

2018 Edition

# Innodisk High Performance Solutions for Aerospace and Defense Applications

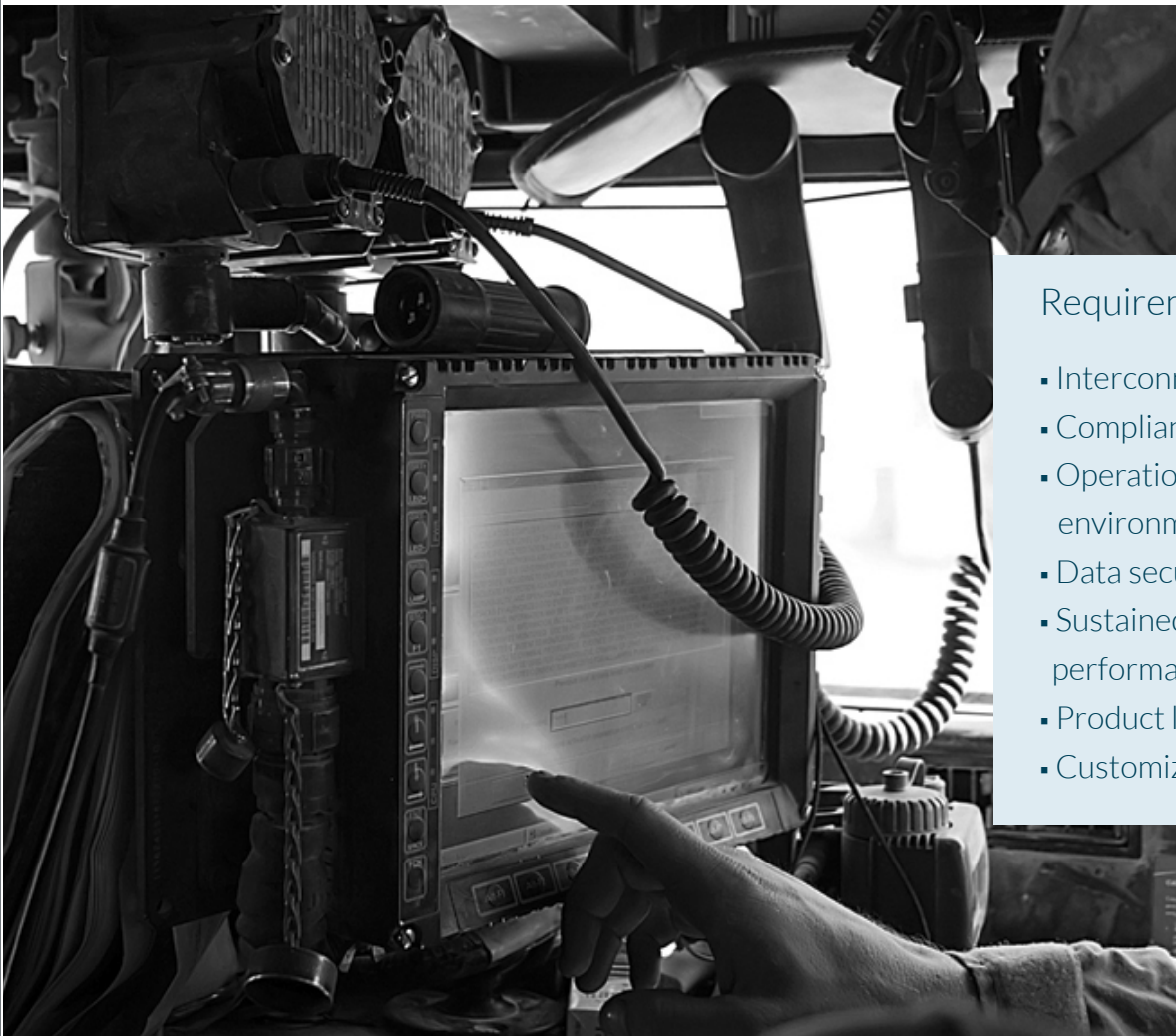
Robust Hardware and Software Solutions for Storage, Memory, and Embedded System Expansion



**innodisk**



# Introduction



## Requirements

- Interconnectivity
- Compliant with MIL-STD-810G
- Operational in extreme environments
- Data security
- Sustained (uninterrupted) performance
- Product longevity and support
- Customization

The Aerospace and Defense industry has always been on the forefront of technological innovation – constantly striving for the edge that sets them apart from the other players in the market.

