits are found during data retrieval.

| Series | Mini DIMM Solution | |
|---|---|---|
| Module Type | DDR4 Mini ECC VLP | DDR4 Mini RDIMM VLP |
| Data Rate | 2133MT/s, 2400 MT/s | |
| Capacity | 4GB/8GB/16GB | 4GB/8GB |
| Function | ECC Unbuffered Memory | Registered Memory with ECC |
| Pin Number | 288pin | |
| Width | 72Bits | |
| Voltage | 1.2V | 1.2V |
| PCB Height | 0.738 Inches | 0.738 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ |
| Anti-Sulfuration | √ | √ |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | |

| Series | Mini DIMM Solution | | |
|---|---|---|---|
| Module Type | DDR3 Mini DIMM ECC ULP | DDR3 Mini DIMM RDIMM | DDR3 Mini RDIMM VLP |
| Data Rate | 1066 MT/s, 1333 MT/s, 1600 MT/s | | |
| Capacity | 2GB/4GB | 8GB | 2GB/4GB |
| Function | ECC Unbuffered Memory | Registered Memory with ECC | Registered Memory with ECC |
| Pin Number | 244pin | | |
| Width | 72Bits | | |
| Voltage | 1.5V/1.35V | 1.5V/1.35V | 1.5V/1.35V |
| PCB Height | 0.7 Inches | 1.18 Inches | 0.738 Inches |
| Operating Temperature | 0 ~ 85°C | 0 ~ 85°C | 0 ~ 85°C |
| Golden finger 30μ" | √ | √ | √ |
| Anti-Sulfuration | — | — | — |
| Value-Added Service (Optional) | Conformal Coating / Side Fill | | |

# Special / Customized

## XR-DIMM

In order to meet the high standards of the aerospace and defense industry, our XR-DIMM comes equipped with several advantages which will satisfy your expectation for robust DRAM modules. We offer two densities of DDR4 XR-DIMM, 8GB & 16GB, both with an integrated error checking and correction function. With its 300-pin socket connector, Innodisk's XR-DIMM exceeds the pin number standard established by the SFF Special Interest Group (SFF-SIG), ensuring a firm connection between the CPU and DRAM module. This customized design enables XRDIMM to be highly resistant to shock and vibration, providing a more reliable performance for the aerospace and defense vertical market.

| Series | XR-DIMM Solutions | | | |
|---|---|---|---|---|
| Module Type | DDR4 XR-DIMM | | DDR3 XR-DIMM | |
| Data Rate | 2400 MT/s | | 1600MT/s, 1866 MT/s | |
| Capacity | 8GB/16GB | | 4GB/8GB | |
| Function | ECC Unbuffered Memory | Non-ECC Unbuffered Memory | ECC Unbuffered Memory | Non-ECC Unbuffered Memory |
| Pin Number | 300pin | | 300pin | |
| Width | 72Bits | 64Bits | 72Bits | 64Bits |
| Voltage | 1.2V | | 1.5V/1.35V | |
| PCB Height | 1.18 Inches | | 1.49 Inches | |
| Anti-sulfuration | √ | √ | — | — |
| Mounting Hole | 2 | 2 | 2 | 2 |
| Value-Added Service (Optional) | Side Fill | | | |

# Embedded Peripheral Modules

Embedded Peripheral Modules provide LAN, PoE, CANBus, DIO, Serial Port, Storage, RAID and Display functionality to embedded systems. In order to enrich industrial customer's embedded solutions with flexibility at the best TCO (Total Cost of Ownership), we are dedicated to creating expandable, space-efficient expansion modules.

Innodisk is experienced with the most common interface which include PCIe, USB, SATA and is able to provide this functionality in the wide range of space-saving form factors available today. Just like Innodisk's esteemed memory solutions, our Standard PCIe, mPCIe, 2.5" SSD and M.2(NGFF) modules fit perfectly into any industrial system.



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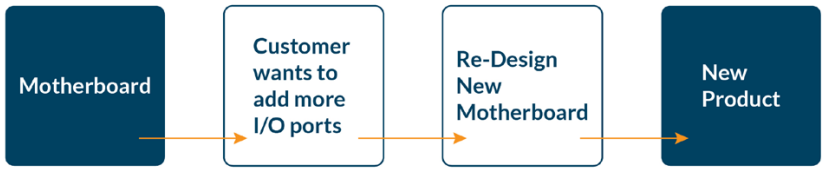
# Innodisk Efficient Modular Expansion

When it comes to motherboards, adding additional input/ output ports will often require costly re-design. Innodisk can offer solutions that allow for easily implemented expansions on already existing motherboards, saving the system integrator from costly and time-consuming re-design. In other words, using a standard motherboard as a basis, Innodisk can assist you in creating various products according to different specifications.

## Traditional scenario : Standard mother board with different fixed I/O



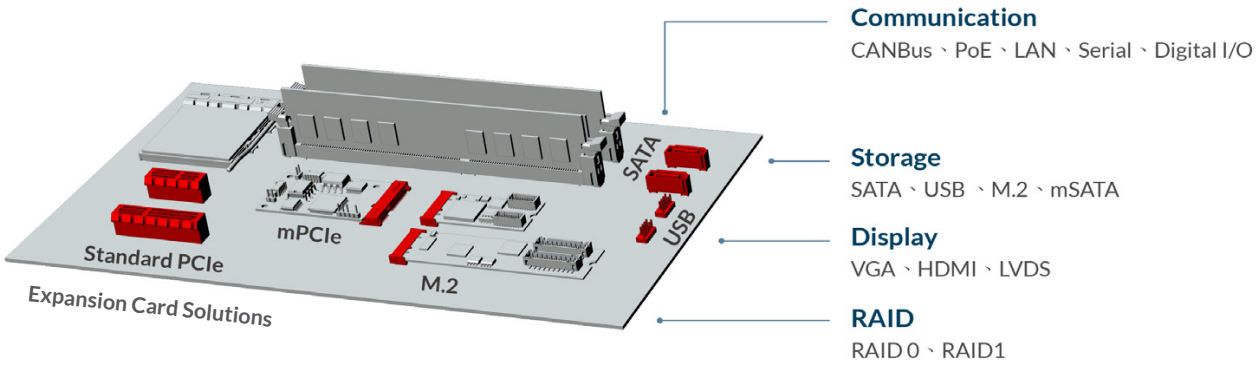

## Innodisk Solution: Standard motherboard with Innodisk Efficient Modular Expansion

### Benefits

1. One motherboard for multiple products
2. Efficient components sharing
3. Accelerate the process of new products to the market
4. Significantly reduce development costs

# Product Categories and I/O Descriptions

Through expansion slots such as PCIe, M.2, mPCIe, SATA and USB pin header Innodisk modules can easily expand to various I/O devices.




