

PATA NANDrive™ Evaluation Board User Guide

Rev 00.001

**Greenliant Systems
Proprietary and Confidential
03/18/2011**

Application Note

March 2011

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Revision History

Number	Description	Date
00.001	Converted to Greenliant format	03/18/2011

1 Introduction

The NANDrive™ integrated circuit (IC) is a high-performance, fully-integrated, embedded flash solid state drive. It combines an integrated ATA Controller and NAND Flash in a multi-chip package. This product is ideal for solid state mass storage applications offering new and expanded functionality while enabling cost-effective designs.

The NANDrive Evaluation Board allows NANDrive products to be tested and/or demonstrated in a realistic environment. The board connects to the user environment using the Integrated Drive Electronics (IDE) interface. This board works for all NANDrive products.

1.1 Required Equipment

The Greenliant NANDrive evaluation board will operate in any environment where any typical off the shelf ATA based storage device is found. This would include any computer environment that utilizes the IDE interface with such Operating Systems as Windows XP, Windows 2000, Windows Vista, DOS, Linux, or even proprietary operating systems.

1.2 Included Equipment

NANDrive Evaluation Board – Two board options, a 40-pin connector or a 44-pin connector. See Figures 1-3.

1.3 Board Layout

The evaluation board has two interface connector options, see Figures 1 and 2. For the board layout, see Figure 3 and Table 1.



Figure 1: NANDrive Evaluation Board, 40-pin Connector

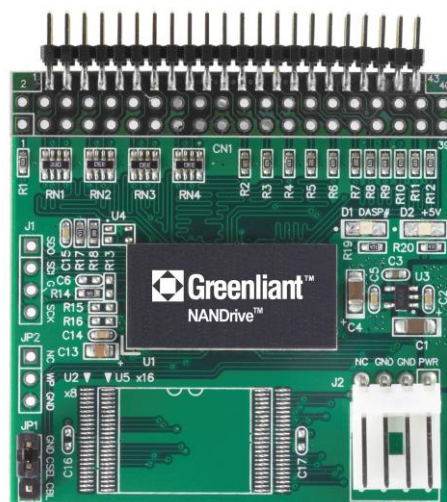


Figure 2: NANDrive Evaluation Board, 44-pin Connector

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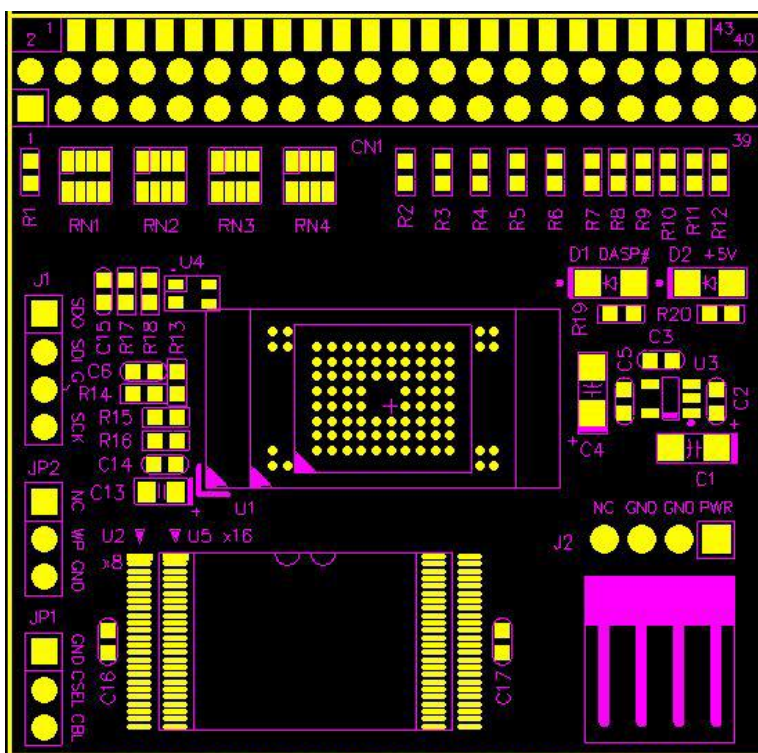


