Pegasus M4
Product Manual

Version 1.0

Copyright

Important data protection information

You should back up all data before installing any drive controller or storage peripheral. PROMISE Technology is not responsible for any loss of data resulting from the use, disuse or misuse of this or any other PROMISE Technology product.

Notice

Recommendations

In this *Product Manual*, the appearance of products made by other companies, including but not limited to software, servers, and disk drives, is for the purpose of illustration and explanation only. PROMISE Technology does not recommend, endorse, prefer, or support any product made by another manufacturer.

About this guide

This *Product Manual* describes how to setup, use, and maintain the Pegasus M4 unit. It also describes how to use the PROMISE Utility Pro software that you install and run on your computer. Please notice that there are different setup instructions for Mac users and Windows users.

Although this manual is written specifically for the Pegasus models, many of the functions and descriptions can be applied to previous releases of the PROMISE Pegasus line.

This manual includes a full table of contents, chapter task lists, and numerous cross-references to help you find the specific information you are looking for.

Also included are four levels of notices:

Note
A *Note* provides helpful information such as hints or alternative ways of doing a task.

Important
An *Important* notice calls attention to an essential step or point required to complete a task. Important items include things often missed.

CAUTION
A *Caution* informs you of possible equipment damage or loss of data and how to avoid them.

WARNING
A *Warning* notifies you of probable equipment damage or loss of data, or the possibility of physical injury, and how to avoid them.

Notices for USA

Federal Communications Commission (FCC) notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.

— Increase the separation between the equipment and receiver.

— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

— Consult the dealer or an experienced radio/TV technician for help.

Modification

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by PROMISE TECHNOLOGY INC. may void the user's authority to operate the equipment.

Notices for Canada (Avis Canadien)

CAN ICES-003 (B) / NMB-003 (B)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Information Technology Equipment (Including Digital Apparatus)", ICES-003 of the Canadian Department of Communications.

Cet appareil num érique respecte les limites bruits radio é lectriques applicables aux appareils num é riques de Class B prescrites dans la norme sur le mat é riel brouilleur: "Mat é riel informatique (y compris appareils num é riques)", NMB-003 é dict é e par le Ministre Canadien des Communications.

Notices for European Union

The product herewith complies with the requirements of the Low Voltage Directive 2014/35/EU, the EMC Directive 2014/30/EU, the ErP Directive 2009/125/EC, the RoHS Directive 2011/65/EU and carries the CE-marking accordingly.

B 급 기기(가정용 방송통신기기)

이 기기는 가정용(B 급)으로 전자파적합등록을 한 기기로서 주로 가정에서 사용하는 것을 목적으로하며, 모든 지역에서 사용할 수 있습니다.

PROMISE
TECHNOLOGY

EU Declaration of Conformity

We, under this signature

Manufacturer	PROMISE TECHNOLOGY INC.		
Address	2F, 30 Industry E.Rd. IX, Hsinchu Science Park, Hsinchu County, Taiwan, R.O.C.		
Authorized to:	PROMISE TECHNOLOGY EUROPE B.V.		
Address	Beatrix de Rijkweg 8 (2F), 5657EG, Eindhoven, The Netherlands		
E-Mail	sales@eu.promise.com		
Phone	+31 (0) 40-235-2600	Fax	+31(0) 40-256-9463

We declare the following products

Product Name	Direct Attached Storage
Model No.	Pegasus M4

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

EMC by Directive 2014/30/EU

EN 55032:2015+A11:2020	EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021	EN 61000-3-3:2013+A2:2021

LVD by Directive 2014/35/EU

EN 62368-1:2014/A11:2017

Ecodesign Directive 2009/125 / EC

Regulation (EC) No. 1275/2008
Regulation (EC) No. 801/2013

RoHS by Directive 2011/65/EU

EN IEC 63000:2018

CE mark

CE

Signed for and on behalf of : PROMISE TECHNOLOGY INC.

Name and function	Sunny Hong Quality management System Dept. Management Representative	Signature
Place of issue	Taiwan, R.O.C.	Date: 2022/12/21

PROMISE
TECHNOLOGY

UKCA Declaration of Conformity

We, under this signature

Manufacturer	PROMISE TECHNOLOGY INC.		
Address	2F, 30 Industry E.Rd. IX, Hsinchu Science Park, Hsinchu County, Taiwan, R.O.C.		
Authorized to:	PROMISE TECHNOLOGY EUROPE B.V.		
Address	Beatrix de Rijkweg 8 (2F), 5657EG, Eindhoven, The Netherlands		
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EMC by Directive Electromagnetic Compatibility Regulations 2016

BS EN 55032:2015+A11:2020	BS EN 55035:2017+A11:2020
BS EN IEC 61000-3-2:2019+A1:2021	BS EN 61000-3-3:2013+A2:2021

LVD by Directive Electrical Equipment (Safety) Regulations 2016

BS EN 62368-1:2014/A11:2017

Ecodesign Directive 2009/125 / EC and The Ecodesign for Energy-Related Products Regulations 2010

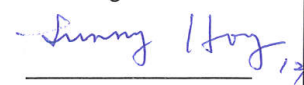| Regulation (EC) No. 1275/2008 |
|---|
| Regulation (EC) No. 801/2013 |

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

BS EN IEC 63000:2018

UKCA mark

UK
CA

Signed for and on behalf of : PROMISE TECHNOLOGY INC.

Name and function	Sunny Hong	Signature
	Quality management System Dept. Management Representative	*Sunny Hong* 12/21/22
Place of issue	Taiwan, R.O.C.	Date:2022/12/21

Safety Information

Observe all warnings on the product and in the operating instructions. To reduce the risk of bodily injury, electric shock, fire, and damage to the equipment, observe all precautions included in this guide.

You must become familiar with the safety information in this guide before you install, operate, or service PROMISE products.

Use environment

- Make sure that the area in which you install the equipment is properly ventilated and climate controlled. The operate normally in the temperature of 5 ° C – 35 ° C and relative humidity of 10% – 95%.

- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the electrical rating label of the equipment.

- Never use the equipment in a wet location.

 Chassis

- Do not block or cover the openings to the equipment.

- Never push objects of any kind through openings in the equipment. Dangerous voltages might be present.

- Conductive foreign objects can produce a short circuit and cause fire, electric shock, or damage to your equipment.

- Lift equipment using both hands and with your knees bent.

Power Cords

To reduce the risk of electric shock or damage to the equipment:

- Use an approved power cord. If you have questions about the type of power cord to use, contact your PROMISE TECHNOLOGY INC. authorized service provider.

- If you have not been provided with a power cord for your product or for any AC-powered option intended for your product, purchase a power cord that is approved for use in your country.

- You must use a power cord rated for your product and for the voltage and current marked on the electrical ratings label of the product. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

- Do not place objects on AC power cords or cables. Arrange them so that no one might accidentally step on or trip over them.

- Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

- To reduce the risk of electrical shock, disconnect all power cords before servicing the equipment.

Equipment Modifications

Do not make mechanical modifications to the system. PROMISE TECHNOLOGY INC. is not responsible for the regulatory compliance of PROMISE TECHNOLOGY INC. equipment that has been modified.

Equipment Repairs and Servicing

The installation of internal options and routine maintenance and service of this equipment should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy levels.

- Do not exceed the level of repair specified in the procedures in the product documentation. Improper repairs can create a safety hazard.

- Remove all watches, rings, or loose jewelry when working before removing covers and touching internal components.

- Do not use conductive tools that could bridge live parts.

- Use gloves when you remove or replace internal components; they can become hot to the touch.

If the equipment sustains damage requiring service, disconnect the equipment from the AC electrical outlet and refer servicing to an authorized service provider. Examples of damage requiring service include:

– The power cord, extension cord, or plug has been damaged.

– Liquid has been spilled on the equipment or an object has fallen into the product.

– The equipment has been exposed to rain or water.

– The equipment has been dropped or damaged.

– The equipment does not operate normally when you follow the operating instructions.
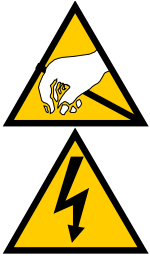
CAUTION

The electronic components within the Pegasus unit are sensitive to damage from Electro-Static Discharge (ESD). Observe appropriate precautions at all times when handling the Pegasus unit or its subassemblies.
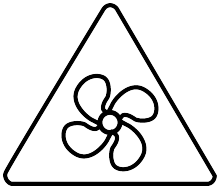
WARNING: Hazardous moving fan blade. Keep away from moving fan blades. To reduce the risk of injury from a hot component, allow the surface to cool before touching.
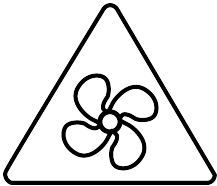
AVERTISSEMENT : Pale mobile de ventilateur dangereuses. Tenir à l'écart des pales de ventilateur en mouvement. Pour réduire le risque de blessure par un composant chaud, laissez la surface refroidir avant de la toucher.

CAUTION

To avoid hand contact with an electrical hazard, do not remove more than one drive carrier a time" or the equivalent.