## Industrial design

Industrial temperature (-40 °C to 85 °C)

Up to ESD contact 8KV and air 15KV protection

Up to 2.5 KV isolation to prevent damage your system

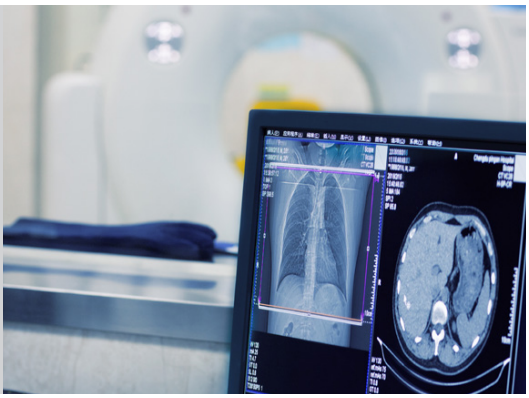
# Fulfilling the Needs of Various Vertical Markets

## Transportation

Transportation includes interfaces such as Power over Ethernet (PoE), CANbus and LAN. With Innodisk expansion cards, the system integrator can facilitate seamless connectivity and data safety for in-vehicle systems.

## Medical

Medical industrial devices link to a variety of other devices, such as: VOIP phones, web cameras, high quality speakers, MSR and bar code scanners. These devices commonly use USB and serial interfaces. A RAID solution offers strong data integrity for critical applications.



## Automation

Industrial control units using RS422/485 signals to control devices requires solid Ethernet network extensions. HMI devices are used to display important data regarding ongoing operations.

## Retail

Retail industry includes point-of-sales, kiosk and digital signage products. This kind of equipment runs on Serial and USB expansions. In addition, digital signage usually need to support multi-screen, can use Innodisk's display expansion card which supports up to three screens at the same time.

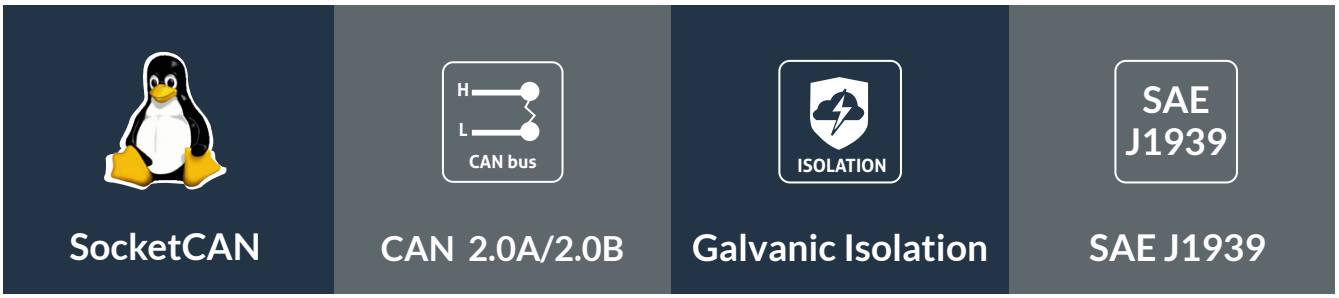
# Communication

Innodisk expansion modules aim to provide flexible connectivity and bandwidth to industrial systems. With our mPCIe GbE LAN, PoE, CANBus and serial communication modules, users can expand the existing system to meet dynamic connectivity under IoT.

## 1-1 CANbus

CANBus (Controller Area Network) is a type of serial communication that is widely used in automation, embedded systems and the automotive industry. Innodisk has developed the EMUC-B202 CANbus expansion card specifically to fulfill these needs. It provides dual-port CAN 2.0B/J1939 connectivity with an isolation design, and supports a wide temperature range in order to enhance system security and reliability.

Based on an inbuilt Linux CDC-ACM, the Innodisk EMUC-B202 uses a custom-made SocketCAN network driver that allows two ports on a single card. Thus, it provides maximum compatibility for customers when developing programs. Other than SocketCAN, Innodisk also provides complete Windows/Linux software API, test utility and sample code for traditional character drivers.




**Complete Software Support**

### API Sample Code
By using GUI or Command base test utility the user can easily verify modules

### Test Utility
Provides C/C++/C# sample code to speed up program integration

### Platform Support
API can be used in Windows, Linux and QNX. Other than x86 system, a cross-compiler service for ARM system is also available.

| Model Name | EMUC-B202 | EGPC-B201 |
|---|---|---|
| Module Type | USB to dual isolated CANbus 2.0B/J1939 Module | M.2 to dual isolated CANbus 2.0B/J1939 Module |
| Key Features | 1. CANbus 2.0B backward compatible with 2.0A<br>2. Support baud rate 100/125/250/500(default)/800/1000K<br>3. Support CAN message acceptance filter<br>4. Keep configuration after hardware reboot<br>5. Up to 6000 CAN messages per second (receive data)<br>6. Support Listen-only mode<br>7. Additional driver to support Linux SocketCAN<br>8. Support SAE J1939 high layer protocol (Optional)<br>9. Termination resistor enabled/disabled by jumper<br>10. Supports 3rd mounting hole and USB Pin header for out-of-minicard installation<br>11. Complies with EN61000-4-5 2.5kV Surge protection<br>12. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2.5kV HiPOT protection<br>13. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>14. Industrial temperature -40 °C to 85 °C | 1. Alternative M.2 2260 or 2280 B-M key<br>2. CANbus 2.0B backward compatible with 2.0A<br>3. Support baud rate 100/125/250/500(default)/800/1000K<br>4. Support CAN message acceptance filter<br>5. Keep configuration after hardware reboot<br>6. Up to 6000 CAN messages per second (receive data)<br>7. Support Listen-only mode<br>8. Additional driver to support Linux SocketCAN<br>9. Support SAE J1939 high layer protocol (Optional)<br>10. Termination resistor enabled/disabled by jumper<br>11. Complies with EN61000-4-5 2.5kV Surge protection<br>12. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2.5kV HiPOT protection<br>13. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>14. Industrial temperature -40 °C to 85 °C |
| Form-Factor | mPCIe | M.2 2260/2280 |
| Input I/F | USB 2.0 | PCI Express 2.0 |
| Input Connector | mPCIe or 5Pin Header | M.2 B-M |
| Output I/F | CANbus 2.0B/J1939 x 2 | CANbus 2.0B/J1939 x 2 |
| Output Connector | DB-9 x 2 | DB-9 x 2 |
| Dimension (WxLxH/mm) | 30 x 50.9 x 6.1 | 22 x 60 x 6.1<br>22 x 80 x 6.1 |
| Operating Temperature | Wide temp : -40°~85°C | Wide temp : -40°~85°C |
| Order Info. | EMUC-B202-W1 (CAN 2.0B)<br>EMUC-B202-W2 (J1939) | EGPC-B201-W1 (2280, CAN2.0B)<br>EGPC-B201-W2 (2280, J1939)<br>EGPC-B201-W3 (2260, CAN2.0B)<br>EGPC-B201-W4 (2260, J1939) |

# 1-2 Power over Ethernet (PoE)

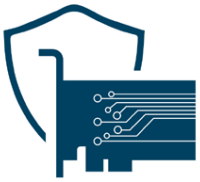
The Industrial-grade Power over Ethernet (PoE) series complies with IEEE 802.3af and 802.3at, ensuring reliable power and data transfer. These expansion cards feature isolated, wide temperature design and are certified to withstand HiPOT and surge occurrences, making it the optimal choice for operation in extreme conditions.

