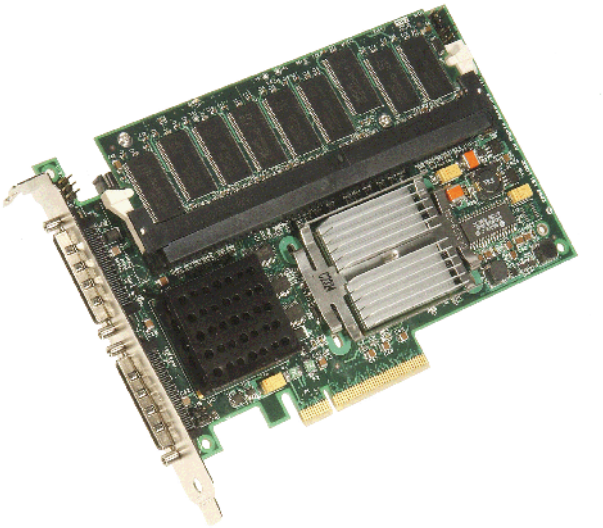
LSI Logic MegaRAID® SCSI 320-2E Controller



Thank you for purchasing the MegaRAID SCSI 320-2E Controller. Please take a few minutes to read this quick hardware setup guide before you install the MegaRAID SCSI 320-2E. If you need more information about any topic covered in this guide, refer to the other documents on your MegaRAID Universal Software Suite CD.

If the MegaRAID SCSI 320-2E Controller appears to be damaged, or if the MegaRAID Universal Software Suite CD is missing, contact LSI Logic or your MegaRAID OEM support representative.

Contents of MegaRAID Universal Software Suite CD

The MegaRAID Universal Software Suite CD is packaged with the MegaRAID SCSI 320-2E. The CD contains utility programs, device drivers for various operating systems, and the following documentation:

- *MegaRAID 320 Storage Adapters User's Guide*
- *MegaRAID Configuration Software User's Guide*
- *MegaRAID Device Driver Installation User's Guide*
- Software license agreement and warranty registration card

Technical Support

If you need help installing, configuring, or running the MegaRAID SCSI 320-2E Controller, contact LSI Logic Technical Support:

Phone Support: 678-728-1250 or 800-633-4545 #3
Web Site:
http://www.lsilogic.com/downloads/selectDownload.do
E-mail: support@lsil.com

In Europe, you can contact the LSI Logic Technical Support team:

Phone Support: +44.1344.413.441 (English) or +49.89.45833.338 (Deutsch)
E-mail: eurosupport@lsil.com

MegaRAID 320-2E Controller Installation

Caution: Make a backup of your data before you change your system configuration. Otherwise you may lose data.

Follow these steps to install the MegaRAID SCSI 320-2E. Each step is explained more fully in the following table:

Step	Action
1	Unpack the MegaRAID SCSI 320-2E.
2	Turn off the computer, remove the power cord, and remove the cover.
3	Verify the MegaRAID SCSI 320-2E jumper settings.
4	Install the MegaRAID SCSI 320-2E.
5	Connect the SCSI devices to the MegaRAID SCSI 320-2E.
6	Set the target IDs for the SCSI devices.
7	Set SCSI termination.
8	Replace the computer cover and turn the power on.
9	Run the MegaRAID BIOS Configuration Utility.
10	Install the operating system driver.

Step 1: Unpack the MegaRAID SCSI 320-2E

Unpack and install the MegaRAID SCSI 320-2E Controller in a static-free environment. Remove the MegaRAID SCSI 320-2E from the antistatic bag and inspect it for damage.

Step 2: Prepare the Computer

Turn off the computer and remove the power cord from the back of the power supply. Remove the cover from the chassis. *Make sure the computer is disconnected from the power and from any networks before installing the controller card*.

Step 3: Review the MegaRAID Controller Jumpers

Make sure the jumper settings on the MegaRAID SCSI 320-2E are correct. The jumpers are set at the factory, and you probably do not need to change them. The following table lists the jumpers and connectors on the RAID controller.