INTRODUCTION TO PEGASUS M4

This chapter covers the following topics:

- "Packing List"

- "Specifications"

- "Hardware"

PACKING LIST

Check the shipping package to make sure you have the following items:

- Pegasus M4

- Four Solid State Drives (installed)

- Quick Start Guide

- Thunderbolt 3 / USB cable

- Power cord

SPECIFICATIONS

General Information	
Form Factor	4-Bay / Hardware RAID / Enclosure
Drive Support	2.5" SATA3 SSD, 4TB/8TB
Processor	Integrated SAS ROC (Raid-On-Chip).
Memory	1GB DDR3 1866 ECC on board
Expansion	Dual Thunderbolt ports use for daisy chain
Host Interface	Thunderbolt 40Gbps (Port A and B) or USB 3.1 Gen 2 10Gbps (Port A only).
Thunderbolt Ports	Dual Thunderbolt ports, one for host connection, one for downstream daisy chain
Port Type	USB Type C

RAID & Features	
RAID Level	RAID 0, 1, 5, 6, 10, JBOD
Hot Spare	Yes
Max LUNs	128
Hot Swap	Yes

Software Highlights	
Supported OS	macOS/Windows, Driver and Management Tool. Linux (driver only)
Management Tool	Promise Utility Pro
Product Specific	Intelligent Cooling/Acoustic control, Drive SMART health Polling

Physical Information	
Dimension (H x W x D)	107mm x 127mm x 167mm
Weight	1.9kg
AC Input	100-240V auto-ranging, 50~60Hz AC
Power Supply	120W

Environment	
Temperature Range	Operating: 5° ~ 35° C , Non-operating: -40° ~ 70° C
Humidity	Operating: 10% ~ 95% non-condensing , Storage: 5% - 95% non-condensing
Regulatory/Safety	EMC: FCC, CE , Safety: cTUVus, CB

Warranty and Support	
Warranty	3-years standard warranty, optional extended warranty, and on-site parts replacement program (PROMISE ServicePlus) available.
Support	24/7 PROMISE eSupport Portal (support.promise.com), optional 24/7 phone and email support available.

HARDWARE

This section provides a brief introduction to the external hardware of the Pegasus M4.

Pegasus M4 front view

Power button /
Status LED

Pegasus M4

Drive Power/
Status LED

Drive Activity LED

Link LED

Drive Carriers

LED	Description
System Status*	The System Status LED located on the Power button lights blue when the Pegasus is operating normally. When the system is booting up, this lights orange and will light blue when fully booted if there are no problems detected. A red System Status LED indicates a serious problem such as an incomplete array or failed hard disk drive.
Thunderbolt ™ / USB Link	This LED will light blue when the Thunderbolt / USB cable is connected; it remains dark if there is no Thunderbolt / USB Link link.
Drive Status and Activity*	The Drive Status LED lights blue when a physical drive is present and functioning normally. A red Drive Status LED indicates a problem with the physical drive or an array. The Drive Activity LED lights blue when the physical drive is present and blinks blue when there is activity on the drive.

Pegasus M4 back view
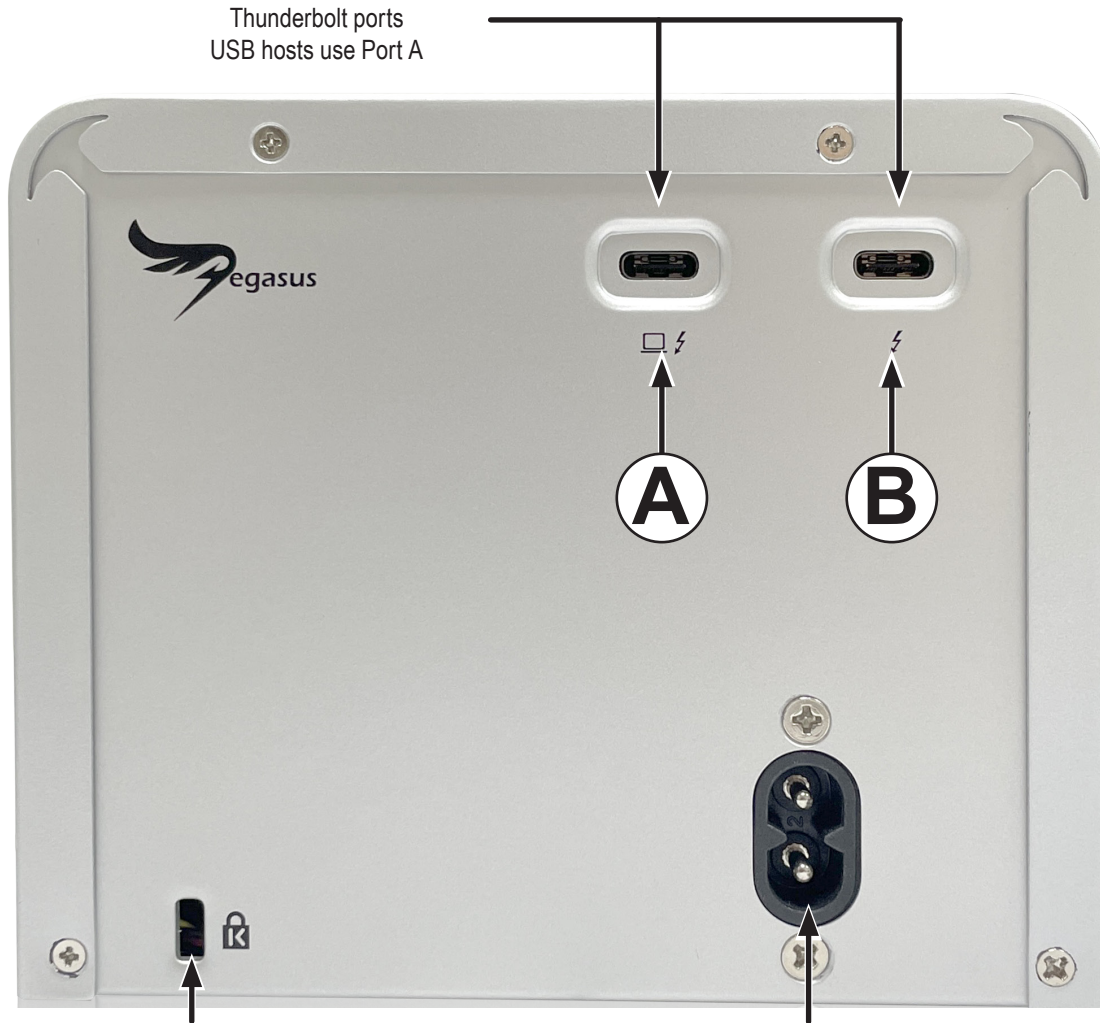
Thunderbolt ports
USB hosts use Port A

Kensington Security
Slot Use to lock the Pegasus M4 unit to a heavy
object as a theft prevention precaution. Requires
cable with a Kensington lock.

AC Power connection

Feature	Description
Thunderbolt / USB	Use a Thunderbolt cable to connect the Pegasus M4 to a Thunderbolt or equipped computer. This connection completes the physical link, it is the path through which the SATA link is established.
	For a USB connection, connect a USB cable with Type C connectors to Port A only
	Either port can be used for the SATA link in USB or Thunderbolt mode; Thunderbolt ports are able to daisy chain to another Thunderbolt device.
AC Power connection	• Use an power cord shipped with device.
	• Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.
	• Make sure that the total ampere rating of all products plugged into an extension cord or power strip does not exceed 80 percent of the ampere ratings limit for the extension cord or power strip.

HARDWARE INSTALLATION

This chapter contains the following topics:

- "Summary of the setup procedure"

- "Connect the power cord"

- "Connect to computer, power on"
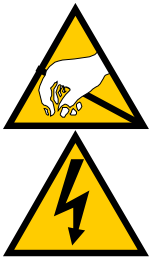
CAUTION

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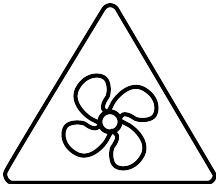
WARNING: Hazardous moving fan blade. Keep away from moving fan blades. To reduce the risk of injury from a hot component, allow the surface to cool before touching.
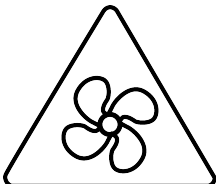
AVERTISSEMENT : Pale mobile de ventilateur dangereuses. Tenir à l'écart des pales de ventilateur en mouvement. Pour réduire le risque de blessure par un composant chaud, laissez la surface refroidir avant de la toucher.

Summary of the setup procedure

The setup procedure for the Pegasus is simple and easy. The device is shipped with hard disk drives installed and a RAID array configured, so it is just necessary to plug it in and connect the device. However, you should install the PROMISE Utility Pro software used for monitoring and administration of the system. Mac users, please follow the setup procedure here or in the Quick Start Guide.

The setup process is summarized below.

1.   Unpack the Pegasus shipping package

2.   Connect the power cord and power on the Pegasus M4.

3.   Connect the Pegasus to your computer with a Thunderbolt™ 3 / USB cable.

4.   Use PROMISE Utility Pro software to set up the Pegasus M4. Mac users can locate the PROMISE Utility Pro installation package located on the device (Pegasus is shipped with RAID 5 configuration) and install the management software utility. Windows users will need to download the PROMISE Utility Pro installation package from the PROMISE website (www.promise.com).

> **Important**
> For instructions on installing and using PROMISE Utility Pro, please refer to the PROMISE Utility Pro manual available from the PROMISE website (www.promise.com).

