FirmTek

Store and Share your Digital Creations

Ultimate Trayless Enclosure for 2.5″ Drives

miniSwap/ES™

Dual Bay, Hot-Swap, 2.5” External Serial ATA Enclosure

User Manual

FirmTek, LLC
www.firmtek.com

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Before installing the miniSwap/ES or any other hardware or software, you are responsible for backing up data contained on any storage devices. After the hardware or software installation, you are responsible for backing up data on any storage devices at frequent intervals. FirmTek, LLC is not liable for any loss of data or damage to equipment resulting from the use of FirmTek products.

External Shielded Serial ATA Cables
SeriTek/e6G, SeriTek/2ME4-E, SeriTek/6G and SeriTek/2SM2-E host adapters use specially shielded external Serial ATA cables to ensure integrity during data transfers. Use caution and handle the cables with care. When inserting and removing the cable, hold the connector at the ends (not the cable) when inserting and removing the cable from the eSATA controller port and the external Serial ATA enclosure.

> ***Note:*** *The* SeriTek/e6G, SeriTek/2ME4-E, SeriTek/6G and SeriTek/2SM2-E *utilize "Type I" Serial ATA cables and connectors: This external SATA cable/connector is specifically design to provide secure connections with external eSATA ports.*

If you will be using the miniSwap/ES with a Macintosh computer, please note that Macintosh computers require unique external shielded Serial ATA cables for maximum reliability. FirmTek Serial ATA cables are specially designed to be compatible with both PC and Macintosh computers. Please only use FirmTek external shielded Serial ATA cables with the miniSwap/ES.

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I. Introduction

Welcome

Congratulations and thank you for purchasing the miniSwap/ES Trayless, Dual Bay, Hot-Swap, 2.5" External Serial ATA Enclosure. This product is yet another innovative solution from FirmTek.

About This User Manual

The user manual will introduce you to the miniSwap/ES enclosure. Please read it carefully to familiarize yourself with the proper operation of the miniSwap/ES.

About Serial ATA Technology

An evolutionary replacement for the Parallel ATA storage interface, Serial ATA (Advanced Technology Architecture) provides greater speed, simpler upgrades and easier configuration. Serial ATA is fully compliant with the ATA protocol and offers up to 600MB/sec performance compared to a maximum of 133MB/sec for Parallel ATA. Serial ATA devices can be hot-swapped (with most operating systems), something that is not normally possible with Parallel ATA devices. Serial ATA uses insulated cables that are thinner and longer with smaller 7-pin connectors.

About the miniSwap/ES

The miniSwap/ES is a Trayless, high quality, Aluminum, External, Dual-Bay, Hot-Swap, Serial ATA (SATA) drive enclosure. It supports 2.5" SATA and Solid State Drives (SSD). The silver aluminum case is crafted for maximum durability and heat dissipation. For maximum performance each hard disk is provided its own "direct connect" eSATA connector. The unique Trayless design, allows customers to easily hot-swap bare drives in and out of the enclosure within seconds. This feature provides virtually unlimited storage possibilities in an ultra-small form-factor. Built from the ground-up as a true 6G Serial ATA solution, the miniSwap/ES is designed to provide the ultimate in performance with external SSD and 2.5" SATA hard disks.

Allowing for true end-to-end Serial ATA capabilities, the miniSwap/ES is compatible with external PCI/PCI-X and PCIe to Serial ATA host adapters such as the SeriTek/2SE4, SeriTek/e6G, SeriTek/2ME4-E, SeriTek/2SE2-E, SeriTek/6G and SeriTek/2SM2-E (using eSATA to eSATA data cables). The miniSwap/ES enclosure is custom designed with shielded Serial ATA ports meeting regulatory requirements for electrostatic discharge (ESD), electromagnetic interference (EMI) emissions, and susceptibility. This ensures a good ground path exists between the cables and the connectors to prevent any ESD discharge during cable insertion or removal.

In contrast to competing solutions, the miniSwap/ES is designed with an innovative internal Serial ATA direct backplane (no data cable inside the enclosure). This makes the installation and removal of drives easy and provides maximum data signal strength.