The same holds true in the era of digitization and IoT. Increases in device-to-device communications have drastically improved many facets of modern Aerospace and Defense operations, including combined operations logistics support, tactical-level situational awareness, targeting, monitoring of vehicle and soldier status, battlefield medical care and even environmental monitoring.

This creates a much clearer overall picture of the current situation and allows the person in command to draw information from all sources in real-time when making a decision.

However, these technological advances are reliant on sophisticated and rugged hardware and software solutions. At the same time, the critical nature of Aerospace and Defense applications necessitates secure and reliable data protection measures.

# The Innodisk Solution

Innodisk can deliver comprehensive hardware, firmware, and software-based solutions that fit the modern requirements of the Aerospace and Defense market. For efficient cloud-based management, the Innodisk Cloud Administration Platform (iCAP™) enables easy remote access to all connected devices to monitor and manage hardware components.

The InnoRobust™ SSD series is designed for the Aerospace and Defense industry and conform to relevant military standards, ensuring robustness and strong safeguards against harsh environmental conditions. For data security, the AES self-encrypting drive (SED) features TCG Opal 2.0-compliant software that facilitates easy and intuitive storage management. The Innodisk DRAM modules offer varied form factors and features that allow for tailor-made solutions. The XR-DIMM is the epitome of rugged DRAM and its custom design is specifically geared towards the Aerospace and Defense industry. For embedded system expansions, Innodisk can offer a varied selection of industrial-grade modules with potent safeguards against electromagnetic interference, and thermal and mechanical stress.

MIL-STD-  
810G  
Compliant

***Military-Grade System  
Design Standard***

Innodisk products meet the strict specifications set by United States Military Standards for all products used in military and defense applications.

MIL-I-  
46058C  
Compliant

***Silicone Conformal Coating  
Standard***

Innodisk products comply with conformal coating standards to ensure maximum protection in harsh environments.

TCG  
Opal 2.0  
Compliant

***Self-encrypting Drive  
Management Standard***

Innodisk SED solution complies with TCG Opal 2.0 for more user-friendly and secure data encryption management





Innodisk's rugged and cloud-based solutions are used in a wide variety of aerospace and defense applications.

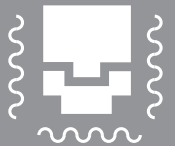
# Our Advantages



## **Resistance to Severe Shock and Vibration**

Innodisk's ruggedized design solves the problem of damage caused by severe shock and vibration. Our stringent testing and flexible design ensure rock-solid performance in military vehicles and aircraft that must operate in harsh conditions. In addition, our modules are clamped with through-holes, which further reduce the possibility of damage caused by shock and vibration.

*Reduces the possibility of damage caused by shock and vibration.*



*Ensures maximum protection in harsh environments.*



## **Moister-, Dust-, and Chemical-Proof**

At Innodisk, we apply a protective coating to all our flash disks and DRAM modules designed for aerospace and defense applications. This conformal coating ensures maximum protection in harsh environments, where moisture, dust and other particles, and chemical exposure can destroy the operability of storage disks and DRAM modules.

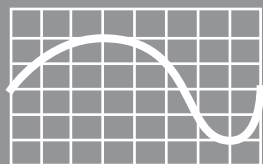
## **Data Protection in Case of Abnormal Power Failure**

Our proprietary iCell technology uses capacitors with voltage detectors to ensure the instant and reliable total transfer of buffer data to flash storage. iCell's sophisticated data buffer management guarantees that all buffer data is flushed to the flash chip before a total power loss.

*Guarantees all buffer data is flushed to the flash chip before total power loss.*



***Ensures that SSDs stay within temperature limits.***



#### **Prevention of Failure Due to Overheating**

Innodisk's Thermal Sensor instructs the SSD to either change speed or throttle back on flash access, ensuring that the SSD stays within temperature limits, and thus preventing failure due to overheating.

