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Doc. #: 1539-V2-01-0



GSI VESA EXTENDER MODULE

Installation Instructions For

1645-V1 and 1645-V2 VESA Extender Modules



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Doc. #: 1539-V2-01-0

IMPORTANT - READ THIS FIRST
Installation and Support of your GSI Product

Thank you for purchasing a GSI controller. GSI is constantly striving to make our products easy and quick to install. Due to the vast variations in motherboards, disk drives and operating systems it is impossible to test every combination, thus every installation is unique. Please take the time to read the **Installation Section (Page 2)** and **Basic Troubleshooting Section (Page 37)** carefully - before calling for technical support.

After reading the installation and basic troubleshooting sections, if you are still having problems with installation, please follow the below steps:

1. Have your serial number ready. **The serial number is a six digit number located on the back of the board- YOU WILL NEED THIS NUMBER, SO WRITE IT DOWN ON PAGE 37!** The part number (1645-VX-XX-X) is **NOT** the serial number.

2. Please fill in as much information on page 37 as possible and after doing so, call GSI support at 714-261-9744.

GSI requires the above two steps to be completed to provide accurate technical support in a timely manner. **Remember, without the GSI serial number, GSI cannot provide technical support!**

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This manual is applicable to all revisions of the GSI VESA Extender Modules and GSI-ISA BIOS versions 4.0A and later.

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The following section summaries will help you identify the sections you need to read. However, for best results we recommend that you read the entire manual before installing and using the GSI VESA Extender Modules.

Conventions Used

This section explains both text and graphics usage in this manual.

Product Overview

Explains the features and functions of the VESA Extender Modules.

Configuration Director <<START HERE>>

This chart points to the proper installation section in this manual for the GSI-ISA controller you have. **Start here to find the correct installation section in this manual.**

Install Options

There are various installation options, one for each possible combination of GSI-ISA and VESA adapters. Each is intended to provide a quick reference for installation and using the GSI VESA Extenders.

Appendices

The Appendices in this manual further explain items quickly referenced in the Installation Options.

Appendix C — Basic Troubleshooting

This important section provides basic troubleshooting should you experience difficulties during the installation process.

Installation Notes

During installation, you should take down specific notes regarding the GSI VESA Extender and your system. These notes will help should you need to troubleshoot your installation.

This section explains both text and graphics usage in this manual.

Bold Type

Bold Type usually indicates a section heading. If bold type is used outside a heading, it is used to highlight a term of importance.

Courier Type

Courier Type is used to show responses from the computer, or commands to the computer.

Graphics

A few graphics are used to call attention to items:



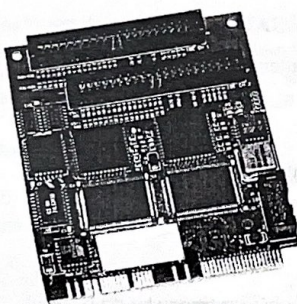
Indicates a special note on a related subject.



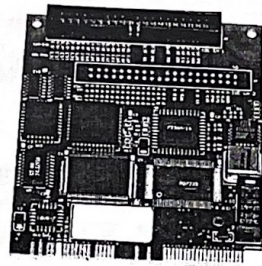
Indicates an area where caution should be used.



Indicates where damage could occur.



1645-V2 VESA
Extender Module



1645-V1 VESA
Extender Module

PRODUCT OVERVIEW

The GSI 1645-V1 and 1645-V2 VESA Extender Modules eliminate the ISA-bus performance limitation by providing full PIO Mode 3 and PIO Mode 4 data transfers. The GSI VESA Modules simply extend any GSI-ISA Accelerator board to the VESA local bus. Using the VESA local bus with new Enhanced IDE and Fast ATA (or Fast ATA-2) hard drives, the VESA Modules can allow these drives to achieve their maximum data transfer rates. Using an advanced engineering process the GSI VESA Modules have the unique ability to Mix & Match various Modes of drives without performance loss! GSI VESA Modules can run Mode 4 drives on the same cable as Mode 1 drives while maximizing the performance of each!