Connect the power cord

To connect the power cord the Pegasus unit:

1.　Attach the power cord on the back of the Pegasus unit.

2.　Plug the other end into a suitable power source.

Thunderbolt™/USB data connection and power connection
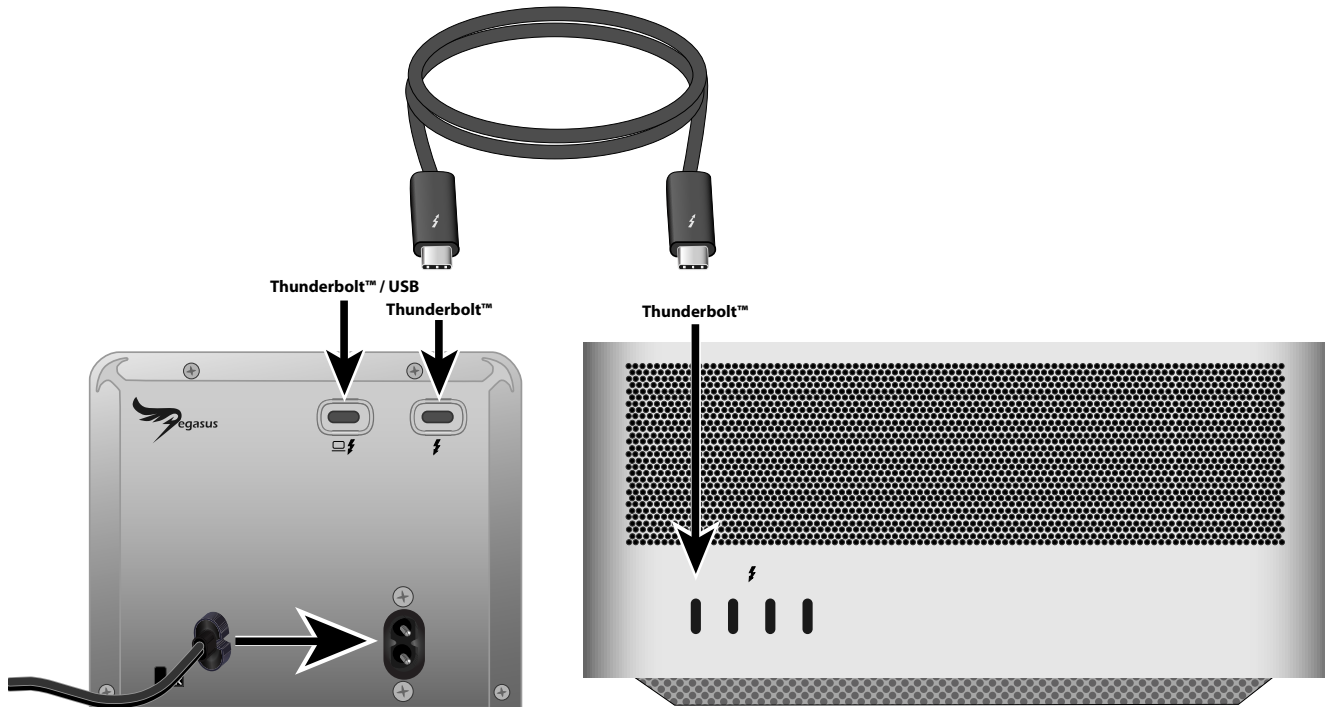
Make sure the computer port is a Type-C female connection. If the port is a Thunderbolt™ 3 port, you will see a Thunderbolt™ icon next to the port. If the port is a USB 3.2 Gen 2 port, you will see the USB 3.2 Gen 2 icon next to the port.

Type-C Male connector　　　Type-C Female port　　　USB 3.2 Gen 2 icon　　　Thunderbolt™ icon
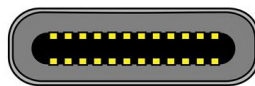
Connect to computer, power on

USB/Thunderbolt™
Type-C Female port
"Port A"
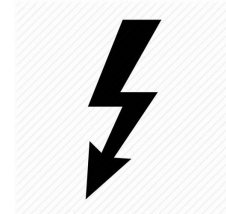
Thunderbolt™ (only)
Type-C Female port
"Port B"
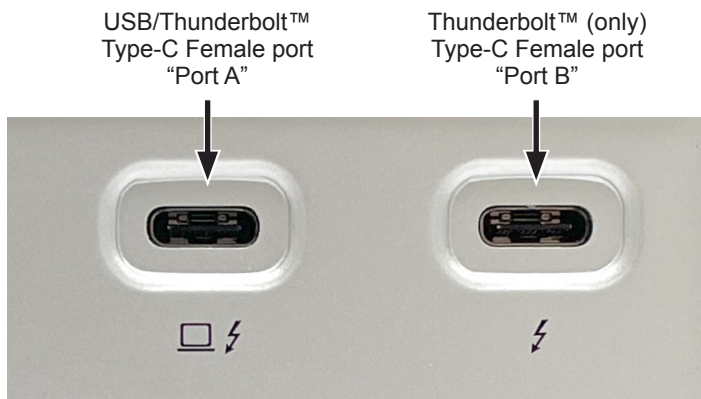
Thunderbolt™ Connections

To establish a Thunderbolt™ connection:

1.   Connect a Thunderbolt™ cable from one of the Thunderbolt™ ports on the back of the Pegasus M4 to the Thunderbolt™ port on your computer.

2.   If the Pegasus M4 is plugged into a power source and the computer is running, the Pegasus M4 will power on and begin to boot up.
     You will notice the following:

     •   The Power Button LED is lit orange at first, then blue.

     •   The drive carrier Power / Status LEDs is lit blue.

     •   The Thunderbolt™ Link LED for the port connection is lit blue.

     •   The "Pegasus M4" storage drive icon appears on your desktop. This indicates the Pegasus M4 is ready for use.

USB Connections

To establish a USB connection:

1. Connect a Thunderbolt™ / USB (Type-C) cable from **Port A** (port with computer icon) on the back of the Pegasus M4 to the USB (Type-C) port on your computer.

2. If the Pegasus M4 is plugged into a power source and the computer is running, the Pegasus M4 will power on and begin to boot up.
    You will notice the following:

    - The Power Button LED is lit orange at first, then blue.

    - The drive carrier Power / Status LEDs is lit blue.

    - The Thunderbolt™ Link LED for the port connection is lit blue.

    - The "Pegasus M4" storage drive icon appears on your desktop. This indicates the Pegasus M4 is ready for use.

TROUBLESHOOTING

This chapter deals problems you might encounter with your Pegasus unit and how to resolve them.

- "Responding to an Audible Alarm" (below)

- "Checking LEDs"

- "Promise Utility Pro"ro"

- "Viewing the Event Logs"

- "Physical Drive Problems"

- "Disk Array and Logical Drive Problems"

- "Connection Problems"

> **Note**
> For troubleshooting information regarding installation of software or driver on Mac, please see "Troubleshooting for installing software or driver on Mac" on page 23.

Responding to an Audible Alarm

The Pegasus unit has two beep patterns:

- **Two beeps, not repeated** – The Pegasus is powering up or ready

- **Two beeps, continuously repeated** – The Pegasus reports a problem

When you boot Pegasus unit, the buzzer beeps twice to acknowledge power up and twice again when the unit is online and ready for work.

If you hear the repeating two-beep pattern, check the following items:

- System Status LED

- Drive Carrier LEDs

Checking LEDs

When you boot Pegasus unit, the Power Button LED turns orange. When fully booted, the LED turns blue. See page 102, Figure 1.

See "Subsystem LEDs" on page 102.

The drive carrier Power/Status LEDs turn blue if a physical drive is installed. See "Drive Carrier LEDs" on page 103.

Subsystem LEDs

The Pegasus subsystem LEDs are the Power Button and the Thunderbolt ports.

State	Power Button	Link LEDs
Dark	No power	No connection
Blue	Normal	Normal
Flashing Blue	—	Activity
Orange	Booting or shutting down	—

Subsystem LEDs
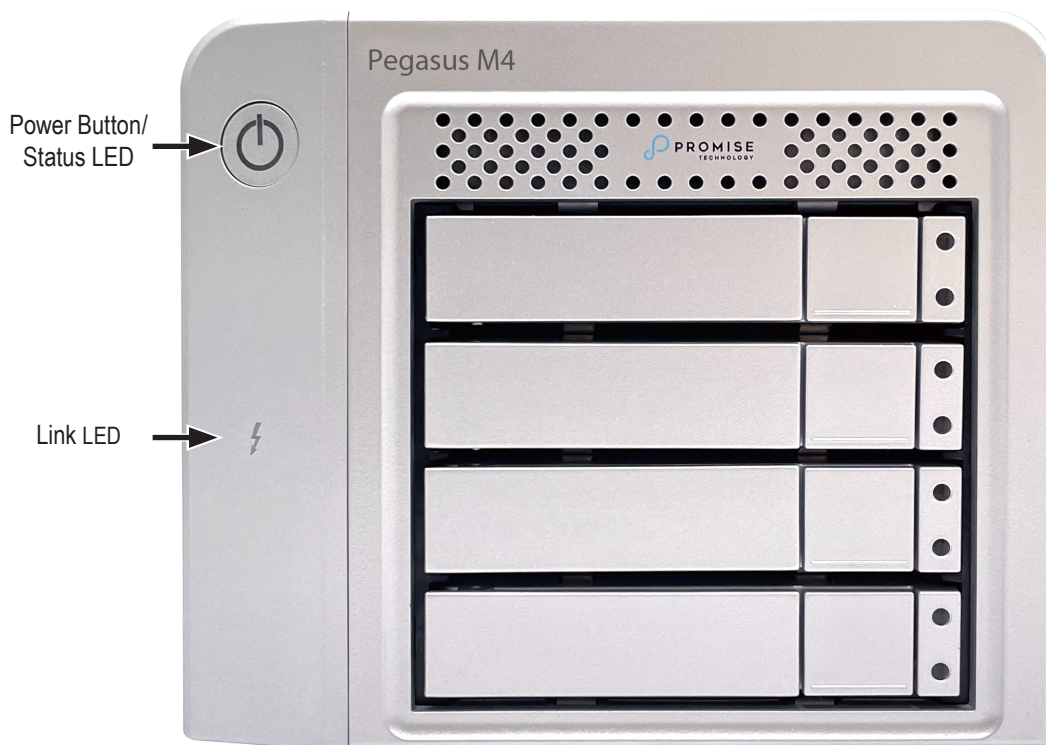
Drive Carrier LEDs

The Pegasus unit spins up the disk drives sequentially to equalize power draw during start-up. After a few moments:

• The Power/Status LEDs turn blue.