Figure 3: Top View of Board Layout

Table 1: BOM

Symbol	Description	Notes
D1	Green LED	Indicates activity
D2	Red LED	Indicates power on
J1	SCI debug header	Output information for debugging. This port is a valuable debugging aid because it opens a stream of status information for evaluation.
J2	Power connector	Pin #1 = 5V Pin #2 and 3 = GND Pin #4 = NC
JP1	Master/ Slave selector	Pin #1 and 2 shorted: Master mode Pin #2 and 3 shorted: Cable select from cable No pins are shorted: Slave mode
JP2	Write-Protection or Power-Down connector	Either function is enabled by shorting Pin #2 to Pin #3. Pin #2 default is Write-Protection, but can be defined as Power-Down using the IDFE command or the PT2 utility.
CN1	40-pin or 44-pin bus connector	
U1	NANDrive	
U2/U5	External 48-pin TSOP NAND flash media device	Currently not supported

2 Install the Evaluation Board

Perform these three tasks to install the evaluation board:

1. Connect board to PC
2. Detect the device
3. Add a new drive

2.1 Connect Board to PC

The evaluation board easily connects to any desktop PC with a parallel ATA interface.

CAUTION: Ensure that the power is off before connecting /disconnecting any devices to your PC. Failure to do so can damage the PC and the evaluation board.

To connect the board:

1. Turn off the PC.
2. Open the PC chassis.

CAUTION: Static electricity can damage electronic devices. To prevent static damage, discharge static electricity before you touch any electronic components.

3. If your evaluation board has a 40-pin ATA connector, connect the peripheral power cable to J2 on the evaluation board. If your evaluation board has a 44-pin connector, no additional connections are required because the PC supplies power to the device through pins 41 and 42 on the connector.
4. Connect the PC IDE cable to CN1 on the evaluation board. If necessary, use an existing connector on a used ATA cable.
5. Set JP1 to either Master or Slave on the evaluation board. If another device uses the same IDE cable as the NANDrive, one device must be set as Master and the other as Slave.

2.2 Detect the Device

When you power on the PC, the BIOS should detect and report the correct density of the NANDrive attached to the evaluation board. If the BIOS does not detect the NANDrive, follow the power on procedures below.

To power on the PC:

1. Turn on the PC. If the BIOS detects the NANDrive, stop. If it does not detect the NANDrive, go to step 2.
2. Wait until LED D1 on the evaluation board begins to quickly blink. This indicates that initialization has completed successfully.
3. Reboot the PC. If the BIOS detects the NANDrive, stop. If it does not detect the NANDrive, go to step 4.
4. Check that the BIOS IDE settings are set to Auto Detect and the IDE mode is set as shown in Table 2 below.

Table 2: IDE Mode Settings

Product Type	Mode Settings
Ultra-DMA mode: Not supported	Multi-Word DMA Mode2 or PIO mode4
Ultra-DMA mode: Supported (LD020 based NANDrive)	Multi-Word DMA mode4, PIO mode6 ^{a)} or Ultra-DMA mode4
Ultra-DMA mode: Supported (LD040 based NANDrive)	Multi-Word DMA mode4 ^{b)} , PIO mode6 ^{a)} or Ultra-DMA mode6

^{a)} PATA NANDrive is capable of supporting PIO Mode-6 but Identify drive information report as PIO Mode-4

^{b)} PATA NANDrive is capable of supporting Multi-Word DMA Mode-4 but Identify drive information report as MWDMA Mode-2

5. If after executing all the above steps the BIOS does not detect the NANDrive, contact Greenliant for support.

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2.3 Add a New Device

Consult the PC's user manual for specific instructions on how to add a new drive. Below are the directions for Windows XP and DOS systems.

The NANDrive can be installed as either a physical drive or as an OS-partitioned drive. When configured as a physical drive, do not access the drive through the OS. When configured as an OS-partitioned drive, access the drive through the OS.

2.3.1 To add a drive in Windows XP:

1. Right-click on **My Computer**.
2. Select **Manage** from the drop-down list. This will open the **Computer Management** interface as shown in Figure 4.