Package Contents

*Part number **SATA-miniSwap/ES** includes:*

One Dual-Bay external Serial ATA chassis	
Two external shielded Serial ATA data cables eSATA, 1-meter each	
Four rubber feet	
Universal power adapter	
One CD-ROM containing the miniSwap/ES User's Manual	

*Part number **ES-e6G** also includes:*

One SeriTek/e6G 2-port PCI-Express external SATA PM host adapter	

*Part number **ES-2SE2** also includes:*

One SeriTek/2SE2-E 2-port PCI-Express external SATA PM host adapter	

*Part number **ES-6G** also includes:*

One SeriTek/6G 2-port SATA PM ExpressCard/34 MacBook Pro & PC Notebooks	

*Part number **ES-2SM2** also includes:*

One SeriTek/2SM2-E 2-port SATA PM ExpressCard/34 MacBook Pro & PC Notebooks	

Part number **ES-2ME4** *also includes:*

One SeriTek/2ME4-E
4-port PCI-Express external
SATA PM host adapter

Part number **ES-2SE4** *also includes:*

One SeriTek/2SE4
4-port PCI-X external
SATA PM host adapter

miniSwap/ES Highlights

- Attractive, durable, portable Trayless enclosure supports dual 2.5" SATA SSD or HDD
- Easy to set up: No screws, no drive tray required, simply swap drives in seconds
- Easy to operate: Simply open the door to insert or remove storage devices for virtually unlimited storage
- Supports 7mm, 9.5mm, 12.5mm and 14.9mm drive heights
- Smart Power Management: User selectable power settings for Auto-on or Manual-turn-on
- High performance design – Integrated Direct Connect eSATA backplane; no internal cabling
- High bandwidth design – SATA 6.0Gbps up to 600MB/sec per drive
- Supports SATA 1.5G, 3G or 6G HDD or SSD 2.5" form factor with any capacity
- Fully RAID capable: Compatible with Operating System and host adapter based RAID solutions
- Can be configured as JBOD or RAID and used with multiple miniSwap/ES enclosures
- Power and Activity LEDs for each hard drive
- Aluminum case for maximum durability and heat dissipation
- Ultra quiet, fan free, aluminum heat dissipation cooling system
- High performance to handle multiple projects simultaneously
- Perfect for both storage-hungry and speed-sensitive applications
- Cross-platform, PC and Macintosh compatible, operating system independent
- Expand storage without overloading the computer's power supply or increasing heat within its chassis
- Works with Macintosh or PC with shielded Serial ATA ports running Mac OS X, Windows or Linux
- Kensington Security Slot

miniSwap/ES Applications

- Graphic arts
- Digital photography
- Computer animation
- Offsite backup
- Bulk data transport
- High-performance workstations
- File sharing over high-speed networks
- Digital audio/music composition, recording, editing, storage and playback
- Personal and professional high-definition digital video creation and editing
- Supported Video Formats: 10-bit uncompressed HD; 1080/60i, 8-bit; uncompressed SD; DVCPro 25/50; HDV, DV, DVCA

miniSwap/ES Specifications

General System Hardware Requirements	**Compatible with external ExpressCard/34, PCIe, PCI-X, and PCI to SATA host adapters. Such as: SeriTek/6G, SeriTek/2SM2-E SeriTek/e6G, SeriTek/2ME4-E, or SeriTek/2SE4**
Operating Systems Supported	• System independent • Cross-platform, PC and Macintosh compatible
Enclosure Capacity	• Dual 2.5" Trayless hot-swappable drive bays
External Connectors	• 2-port shielded eSATA (I type receptacle)
Cables Supported	• 7-pin shielded eSATA (I type data cable), up to 2 meter in length
Hard Drive Types Supported	• 2.5" Serial ATA hard drive (HDD) or solid state drive (SSD) • Supports 7mm, 9.5mm, 12.5mm, 14.9mm drive heights • Any capacity
Data Transfer Rates	• Up to 600 Mbytes/second or 6 Gbps burst data
Advanced Data Features	• Fully compliant with SATA 1.5, 3 and 6.0Gbps • Direct connect – each device has its own eSATA connector • JBOD (Just A Bunch Of Disks) • Fully RAID-capable: Compatible with most operating system and host adapter based RAID solutions • RAID arrays can span across multiple enclosures • Software RAID 0 OR RAID 1 can be configured
Advanced Power Features	• Digital power button ON/OFF (Press/Hold for 5 second) • Smart Power Management: Press power button twice to change the power Mode * *Server Mode:* - Auto-on after power disruption - Power button LED flashes * *Standard Mode:* - Stays off after power disruption - Power button LED steady
Warranty	• One year limited parts & labor
Enclosure Dimensions	• 170.5 mm (L) x 23.9 mm (H) x 188.5 mm (W)
Enclosure Weight	• Enclosure Only: 1lb 9oz: (without hard drives)
Color	• Silver Aluminum
Other Status LEDs	• Enclosure Rear Power on – White • Drive Power on LED on each bay – Green • Drive activity LED on each bay – Blue (Disk activity LED not supported on all drives) • Some SSD drives may display a blue power light
Power Adapter	• Universal power adapter: • Input: 105 – 240 VAC; 1.2A, 50-60Hz • Output: 12V 2.0A (25 Watts)
Environmental	• Operation Temperature: +41°F to +131°F (+5°C to +55°C)
RoHS	• Compliant
EMC Compliance	• EN55022/1998, EN55024/1998 (European Community) • FCC Part 15 Class B (US)