#### **Operational in Extreme Temperatures**

Mission-critical-grade vehicles and equipment operate in a wide range of temperatures which can lead to loss of data integrity. Our modules are rigorously tested to ensure operability in extreme temperatures, ranging from -40°C to 85°C.

***Operability in extreme temperatures, ranging from -40°C to 85°C.***



***Erases 128GB of data in 7 seconds.***



#### **Data Security: Erase, and Destroy**

Our data security system provides quick erase, and secure destroy technologies that meet the standards of the U.S. Navy, Air Force, and Army; the Department of Defense; the National Security Agency; and the National Industrial Security Program Operating Manual Supplement (NISPOMSUP). In addition, our proprietary QEraser function can erase 128GB data in just seven seconds.

#### **Avoid ECC failure during an unexpected loss of power**

Our iData Guard technology is comprised of a built-in low power detector and firmware power-down recovery algorithm that prevents ECC failure caused by power loss. Once the low power detector is triggered, a safe power-down recovery algorithm is executed to help prevent data loss and ensure data integrity.

***A patented and enhanced Power Cycling data management system to ensure data integrity.***





# Integrated TCG Opal-Compliant Solution

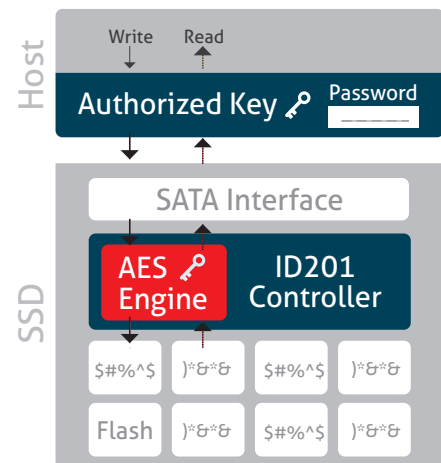
## High-Security AES Encryption with iOpal™

### Intuitive Management with iOpal™

The TCG-defined standard for self-encrypting drives (SED) emphasizes data security and ease of use. Our proprietary iOpal™ software conforms to this standard and provides 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.

### How does an AES SED work?

After an SED receives a data package from the host, the AES engine encrypts the data packets and saves the encrypted data into a NAND flash. In addition, the authorization key is set to be locked and prevented from being accessed after a power cycle. An SED with ATA security-authorized key can provide advanced security protection for your data with the encryption key being stored in a secured area of the SSD. You can quickly destroy the data on the drive by simply destroying the AES key which takes less than 1 second to perform. Without the AES key, the data cannot be unencrypted.



### Features

- Equipped with hardware-based AES 256-bit Key
- Instant data erase when destroying the AES key
- iOpal™: Intuitive TCG Opal-compliant software
- Compliant with TCG Opal 2.0 for IEEE 1667
- Capacity up to 2TB
- Exclusive L<sup>2</sup> architecture
- iData Guard technology for abnormal power failure
- DEVSLP supported for low power consumption
- Supports wide temperature from -40°C to 85°C







## 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. Conformal coating protects against moisture, contaminant, dust and acid-or-alkaline materials, meeting IPC-A-610 standards for electronic components.

---



## 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 IC, side fill can reinforce the joints between the BGA and the PCB, thus increasing robustness. Side Fill Technology is highly recommended for aerospace and defense applications to further strengthen DRAM durability.

---



## 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.

# Innodisk Cloud Administration Platform ( iCAP™ )

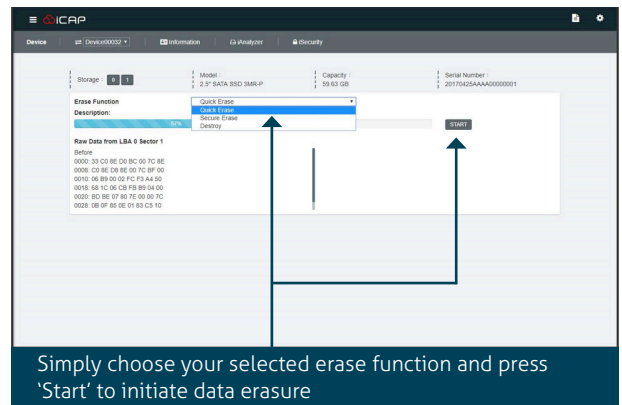
iCAP™ is a browser-accessed management platform that allows you to monitor the status of solid state drives (SSD), memory and other components in edge devices. It does this by gathering data from all connected devices and storing it on a central server, either on the cloud or on a local intranet. From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