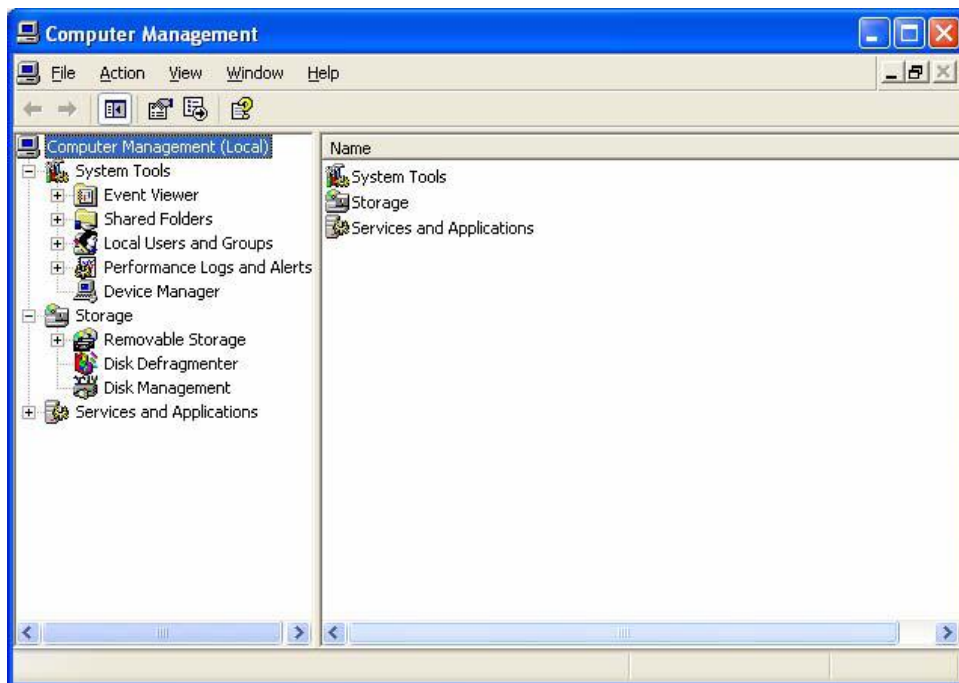


Figure 4: Computer Management Interface

3. In the left-hand pane of the **Computer Management** interface, click on **Device Manager**. The NANDrive will appear in the right-hand window under **Disk Drives**. See Figure 5.

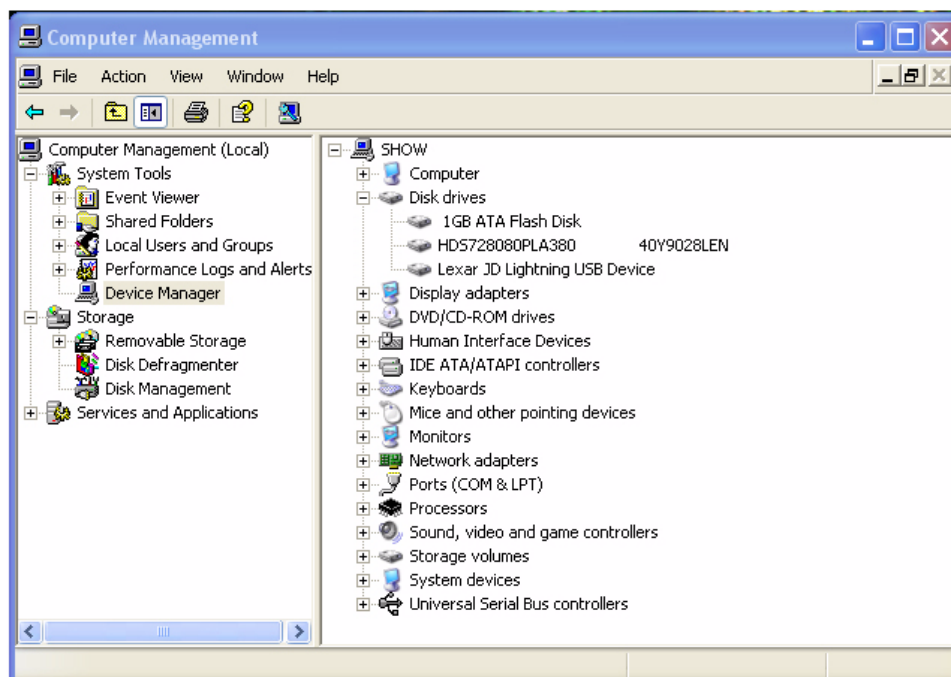


Figure 5: Device Manager

4. In the left-hand pane, click on **Disk Management**. Choose if you want to connect the NANDrive as a physical drive or as a partitioned drive. Follow the appropriate directions below.

2.3.2 To connect as a physical drive:

1. Right-click on the NANDrive icon in the right-hand pane. See Figure 6.
2. Select **Delete Partition**. The label for the NANDrive will change to “unallocated” and the drive will not show up as a resource under **My Computer**.