Item	Description	Type
J1	Write Pending Indicator (Dirty Cache LED)	2-pin header. Connector for enclosure LED to indicate when data in the cache has yet to be written to the device. Optional.
J2	Onboard BIOS Enable	2-pin header. No jumper = Enabled (default setting) Jumpered = Disabled
J4	I^2C Header	2-pin header. Reserved.
J5	SCSI Termination Enable Channel 0	2-pin header. Jumper pins 1–2 to enable software control of SCSI termination through drive detection. Jumper pins 2–3 to disable onboard SCSI termination. No jumper installed enables onboard SCSI termination. (Refer to J17 and J18.) This is the default.
J6	SCSI Termination Enable Channel 1	
J7	Serial Port (RS232)	3-pin connector. Connector is for diagnostic purposes. Pin 1 – RXD (Receive Data) Pin 2 – TXD (Transmit Data) Pin 3 – GND (Ground)

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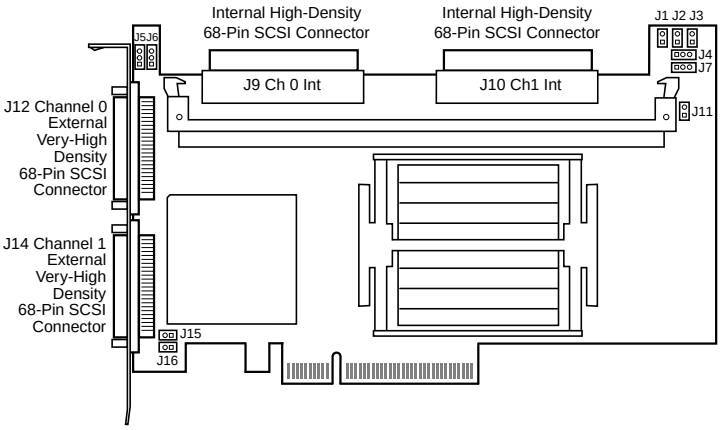
Item	Description	Type
J9	Internal SCSI Channel 0 connector	68-pin connector. Internal high-density SCSI connector. Connection is optional.
J10	Internal SCSI Channel 1 connector	68-pin connector. Internal high-density SCSI connector. Connection is optional.
J11	Mode Select	2-pin header. Reserved for internal use.
J12	External SCSI Channel 0 connector	68-pin connector. External very-high density SCSI connector. Connection is optional.
J14	External SCSI Channel 1 connector	68-pin connector. External very-high density SCSI connector. Connection is optional.
J15	Termination Power	–
J16	Termination Power	–

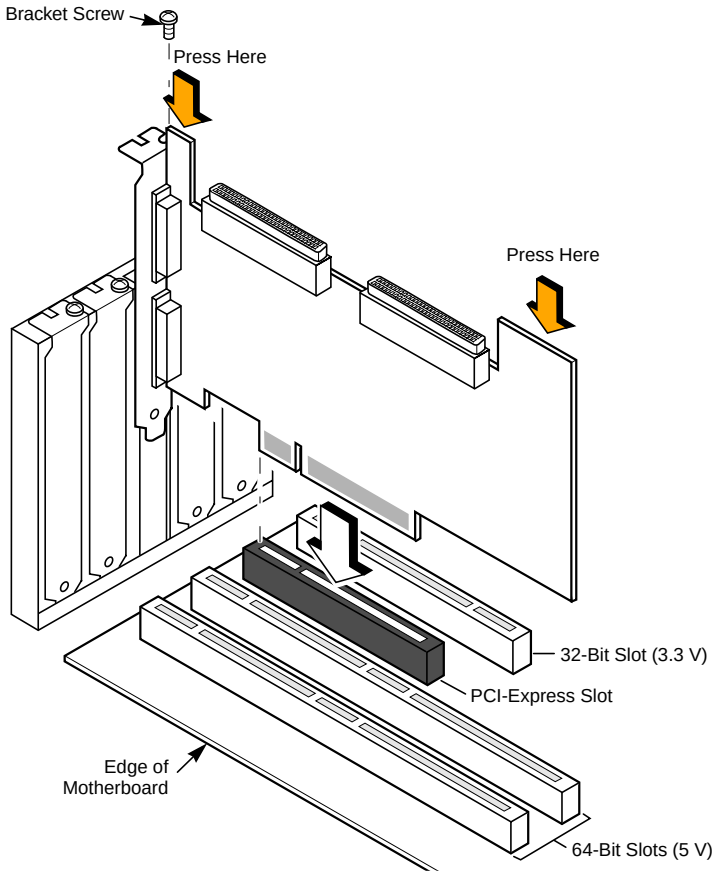
The following diagram shows the location of the jumpers and connectors on the MegaRAID SCSI 320-2E Controller.