## Aerospace and Defense – Data Security

Data falling into the wrong hands can have devastating consequences. Devices such as unmanned vehicles and drones are often located far away from their operator. Once a failure occurs, they can be exceedingly hard to retrieve. In such instances, expedient data erasure is imperative. iCAP allows the operator to execute drive erasure commands that ensure the complete erasure of any sensitive onboard data.

### Data Erase Functions

- Quick Erase – Erases all data within seconds
- Secure Erase – Military-standard data erasure protocol
- Destroy – Erases all data, as well as firmware to render SSD unusable



Simply choose your selected erase function and press 'Start' to initiate data erasure

### Efficient Storage Prediction

SSDs have a finite life expectancy. As iCAP monitors all changes to the SSD, it continuously tracks the SSD health status. When the end of the SSD lifecycle approaches, iCAP alerts the operator so that maintenance can take place in a timely manner.



## iCAP Advantage

**Windows**

**Linux**

### High Compatibility

The iCAP agent application supports devices running on both Windows and Linux and seamlessly integrates any device not already supported by iCAP.

### Flexible Deployment

Implementing iCAP into your system is easy. Whether it is on-premise or on the cloud, the user-friendly design of iCAP ensures a smooth and efficient deployment.



### Easy Access

iCAP can be run on a long list of supported web browsers, allowing quick access with internet connectivity, no matter where you are located.

### 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.



### System Backup & Recovery

iCAP integrates Innodisk's proprietary iCover tool that allows for remotely initialized system backup and recovery

## 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:

Intel® 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 12.04+ | 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

# Successful Story



## Precise and Secure Guidance

### The Situation

Modern weapon systems are constantly undergoing digitalization and automation, leading to ever growing demands for robust and high-performance systems. A leading European weapons manufacturer approached several companies to help with the design of a guided missile training system for new personnel. The system had to stay fully functional in challenging environments, handle stringent performance requirements, and provide rigid safety measures to keep sensitive data protected. As the sole provider, Innodisk was able to present a solution that satisfied all the requirements of the client.

### Challenges

1. Data security – Military equipment contains sensitive data that poses a security risk if compromised
2. Harsh conditions – Military operations happen in vastly different climates and environments and have to be able to withstand harsh conditions
3. High-performance requirements – Running the training software requires high-performing storage and memory modules

### Solutions

1. Military-grade Data Security – Hardware-based AES-encrypted SSD with secure erase function
2. Rugged, wide temperature solution – Modules that can withstand wide temperature variations and harsh conditions
3. High-performance modules – High-speed DRAM and SSD modules that can handle intensive operations

### Our Roadmap to Success

#### 2.5" 512GB 3MR2-P SSD

- 256-Bit AES hardware encryption supported by TCG Opal 2.0
- Wide temperature -40°C to 85°C
- Compliant with MIL-STD-810G · Military-standard Secure
- Military-standard Secure Erase function

#### XR-DIMM Military-Grade DRAM

- Robust design aimed specifically at military applications · High transfer rate with 2666MT/s DDR4
- Wide temperature -40°C to 85°C
- Conformal Coating for added protection

### Result

With the support of secure and durable components the training system is ready for operation anywhere in the world. Only Innodisk was able to deliver a satisfactory solution that met all the customer's requirements. Through this project Innodisk has reaffirmed its position as a leading provider of aerospace and defense solutions, and most importantly, strengthened the partnership with the client.