**Complete Form factor**

- Compact and easily integrated form factors: PCIe / mPCIe / M.2 2280

**Flexible Expansion**

- Supports 12~24V power input via internal 4 pin header or external DC Jack
- Supports alternative fixed approach of mounting hole or bracket for daughter board



**Industrial Design**

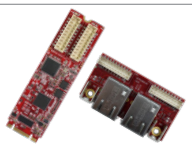
- Supports wide temperature -40° ~ +85°C
- Complies with EN61000-4-2 (ESD) Air up to 15kV, Contact up to 8kV
- Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 HiPOT protection
- Complies with EN61000-4-5 Surge protection

| Model Name | EMPL-G2P1 | EMPL-G2P2 | EGPL-G2P1 | ESPL-G4P1 |
|---|---|---|---|---|
| Module Type | mPCIe to dual Isolated PoE Module | mPCIe to dual Isolated PoE+ Module | M.2 to dual Isolated PoE Module | PCIe to four isolated PoE/PoE+ Module |
| Key Features | 1. Supports dual isolated GbE LAN ports<br>2. Two independent PSE channels<br>3. Supports 12V~24V power input via 4pin header or DC-Jack<br>4. Complies with IEEE 802.3af, up to 15.4W at 48V per PoE port<br>5. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 1.7KV HiPOT protection<br>6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>7. Industrial temperature -40 °C to 85 °C | 1. Supports dual isolated GbE LAN ports<br>2. Two independent PSE channels<br>3. Supports 19V~24V power input via 4pin header<br>4. Complies with IEEE 802.3at, up to 25.5W at 52V per PoE port<br>5. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 1.7KV HiPOT protection<br>6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>7. Industrial temperature -40 °C to 85 °C | 1. Supports dual isolated GbE LAN ports<br>2. Two independent PSE channels<br>3. Supports 12V~24V power input via 4pin header or DC-Jack<br>4. Complies with IEEE 802.3af, up to 15.4W at 48V per PoE port.<br>5. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 1.7KV HiPOT protection<br>6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>7. Industrial temperature -40 °C to 85 °C | 1. Supports four isolated GbE LAN ports<br>2. Four independent PSE channels<br>3. Complies with IEEE 802.3af, up to 15.4W at 48V per PoE port<br>4. Complies with IEEE 802.3at, up to 25.5W at 54V per PoE port<br>5. Supports 12V~24V power input via 6pin PCIE-ATX<br>6. Supplies total power up to 75W<br>7. Complies with EN61000-4-5 2kV Surge protection<br>8. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection |
| Form-Factor | mPCIe | mPCIe | M.2 2280 | Standard PCIe |
| Input I/F | PCI Express 2.1 | PCI Express 2.1 | PCI Express 2.1 x 1 | PCI Express 2.1 |
| Input Connector | mPCIe | mPCIe | M.2 B-M | PCIe x 4 |
| Output I/F | PoE x 2 | PoE+ x 2 | PoE x 2 | PoE/PoE+ x 4 |
| Output Connector | RJ45 x 2 | RJ45 x 2 | RJ45 x 2 | RJ45 x 4 |
| Dimension (WxLxH/mm) | 30 x 50.9 x 7.6 | 30 x 50.9 x 7.6 | 22 x 80 x 7.1 | 169.55 x 111.15 x 19.6 |
| Operating Temperature | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C |
| Order Infomation | EMPL-G2P1-C1<br>(Mounting hole, 4pin header)<br>EMPL-G2P1-W1<br>(Mounting hole, 4pin header)<br>EMPL-G2P1-C2<br>(Bracket, 4pin header)<br>EMPL-G2P1-W2<br>(Bracket, 4pin header)<br>EMPL-G2P1-C3<br>(Mounting hole, DC Jack )<br>EMPL-G2P1-W3<br>(Mounting hole, DC Jack)<br>EMPL-G2P1-C4 (Bracket, DC Jack)<br>EMPL-G2P1-W4(Bracket, DC Jack) | EMPL-G2P2-C1<br>(Mounting hole, 4pin header)<br>EMPL-G2P2-W1<br>(Mounting hole, 4pin header)<br>EMPL-G2P2-C2<br>(Bracket, 4pin header)<br>EMPL-G2P2-W2<br>(Bracket, 4pin header) | EGPL-G2P1-C1<br>(Mounting hole, 4pin header)<br>EGPL-G2P1-W1<br>(Mounting hole, 4pin heade)<br>EGPL-G2P1-C2<br>(Bracket, 4pin heade)<br>EGPL-G2P1-W2<br>(Bracket, 4pin header)<br>EGPL-G2P1-C3 (Mounting hole)<br>EGPL-G2P1-W3<br>(Mounting hole, DC Jack)<br>EGPL-G2P1-C4 (Bracket, DC Jack)<br>EGPL-G2P1-W4 (Bracket, DC Jack) | ESPL-G4P1-C1<br>ESPL-G4P1-W1 |

## 1-3 GbE LAN

mPCIe and M.2 based GbE LAN cards using Intel Ethernet chip provide high performance 10/100/1000 Mbps network connectivity with an isolation design, and supports a wide temperature range in order to enhance system security and reliability. Small form factor with flexible daughter board can be suitable for smaller industrial computer by using alternative terminal mounting hole of bracket.