Step 4: Install the MegaRAID SCSI 320-2E Controller

Install the MegaRAID SCSI 320-2E Controller in a PCI-Express slot, as shown in the following figure. Press down gently, but firmly, to make sure that the card is properly seated in the slot. The bottom edge of the controller card must be flush with the slot. Attach the MegaRAID SCSI 320-2E to the computer chassis with the bracket screw.

Caution: If your board has a memory module, *never* apply pressure to the module when inserting the adapter. Applying pressure could break the module.



Step 5: Connect SCSI Devices to the MegaRAID Controller

Connect SCSI devices to the internal, high-density, 68-pin SCSI connectors (J9 and J10) and/or the external, very-high density, 68-pin SCSI connectors (J12 and J14). To achieve maximum data throughput, use only Ultra320 SCSI devices. The MegaRAID SCSI 320-2E Controller supports up to 30 Ultra320 SCSI devices at a maximum SCSI bus cable length of 12 meters. You also can connect Ultra160 and Ultra2 SCSI devices. The *MegaRAID 320 Storage Adapters User's Guide* lists the maximum number of devices and maximum cable length for each SCSI device.

Disable SCSI termination on all devices that are not connected at the end of the SCSI bus. Use only high-quality ribbon SCSI cables for internal devices and high-quality round SCSI cables for external devices.

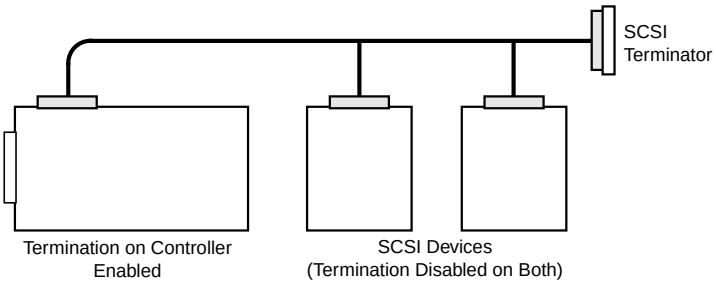
Step 6: Set the Target IDs for the SCSI Devices

Each connected SCSI device must have a unique Target ID (TID), ranging from 0 to 15 for 16-bit devices. Note that under the DOS Advanced SCSI Programming Interface, SCSI devices are limited to SCSI IDs 0–6. The MegaRAID SCSI 320-2E Controller is automatically assigned TID 7, which has the highest priority. Verify that no two SCSI devices are set to the same TID. Change the TIDs as needed. Refer to the SCSI device documentation if you are not sure how to do this.

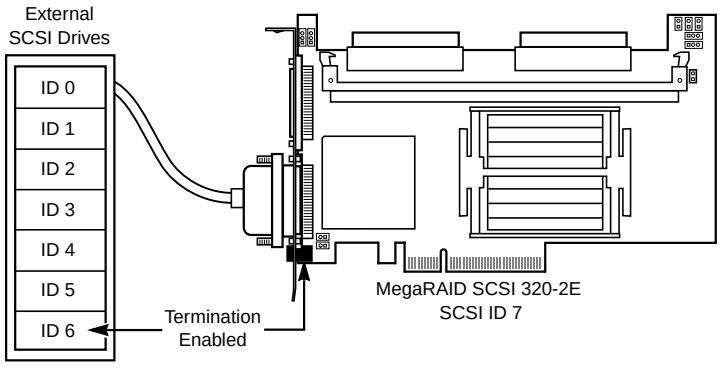
Step 7: Set SCSI Termination

The SCSI bus, which consists of connected SCSI cables and SCSI devices, is an electrical transmission line that must be terminated properly to minimize signal reflections and prevent data loss. Disk enclosures normally handle termination for the SCSI devices in the enclosure. Refer to your enclosure documentation for details.