• The Activity LEDs turn blue if a drive is installed.

The drive carrier Power/Status LEDs report the condition of the physical drives. See the table below.

Drive carrier LEDs

Drive Carrier LEDs		
State	**Power/Status**	**Drive Activity**
Dark	No power	No drive in carrier
Steady Blue	Power is present	Drive is present
Flashing Blue	—	Activity on drive
Blinking Blue and Orange	Locator feature or Drive is rebuilding	—
Red	Drive error or failure	—

See "Physical Drive Problems" on page 106 for a discussion of rebuilding and failed physical drives for

more information.

Promise Utility Pro

Viewing the Event Logs

Viewing Event Logs includes:

- "Viewing Runtime Events"

- "Viewing NVRAM Events"

- "Event Severity Descriptions"

Viewing Runtime Events

To display Runtime Events, click the Crtiical Events button on the utility toolbar and then select See All Events. The log of Runtime Events appears.

Events are added to the top of the list. Each event includes:

- **Index** – Sequence number of the event. Begins with 0 at system startup.

- **Device** – Disk Array, Logical Drive, Physical Drive by its ID number.

- **Severity** – (lowest to highest) Information, Warning, Minor, Major, Critical and Fatal

- **Time** – Date and time the event happened.

- **Description** – A description of the event in plain language.

View Runtime Events

Viewing NVRAM Events

This screen displays a list of and information about most important events.

To display NVRAM events:

1. Click the Critical Events button on the utility toolbar and then select See All Events

    The log of Runtime Events appears.

2. Click the NVRAM Events button.

    The log of NVRAM Events appears.

    Events are added to the top of the list. Each item includes:

    *   **Index** – Sequence number of the event. Begins with 0 at system startup.

    *   **Device** – Disk Array, Logical Drive, Physical Drive by its ID number.

    *   **Severity** – (lowest to highest) Information, Warning, Minor, Major, Critical and Fatal

    *   **Time** – Date and time the event happened.

    *   **Description** – A description of the event in plain language.

View NVRAM Events
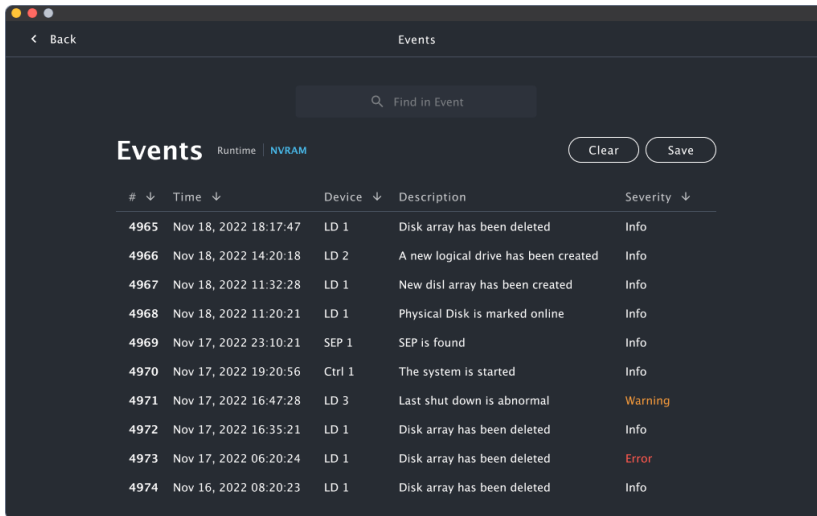
Event Severity Descriptions

Level	Meaning
Fatal	Non-Recoverable error or failure has occurred
Critical	Action is required now and the implications of the condition are serious
Major	Action is required now
Minor	Action is required but the condition is not a serious at this time
Warning	User can decide whether or not action is required
Information	Information only, no action is required

Saving Event Logs

To save event logs,

1. Click the Critical Events button on the utility toolbar and select See All Events. The log of Runtime/NVRAM Events appears.

2. Click the Save button at the top of the menu.

Physical Drive Problems

Physical drive troubleshooting includes:

- "Diagnosis using the Promise Utility Pro"ro"

- "Replacing a Physical Drive"

- "Physical Drive Warning Message"

Physical drives are the foundation of data storage. A physical drive problem can affect your entire RAID system.

Diagnosis using the Promise Utility Pro

The Dashboard menu will indicate if there is a failed drive. The front view of the device indicates physical drive status using color (Red = failed, Orange = warning, Blue = normal); mouse over a drive to display status in text.
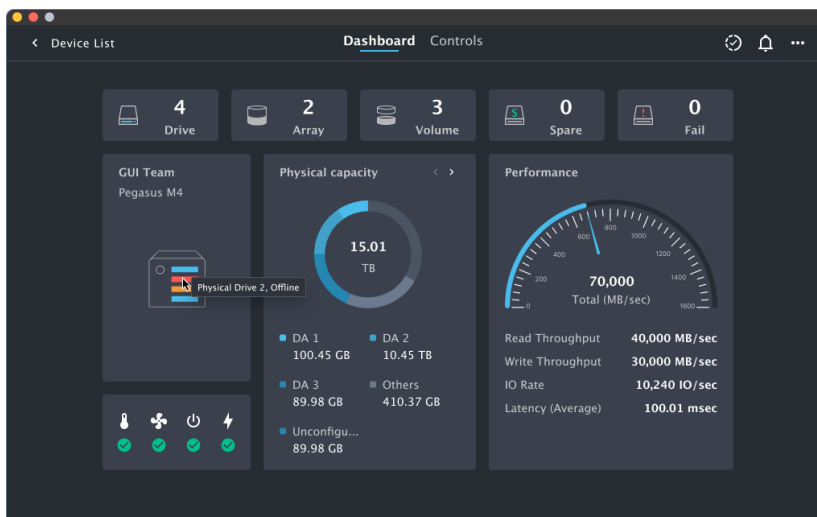
To see more detail about any drive, go to Control page > Device tab and click on the front view of each drive. Mouse over a drive for basic information about the drive.
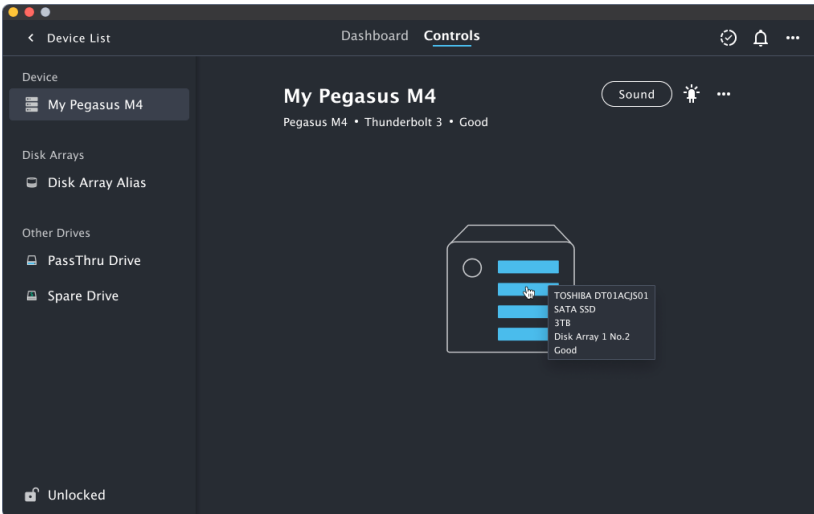
Show Disk Array and Logical Drive status in Disk Arrays tab

Click the Disk Array Alias tab in the Controls men to view status for the Logical Drive and its components.
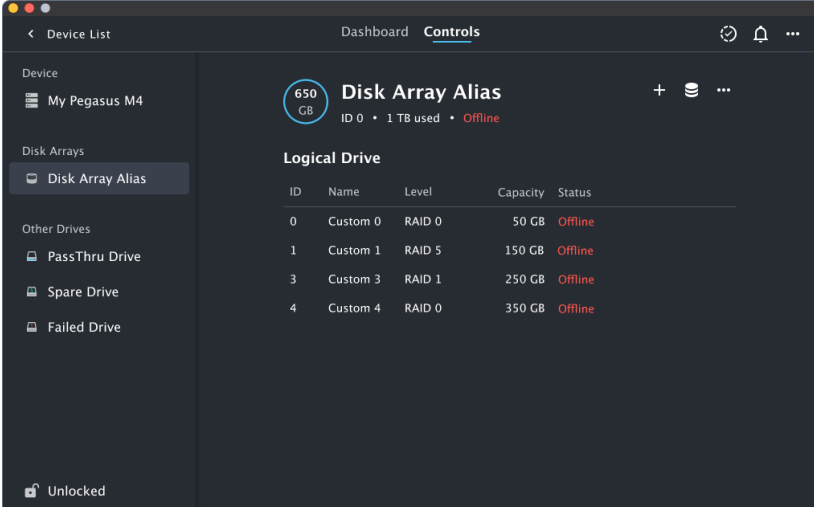
Failed Drive tab

The Failed Drive tab lists drives currently in failed drive status. Operational Status indicates the current condition of the physical drives. The possible states for failed status are:

- Offline – The physical drive cannot be repaired. You must replace the failed drive.