| Model Name | EMPL-G101 | EMPL-G201 | EMPL-G102 | EMPL-G202 | EGPL-G101 |
|---|---|---|---|---|---|
| Module Type | mPCIe to single isolated GbE LAN Module | mPCIe to dual isolated GbE | mPCIe to single isolated GbE LAN horizontal Module | mPCIe to dual isolated GbE LAN horizontal Module | M.2 to single isolated GbE LAN Module |
| Key Features | 1. Single isolated GbE LAN ports<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 \ (ESD) Air-15kV, Contact-8kV<br>5. Flexible daughter board with cable to fit into different system<br>6. Supports mounting terminal or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C | 1. Dual isolated GbE LAN ports<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Flexible daughter board with cable to fit into different system<br>6. Supports mounting terminal or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C | 1. Single isolated GbE LAN port<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Flexible daughter board with cable to fit into different system<br>6. Optional terminal mounting hole or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C | 1. Dual isolated GbE LAN port<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Flexible daughter board with cable to fit into different system<br>6. Optional terminal mounting hole or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C | 1. Single isolated GbE LAN port<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Flexible daughter board with cable to fit into different system<br>6. Optional terminal mounting hole or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C |
| Form-Factor | mPCIe | mPCIe | mPCIe | mPCIe | M.2 2280 |
| Input I/F | PCI Express 2.1 | PCI Express 2.1 | PCI Express 2.1 | PCI Express 2.1 | PCI Express 2.1 x 1 |
| Input Connector | mPCIe | mPCIe | mPCIe | mPCIe | M.2 B-M |
| Output I/F | GbE LAN x 1 | GbE LAN x 2 | GbE LAN x 1 | GbE LAN x 2 | Gbe LAN x 1 |
| Output Connector | RJ45 x 1 | RJ45 x 2 | RJ45 x 1 | RJ45 x 2 | RJ45 x 1 |
| Dimension (WxLxH/mm) | 30 x 50.9 x 7.6 | 30 x 50.9 x 7.6 | 30 x 50.9 x 5.8 | 30 x 50.9 x 5.8 | 22 x 80 x 7.1 |
| Operating Temperature | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C |
| Order Infomation | EMPL-G101-C1<br>EMPL-G101-W1<br>EMPL-G101-C2<br>(with bracket)<br>EMPL-G101-W2<br>(with bracket) | EMPL-G201-C1<br>EMPL-G201-W1<br>EMPL-G201-C2<br>(with bracket)<br>EMPL-G201-W2<br>(with bracket) | EMPL-G102-C1<br>(Terminal mounting hole, Standard Temp.)<br>EMPL-G102-W1<br>(Terminal mounting hole , Wide Temp.)<br>EMPL-G102-C2<br>(Bracket, Standard Temp.)<br>EMPL-G102-W2<br>(Bracket, Wide Temp.) | EMPL-G202-C1<br>(Terminal mounting hole, Standard Temp.)<br>EMPL-G202-W1<br>(Terminal mounting hole , Wide Temp.)<br>EMPL-G202-C2<br>(Bracket, Standard Temp.)<br>EMPL-G202-W2<br>(Bracket, Wide Temp.) | EGPL-G101-C1<br>EGPL-G101-W1<br>EGPL-G101-C2<br>(with bracket)<br>EGPL-G101-W2<br>(with bracket) |



| Model Name | EGPL-G201 | EGPL-G102 | EGPL-G202 | EMPL-G103 | EMPL-G203 |
|---|---|---|---|---|---|
| Module Type | M.2 to dual isolated GbE LAN Module | M.2 to single isolated GbE LAN Module | M.2 to dual isolated GbE LAN Module | mPCIe to single GbE LAN Module | mPCIe to dual GbE LAN Module |
| Key Features | 1. Dual isolated GbE LAN ports<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Flexible daughter board with cable to fit into different system<br>6. Optional terminal mounting hole or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C | 1. Single isolated GbE LAN port<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Flexible and small daughter board with cable to fit into different system<br>6. Optional terminal mounting hole or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C | 1. Dual isolated GbE LAN ports<br>2. Complies with EN61000-4-5 2kV Surge protection<br>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Flexible and small daughter board with cable to fit into different system<br>6. Optional terminal mounting hole or bracket for daughter board<br>7. Industrial temperature -40 °C to 85 °C | 1. Single isolated GbE LAN port<br>2. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>3. Transformer on PCB for flexible cable design<br>4. External LED indicator pin for speed 10/100/1000<br>5. Industrial temperature -40 °C to 85 °C | 1. Dual isolated GbE LAN ports<br>2. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>3. Transformer on PCB for flexible cable design<br>4. External LED indicator pin for speed 10/100/1000<br>5. Industrial temperature -40 °C to 85 °C |
| Form-Factor | M.2 2280 | M.2 2242 | M.2 2242 | mPCIe | mPCIe |
| Input I/F | PCI Express 2.1 | PCI Express 2.1 x 1 | PCI Express 2.1 x 1 | PCI Express 2.1 | PCI Express 2.1 |
| Input Connector | M.2 B-M | M.2 B-M | M.2 B-M | mPCIe | mPCIe |
| Output I/F | GbE LAN x 2 | Gbe LAN x 1 | GbE LAN x 2 | GbE LAN x 1 | GbE LAN x 2 |
| Output Connector | RJ45 x 2 | RJ45 x 1 | RJ45 x 2 | RJ45 x 1 | RJ45 x 2 |
| Dimension (WxLxH/mm) | 22 x 80 x 7.1 | 22 x 42 x 9.15 | 22 x 42 x 9.15 | 30 x 50.9 x 7.6 | 30 x 50.9 x 7.6 |
| Operating Temperature | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C |
| Order Infomation | EGPL-G201-C1<br>EGPL-G201-W1<br>EGPL-G201-C2 (with bracket)<br>EGPL-G201-W2 (with bracket) | EGPL-G102-C1<br>EGPL-G102-W1 | EGPL-G202-C1<br>EGPL-G202-W1 | EMPL-G103-C1<br>EMPL-G103-W1 | EMPL-G203-C1<br>EMPL-G203-W1 |

## 1-4 Serial Port

Various mPCIe-expanded serial cards provide the combination of 2/4/8 ports RS232/RS422/RS485 with PCIe or USB input and ISOLATION/ESD provides efficient system expansions. Software switches that can help switch the serial port RS232/RS422/485 without the need to open system chassis.

| Model Name | EMP2-X202 | EMP2-X402 | EMP2-X203 | EMP2-X403 |
|---|---|---|---|---|
| Module Type | mPCIe to dual RS-422/485 Module | mPCIe to four RS-422/485 Module | mPCIe to dual RS-232 Module | mPCIe to four RS-232 Module |
| Key Features | 1. PCIe 2.0 compliant. RS-422/485 mode configurable by switch. Supports 485HD(Half Duplex) and 485FD (Full Duplex)<br>2. Up to 25 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs<br>3. Flexible design with DB-9 connectors and cable.<br>4. Termination Resistor by jumper setting.<br>5. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>6. Industrial temperature -40 °C to 85 °C | 1. PCIe 2.0 compliant. RS-422/485 mode configurable by switch. Supports 485HD(Half Duplex) and 485FD (Full Duplex)<br>2. Up to 25 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs<br>3. Flexible design with DB-9 connectors and cable<br>4. Termination Resistor by jumper setting<br>5. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>6. Industrial temperature -40 °C to 85 °C | 1. PCI-Express specification Rev. 2.0 compliant<br>2. Up to 1 Mbps serial data rate. 16550 compatible. 256-byte FIFOs<br>3. Flexible design with DB-9 connectors and cable<br>4. Supports CTS/RTS hardware flow control<br>5. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>6. Industrial temperature -40 °C to 85 °C | 1. PCI-Express specification Rev. 2.0 compliant<br>2. Up to 1 Mbps serial data rate. 16550 compatible. 256-byte FIFOs<br>3. Flexible design with DB-9 connectors and cable<br>4. Supports CTS/RTS hardware flow control<br>5. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>6. Industrial temperature -40 °C to 85 °C |
| Form-Factor | mPCIe | mPCIe | mPCIe | mPCIe |
| Input I/F | PCI Express 2.0 | PCI Express 2.0 | PCI Express 2.0 | PCI Express 2.0 |
| Input Connector | mPCIe | mPCIe | mPCIe | mPCIe |
| Output I/F | RS-422/485 x 2 | RS-422/485 x 4 | RS-232 x 2 | RS-232 x 4 |
| Output Connector | DB-9 x 2 | DB-9 x 4 | DB-9 x 2 | DB-9 x 4 |
| Dimension (WxLxH/mm) | 30 x 50.9 x 8.2 | 30 x 50.9 x 8.2 | 30 x 50.9 x 6.7 | 30 x 50.9 x 6.7 |
| Operating Temperature | Wide temp : -40°~85°C | Wide temp : -40°~85°C | Wide temp : -40°~85°C | Wide temp : -40°~85°C |
| Order Infomation | EMP2-X202-W1 | EMP2-X402-W1 | EMP2-X203-W1 | EMP2-X403-W1 |