GSI 1645-V1 VESA Extender Module Features:

- 32-bit VESA Compliant with new Enhanced IDE and Fast ATA(2) standards
- Provides full PIO Mode 3 (11.1MB/s) & Mode 4 (16.6MB/s) performance with I/O Channel Ready
- Simply extends any GSI-ISA Accelerator Board to the VESA Local bus
- Supports DMA Multiword Modes 1 & 2
- Mix & Match older Mode 0,1 or 2 drives with new Mode 3 or 4 drives on the same cable — with no data transfer loss!
- Onboard Flash BIOS provides quick, easy installation, but takes NO memory addressing (GSI *ghost* BIOS technology)!
- No device drivers required for any operating system or software (totally transparent to the O/S!)
- Compatible with DOS, Windows®95, Windows® 3.x, Windows® for Workgroups, Windows NT™, OS/2 and Novell networks
- Designed, manufactured & tested in the USA
- Requires VESA motherboard

GSI 1645-V2 VESA Extender Module Features:

- Same high performance and easy installation features as 1645-V1 VESA Module
- Supports four (4) IDE drives on two (2) IDE channels (GSI-IDE channels)

The VESA Extenders require no special drivers or system CMOS support to accelerate data transfer rates. The only requirement is that they are used in conjunction with a GSI-ISA Accelerator Board. Installation should be simple and quick!

STOP! Remember to note YOUR SERIAL NUMBER from your VESA Extender Module BEFORE INSTALLING IT for use in registering your GSI product (using the Product Registration Card) and FOR TECHNICAL SUPPORT! Write this number in the Installation Notes section of this manual.

CONFIGURATION DIRECTOR <<START HERE>>

There are many possible combinations of GSI-ISA and VESA controllers. This section should be the **STARTING POINT** to installing your VESA Extender for the GSI-ISA controller(s) you have. The section will determine how you will install the VESA Extender and which of the components included with the VESA Extender you will need to use.

What is "VESA-Ready"?

GSI-ISA controllers that are "VESA-Ready" have a J1 Local Bus I/O Option connector for direct connection to the GSI VESA Extender. If you have a Pre-"VESA-Ready" GSI-ISA controller, you will need to use the GSI Legacy Adapter. This adapter is included with the GSI VESA Extenders and has the GSI PCB Part Number 1691-PC-02-4. Two GSI Legacy Adapters are included with the 1645-V2 Module.

STEP ONE: Is your GSI-ISA Controller "VESA-Ready"?

First find the correct Part Number of GSI-ISA controller(s) you have. The Part Number is located on a label on the controller (example, PN: 1533-21-09-1). You must also know what Mode the GSI controller is running in (primary, secondary, tertiary or quaternary). This may be confirmed by reading the GSI banner during the boot process.

GSI-ISA Controller Part Number	Controller is VESA-Ready?	Legacy Adapter Board Req'd?
1533-18-06-1 or later	Yes	No
1533-18-05-4 or earlier	No	Yes
1533-21-09-1 or later	Yes	No
1533-21-07-5 or earlier	No	Yes
1533-32-02-9	No	Yes
1533-4C-01-0	See Special Install Option 7	

Now that you have determined if the controller(s) you are using is VESA-Ready, move on to STEP TWO.



NOTE: For the GSI Model 4C, skip to Special Install Section 7.

CONFIGURATION DIRECTOR (CONT.)

STEP TWO: What is your system configuration?