- Predictive Failure – Caused by a bad block or sector.

- Stale – Caused by obsolete array information on the physical drive.
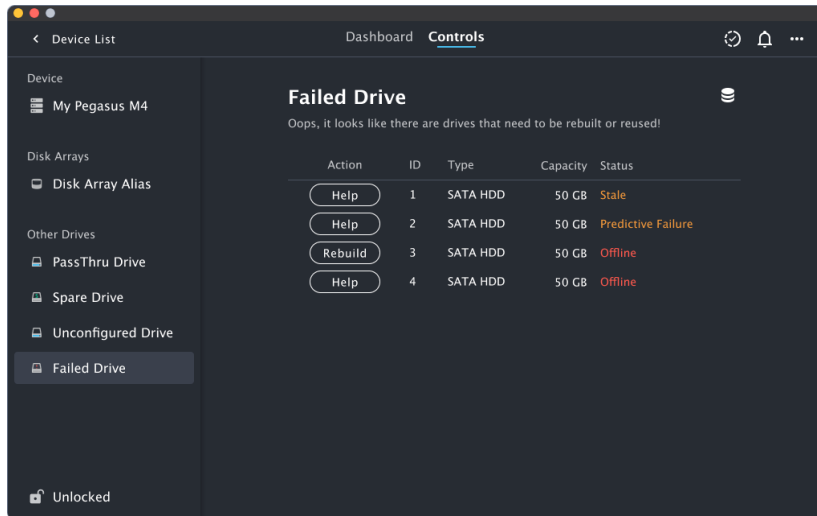
Disk Array and Logical Drive Problems

Disk array and logical drive troubleshooting include:

- "Disk Array Degraded / Logical Drive Critical"

- "Disk Array Offline / Logical Drive Offline"

- "Repairing an Offline Disk Array or Logical Drive"

- "Rebuilding a Disk Array"

- "Incomplete Array"

- "Unreadable Disk Warning"

Disk array problems typically result from a physical drive failure. The most common problem is a degraded disk array. The RAID controller can rebuild a degraded disk array. See "Rebuilding a Disk Array" on page 21.

Disk Array Degraded / Logical Drive Critical

Disk arrays are made up of physical drives. Logical drives are created on the disk array. When one of the physical drives in a disk array fails:

- The operational status of the disk array becomes Critical.

- The operational status of the logical drives becomes Critical or Degraded.

- The operational status of the physical drive becomes Offline. The Promise Utility Pro reports these conditions in the following places:

    - Dashboard – The dashboard shows how many failed drive numbers. The front view of the device will show the physical drive status with colors and words of status when the mouse hovers over each drive.

    - Physical Drive– Physical drives are shown Offline or Missing.

    - Logical Drive

  RAID 6 logical drives are marked:

  Degraded when ONE physical drive is offline.

  Critical when TWO physical drives are offline. RAID 0 logical drives show Offline status.

    - Events – Logs a Major event for the logical drives and a Warning event for the physical drive.

    - Failed drives tab - Help button guides the user through that if there is no spare drive in the Pegasus unit, you must provide the replacement drive.

Disk Array Offline / Logical Drive Offline

Disk arrays are made up of physical drives. Logical drives are created on the disk array. When a disk array and its logical drives go Offline, the data stored in the logical drives is no longer accessible.

RAID 0 logical drives go Offline when ONE physical drive is removed or fails. RAID 1, 1E, 5, and 10 logical drives go Offline when TWO physical drives are removed or fail.

RAID 6 logical drives go Offline when THREE physical drives are removed or fail.

The Promise Utility Pro reports these conditions in the following places:

- Dashboard icon - The dashboard shows how many failed drive numbers. The front view of the device will show the physical drive status with colors and words of status when the mouse hovers over each drive.

- Physical Drive – Physical drives are shown Offline, or Missing.

- Logical Drive – Disk Array and Logical Drives are shown Offline.

- Event – Major event for the logical drive and a Warning event for the physical drive.

- Failed drives tab - Help button guides the user through that if there is no spare drive in the Pegasus unit, you must provide the replacement drive.

Repairing an Offline Disk Array or Logical Drive

RAID 1, 1E, 5, 6, and 10 Logical Drives

If a fault-tolerant logical drive, RAID 1, 1E, 5, 6, and 10, goes Offline, it may be possible to recover your data.

RAID 0 Logical Drives

⚠️	**WARNING** Take no further corrective action until you have consulted with Technical Support!

If a logical drive based on a non-fault-tolerant disk array, RAID 0, goes offline, all of the data on the logical drive is lost.

To recreate your logical drive:

1. Identify the failed physical drive.

2. Replace the failed drive. See "Replacing a Physical Drive" on page 52.

3. If the disk array had more than one physical drive, delete the disk array and re-create it. See "Delete Disk Array" on page 35 and "Unconfigured Drive tab in Controls menu" on page 44 for instructions.

4. Restore the data from your backup source.

Rebuilding a Disk Array

When you rebuild a disk array, you are actually rebuilding the data on one of its physical drives.

If there is no spare drive of adequate capacity, you must replace the failed drive with an unconfigured physical drive, then perform a Rebuild manually.

See "Replacing a Physical Drive" on page 28 To perform a manual rebuild:

1. Click on the Failed drive tab.

2. Click on Rebuild.

3. Choose the physical drive to rebuild data.
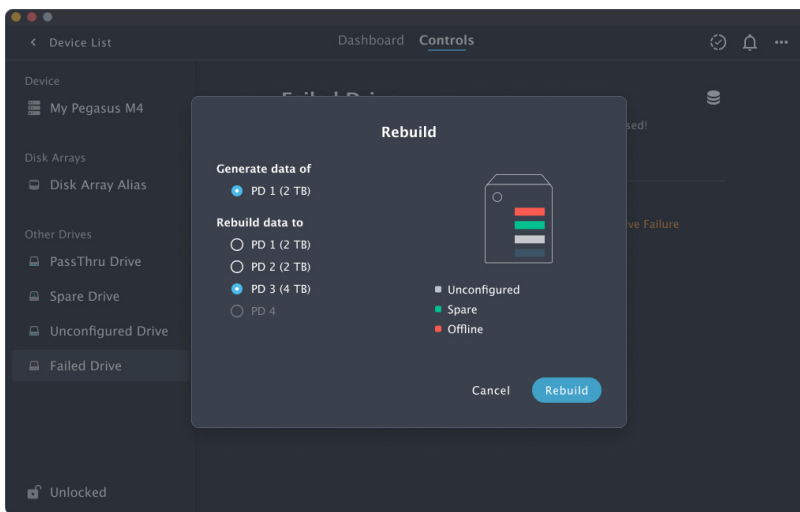
When the disk array is rebuilding:

The disk array shows the Rebuilding status.

Logical drives under the disk array continue to show a yellow Critical, Rebuilding status.
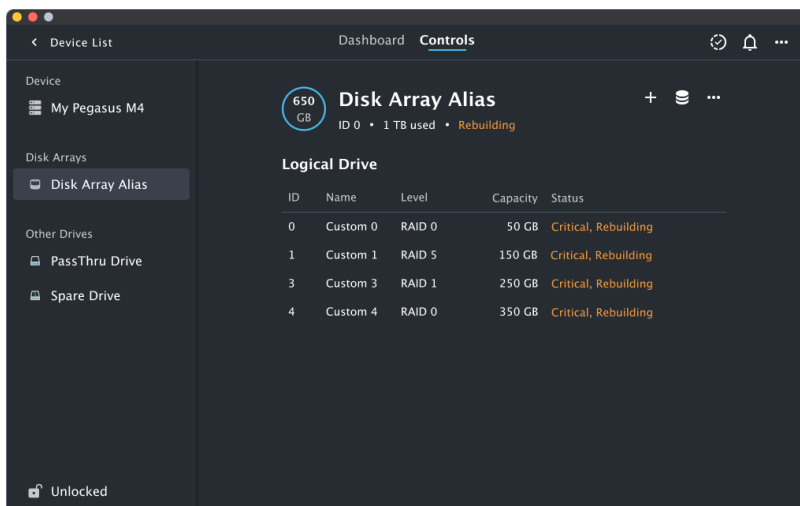
If the buzzer is enabled, the Pegasus unit emits two quick beeps every five seconds. When the beeps stop, the rebuild is done.

Incomplete Array

A more serious, but far less common problem is an Incomplete Array. An incomplete array results from a physical drive that fails or becomes missing during:

- **Disk array transport**

> ⚠️ **WARNING**
> If you are using the utility to accept an incomplete array, the system will reboot if Pegasus is running USB mode. It is important to make sure the Pegasus is not being accessed (no IO operation in progress) before submitting the request.