miniSwap/ES System Requirements

Hardware Requirements

- Compatible with external PCIe, PCI-X, and PCI to SATA host adapters. Such as SeriTek/e6G, SeriTek/2ME4-E, SeriTek/6G, SeriTek/2SM2-E and SeriTek/2SE4 with shielded eSATA/I type receptacle
- 2.5” SATA 1.5G, 3G, 6G hard drive or SSD, any capacity
- RAID or non-RAID configurations; JBOD
- Available 105-240VAC, 50-60Hz power

II. Preparing the miniSwap/ES

Caution:
Please verify your data is backed up before attempting to use the miniSwap/ES external enclosure.

The miniSwap/ES enclosure, hard drive/SSD and computer contain sensitive components that can be permanently damaged by Static Electric Discharge. Be sure you're working in an area free of static electricity to prevent damage. Use a wrist grounding strap if you have one or regularly touch a metal part of the computer chassis such as the power supply case or a port access cover to discharge any built-up static electricity from your body. Make sure to handle the hard drives around the edges to avoid damage by static electricity.

Getting Started

This section describes the proper method of preparing the miniSwap/ES for use. Please review this section and familiarize yourself with the miniSwap/ES enclosure before installing hard drives and connecting it to your computer.

Front view of the miniSwap/ES enclosure:

Rear view of the miniSwap/ES enclosure:

Mount Rubber Feet

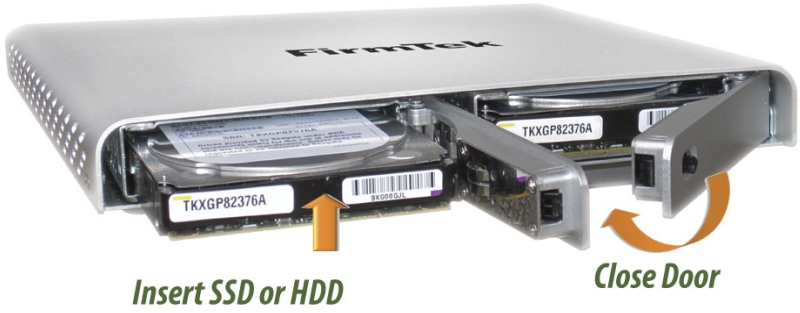
Once the miniSwap is out of the box, please mount the included four rubber feet as shown in the images above. Two rubber feet are attached in the front and two in the rear.

Drive Installation

There are three steps to install a hard drive or SSD and attach the miniSwap to the computer.

1. **Open the Bay Door**
   To open the bay door, slide the latch to the right.

2. **Insert the HDD or SSD**
   Insert the hard drive with the label facing up and the SATA pins in the rear. The SATA pins will be the first part of the device to enter the miniSwap bay. Push the drive in (as far as possible) using your thumb until the bay door starts to close.



⚠ WARNING - POTENTIAL DAMAGE

The SATA pins must be in the correct position to avoid damage. DO NOT insert a PATA device into the miniSwap as this will cause damage not covered by warranty.