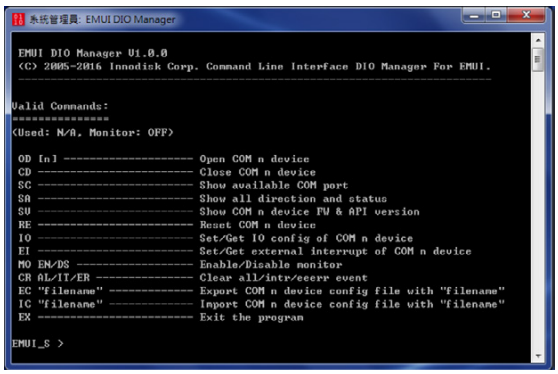
| Model Name | EMP2-X404 | EMP2-X801 | EMU2-X1S1 | EMU2-X2S1 |
|---|---|---|---|---|
| Module Type | mPCIe to four RS-232/422/485 Module | mPCIe to eight RS-232/422/485 Module | USB to single Isolated RS-232 Module | USB to dual Isolated RS-232 Module |
| Key Features | 1. PCIe 2.0 compliant. RS-232/422/485 mode configurable by software<br>2. Up to 25 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs<br>3. Full RS-232 functions with DB9 connector<br>4. Termination resistor enabled/disabled by DIP switch<br>5. RI/5V/12V output switched by Jumper<br>6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>7. Industrial temperature -40 °C to 85 °C | 1. PCIe 2.0 compliant. RS-232/422/485 mode configurable by software<br>2. Up to 25 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs<br>3. Flexible design with cable and daughter board x 8 (with DB-9 connectors)<br>4. Termination Resistor and 5V/12V output by jumper setting on daughterboard<br>5. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>6. Industrial temperature -40 °C to 85 °C | 1. USB specification Rev. 2.0 compliant<br>2. Up to 1 Mbps serial data rate. 512-byte FIFOs<br>3. Full RS232 functions with DB9 connector<br>4. Supports port-to-port and port-to-computer isolation, complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2.5kV HiPOT protection<br>5. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>6. Power LED, UART TX/RX access LED<br>7. Supports 3rd mounting hole and USB Pin header for out-of-minicard installation<br>8. Industrial temperature -40 °C to 85 °C | 1. USB specification Rev. 2.0 compliant<br>2. Up to 1 Mbps serial data rate. 512-byte FIFOs<br>3. Full RS232 functions with DB9 connector<br>4. Supports port-to-port and port-to-computer isolation, complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2.5kV HiPOT protection<br>5. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>6. Power LED, UART TX/RX access LED<br>7. Supports 3rd mounting hole and USB Pin header for out-of-minicard installation<br>8. Industrial temperature -40 °C to 85 °C |
| Form-Factor | mPCIe | mPCIe | mPCIe | mPCIe |
| Input I/F | PCI Express 2.0 | PCI Express 2.0 | USB 2.0 | USB 2.0 |
| Input Connector | mPCIe | mPCIe | mPCIe or 5Pin Header | mPCIe or 5Pin Header |
| Output I/F | RS-232/422/485 x 4 | RS-232/422/485 x 8 | RS-232 x 1 | RS-232 x 2 |
| Output Connector | DB-9 x 4 | DB-9 x 8 | DB-9 x 1 | DB-9 x 2 |
| Dimension (WxLxH/mm) | 30 x 50.9 x 6.1 | 30 x 50.9 x 6.1 | 30 x 50.9 x 6.1 | 30 x 50.9 x 6.1 |
| Operating Temperature | Wide temp : -40°~85°C | Wide temp : -40°~85°C | Wide temp : -40°~85°C | Wide temp : -40°~85°C |
| Order Infomation | EMP2-X404-W1 | EMP2-X801-W1 | EMU2-X1S1-W1 | EMU2-X2S1-W1 |

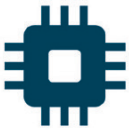
| Model Name | EMP2-X4S1 | EMP2-X4S2 | EGP2-X401 |
|---|---|---|---|
| Module Type | mPCIe to four Isolated RS-485 Module | mPCIe to dual Isolated RS-422 & RS-485 Module | M.2 to four RS-232/422/485 Module |
| Key Features | 1. PCI-Express specification Rev. 2.0 compliant<br>2. Up to 10 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs<br>3. Supports port-to-computer isolation, complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2.5kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Termination Resistor by switch setting<br>6. Industrial temperature -40 °C to 85 °C | 1. PCI-Express specification Rev. 2.0 compliant<br>2. Up to 10 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs<br>3. Supports port-to-computer isolation, complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2.5kV HiPOT protection<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. Termination Resistor by switch setting<br>6. Industrial temperature -40 °C to 85 °C | 1. PCIe 2.0 compliant. RS-232/422/485 mode configurable by software<br>2. Up to 25 Mbps serial data rate. 16C550 compatible. 256-byte FIFOs<br>3. Alternative vertical or horizontal connector<br>4. Full RS-232 functions with DB9 connector<br>5. Termination resistor enabled/disabled by DIP switch<br>6. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>7. Industrial temperature -40 °C to 85 °C |
| Form-Factor | mPCIe | mPCIe | M.2 2242 |
| Input I/F | PCI Express 2.0 | PCI Express 2.0 | PCI Express 2.0 x 1 |
| Input Connector | mPCIe | mPCIe | M.2 B-M |
| Output I/F | RS-485 x 4 | RS-422 x 2, RS-485 x 2 | RS-232/422/485 x 4 |
| Output Connector | DB-9 x 4 | DB-9 x 4 | DB-9 x 4 |
| Dimension (WxLxH/mm) | 30 x 50.9 x 12.55 | 30 x 50.9 x 12.55 | Vertical : 22 x 42 x 6.45<br>Horizontal : 22 x 42 x 7.65 |
| Operating Temperature | Wide temp : -40°~85°C | Wide temp : -40°~85°C | Wide temp : -40°~85°C |
| Order Infomation | EMP2-X4S1-W1 | EMP2-X4S2-W1 | EGP2-x401-W1 (Vertical connector)<br>EGP2-x401-W2 (Horizontal connector) |

## 1-5 DIO

Digital I/O (Digital Input and Output). Digital Inputs allow a host system to detect logic states, and Digital Outputs allow a host system to output logic states. Innodisk digital input/output expansion cards aim to fulfil the IoT communication needs of industrial systems. We provide API, which supports Windows and Linux as well as test utilities and sample codes. Users can quickly verify the functionality of the card and easily integrate it into their applications.