- **Transport**

Transport is the action of moving the physical drives of a disk array:

To different slots in the same hardware

From one hardware to another

If a physical drive fails during transport, or you do not move all of the physical drives to their new locations, the Promise Utility Pro displays an incomplete array. When the Promise Utility Pro discovers an incomplete array, click on the Accept incomplete disk in the menu then it will display a dialog box asking you to:
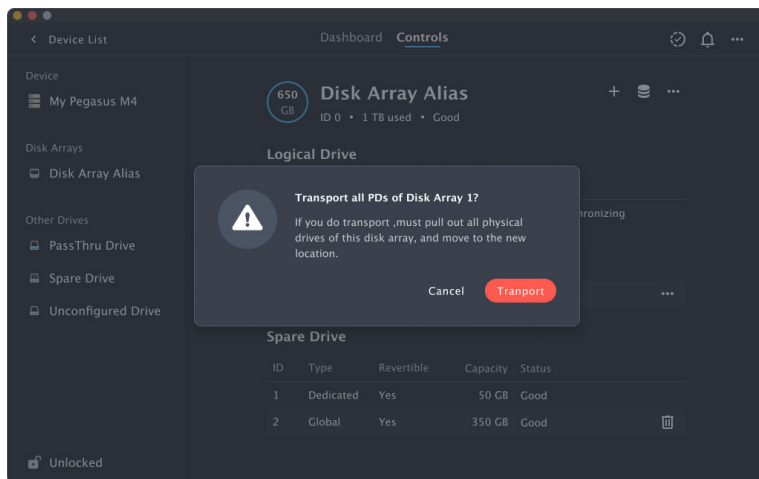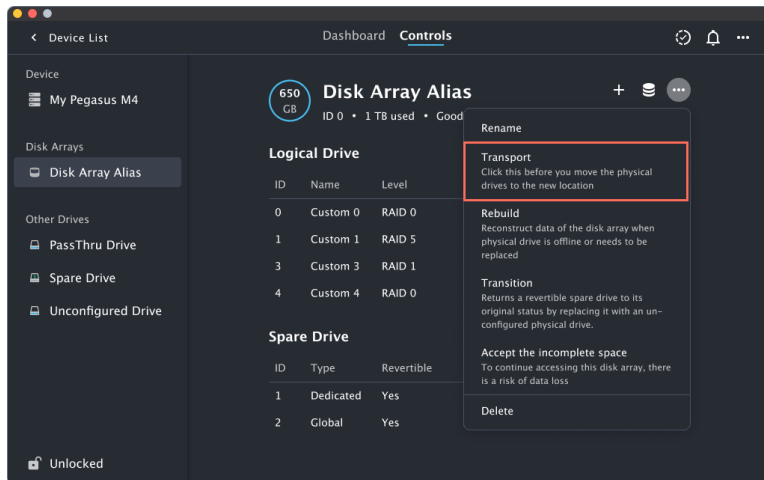
- Click the Accept button to accept the incomplete array.

- Click the Cancel button to reject the incomplete array.
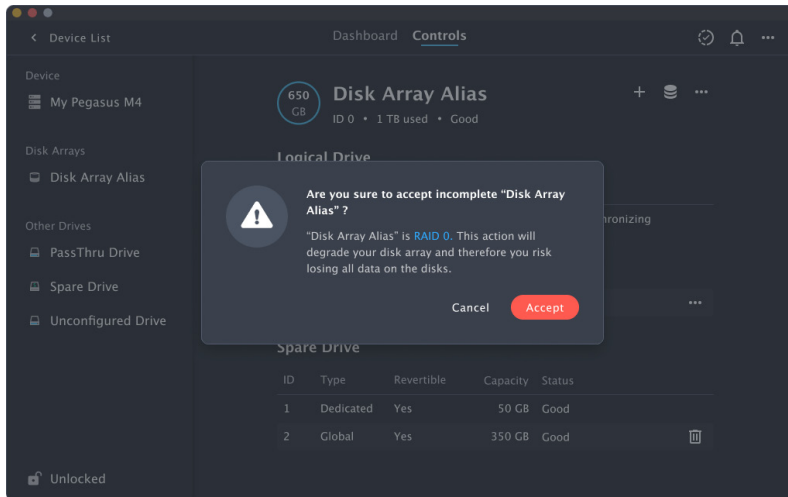
Before you accept the incomplete array, be sure all of the physical drives are present and that their drive carriers are properly installed into the hardware. See "Replacing a Physical Drive" on page 28.

If you choose to accept the incomplete array:

1. Click Accept in the incomplete array dialog box.

2. Check the operational status of the logical drives in the array.

   - If the logical drives are Critical, proceed with a rebuild.

   - If the logical drives are Offline, contact Technical Support. See "Contacting Technical Support" on page 35.

3. Restore your data from a backup source.

If you choose NOT to accept the incomplete array:

1. Click Cancel in the incomplete array dialog box.

2. Do one of the following:

   - Delete the array. This action deletes all logical drives on the array.

   - Replace the missing physical drive.

Unreadable Disk Warning

Your Pegasus logical drive displays on the computer's desktop as a removable-drive icon.

If your computer's operating system recognizes a logical drive but cannot access it, the computer might display a warning message.
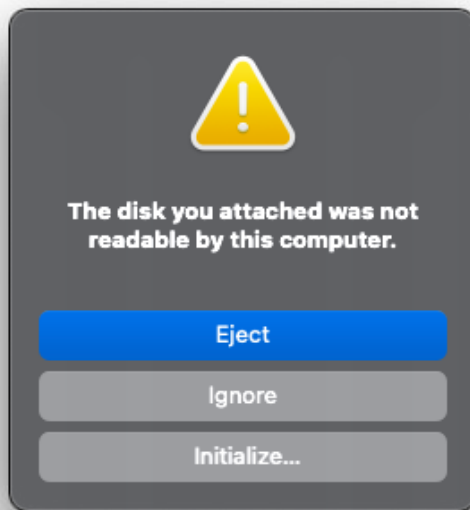
Normally, you never see this warning message for Pegasus logical drive because the Promise Utility Pro formats your logical drives automatically. If the warning message appears, try using the computer's disk utility to REPAIR the problem logical drive. For more information, see the utility's online help or the computer's User Manual. If the disk utility cannot repair the logical drive, contact Technical Support for advice and assistance.

See "Contacting Technical Support" on page 35.

> ### CAUTION
> If a logical drive has been in use and suddenly displays this warning message, do not format the logical drive. Formatting erases all of your data on your logical drive.

Hardware Problems

Diagnosing Hardware Problem

Check System Status on the Dashboard. If there is a failure with one of the components, an indicator icon will be displayed next to the component.
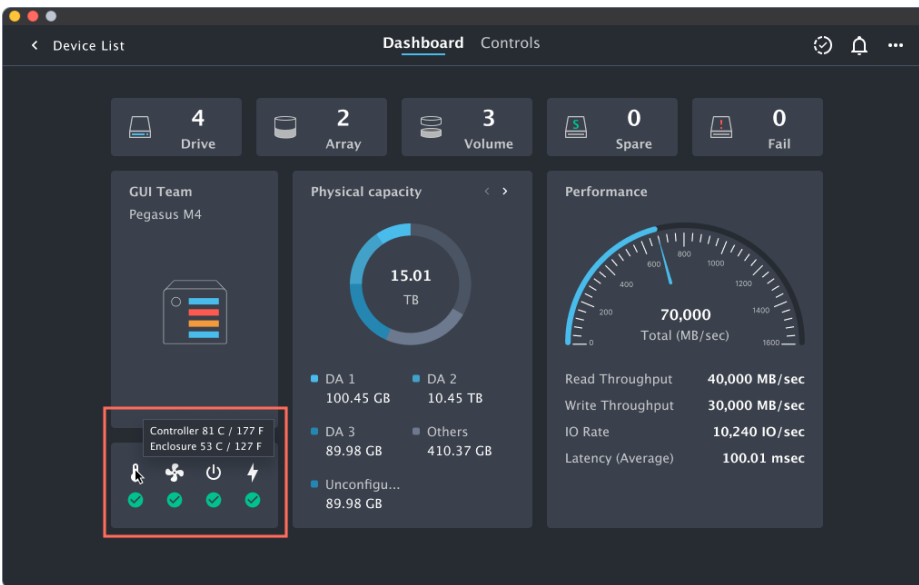
Connection Problems

Cables

If the installation of the cables and components are correctly installed, but they don't function properly, or at all, some of the possible reason could be:

- A connector is dirty or corroded

- A connector is loose or damaged

- A cable looks OK outside but has an open circuit inside

- The wrong cable was used. Look for the Thunderbolt™ logo and **100W** printed on the cable. See the Note below

Be sure to use approved cables because:

- They are the proper ones for your system.

- They are sold in brand-new condition.

> **Note**
> Thunderbolt™ 3 cables are labeled with a Thunderbolt logo and the number three (3). In addition, you should see **100W** printed on the cable. Cable length is 0.7 meter.