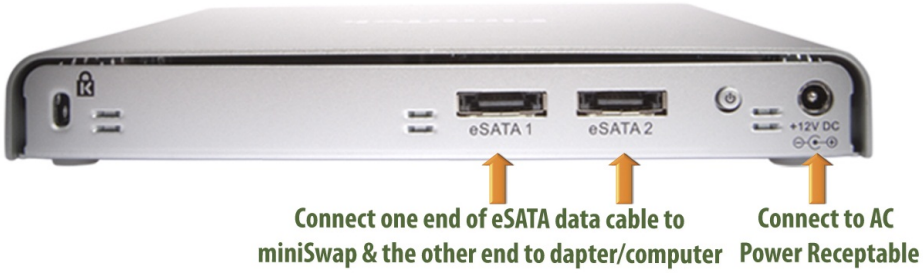
- Carefully press the miniSwap door closed. The bay is now ready to be used.

Note: *This is a critical step. If the fit is too tight, back out the disk and ensure the drive is the correct type and positioned properly. Do not use excessive force when inserting the disk. Excessive force can cause damage to the drive and the enclosure.*

- Repeat the procedure to install the second hard disk or SSD. To remove a disk, slide the latch to the right and open the door. Next, remove the disk as shown below.

3. Attach the eSATA cables

Install an eSATA data cable on the rear of the miniSwap/ES for each hard disk/SSD inserted into the enclosure. Attach the other end of the eSATA cable to a SATA controller or an eSATA ExpressCard.



Note:

- *The original Serial ATA (Type A SATA) connectors have an L shaped opening. This type of connector is **not** used on the back of the miniSwap/ES enclosure. See Figure 2A.*

- *The newer " eSATA" connectors have a rectangular opening. This style of connector is provided on the back of the miniSwap/ES for connecting to the SATA host adapter. See Figure 2B.*

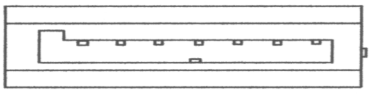


Figure 2A: "L shaped" connector

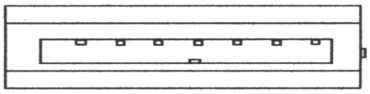


Figure 2B: "I shaped" eSATA connector

Figure 2: Serial ATA Connector Types: "L shaped" & "I shaped" eSATA

Figure 3: Serial ATA Cable Connectors Ship with the miniSwap/ES. Both ends of the cable have eSATA type I connectors.

Making the SATA Connections:

⚠ **Caution**: Be sure to connect the cable using the proper orientation to your SeriTek host adapter and external enclosure. It should easily snap into place. Please do not force the cable connector onto the host adapter and hard drive or peripheral interface.

Remember the male and female connectors must be of the same type for a correct fit - eSATA female to eSATA male are used on the miniSwap.

- First check that you are connecting the correct type of connector
- If the connector still does not fit, rotate the cable and try again

Power Operation

Power ON enclosure - Press the button to turn ON - a white LED will glow
Power OFF enclosure - Press and hold the button for five seconds to turn OFF

Power Button - Standard Mode:
- Power LED glows white
- Enclosure stays off after power disruption

Power Button - Server Mode:
- White power LED blinks
- Enclosure automatically turns on after power disruption

Note: Pressing the power button twice within a second, will change the mode.

Front Panel Status Lights

Activity Lights
On the front of the miniSwap/ES Dual-Bay Enclosure are two multi-color status/activity lights. These lights appear on the right side of each bay door. The lights will be off if the power is off or if the power is on and no device is installed in the bay. When a HDD or SSD is mounted inside the bay, the LED will normally glow green. With some SSD models a blue power light will be displayed. When a hard disk is being accessed the light will blink with a blue color.

Note: Most Solid State Drives do not support disk activity. This issue may also apply to some SATA hard drive models.

III. Hot-Swapping Hard Drives

Introduction

The miniSwap/ES external enclosure extends Serial ATA's and SSD storage capabilities outside the computer chassis. Serial ATA drives can be swapped in and out of the miniSwap/ES enclosure within seconds.

While most hard drives may be easily inserted and removed, some operating systems and/or host adapters do not support the removal and addition of hard drives while the computer is running. Hot-swapping hard drives on a Macintosh computer with the miniSwap/ES is only supported when utilizing FirmTek's SeriTek/2SE4, SeriTek/e6G, SeriTek/2ME4-E, SeriTek/6G or SeriTek/2SM2-E external host adapters that include advanced hot-swap capabilities. Windows hot swapping is supported when a special procedure is followed (described below under "Windows Hot-Swap Procedure").