The Utility Console



**Programmable DIO**

Configurable Input / Output

Status Setting

Supports External Interrupt

Input Status Change Notification

| Model Name | EMUI-0D01 |
|---|---|
| Module Type | USB to 32bit Digital I/O Module |
| Key Features | 1. 32bit digital I/O in 4 ports(each port 8bit)<br>2. Programmable I/O<br>3. Selectable VCCIO 3.3V or 5V by DIP switch<br>4. Buffered I/O<br>(Output 5V, 32mA source, 32mA sink)<br>(Output 3.3V, 24mA source, 24mA sink)<br>5. 4 external interrupts with rising/falling edge on port D<br>6. Keep configuration after hardware reboot<br>7. Supports 3rd mounting hole and USB Pin header for out-of-minicard installation<br>8. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>9. Industrial temperature(-40 °C to 85 °C) operation |
| Form-Factor | mPCIe |
| Input I/F | USB 2.0 |
| Input Connector | mPCIe or 5Pin Header |
| Output I/F | 32bit Digital I/O |
| Output Connector | 40pin 1.25mm (40DP-1.25 ) with DB37 male cable |
| Dimension (WxLxH/mm) | 30 x 50.9 x 8.2 |
| Operating Temperature | Wide temp : -40°~85°C |
| Order Infomation | EMUI-0D01-W1 |

# Disk Array

Innodisk provides RAID (Redundant Array of Independent Disks) modules to combine multiple types of embedded flash for the purposes of data redundancy or capacity aggregation.

| Model Name | EMSS-32R1 | EMPS-32R1 | EGSS-32R1 |
|---|---|---|---|
| Module Type | mPCIe to dual SATA III RAID module | mPCIe to dual SATA III RAID module | M.2 2242 to SATA RAID module |
| Key Features | 1. Supports SATA to dual SATA III Port Multiplier<br>2. Supports H/W RAID 0/1 over SATA<br>3. optional USB 2.0 to dual SATA III<br>4. Industrial temperature -40 °C to 85 °C | 1. PCIe to dual SATA III ports<br>2. Supports AHCI, Port-Multiplier<br>3. Supports Hardware RAID 0, RAID1<br>4. Industrial temperature -40 °C to 85 °C | 1. Supports SATA to dual SATA III Port Multiplier<br>2. Supports H/W RAID 0/1 over SATA<br>3. Industrial temperature -40 °C to 85 °C |
| Form-Factor | mSATA | mPCIe | M.2 2242 |
| Input I/F | SATA III | PCI Express 2.0 | SATA III |
| Input Connector | mPCIe | mPCIe | M.2 B-M |
| Output I/F | SATA III | SATA III | SATA III |
| Output Connector | SATA 7 Pin x 2 | SATA 7 Pin x 2 | SATA 7 Pin x 2 |
| Dimension (WxLxH/mm) | 29.8 x 50.8 x 11.5 | 30.0 x 50.9 x 10.7 | 22.0 x 42.0 x 10.8 |
| Operating Temperature | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C |
| Order Infomation | EMSS-32R1-C1<br>EMSS-32R1-W1 | EMPS-32R1-C1<br>EMPS-32R1-W1 | EGSS-32R1-C1<br>EGSS-32R1-W1 |

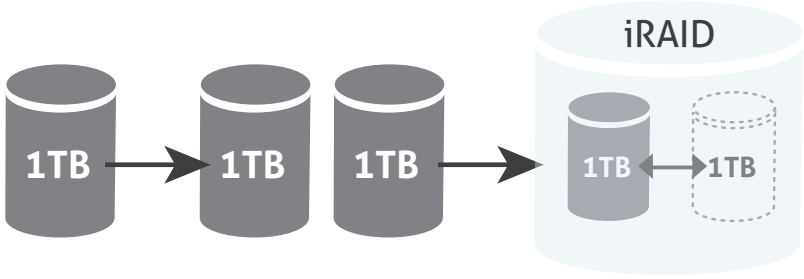
| Model Name | E2SS-32R1 | E2SS-32R2 | ELPS-32R1 |
|---|---|---|---|
| Module Type | 2.5" SSD to dual mSATA RAID module | 2.5" SSD to dual M.2 RAID Module | PCIe x 4 to dual M.2 RAID Module |
| Key Features | 1. 2.5" SSD to dual mSATA slots<br>2. Supports SATA III to SATA III port multiplier<br>3. Supports H/W RAID 0/1 over SATA<br>4. Excellent data transfer speed | 1. 2.5" SSD to dual M.2 slots.<br>2. Supports M.2 Key-B 2242/2260/2280<br>3. Supports SATA III to SATA III Port Multiplier.<br>4. Supports H/W RAID 0/1 over SATA<br>5. Excellent data transfer speed | 1. PCIe x 4 to dual M.2 ports.<br>2. Supports M.2 Key-B 2242/2260/2280/22110<br>3. Support wide temp<br>4. Supports AHCI, Port-Multiplier.<br>5. Supports Native Command Queuing<br>6. Support Hardware RAID 0, RAID 1 |
| Form-Factor | 2.5" SSD | 2.5" SSD | Low Profile PCIe |
| Input I/F | SATA III | SATA III | PCI Express 2.0 x 2 |
| Input Connector | SATA 7+15 Pin | SATA 7+15 Pin | PCIe x 4 |
| Output I/F | SATA III | SATA III | SATA III |
| Output Connector | mSATA x 2 | M.2 Key-B x 2 | M.2 Key-B x 2 |
| Dimension (WxLxH/mm) | 69.85 x 100.1 x 11.0 | 69.85 x 100.1 x 11.0 | 130.35 x 68.9 x 12.0 |
| Operating Temperature | STD temp : 0°~70°C | STD temp : 0°~70°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C |
| Order Infomation | E2SS-32R1-C1 | E2SS-32R2-C1 | ELPS-32R1-C1<br>ELPS-32R1-W1 |

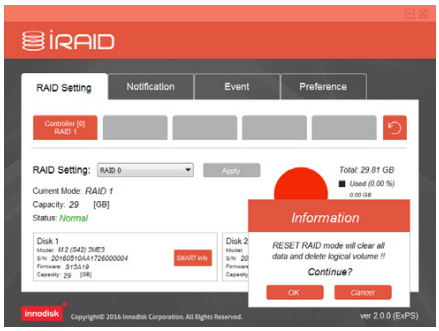
# iRAID

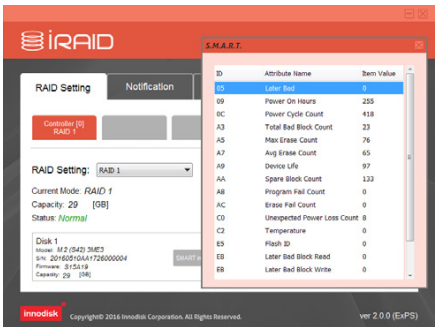
**Simplifying the configuration and management of innodisk's RAID controller**

Innodisk's iRAID is a Redundant Array of Independent Disks (RAID) management tool that enables system integrators to configure, monitor, and manage RAID 0 and RAID 1 storage configurations on Solid State Drives (SSDs). When used in combination with innodisk's RAID cards and compatible SSDs, iRAID becomes a powerful monitoring tool that provides detailed Self-Monitoring, and Reporting Technology information (SMART info).