# Flash Firmware



## Security Erase

Security Erase is designed for emergency data erasure compliant with the following military standards :

DoD 5220.22-M	USA-Army 380-19
USA-AF AFSSI 5020	NISPOMSUP Chap 8, Sect. 8-501
USA Navy NAVSO P-5239-26	NSA Manual 9-12
NSA Manual 130-2	IRIG 106



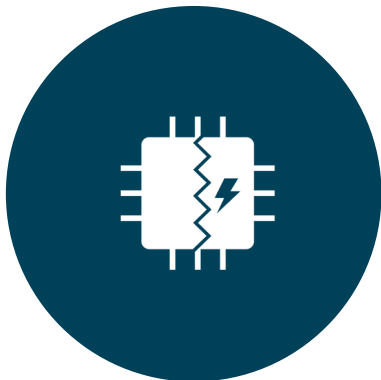
## Quick Erase

In an emergency, Quick Erase will erase data within a few seconds.



## Destroy

Destroy is the ultimate SSD data erase function. Once Destroy is triggered, all confidential data, SSD information and even firmware will be erased and unrecoverable.

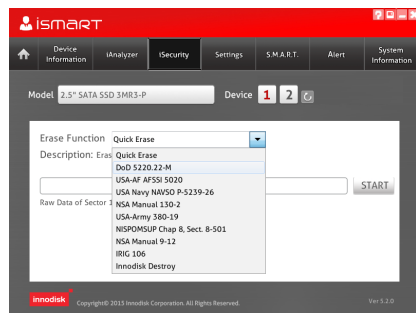


## Physical Destroy

Physical Destroy uses high voltage to completely destroy flash cells and firmware, making data completely unrecoverable.

# Technologies

## Software



The iSecurity function under iSMART allows the user to easily operate data erase commands. The user can select the data erase function, monitor erase progress and also choose data before and after the erase.

## Hardware



### iPower Guard™

Sophisticated measures that safeguard devices during startup, operation and shutdown in harsh environments.



### Stable Power Control




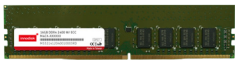
Optimized power circuits and established OCP/OVP mechanisms prevent electronic components from burning out due to voltage and current surges.




## Flash Products



Model Name	2.5" SATA SSD 3MR2-P	2.5" SATA SSD 3SR3-P	1.8" SATA SSD 3MG2-P	1.8" SATA SSD 3SE2-P	2.5" PATA 1MG3-P
Key Features	<ol style="list-style-type: none"> <li>Compliant with MIL-STD-810-G</li> <li>HW/SW Data Security (Quick Erase/ Destroy/ Security Erase/ Write Protect)</li> <li>High random performance</li> <li>iCell supported, 100% data protection</li> </ol>	<ol style="list-style-type: none"> <li>Compliant with MIL-STD-810-F/G</li> <li>HW/SW Data Security (QEraser/ Destroy/ SEraser/ Write Protect)</li> <li>iCell supported, 100% data protection</li> </ol>	<ol style="list-style-type: none"> <li>Built-in DRAM buffer</li> <li>Intelligent error recovery system</li> <li>Excellent data transfer speed and high IOPS performance</li> <li>iData Guard™ for abnormal power failure</li> </ol>	<ol style="list-style-type: none"> <li>High IOPS performance with DRAM solution</li> <li>High quality SLC-based solution</li> <li>Support AES function</li> <li>iCell supported, 100% data protection</li> </ol>	<ol style="list-style-type: none"> <li>Built-in DRAM buffer</li> <li>Intelligent error recovery system</li> <li>Excellent data transfer speed</li> <li>iData Guard™ Protection</li> </ol>
Interface	SATA III 6Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s	SATA III 6.0Gb/s	PIO Mode 0~4 Ultra DMA 0~5
Flash Type	MLC	SLC	MLC	SLC	MLC
Capacity	8GB-2TB	8GB-512GB	32GB-1TB	8GB-512GB	8GB-512GB
Max. Channel	4	4	4	4	4
Sequential R/W (MB/sec, max)	520/450	490/280	520/450	540/360	90/90
Max. Power consumption	6W (5V x 1.2mA)	2.65 W (5V x 530mA)	6W (5V x 1.2mA)	A: 2.9W(3.3V x 880mA)* B: 3.9W(5V x 780mA)*	2W (5V x 400mA)
Thermal Sensor	Y	Y	Y	Y	STD: N W/T: Y
External DRAM Buffer	Y	Y	Y	Y	Y
iData Guard	Y	Y	Y	Y	Y
iCell	Y	Y	Optional	Optional	N
TRIM	Y	Y	Y	Y	Y
ATA Security	Y	Y	Y	Y	Y
AES 256-Bit	Optional	N	N	Y	N
S.M.A.R.T	Y	Y	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	54.0 x 78.5 x 5.0	69.8 x 99.8 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)	DRS25-XXxD81%***P DRS25-XXxD82%***P	DRS25-XXxD70SC***	DGS18-XXxD81SC***	DES18-XXxD82SCA**(P) DES18-XXxD82SCB**(P)	DGP25-XXxD70%***
Wide temp. OP(-40°C~+85°C)	DRS25-XXxD81%W***P DRS25-XXxD82%W***P	DRS25-XXxD70SW***	DGS18-XXxD81SW***	DES18-XXxD82SWA**(P) DES18-XXxD82SWB**(P)	DGP25-XXxD70%W***
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				