General Hot-Swap Guidelines

- Do not disconnect or remove hard drives while transferring data.
- Save your work and close associated applications before removing the external hard drive (applications need to be closed since they may keep temporary working files open on the external hard drive).
- Always unmount the volumes (eject, disable, or drag the volumes to trash) associated with an external hard drive before removing it.
- As a general rule, power-down the miniSwap/ES external enclosure after powering down the computer. Power on the external enclosure before powering on the computer.
- If RAID volumes span internal and external hard drives, do not attempt to remove external hard drives that partially support the RAID volume or data loss may occur. An example is a RAID volume that spans hard drives located within the computer chassis and the miniSwap/ES external enclosure.
- Do not remove a disk that is being used as the Startup Disk.

Macintosh Hot-Swap Procedure with the SeriTek/2SE4, Seriek/e6G, SeriTek/2ME4-E, SeriTek/6G and SeriTek/2SM2-E host bus adapters External Host Adapter

Connecting External Hard Drive(s)

If your Macintosh computer is not turned on, power on the external enclosure then power on the computer. If the Macintosh computer is already powered on, insert the hard drives and then power on the enclosure.

Removing External Hard Drive(s)

⚠ **Caution**: To prevent loss of data, save your work and close associated applications before removing an external hard drive (applications need to be closed since they may keep temporary working files open on the external hard drive). Always unmount the volumes (eject or drag the volumes to trash) associated with an external hard drive before removing it. Eject or drag all of the volumes associated with the hard drive(s) before disconnecting or removing them.

Windows Hot-Swap Procedure

Hard drives may be hot-swapped under Windows 2000, Windows XP, and Windows 2007. Note: Hot-swap functionality is not available for Windows 98/98SE/ME; please shut down the system before adding or removing hard drives when using these operating systems.

⚠ **Caution**: To prevent loss of data, save your work and close associated applications and directory folders before removing the external hard drive (applications need to be closed since they may keep temporary working files open on the external hard drive).

Hot-Swap Procedure

- Bring up the Windows Device Manager: Right-click on *My Computer*, click *Manage*, and then click *Device Manager.*
- Go to *Disk Drives* and find the disk you want to remove.
- Right click on the desired disk drive and select *Remove/Disable.*
- After performing this operation, you can remove the hard drive without risk of losing any data that is currently stored in cache memory.
- To reconnect the external hard drive, reconnect it and Windows will automatically detect it.
- If you are re-attaching a hard drive after the remove/disable operation as explained above, you must make sure that the hard drive is power cycled before reconnecting it (Removing, waiting a few seconds, and reinserting the hard drive into the miniSwap/ES external enclosure will effectively power-cycle the drive. If several drives were removed/disabled, then the external enclosure itself may need to be power-cycled).

IV. Sleeping & Wake-Up Procedures:

When you wish to sleep or shutdown the system and the miniSwap/ES:

1. Dismount the volume: On a Mac dragging the volume to the trash causes the trash icon to change; dropping the volume there dismounts the volume.
2. Turn off the miniSwap/ES enclosure.
3. Put the system into Sleep mode, or shutdown normally.

When you wish to Wake-Up or Turn-On the Computer System:

1. Turn on your miniSwap/ES enclosure.
2. Wake-Up or Turn-On your System normally.

At this point your system should automatically load, then discover, and mount the volumes.

V. Troubleshooting

- **My hard drive isn't recognized**
  Check cables and connections. Ensure the 7-pin eSATA cable is properly oriented to the connectors on the computer and the external enclosure. Ensure the enclosure is properly powered. Make sure the hard drive(s) has been initialized for use with the OS.

- **The Activity light does not blink**
  The miniSwap activity light will not blink with most SSD devices and may not work with some 2.5" SATA hard disks that do not have the correct pin configuration.

- **Does the miniSwap/ES work with all PPC and Intel based Macintosh computers?**
  No, the miniSwap/ES only works with computers with at least one PCI, PCI-X or PCIe slot available. If your system lacks PCI, PCI-X or PCIe slots you cannot install the SeriTek/2SE4, SeriTek/e6G, SeriTek/2ME4-E, SeriTek/6G or the SeriTek/2SM2-E host adapter.