Thunderbolt™ 3 / USB cable connectors
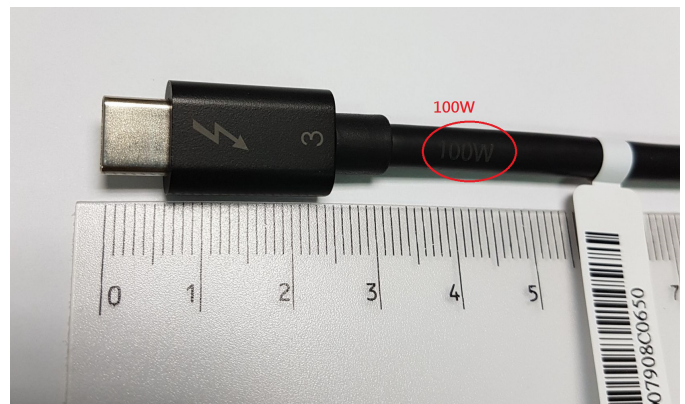
USB Connection Problems

If you are having problems with a USB connection to a host computer, make sure the USB-to-host connection is using Port A. Port A is the Type C port with the computer icon.

To reconnect to Port A, power down your computer before switching the cable to Port A.

Pegasus M4 back view

Replacing a Physical Drive

A failed physical drive displays a red X icon in the Promise Utility Pro and a red Power/Status LED on the drive carrier.

Failed physical drive

Power/Status LED is red

Activity LED is blue

Check the failed drive, then obtain a replacement drive of the same:

- **Type** – Hard disk drive (HDD) or solid state drive (SSD)
- **Interface** – SATA 3 Gb/s or 6 Gb/s
- **Spin speed** – 7,200 RPM or 15,000 RPM
- **Capacity** – Equal size or larger

You do not have to install the identical make and model of the physical drives being used. However replacing with the same make and model of drive makes the process easier and simpler.

You can replace a physical drive without shutting down the Pegasus unit.

> ⚠ **CAUTION**
>
> To avoid hand contact with an electrical hazard, remove only one drive carrier a time.

> ✓ **Important**
>
> Please read the Compatibly List for physical drives before purchasing new drives to install in Pegasus. Download the list from the PROMISE website.

To replace a physical drive:

1.   Press the release button to unlock the drive carrier.

The drive carrier handle swings out.

2.   Grasp the handle and gently pull the drive carrier out of the Pegasus unit and place it onto a static-free surface.

1.   Remove the four mounting screws, then slide the failed drive out of the carrier.
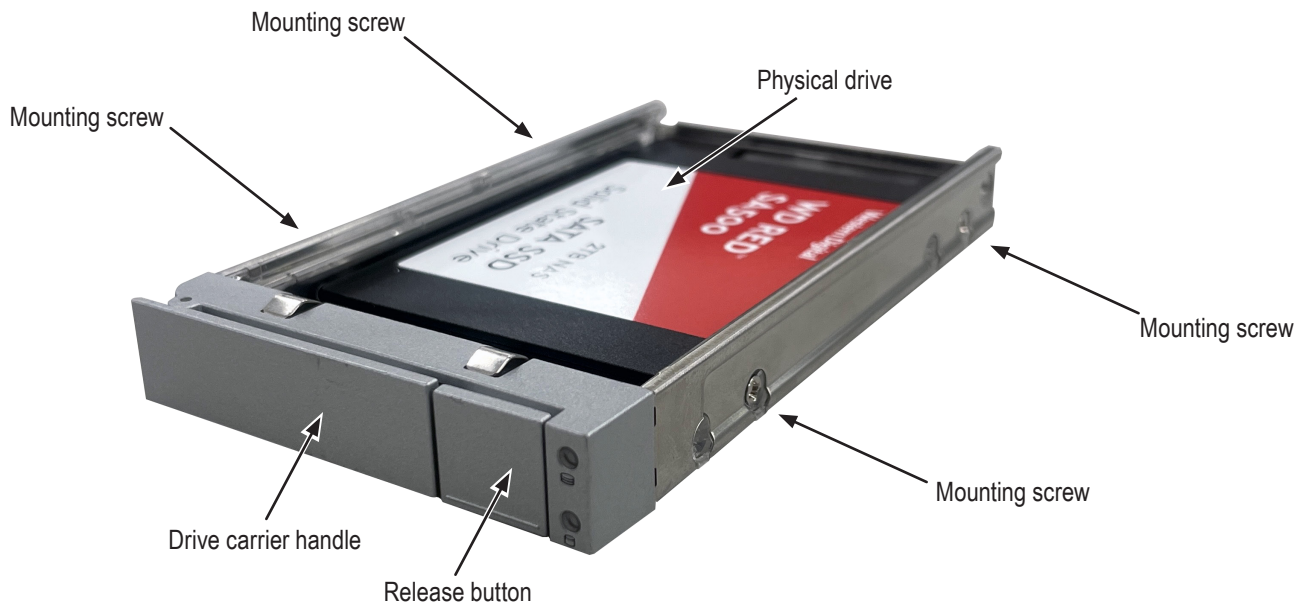
2.   Place the replacement drive into the carrier then install the four mounting screws. Tighten the screws just until they are snug. Position the drive carrier handle in an outward position and slide the drive carrier back into the Pegasus unit.

3.   Press the drive carrier handle inward until it locks.

Physical Drive Warning Message

If you see messages that says, "ajar HDD from the backplane," you must reseat the physical drives.

To reseat the physical drives:

1.   On the Pegasus unit, press and hold the Power Button LED until it turns red.

2.   Wait until the Power Button LED goes dark.

3.   For each drive carrier, press the Release button, pull the drive carrier part way out of the unit, then press the drive carrier back in until it locks.

   See "Replacing a Physical Drive" on page 28.

4.   Press the Power Button LED to power up the Pegasus unit.

FILE SYSTEM CONVERSION

This chapter describes the procedures used to convert a Mac file system (APFS) on Pegasus so it can be used with a Windows operating system. And, how to convert a Windows file system (NTFS) on Pegasus so it can be used with a Mac operating system.

The instruction in this chapter describe how to do the following:

- •Format Pegasus with NTFS for use with Windows

- •Format Pegasus with APFS for use with Mac

⚠ **WARNING**
Converting the file system will erase the entire contents of the drives on Pegasus. **All data currently on the hard drives will be lost**.

Make sure you back up all data to another system before proceeding.

If your Pegasus is currently formatted with Windows NTFS:

- To use Promise Utility to reformat the drives with APFS.
  See "Format drives for Mac APFS with Promise Utility" on page 79.

- To use Mac Disk Utility to reformat the drives with APFS.
  See "Format drives for Mac APFS with Mac Disk Utility" on page 33.

Format drives for Mac APFS with Mac Disk Utility

<table>
<tr>
<td>⚠️</td>
<td>

WARNING

Converting the file system will erase the entire contents of the drives on Pegasus. **All data currently on the hard drives will be lost**.

Make sure you back up all data to another system before proceeding.

</td>
</tr>
</table>

Follow these instructions to change the file system to APFS using Mac Disk Utility.

1. If the Mac Driver of Pegasus has been installed and loaded successfully, you will see the NTFS volume on your Desktop. Note that the Volume is read-only until you change to APFS file system.

   - If Pegasus is connected to a Thunderbolt port on your Mac, the volume icon looks like this:

   - If Pegasus is connected to a USB port on your Mac, the volume icon looks like this:
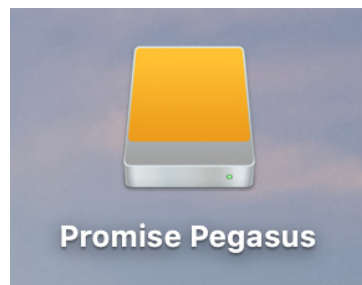
2. Use Mac Disk Utility to Erase Volume from and format with APFS. Select **External device > The Partition Promise Pegasus**, click **Erase** to format APFS.
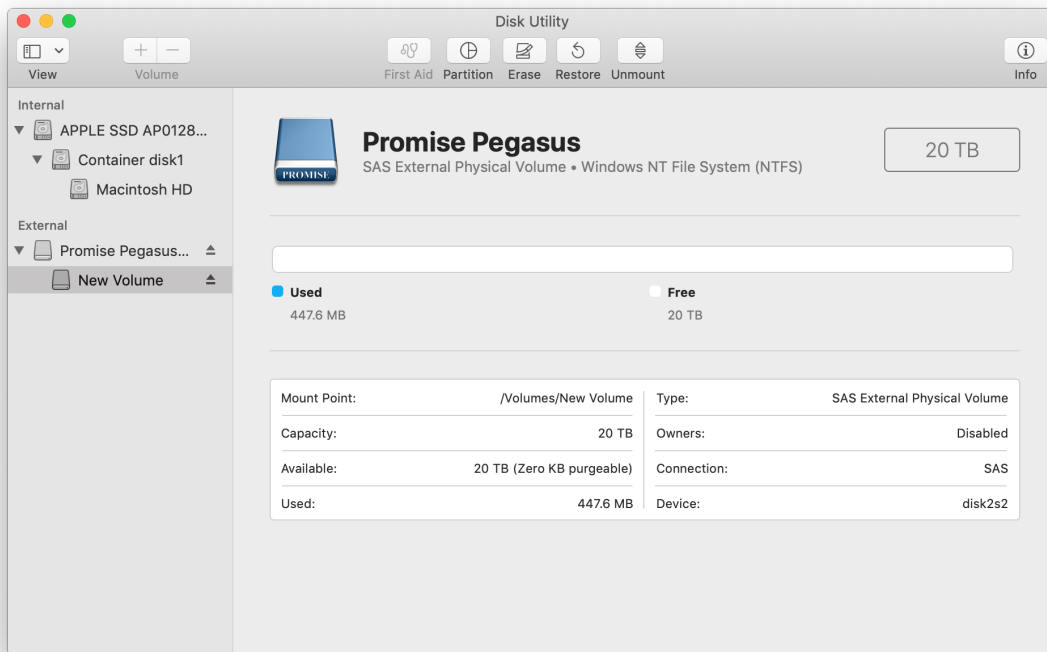
3. Type a **Volume Name** and select **Format** type *Mac OS Extended (Journaled)*.
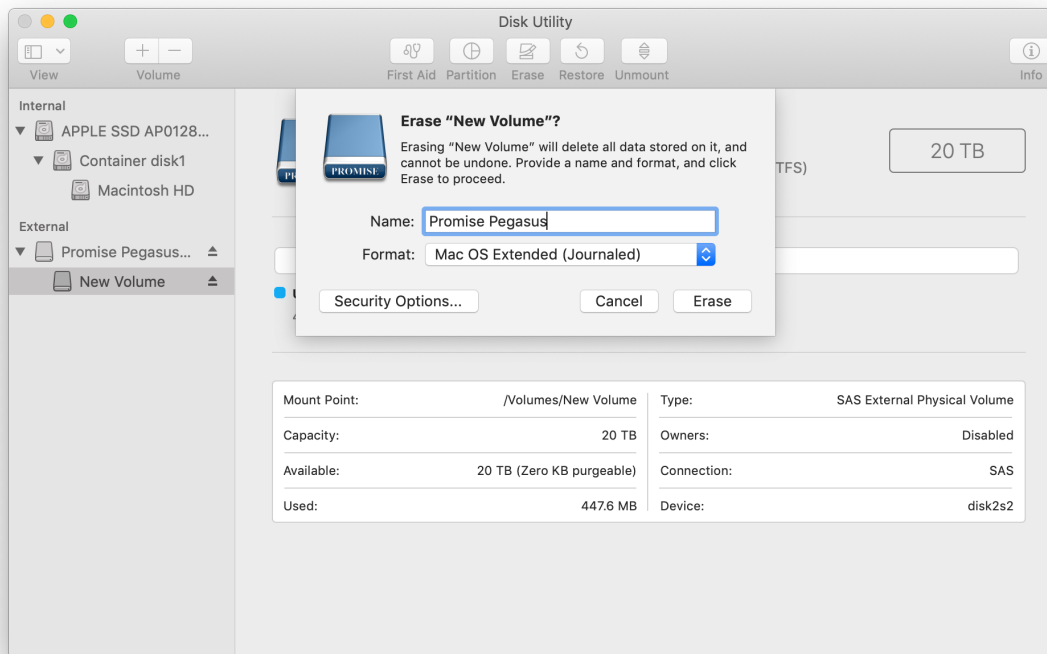
CONTACTING TECHNICAL SUPPORT

