FireFly™

FireFly™
Digital Intelligence

Pwr   WrBlk   Act

DC IN
+5V

800/400
Bilingual

Digital Intelligence®
forensic solutions

N O T I C E

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There are no serviceable parts inside the FireFly. Do not attempt to open or disassemble the FireFly device due to an electrical shock hazard. Opening or disassembling the FireFly case (except at the request of DI Technical Support) will void the warranty.

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Package Contents

Included in the FireFly Kit:

- FireFly IDE or SATA (1)
- Power Supply and power cord (1)
- FireFly Power Adapter (1)
- FireWire Cable (9-pin to 9-pin) (1)
- FireWire Adapter (9-pin to 6-pin) (1)
- FireWire Adapter (9-pin to 4-pin) (1)

What is the FireFly?

The FireFly device is a hardware (firmware) based write blocker that allows an IDE (with the FireFly IDE) or SATA (with the FireFly SATA) hard drive to be connected to a host computer via IEEE 1394 (FireWire) interface for forensic image acquisition and analysis. FireFly devices support connection via FireWire 400 (1394a) or FireWire 800 (1394b) interfaces. By default the FireFly device is configured as Read-Only but can be configured to provide Read-Write operation.

Power Considerations

The FireFly power supply and power adapter provide the required power connections for the device and attached hard drive. The FireFly is powered from a standard 4-pin mini Molex type power connector (labeled "DC IN +5V").

Do not attempt to power more than one hard drive or one FireFly from the power supply. Attempting to power multiple drives or FireFly devices from a single power supply may result in physical damage to the power supply and attached devices.

Caution: If connecting the FireFly SATA to a SATA hard drive that has both 15-pin SATA and 4-pin legacy power connectors DO NOT connect the 4-pin power connector to the hard drive or the hard drive and FireFly may be damaged as a result. In this configuration the drive power is supplied through the 15-pin connector on the FireFly.

FireFly cabling to PC

You should select a single cable to connect the FireFly to your PC.

Multiple FireFly devices can be daisy chain (cascaded.) To accomplish this, connect the first FireFly to the PC using the appropriate cable. Then use a bilingual FireWire800 (9-pin to 9-pin) cable to connect the first FireFly to the second FireFly. Additional FireWire devices can be daisy chained using this technique. Note that each FireFly must have a separate power supply.

Drive Configuration

> **Note:** **Please consult the Hard Drive Manufacturer for information on proper jumper configuration.**

An IDE disk drive **must** be configured (jumpered) as a **Single Master Device prior** to connection to the FireFly. SATA hard drive require no jumper settings.

Diagnostic LED's

A "Power" LED indicates a live power source is connected to the device.

The "Activity" LED indicates drive activity.

The "Write Block" LED will illuminate if the unit is operating in Read-Only mode. Furthermore, it will flash when an attempted write is blocked.

Drivers

No device specific drivers are required for the FireFly. Full driver support is provided by the Host operating system and/or FireWire Controller. Normally, the required drivers will automatically be loaded by the operating system. Please refer to your operating system, motherboard, or FireWire controller manufacturer for additional driver related information.

Cables

Use only high quality FireWire cables. FireWire 400 to FireWire 800 cables (4 pin to 9 pin and 6 pin to 9 pin) are available as an option from Digital Intelligence.

Attaching the FireFly

1. *Connect FireFly to the Hard Drive:* Connect the FireFly female connector directly to the hard drive, making sure the connector is properly aligned and seated.

2. ***Connect Power Adapter (IDE version):*** Connect the FireFly power adapter to the 4-pin power connector on the hard drive and to the 4-pin power connector on the FireFly. Finally, connect the 5 pin DIN connector from the power adapter to the power supply.

   Connect Power Adapter (SATA version): Connect the FireFly power adapter to the 4-pin power connector on the FireFly. If connecting to a SATA drive that has both 15-pin SATA power and 4-pin legacy power connectors ***DO NOT*** connect the 4-pin power connector to the hard drive or the hard drive and FireFly may be damaged as a result. In this configuration the drive power is supplied through the 15-pin connector on the FireFly. Finally, connect the 5 pin DIN connector from the power adapter to the power supply.

3. ***Connect FireFly to PC:*** Connect the FireFly to your PC using the appropriate FireWire cable.

Changing Drives

1. ***"Stop", "Unload", or "Dismount" the associated FireWire device using the applicable Operating System Icon, Process, or Utility.*** This will notify the operating system to complete any pending transfer operations such that the device can be properly disconnected.

2. ***Disconnect FireFly power supply:*** Disconnect the power supply from the power adapter at the 5 pin DIN connector.

3. ***Remove existing drive:*** Disconnect both the 4 pin power connector and FireFly from the hard drive.

4. ***Attach New Drive:*** Attach the FireFly and power connectors to the new IDE hard drive.

5. ***Reconnect Power:*** Reconnect the power supply to the power adapter at the 5 pin DIN connector.

Disconnecting the FireFly:

1. ***"Stop", "Unload", or "Dismount" the associated FireWire device using the applicable Operating System Icon, Process, or Utility.*** This will notify the operating system to complete any pending transfer operations such that the device can be properly disconnected.

2. ***Disconnect FireFly from PC:*** Disconnect the FireWire cable from the PC and the FireFly.

3. ***Disconnect FireFly power supply:*** Disconnect the power supply from the power adapter at the 5 pin DIN connector.