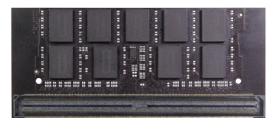
# DRAM Products

	DIMM/SODIMM		DIMM/ SODIMM w/ECC	
				
Module Type	DDR4 SODIMM	DDR4 LONG DIMM	DDR4 SODIMM	DDR4 LONG DIMM
Data Rate	2133 MT/s, 2400 MT/s		2133 MT/s, 2400 MT/s	
Capacity	2GB/4GB/8GB/16GB	4GB/8GB/16GB	4GB/8GB/16GB	
Function	Non-ECC Unbuffered Memory		Unbuffered Memory	
Pin Number	260 pin	288 pin	260 pin	288 pin
Width	64 Bits		72Bits	
Voltage	1.2V		1.2V	
PCB Height	1.18 Inches	1.23 Inches	1.18 Inches	1.23 Inches
Operation Temperature	0°C ~ 85 °C		0°C ~ 85°C	

	Wide Temperature		
			
Module Type	DDR4 LONG DIMM/ SODIMM	DDR3 LONG DIMM/ SODIMM	DDR2 SODIMM
Data Rate	2133 MT/s	1600 MT/s, 1866 MT/s	667 MT/s, 800 MT/s
Capacity	4GB/8GB/16GB	2GB/4GB/8GB	1GB/2GB
Function	With or without ECC		Non ECC Unbuffered Memory
Pin Number	288/260 pin	240/204 pin	200 pin
Width	64/72 Bits	64/72 Bits	64 Bits
Voltage	1.2V	1.35V	1.8V
PCB Height	1.23 inches/ 1.18 inches	1.18 inches	1.18 inches
Operation Temperature	-40°C ~ 85 °C		

## DDR4 XR-DIMM

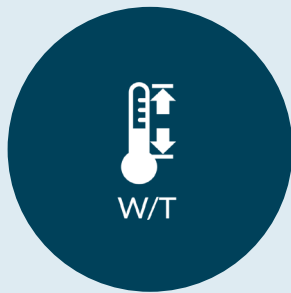
In order to meet the high standards of the aerospace and defense industry, our XR-DIMM equipped with several advantages satisfy all your expectations for robust DRAM modules. We offer three densities of DDR4 XR-DIMM, 4GB, 8GB & 16GB, all with integrated error checking and correction functions. With its 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 is highly resistant to shock and vibration, and provides more reliable performance for the aerospace and defense market.



Module Type	DDR4 SODIMM
Data Rate	2133 MT/s, 2400 MT/s
Capacity	4GB/8GB/16GB
Function	Non-ECC Unbuffered Memory
Pin Number	260 pin
Width	64 Bits
Voltage	1.2V
PCB Height	1.18 inches
Operation Temperature	-40°C ~ 85 °C