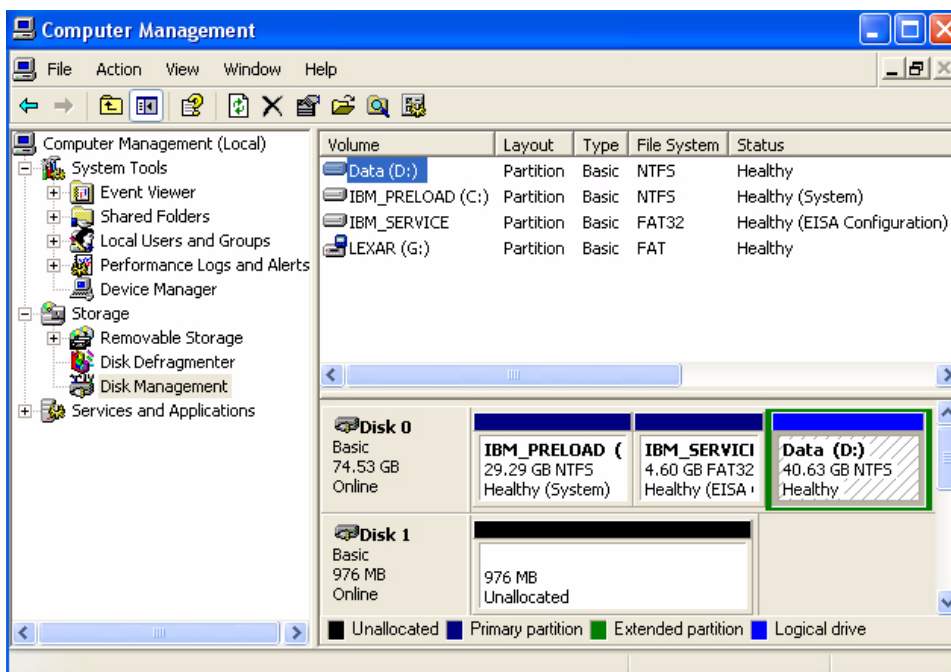


Figure 6: Connect as a Physical Drive

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2.3.3 To connect as an OS-partitioned drive:

1. Right-click on the **NANDrive** icon in the right-hand pane. See Figure 7.
2. Select **New Partition**. Follow the prompts to add a new partition. The NANDrive will now show up as a drive-lettered resource under **My Computer**.