There are seven possible configurations using the GSI-ISA controllers with VESA Extenders. Find your configuration from the tables below and go to the Install Option designated for that configuration:

ONE GSI-ISA Controller, using the 1645-V1 VESA Extender:

Controller is	Running in	Install using	Go to Page
VESA-Ready	Either Mode	Option #1	4
Pre-VESA-Ready	Either Mode	Option #2	7

TWO GSI-ISA Controllers, using the 1645-V2 VESA Extender:

Controllers are	Install using	Go to Page
Both are VESA-Ready	Option #3	11
Both are Pre-VESA-Ready	Option #4	14
Mixed - Pre-VESA Ready as Primary, VESA-Ready running as Secondary	Option #5	18
Mixed - VESA Ready as Primary, Pre-VESA-Ready running as Secondary	Option #6	22



Although no data loss is to be expected, it is always wise to make a backup of your hard drive before making any hardware change.

Once you have found the appropriate Install Option for your system configuration using the above charts, **move on to that section in the manual** and continue the installation process.

1.0 INSTALL OPTION #1 (CONT.)

(6) System CMOS Setup — NO CHANGES

NO SYSTEM CMOS changes are required.

(7) GSI-ISA Flash BIOS VESA-Support Check

Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. **If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 9.**

(8) GSI-ISA Flash BIOS Update Procedure

To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the **SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready** and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. **If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the VESA Extender's Serial Number is located on a bar-code label on the back side of the board!**

(9) Complete the boot-up sequence — watch for GSI Banner

The GSI VESA Extender's *ghost* BIOS will **configure itself for the installed IDE drives**, reading their parameters and saving them in the GSI-ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.

(10) Test each hard, tape and/or CD-ROM drive for proper operation

(11) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing

Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.

Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #1

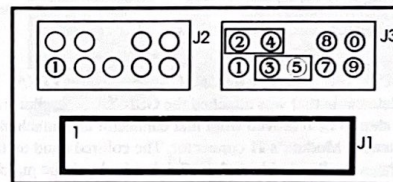
2.0 INSTALL OPTION #2

This installation option is for installing the GSI VESA Extender (1645-V1) with a GSI-ISA controller that is **not VESA-Ready**. The controller can be running in either **primary** or **secondary** mode.

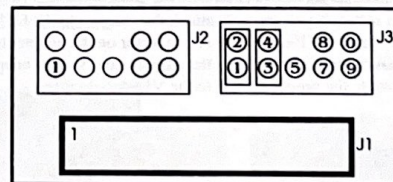
Setting Primary or Secondary Mode on Option Adapter Board

For this install option, you will need to use the GSI Legacy Adapter (marked 1691-PC-02-4 on the board). There are three connectors on this board. The connector marked **J3** is used as a jumper block to select Primary or Secondary Mode (the mode of operation that the GSI-ISA controller is running).

For a GSI-ISA controller running in **Primary Mode**, set the J3 jumpers on the GSI Legacy Adapter as follows:



For a GSI-ISA controller running in **Secondary Mode**, set the J3 jumpers on the GSI Legacy Adapter as follows:



Now that the jumpers have been properly set on the GSI Legacy Adapter, you can begin the installation process.

2.0 INSTALL OPTION #2 (CONT.)

(1) Before Turning System OFF, Make Sure Shadowing is OFF

Before you power down the system, exit all software and go to the DOS prompt. When you installed the GSI-ISA controller board, that board's manual advised you to use either the system CMOS or a memory manager to shadow the GSI BIOS region (for more on shadowing, refer to that manual). If you were using the system CMOS to shadow the GSI-ISA board, you must disable or turn off that shadowing at this time. Just re-boot the system and go into the Advanced System CMOS Setup and make sure that the GSI-ISA board's BIOS region is NOT being shadowed. Once you have confirmed this, power down the system and remove the system cover.



CAUTION! Let disk drives stop before working on the computer. All electronic equipment is sensitive to **static electricity** at levels far below those that humans notice. Take care to **touch the metal case parts before** touching the electronics.