# Embedded Peripherals

## Industrial design principles



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

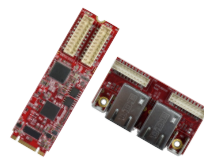
## LAN

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
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
Key Features	<ol style="list-style-type: none"> <li>1. Single isolated GbE LAN ports</li> <li>2. Complies with EN61000-4-5 2kV Surge protection</li> <li>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection</li> <li>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV</li> <li>5. Flexible daughter board with cable to fit into different system</li> <li>6. Supports mounting terminal or bracket for daughter board</li> <li>7. Industrial temperature -40 °C to 85 °C</li> </ol>	<ol style="list-style-type: none"> <li>1. Dual isolated GbE LAN ports</li> <li>2. Complies with EN61000-4-5 2kV Surge protection</li> <li>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection</li> <li>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV</li> <li>5. Flexible daughter board with cable to fit into different system</li> <li>6. Supports mounting terminal or bracket for daughter board</li> <li>7. Industrial temperature -40 °C to 85 °C</li> </ol>	<ol style="list-style-type: none"> <li>1. Single isolated GbE LAN port</li> <li>2. Complies with EN61000-4-5 2kV Surge protection</li> <li>3. Complies with IEC 60950-1: 2005 + A1: 2009 + A2:2013 2kV HiPOT protection</li> <li>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV</li> <li>5. Flexible daughter board with cable to fit into different system</li> <li>6. Optional terminal mounting hole or bracket for daughter board</li> <li>7. Industrial temperature -40 °C to 85 °C</li> </ol>	<ol style="list-style-type: none"> <li>1. Dual isolated GbE LAN port</li> <li>2. Complies with EN61000-4-5 2kV Surge protection</li> <li>3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection</li> <li>4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV</li> <li>5. Flexible daughter board with cable to fit into different system</li> <li>6. Optional terminal mounting hole or bracket for daughter board</li> <li>7. Industrial temperature -40 °C to 85 °C</li> </ol>
Form-Factor	mPCIe	mPCIe	mPCIe	mPCIe
Input I/F	PCI Express 2.1	PCI Express 2.1	PCI Express 2.1	PCI Express 2.1
Input Connector	mPCIe	mPCIe	mPCIe	mPCIe
Output I/F	GbE LAN x 1	GbE LAN x 2	GbE LAN x 1	GbE LAN x 2
Output Connector	RJ45 x 1	RJ45 x 2	RJ45 x 1	RJ45 x 2
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
Operating Temperature	STD temp : 0°~70°C Wide temp : -40°~85°C	STD temp : 0°~70°C Wide temp : -40°~85°C	STD temp : 0°~70°C Wide temp : -40°~85°C	STD temp : 0°~70°C Wide temp : -40°~85°C
Order Information	EMPL-G101-C1 EMPL-G101-W1 EMPL-G101-C2 (with bracket) EMPL-G101-W2 (with bracket)	EMPL-G201-C1 EMPL-G201-W1 EMPL-G201-C2 (with bracket) EMPL-G201-W2 (with bracket)	EMPL-G102-C1 (Terminal mounting hole, Standard Temp.) EMPL-G102-W1 (Terminal mounting hole , Wide Temp.) EMPL-G102-C2 (Bracket, Standard Temp.) EMPL-G102-W2 (Bracket, Wide Temp.)	EMPL-G202-C1 (Terminal mounting hole, Standard Temp.) EMPL-G202-W1 (Terminal mounting hole , Wide Temp.) EMPL-G202-C2 (Bracket, Standard Temp.) EMPL-G202-W2 (Bracket, Wide Temp.)