We provide RAID card for embedded flash modules in standard PCIe, 2.5" and minicard form factor, alongside the software "iRAID" dedicated to the management and configuration of RAID volume.




### Features

- Monitor RAID status
- Change RAID mode
- Get S.M.A.R.T information
- Notification by Email
- Supports Windows and Linux

# Display Card

Innodisk's embedded graphic card features a 2D graphic engine and supports resolutions up to 1920 x 1080. With a fanless design, our mPCIe graphic cards can operate at temperatures ranging from -40°C to 85°C. With support for both Windows and Linux drivers, Innodisk's Display Cards are suitable for a wide variety of industrial platforms.

| Model Name | EMPV-1201 | EMPV-1202 | EGPV-1101 |
|---|---|---|---|
| Module Type | mPCIe to dual VGA & HDMI(DVI) module | mPCIe to VGA & 18/24 bit LVDS module | M.2 to to HDMI or DVI & Single/Dual Channel LVDS Module |
| Key Features | 1. mPCIe to dual VGA & HDMI Graphic Card.<br>2. VGA Output: 1920x1080, up to 75Hz vertical rate.<br>3. HDMI/DVI up to 1080p, Ultra low power consumption.<br>4. Optional VGA/HDMI/DVI cable<br>5. 90°, 180°, and 270° rotation of on-screen images<br>6. Industrial temperature -40 °C to 85 °C | 1. VGA Output up to 1920x1080, up to 75Hz vertical rate<br>2. LVDS resolution supports up to 1600 x 1200<br>3. EMPV-1202-C1 supports 18/24 bit JEIDA LVDS<br>4. EMPV-1202-C2 supports 24 bit VESA LVDS<br>5. Allow for 90°, 180°, and 270° rotation of on-screen images.<br>6. Industrial temperature -40 °C to 85 °C | 1. Support display output of HDMI 1.4 or DVI-D, single/ dual 24bit LVDS channel<br>2. Single HDMI/DVI-D display resolution up to 4K UHD (3840x2160@30p)<br>3. Dual LVDS display resolution up to FHD (1920x1080@60p)<br>4. HW video decoder supports multiple formats H264\AVC\DIVX\XVID\MPEG-4\MPEG-2<br>5. Built-in 256MB DDR 3 memory.<br>6. Industrial temperature -40 °C to 85 °C |
| Form-Factor | mPCIe | mPCIe | M.2 2280 |
| Input I/F | PCI Express 1.0 | PCI Express 1.0 | PCI Express 2.0 x 2 |
| Input Connector | mPCIe | mPCIe | M.2 B-M |
| Output I/F | VGA x 2, HDMI x 1(Optional DVI x 1) | VGA, 18/24 bit LVDS | HDMI or DVI-D x 1 , Single & Dual LVDS |
| Output Connector | 40pin 1.25mm x 2 (40DP-1.25) | 40pin 1.25mm x 1 (40DP-1.25) | 20 pin x 1(HDMI), 20 pin x 2 (LVDS) |
| Dimensions(W*L*H/mm) | 31.5 x 50.9 x 8.2 | 30.0 x 50.9 x 8.2 | 30.0 x 50.9 x 8.2 |
| Operating Temperature | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C |
| Order Infomation | EMPV-1201-C1<br>EMPV-1201-W1 | EMPV-1202-C1, EMPV-1202-W1<br>EMPV-1202-C2, EMPV-1202-W2 | EGPV-1101-C1, EGPV-1101-W1<br>EGPV-1101-C2, EGPV-1101-W2 |

# Storage

Innodisk specializes in wide range of storage interface including PCIe/SATA/USB/PATA. Our modules allow system integrator to expand or convert those interfaces in embedded system.

| Model Name | EMPS-3201 | EMPS-3401 | EGPS-3401 | EMPU-3201 |
|---|---|---|---|---|
| Module Type | mPCIe to dual SATA III module | mPCIe to four SATA III module | M.2 3042 to four SATA module | mPCIe to dual USB 3.0 module |
| Key Features | 1. PCIe 2.0 to dual SATA III ports<br>2. Low power consumption<br>3. Supports AHCI, Port-Multiplier<br>4. Industrial temperature -40 °C to 85 °C | 1. PCIe 2.0 to four SATA III ports<br>2. Supports AHCI, Port-Multiplier<br>3. Low power consumption<br>4. Industrial temperature -40 °C to 85 °C | 1. PCIe 2.0 to four SATAIII ports<br>2. Supports AHCI, Port-Multiplier<br>3. Low power consumption | 1. Compliant with PCI Express Base Specification Revision 2.0<br>2. Compliant with Universal Serial Bus 3.0 Specification Revision 1.0<br>3. Supports 2 downstream USB 3.0 ports<br>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV<br>5. 30µ golden finger, 3 year warranty. |
| Form-Factor | mPCIe | mPCIe | M.2 3042 | mPCIe |
| Input I/F | PCI Express 2.0 | PCI Express 2.0 | PCI Express 2.0 x 1 | PCI Express 2.0 |
| Input Connector | mPCIe | mPCIe | M.2 B-M | mPCIe |
| Output I/F | SATA III | SATA III | SATA III | USB 3.0 |
| Output Connector | SATA 7 Pin x 2 | SATA 7 Pin x 4 | SATA 7 Pin x 4 | 19 Pin box header x 1 |
| Dimension (WxLxH/mm) | 30.0 x 50.9 x 10.7 | 30.0 x 50.9 x 10.9 | 30 x 42 x 10.4 | 30.0 x 50.9 x 8.45 |
| Operating Temperature | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C |
| Order Infomation | EMPS-3201-C1<br>EMPS-3201-W1 | EMPS-3401-C1<br>EMPS-3401-W1 | EGPS-3401-C1 | EMPU-3201-C1<br>EMPU-3201-W1 |

| Model Name | EMPU-3401 | ELPS-3201 | ESPS-3401 |
|---|---|---|---|
| Module Type | mPCIe to four USB 3.0 module | PCIe x 4 to dual M.2 Module | PCIe to four SATA III card |
| Key Features | 1. PCI Express 2.0 to 4 x USB ports with SuperSpeed (5Gbps) data rate<br>2. Independent 1.5A overcurrent protection (OCP) for each port<br>3. Compliant with xHCI 1.0, USB 3.0 Rev 1.0<br>4. Supports USB Battery Charging Specification Revision 1.2<br>5. Industrial temperature -40 °C to 85 °C | 1. PCIe x 4 to dual M.2 ports<br>2. Supports M.2 Key-B 2242/2260/2280/22110<br>3. Supports AHCI, Port-Multiplier<br>4. Supports Native Command Queuing<br>5. Industrial temperature -40 °C to 85 °C | 1. PCIe 2.0 to four SATA III ports<br>2. Supports AHCI, Port-Multiplier<br>3. Low power consumption |
| Form-Factor | mPCIe | Standard PCIe | Standard PCIe |
| Input I/F | PCI Express 2.0 | PCI Express 2.0 x 2 | PCI Express 2.0 |
| Input Connector | mPCIe | PCIe x 4 | PCIe x 1 |
| Output I/F | USB 3.0 | SATA III | SATA III |
| Output Connector | 19 Pin box header x 2 | M.2 Key-B x 2 | SATA 7 Pin x 4, mSATA x 1 |
| Dimension (WxLxH/mm) | 30.0 x 50.9 x 8.45 | 130.35 x 68.9 x 12.75 | 72.1 x 69.8 x 8.3 |
| Operating Temperature | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C<br>Wide temp : -40°~85°C | STD temp : 0°~70°C |
| Order Infomation | EMPU-3401-C1<br>EMPU-3401-W1 | ELPS-3201-C1<br>ELPS-3201-W1 | ESPS-3401-C1 |