Promise offers local Phone Support for Pegasus series during normal business hours:

For telephone support and business hours click here (http://www.promise.com/ContactUs) Web support and Live Chat is offered 24/7

Web: https://support.promise.com

Live Chat: http://www.promise.com/us/Support

Please be sure to register your product at PROMISE eSupport (https://support.promise.com)

The information below is required for troubleshooting. Please register this information or have it readily available at the time of your support call

- **TLA number** - Located on the outside of the box or on label toward rear of Pegasus chassis
- **Serial number** - Located on label toward rear of Pegasus chassis
- **Config Logs**. Please refer http://kb.promise.com/cat/Pegasus-series/ for instruction on acquiring Config Logs.

LIMITATIONS

RMAs issued before 12:00 noon PST M-F can be shipped out on same day. RMAs issued after 12:00 noon PST M- F ship out the next business day.

RMA METHODS

1. Cross Ship (NOT applicable in APAC and EMEAR)

For this method, Credit card information is required for security purposes. The replacement item is first sent to you (customer). Thirty (30) days, from the day of shipment, are allotted for returning the defective unit. If the defective part is not returned within the allotted 30days, your credit card will be charged the MSRP of the replacement part(s) shipped.

2. Return and Replace

Credit card information is not needed for this method. Once your request for an RMA is approved, an RMA number will be emailed to you along with specific shipping instructions. Product(s) must be returned in its original packaging (inner and outer box). If you do not have the original packaging contents please contact Promise Technical Support. All RMA are shipped standard ground to your location.

See "Returning the Product For Repair" on page 41 for more details.

United States

580 Cottonwood Drive

Milpitas, Ca 95035, USA

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Australia

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

EMEA

Netherlands

Science Park Eindhoven 5228

5692 EG Son, The Netherlands

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Austria

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

France

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Germany

Europaplatz 9

44269 Dortmund, Germany

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Sweden

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Switzerland ITF

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Norway ITF

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Belguim

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Luxembourg

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

United Kingdom

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Taiwan

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

China

Room 1108, West Wing, Shi Chuang Plaza, 22 Information Road

Shangdi IT Park, Haidian District, Beijing 100085

Fax: 86-10-8857-8015

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Korea

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Hong Kong

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Singapore

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

Japan

3F, Mura Matsu Bldg, 3-8-5, Hongo Bunkyo-ku

Tokyo 113-0033, Japan

Technical Support (E-Support): https://support.promise.com

Web Site: http://www.promise.com

LIMITED WARRANTY

PROMISE Technology, Inc. ("PROMISE") warrants that this product, from the time of the delivery of the product to the original end user:

    a) all components for a period of three (3) years;

    b) will conform to Promise's specifications;

    c) will be free from defects in material and workmanship under normal use and service.

This warranty:

    a) applies only to products which are new and in cartons on the date of purchase;

    b) is not transferable;

    c) is valid only when accompanied by a copy of the original purchase invoice.

This warranty shall not apply to defects resulting from:

    a) improper or inadequate maintenance, or unauthorized modification(s), performed by the end user;

    b) operation outside the environmental specifications for the product;

    c) accident, misuse, negligence, misapplication, abuse, natural or personal disaster, or maintenance by anyone other than a Promise or a Promise-authorized service center.

Disclaimer of other warranties

This warranty covers only parts and labor, and excludes coverage on software items as expressly set above.

Except as expressly set forth above, Promise disclaims any warranties, expressed or implied, by statute or otherwise, regarding the product, including, without limitation, any warranties for fitness for any purpose, quality, merchantability, non-infringement, or otherwise. Promise makes no warranty or representation concerning the suitability of any product for use with any other item. You assume full responsibility for selecting products and for ensuring that the products selected are compatible and appropriate for use with other goods with which they will be used.

Promise does not warrant that any product is free from errors or that it will interface without problems with your computer system. It is your responsibility to back up or otherwise save important data before installing any product and continue to back up your important data regularly.

No other document, statement or representation may be relied on to vary the terms of this limited warranty.

Promise's sole responsibility with respect to any product is to do one of the following:

    a) replace the product with a conforming unit of the same or superior product;

    b) repair the product.

Promise shall not be liable for the cost of procuring substitute goods, services, lost profits, unrealized savings, equipment damage, costs of recovering, reprogramming, or reproducing of programs or data stored in or used with the products, or for any other general, special, consequential, indirect, incidental, or punitive damages, whether in contract, tort, or otherwise, notwithstanding the failure of the essential purpose of the foregoing remedy and regardless of whether Promise has been advised of the possibility of such damages. Promise is not an insurer. If you desire insurance against such damage, you must obtain insurance from another party.

Some states do not allow the exclusion or limitation of incidental or consequential damages for consumer products, so the above limitation may not apply to you.

This warranty gives specific legal rights, and you may also have other rights that vary from state to state. This limited warranty is governed by the State of California.

Your Responsibilities

You are responsible for determining whether the product is appropriate for your use and will interface with your equipment without malfunction or damage. You are also responsible for backing up your data before installing any product and for regularly backing up your data after installing the product. Promise is not liable for any damage to equipment or data loss resulting from the use of any product.

Returning the Product For Repair

If you suspect a product is not working properly, or if you have any questions about your product, contact our Technical Support staff, and be ready to provide the following information:

- Product model and serial number (required)

- Return shipping address

- Daytime phone number

- Description of the problem

- Copy of the original purchase invoice

The technician helps you determine whether the product requires repair. If the product needs repair, the technician issues an RMA (Return Merchandise Authorization) number.

Important

Obtain an RMA number from Technical Support before you return the product and write the RMA number on the label. The RMA number is essential for tracking your product and providing the proper service.

Return ONLY the specific product covered by the warranty. Do not ship cables, manuals, CDs, etc.

USA and Canada:	Promise Technology, Inc. Customer Service Dept. Attn.: RMA # _____ 47654 Kato Road Fremont, CA 94538
Asia-Pacific:	Please return the product to your dealer or retailer or Contact Promise technical support for instructions before shipping the product.
Other Countries	Please check Promise E-Support: https://support.promise.com for the location nearest you. Contact the office or repair depot for full instructions before shipping the product.

You must follow the packaging guidelines for returning products:

- Use the original shipping carton and packaging

- Include a summary of the product's problem(s)

- Write an attention line on the box with the RMA number

- Include a copy of your proof of purchase

You are responsible for the cost of insurance and shipment of the product to Promise. Note that damage incurred due to improper transport or packaging is not covered under the Limited Warranty.

When repairing returned product(s), Promise may replace defective parts with new or reconditioned parts, or replace the entire unit with a new or reconditioned unit. In the event of a replacement, the replacement unit is under warranty for the remainder of the original warranty term from purchase date, or 30 days, whichever is longer.

Promise pays for outbound standard shipping charges only. You must pay for any additional shipping options, such as express shipping and return of the defective part or unit.