- **Drive is difficult to insert or eject?**
  If the selected 2.5" SATA HDD has a notch in the rear left side, it may cause the disk eject arm to become stuck and the bay door difficult to open. **Do not force the door open** as this may damage the miniSwap. If the drive is difficult to eject, take the three screws off of each side of the miniSwap and remove the top. Next, push the drive forward with your finger to eject the drive.

  You can fill the notch if you wish to continue to use the drive with the miniSwap. One option is to use a knife to cut a small section of wood from a wooden paint stick to fill the gap. Black electrical tape can be used to hold the wood in place. With this modification completed the drive will eject properly. Do not fill the gap with any substance that conducts electricity, as this can damage the HDD.

VI. Product Support

Technical Support

For additional information on how to use miniSwap/ES, download the latest updates, or for technical assistance, please visit us at **www.firmtek.com**, or email us at **support@firmtek.com**.

Please provide the following information when contacting us:

- Product model and serial number
- Computer model
- Computer OS type and version (example: Mac OS X, version 10.2; Windows 2000 or Windows XP)
- Hardware and software installed on your system
- Contact information including daytime telephone number and email address
- A detailed description of the question or problem

Return Merchandise Authorization

To obtain limited warranty service, you must first obtain a Return Materials Authorization (RMA) and ship-to address by contacting FirmTek at http://www.firmtek.com/support. Please, request the RMA by filling out the form at the bottom of the page.

NO RETURNS WILL BE ACCEPTED WITHOUT AN RMA NUMBER.

If FirmTek technical support determines the product needs to be repaired or replaced, a Return Merchandise Authorization (RMA) number and shipping address will be provided. Please pack the product in the original shipping container and include all of the original packaging - including the static bag, all hardware, software, cables, and other accessories that came with the original product. You are responsible for shipping and insurance costs, and any damage incurred due to improper packaging or transport. You should remove all personal information from the product prior to its return. For your protection insure the package and ship via a traceable method such as UPS or FedEx. FirmTek is not responsible for lost or damaged packages.

FirmTek reserves the right to determine whether the product is to be repaired or replaced with refurbished parts, or with a new or refurbished product. Data Recovery is not covered under this warranty and is not part of the warranty returns process. Standard United States return shipping charges are paid by FirmTek, Foreign and other shipping methods such as express shipping are available for an additional charge.

Write down the RMA number on the outside of the shipping container, and include the following information with the shipment:

- A description of the problem
- A copy of the original purchase invoice
- Return shipping address
- Contact information including daytime telephone number and email address

FirmTek, LLC reserves the right to refuse shipments missing a valid RMA number.

VII. Product Warranty and Disclaimers

FirmTek warrants to the original buyer only that this product shall be free from defects in material and workmanship for a period of one year from the original date of purchase. This warranty is valid only when the original purchase invoice is provided. This warranty shall not apply to any defects resulting from improper handling, misuse, misapplication, abuse, or unauthorized modification(s), which are performed by the end user.

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or use of a product from FirmTek, LLC convey a license under any patent rights, copyrights, trademark rights, or any other intellectual property rights of FirmTek, LLC or third parties.

For FirmTek products 1TB or greater: "One gigabyte (GB) is equal to one billion bytes and one terabyte (TB) equals 1,000 GB (one trillion bytes). Accessible capacity will vary from the stated capacity due to formatting and partitioning of the hard drive, the computer's operating system, and other factors". For FirmTek products less than 1TB: "One gigabyte (GB) is equal to one billion bytes when referring to hard drive capacity. Accessible capacity will vary depending on the operating environment and formatting."

VIII. Regulatory Compliance Statements

RoHS compliant
Federal Communications Commission Radio Frequency Interference Statement

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment 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 equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.
- Use a shielded and properly grounded I/O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

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.

CE European Union Compliance Statement

EMC compliance:

Emissions:	EN55022: 1998, Class B
Immunity:	EN55024: 1998
	EN61000-4-2: 1995+A1: 1998
	EN61000-4-3: 1995+A1: 1998
	EN61000-4-4: 1995
	EN61000-4-6: 1996
	EN61000-4-8: 1993