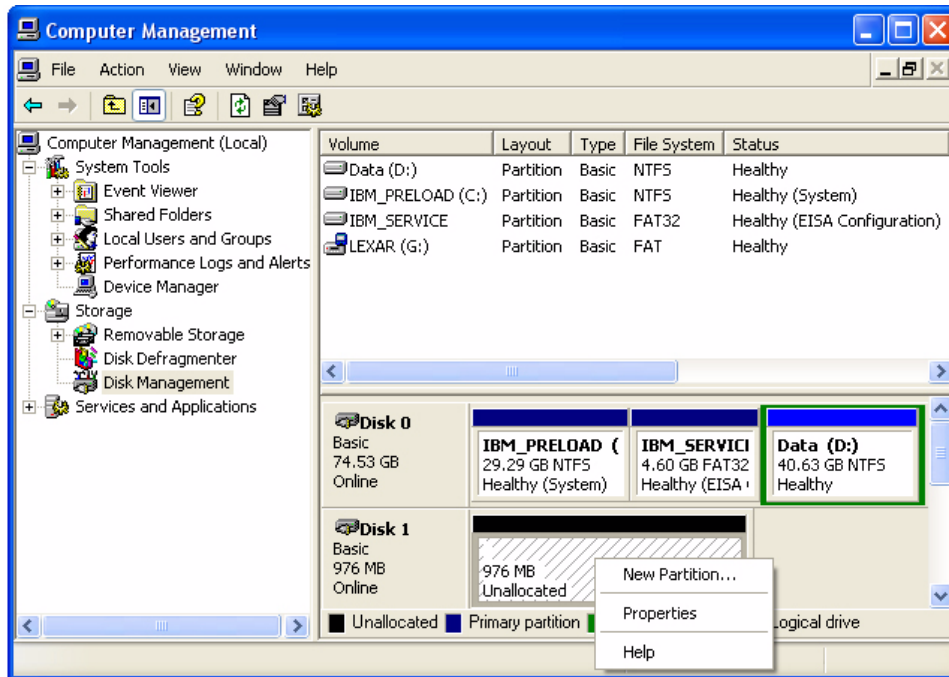


Figure 7: OS-Partitioned Drive

3. Go to **My Computer** to confirm that the NANDrive is connected in your chosen configuration.

2.3.4 To add a drive in DOS:

1. Type FDISK.exe. This will create a partition.
2. Type FORMAT.exe. This will format the new partition.

3 Schematic

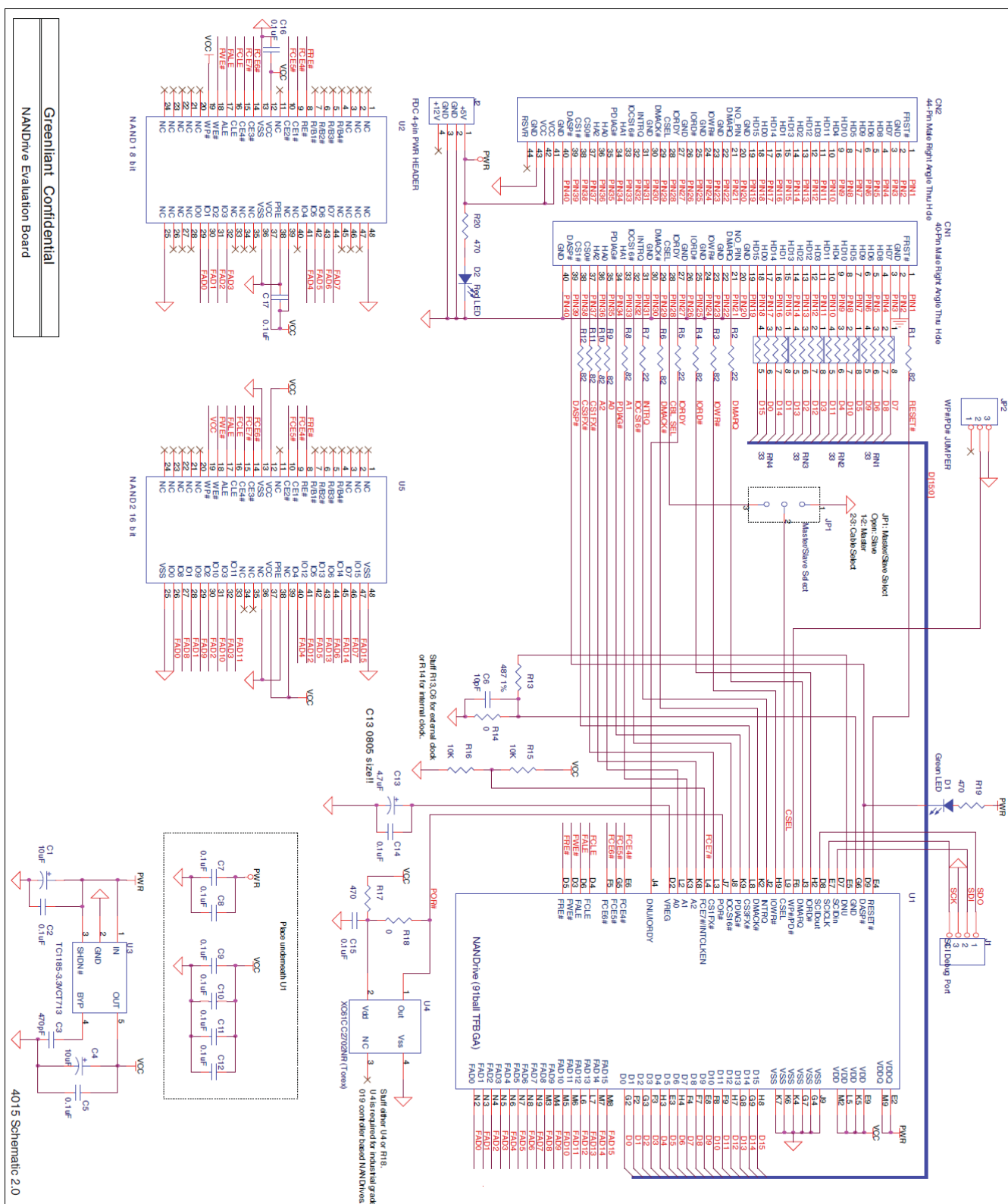


Figure 8: Evaluation Board Schematic



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