Model Name	EGPL-G101	EGPL-G201	EGPL-G102	EGPL-G202
Module Type	M.2 to single isolated GbE LAN Module	M.2 to dual isolated GbE LAN Module	M.2 to single isolated GbE LAN Module	M.2 to dual isolated GbE LAN Module
Key Features	1. Single isolated GbE LAN port 2. Complies with EN61000-4-5 2kV Surge protection 3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection 4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 5. Flexible daughter board with cable to fit into different system 6. Optional terminal mounting hole or bracket for daughter board 7. Industrial temperature -40 °C to 85 °C	1. Dual isolated GbE LAN ports 2. Complies with EN61000-4-5 2kV Surge protection 3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection 4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 5. Flexible daughter board with cable to fit into different system 6. Optional terminal mounting hole or bracket for daughter board 7. Industrial temperature -40 °C to 85 °C	1. Single isolated GbE LAN port 2. Complies with EN61000-4-5 2kV Surge protection 3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection 4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 5. Flexible and small daughter board with cable to fit into different system 6. Optional terminal mounting hole or bracket for daughter board 7. Industrial temperature -40 °C to 85 °C	1. Dual isolated GbE LAN ports 2. Complies with EN61000-4-5 2kV Surge protection 3. Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection 4. Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV 5. Flexible and small daughter board with cable to fit into different system 6. Optional terminal mounting hole or bracket for daughter board 7. Industrial temperature -40 °C to 85 °C
Form-Factor	M.2 2280	M.2 2280	M.2 2242	M.2 2242
Input I/F	PCI Express 2.1 x 1	PCI Express 2.1	PCI Express 2.1 x 1	PCI Express 2.1 x 1
Input Connector	M.2 B-M	M.2 B-M	M.2 B-M	M.2 B-M
Output I/F	Gbe LAN x 1	GbE LAN x 2	Gbe LAN x 1	GbE LAN x 2
Output Connector	RJ45 x 1	RJ45 x 2	RJ45 x 1	RJ45 x 2
Dimension (WxLxH/mm)	30 x 50.9 x 7.05	30 x 50.9 x 7.1	22 x 42 x 9.15	22 x 42 x 9.15
Operating Temperature	STD temp : 0°~70°C Wide temp : -40°~85°C	STD temp : 0°~70°C Wide temp : -40°~85°C	STD temp : 0°~70°C Wide temp : -40°~85°C	STD temp : 0°~70°C Wide temp : -40°~85°C
Order Infomation	EGPL-G101-C1 EGPL-G101-W1 EGPL-G101-C2 (with bracket) EGPL-G101-W2 (with bracket)	EGPL-G201-C1 EGPL-G201-W1 EGPL-G201-C2 (with bracket) EGPL-G201-W2 (with bracket)	EGPL-G102-C1 EGPL-G102-W1 EGPL-G102-C2 (with bracket) EGPL-G102-W2 (with bracket)	EGPL-G202-C1 EGPL-G202-W1 EGPL-G202-C2 (with bracket) EGPL-G202-W2 (with bracket)

## CANBus

Controller Area Network Bus: A vehicle bus-standard that allows electronic control devices to communicate with each other without the presence of a host computer, allowing for a drastic simplification and reduction of on-board wiring.



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



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

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

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

## Our Advantages



### Technical Aptitude by Design

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



### Deeply Rooted in the Market

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



### We Are in It Together

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



## Absolute Integration™

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

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

### Headquarters

#### Innodisk Corporation

5F., No.237, Sec. 1, Datong Rd., Xizhi Dist.,  
New Taipei City, 221, Taiwan

**T** +886-2-7703-3000

**F** +886-2-7703-3555

**E** sales@innodisk.com

### Branch Offices

#### Japan

K.I Bldg 2F/4F, 1-1-14,  
Nihonbashiningyocho Chuo-ku,  
Tokyo 103-0013 Japan

**T** +81-3-6667-0161

**F** +81-3-6667-0162

**E** jpsales@innodisk.com

#### Europe

Insulindelaan 115A,  
5642CV, Eindhoven  
The Netherlands

**T** +31-(0)40 3045 400

**F** +31-(0)40 3045 419

**E** eusales@innodisk.com

#### USA

42996 Osgood Road,  
Fremont, CA 94539 USA

**T** +1-510-770-9421

**F** +1-510-770-9424

**E** usasales@innodisk.com

9 Timber Ln, Marlboro NJ 07746

**T** +1-732-8530455

**F** +1-732-7846401

#### China

602,6 Floor,building A ,Hengyue  
Center, No.19 Dengliang Road,  
Nanshan Dist.,Shenzhen

**T** +86-755-2167-3689

+86-755-2167-3690

**F** +86-755-2167-3691

**E** sales\_cn@innodisk.com

**Shanghai T** +86-21-315-93340

**T** +86 21-315-93341

**Beijing T** +86-10-62669919

**Chengdu T** +86-28-66320052

For more warranty details, please contact the Innodisk Sales Department or visit our website:

**www.innodisk.com**