SCSI termination must be set at each end of the SCSI bus, as shown in the following figure. In this example, only internal SCSI devices are connected to the MegaRAID SCSI 320-2E Controller. The MegaRAID SCSI 320-2E Controller automatically terminates its end of the SCSI bus only if internal and external devices are connected to the SCSI bus. It automatically disables termination if both internal and external devices are connected to the bus, because the MegaRAID SCSI 320-2E Controller is then in the middle of the bus.



For a disk array, set SCSI bus termination so that removing or adding a SCSI device does not disturb termination. To do this, connect the MegaRAID SCSI 320-2E Controller to one end of the SCSI cable and connect a SCSI terminator module at the other end of the cable. Attach SCSI devices to the connectors between the two ends, and disable termination on them. The following figure shows an external drive enclosure with seven SCSI drives. Termination is enabled at the end of the cable closest to the "last" SCSI drive, which is assigned SCSI ID6.



Step 8: Power-Up the Computer

Replace the computer cover and connect the power cords to all SCSI devices and to the computer. Turn on the power to all devices. Be sure the SCSI devices are powered up before the computer or at the same time as the computer. Otherwise, the computer may not recognize the SCSI devices.

Observe the messages that appear during the boot process, until you see the message:

```
Press <Ctrl><M> to run MegaRAID SCSI 320-2E BIOS Configuration
Utility
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Step 9: Run the MegaRAID BIOS Configuration Utility

When the "`Press <Ctrl><M>`" message appears on the screen, press <Ctrl><M> immediately to run the MegaRAID BIOS Configuration Utility. Refer to the *MegaRAID Configuration Software User's Guide* on the MegaRAID Universal Software Suite CD for details on how to run and use this program.

Step 10: Install the Operating System Driver

The MegaRAID SCSI 320-2E can operate under MS-DOS or any DOS-compatible operating system using the standard AT BIOS INT 13h Hard Disk Drive interface. To operate with other operating systems, you must install software drivers.

The MegaRAID Universal Software Suite CD includes drivers for the supported operating systems. You can view the supported operating systems and download the latest drivers for RAID adapters on the LSI Logic web site at http://www.lsilogic.com/downloads/selectDownload.do.

Access the download center and follow the steps to download the driver.

Refer to the *MegaRAID Device Driver Installation User's Guide* on the MegaRAID Universal Software Suite CD for details on installing the driver. Be sure to use the latest Service Packs provided by the operating system manufacturer and review the readme file that accompanies the driver.

Supported RAID Levels

The MegaRAID SCSI 320-2E Controller supports disk arrays using the following RAID levels:

- **RAID 0 (Data striping):** Data is striped across all disks in the array, enabling very fast data throughput. There is no data redundancy. All data is lost if any disk fails. (1–30 disk drives)
- **RAID 1 (Disk mirroring):** Data is written simultaneously to two disks, providing complete data redundancy if one disk fails. The array capacity is one-half of total disk space. (2 disk drives)
- **RAID 5 (Disk striping with distributed parity):** Data is striped across all disks in the array. Part of the capacity of each disk stores parity information that reconstructs data if a disk fails. Provides good data throughput for applications with high read request rates. (3–30 disk drives)
- **RAID 10 (RAID 1 and RAID 0 in spanned arrays):** Uses mirrored pairs of disks to provide complete data redundancy. Provides high data throughput rates. (4–28 disk drives)
- **RAID 50 (RAID 5 and RAID 0 in spanned arrays):** Uses both parity and disk striping across multiple disks to provide complete data redundancy. Provides high data throughput rates. (6–30 disk drives)

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You can find a list of the LSI Logic Corporation U.S. distributors, international distributors, sales offices, and design resource centers on the LSI Logic web site at:

http://www.lsilogic.com/contacts/index.html