4. ***Disconnect FireFly:*** Disconnect the power adapter cable from the disk drive and FireFly.

Modifying the FireFly to enable Read/Write Capabilities

The FireFly is shipped in a Read-Only (write blocking) configuration, but can be configured to enable Read-Write operation if desired. A modification must be made to the housing to enable the Read-Write operation.

Note: For customers with stricter requirements, dedicated firmware is available that disables this option.

Modifying the FireFly to enable Read-Write operation will not affect the warranty.

> **NOTE:** The **YELLOW** FireFly is shipped by default pre-configured in Read-Write Mode

To enable Read-Write operation a small knock out panel located on the top edge of the FireFly case must be removed. Using a small razor knife remove the knock out to provide access to the FireFly's configuration dip switches. (See illustration below)

The default position for all switches is OFF (Read-Only).

Generally, the only switch that is manipulated is switch #1. With switch #1 in the OFF position the unit operates with all writes blocked (Read-Only). With switch #1 in the ON position, the unit operates with writes enabled (Read-Write).

Switches #2 and #3 control the unit's response when in Read-Only mode. They are used for diagnostic operations and to support Operating systems which do not fully support read-only devices. These switches are ignored if Switch #1 is ON (Read-Write mode).

Switch #2 controls whether an error code is returned when a write attempt is blocked. If the switch is OFF, an error is generated for write attempts. If the switch is on, a success code is returned to indicate the write succeeded (although the write was blocked).

Switch #3 controls the type of code page (device characteristics) reported to the calling process when a device query is made. If the switch is OFF, the code page is reported appropriately to indicate the device is write protected. If the switch is ON, the code page is reported as if the device was not write protected.

Summary of Switch Settings

Switch 1: OFF = Read-only (write-blocking enabled)
            ON = Read-write

Switch 2: Only functions if Switch 1 = OFF, i.e., read-only
            OFF = Unit reports errors if writes are attempted
            ON = Unit suppresses errors if writes are attempted (no-error)

Switch 3: Only functions if Switch 1 = OFF, i.e., read-only
            OFF = Unit reports Write-Protect (WP) status in code page
            ON = Unit suppresses Write-Protect (WP) status in code page

Switch 4: Reserved

Important Considerations

Removal of Drives. **DO NOT** disconnect the hard drive from the FireFly while the device is powered up.

SATA Drive Power. If connecting the FireFly SATA to a SATA hard drive that has both 15-pin SATA and 4-pin legacy power connectors DO NOT connect the 4-pin power connector to the hard drive or the hard drive and FireFly may be damaged as a result. In this configuration the drive power is supplied through the 15-pin connector on the FireFly.

Disk Cache. When used with operating systems that cache disk writes and don't properly identify the write protect status (Windows 95/98/ME for example), it may appear information has been written to the drive when viewed with Windows Explorer. In actuality this information has only been stored in the disk cache in memory. A reboot of operating systems will clear and refresh the disk cache showing that no information has been written to the drive. Pressing "CTRL-C" in MS-DOS will cause the disk cache to be reset and demonstrate this fact as well. Since properly designed Forensic Imaging software reads directly from the disk itself, the contents of the operating system disk cache should be of no consequence should something inadvertently be written there. (This includes the "_Restore" directory created by Windows ME).

NTFS Drive Letter Access. Windows NT/2K/XP may attempt to update (write to) an NTFS file system the first time it is attached to a system. If Windows tries to perform this update and writes to the drive are blocked, Windows will not provide logical disk access to the associated file system and no drive letter will be assigned. This condition is a function of the Windows NT/2K/XP operating system and occurs specifically because the write blocker is performing properly. Although logical disk access is not provided, the hard drive can still be imaged without interference from the operating system.

INT13X (LBA) Support. Some small drives that report Int13X (LBA) support do not implement it correctly and may not function properly with the FireFly. These drives are typically quite old, always less than 8 GB in size, and are usually less than 2 GB in size.

Using a FireWire 800 Device with Microsoft Windows. Microsoft Windows 1394 drivers do not identify which port (1394a or 1394b) is being used when a multiport FireWire device is attached. Because of this, if two 1394b (800 Mb/s) capable components (i.e. a controller and a device) are connected via a 1394a (400 Mb/s) cable, the negotiation speeds of the devices will not be set properly and the components (controller and device) will not properly establish

communications. When operating in a Microsoft Windows environment, always use 1394b cables to connect a 1394b capable controller and device.

Microsoft Windows XP Service Pack 2. With SP2, the performance of FireWire 800 (1394b) capable devices will be effectively reduced to the lowest possible negotiation speed. (Well below that of FireWire 400/1394a devices). This problem occurs even if the FireWire 800 (1394b) capable device is attached to a FireWire 400 (1394a) controller or via FireWire 400 (1394a) cables.   Only one controller or device on the FireWire chain needs to be FireWire 800 (1394b) CAPABLE for this problem to occur. Users who install Windows XP SP2 will notice a severe reduction in performance when using FireWire to connect 1394b capable devices to the host PC. FireFly has implemented a firmware "workaround" for the Microsoft's Windows XP SP2 1394/FireWire drivers that allow users to take full advantage of the FireFly device. This firmware update can be downloaded from the Digital Intelligence web site support pages:

http://www.digitalintelligence.com/support.php

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