# Testing Tool

Innodisk provides flash storage with different interfaces and form factors. In order to help customers, we also design the signal converter for testing purposes. The customer can test different types of embedded flash modules with one card.

| Model Name | ESXS-2301 | ESXS-2302 | ELPP-0101 | ELPP-0102 | EMXX-0101 | EMXX-0102 |
|---|---|---|---|---|---|---|
| Module Type | Multipurpose PCIe to mSATA & M.2 card (Backside mSATA ) | Multipurpose PCIe to mSATA & M.2 card (Backside mPCIe ) | PCIe x 1 to mPCIe Module | PCIe to M.2 Module | mPCIe to M.2 A-E key module | mPCIe to M.2 B key module |
| Key Features | 1. Supports low profile/ standard PCIe form factor<br>2. Supports external SATA III and USB 2.0 signal to mSATA & M.2 2242/2260/2280 slot. (Front side)<br>3. Supports mSATA converted from PCIe signal(Backside) | 1. Supports low profile/ standard PCIe form factor<br>2. Supports external SATA III and USB 2.0 signal to mSATA & M.2 242/2260/ 2280(Front Side)<br>3. PCIe to mPCIe pass-through design (BackSide) | 1. PCI-Express specification Rev. 2.0 compliant<br>2. PCIe x1 to mPCIe pass-through design | 1. PCI-Express specification Rev. 3.0 compliant<br>2. PCIe x4 to M.2 pass-through design<br>3. Supports M.2 Key-M 2221/ 2230/2242/2260/ 2280/22110<br>4. Low profile PCI Express form factor<br>5. Industrial temperature -40 °C to 85 °C | 1. PCIe and USB signal pass-through design<br>2. Supports M.2 A-E key wireless module such as 3G, 4G, WLAN, WWAN, Bluetooth<br>3. Supports M.2 2230/2242 form factor<br>4. Supports M.2 PCIe Lane #0 & Lane 1 by pin header setting<br>5. Industrial temperature -40 °C to 85 °C | 1. Support M.2 2230/2242 B key form factor<br>2. Compliant with PCI Express Base Specification<br>3. Compliant with Universal Serial Bus 2.0 Specification<br>4. Compliant with SATA III Specification<br>5. Optional NANO SIM slot on the back side<br>6. Industrial temperature -40 °C to 85 °C |
| Form-Factor | Standard PCIe | Standard PCIe | Low profile PCIe | Low profile PCIe | mPCIe | mPCIe |
| Input I/F | PCI Express 1.0, SATA II, USB 2.0 | PCI Express 1.0, SATA II, USB 2.0 | PCI Express 2.0 | PCI Express 3.0 | PCI Express , USB 2.0 | PCI Express, USB 2.0, SATA |
| Input Connector | PCIe x 1 | PCIe x 1 | PCIe x 1 | PCIe x 4 | mPCIe | mPCIe |
| Output I/F | USB 2.0, SATA III(frontside) SATA II(backside) | USB 2.0, SATA III(frontside) PCI Express 1.0(backside) | PCI Express 2.0 | PCI Express 3.0 | PCI Express , USB 2.0 | PCI Express , USB 2.0, SATA |
| Output Connector | mSATA x 2 (Front and Back) M.2 x 1(2242/2260/2280) | mPCIe x 1(backside), mSATA x 1 M.2 x 1(2242/2260/2280) | mPCIe x 1 | M.2 Key-M | M.2 Key-A-E | M.2 Key B |
| Dimensions(W*L*H/mm) | 110.0 x 68.9 x 12.3 | 110.0 x 68.9 x 12.3 | 72.1 x 68.9 x 10.2 | 143.3 x 68.9 x 5.65 | 30 x 54.4 x 8.15 | 30 x 54.4 x 6.4 |
| Operating Temperature | STD temp : 0°~70°C | STD temp : 0°~70°C | STD temp : 0°~70°C | Wide temp : -40°~85°C | Wide temp : -40°~85°C | Wide temp : -40°~85°C |
| Order Infomation | ESXS-2301-C1 | ESXS-2302-C1 | ELPP-0101-C2 | ELPP-0102-W1 | EMXX-0101-W1 (M.2 Key-A) EMXX-0101-W2 (M.2 Key-E) | EMXX-0101-W1 EMXX-0101-W2 (SIM slot included) |

# Product Overview

| Form Factor | | | Output | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | PCIe | SATA | PATA | USB | POE | VGA Display | LAN | CAN BUS DIO | Serial 232/422.. |
| mPCIe (mSATA) | Input | PCIe | | EMPS-3401<br>EMPS-3201<br>EMPS-32R1 | | EMPU-3401<br>EMPU-3201 | EMPL-G2P1<br>EMPL-G2P2 | EMPV-1201<br>EMPV-1202 | EMPL-G101<br>EMPL-G201<br>EMPL-G102<br>EMPL-G201<br>EMPL-G103<br>EMPL-G203 | | EMP2-X801<br>EMP2-X402<br>EMP2-X403<br>EMP2-X404<br>EMP2-X4S1<br>EMP2-X4S2 |
| | | SATA | | EMSS-32R1 | | | | | | | |
| | | USB | | | | | | | | EMUI-0D01<br>EMUC-B202 | EMU2-X1S1<br>EMU2-X1S2 |
| PCIe Standard | Input | PCIe | | ESPS-3401<br>ELPS-3201<br>ELPS-32R1 | | | ELPS-32R1 | | | | |
| | | SATA | | | | | | | | | |
| | | USB | | | | | | | | | |
| M.2 (NGFF) | Input | PCIe | | EGPS-3401 | | | EGPL-G2P1 | EGPV-1101 | EGPL-G101<br>EGPL-G201<br>EGPL-G102<br>EGPL-G202 | EGPC-B201 | EGP2-X401 |
| | | SATA | | EGSS-32R1 | | | | | | | |
| | | USB | | | | | | | | | |
| 2.5" | Input | SATA | | E2SS-32R1<br>E2SS-32R2 | | | | | | | |
| | | PATA | | | | | | | | | |