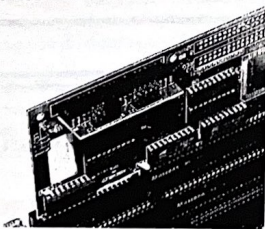
(2) Move the IDE Data Cable from the GSI-ISA to the VESA

The IDE data cable that was attached the GSI-ISA controller's J6 IDE connector should be removed from that connector and attached to the VESA Extender Module's J1 connector. The colored band on the cable edge indicates the Pin-1 side and the Pin-1 side should be matched to the Pin-1 on the VESA Extender (marked with an arrow on the black shrouded header). The HARD drive, TAPE drive or CD-ROM drive jumper settings and cable position **DO NOT CHANGE**.

(3) Attach the GSI Legacy Adapter to GSI-ISA Controller

Once you have set the jumpers on the GSI Legacy Adapter (as per the first part of this section), you can now attach that adapter to the GSI-ISA controller. Match the Pin-1 of the J1 connector on the adapter to Pin-1 of the GSI-ISA controller and attach the adapter snugly. This adapter is needed to route the proper signals to the VESA Extender.

Figure 2.1
Attaching the GSI
Legacy Adapter



(4) Connect the GSI-ISA controller to the VESA Extender

Once the GSI Legacy Adapter is attached, you can now use the ISA-to-VESA attachment cable (GSI Part Number: 1718-10-06-4) to connect the two controllers. Connect one end to the J2 connector on the GSI Legacy Adapter (matching the Pin-1 designators) and the other end to the VESA Extender's J1 connector.

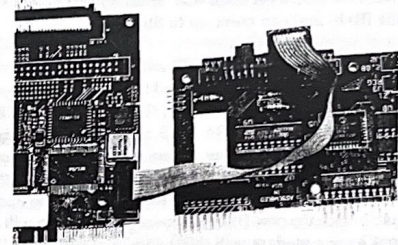


Figure 2.2
Attaching the VESA Extender to the ISA Controller

(5) Install the GSI VESA Extender Module

Find the GSI-ISA controller board in your system. It should be installed in a 16-bit ISA slot or the 16-bit portion of a VESA local bus slot. Install the GSI VESA Extender Module into an open VESA bus connector. The VESA Extender can be in the same physical slot as the GSI-ISA board or in any open VESA connector.

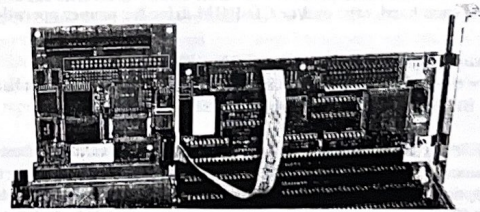


Figure 2.3
GSI-ISA & VESA Controllers sharing the VESA bus slot

2.0 INSTALL OPTION #2 (CONT.)

- (6) Once cables are all attached, close the case and Power ON.
- (7) System CMOS Setup — NO CHANGES
- (8) GSI-ISA Flash BIOS VESA-Support Check
Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 10.
- (9) GSI-ISA Flash BIOS Update Procedure
To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the VESA Extender's Serial Number is located on a barcode label on the back side of the board!
- (10) Complete the boot-up sequence — watch for GSI Banner
The GSI VESA Extender's *ghost* BIOS will configure itself for the installed IDE drives, reading their parameters and saving them in the GSI-ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.
- (11) Test each hard, tape and/or CD-ROM drive for proper operation
- (12) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing
Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.

Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #2

3.0 INSTALL OPTION #3

This installation option is for installing the dual channel GSI VESA Extender (1645-V2) with two GSI-ISA controllers that are both VESA-Ready.

For this installation option we will use the example: a GSI Model 21 (VESA-Ready, running in *primary* mode) and a GSI Model 18 (VESA-Ready, running in *secondary* mode). This setup requires two bus slots: one VESA and one ISA. The Model 21 should be in the VESA slot and the Model 18 in the ISA slot. The VESA Extender will be installed into the 32-bit portion of the VESA bus slot.

The special GSI Legacy Adapter is *not needed* for this configuration. The cable used for connection in this option has the GSI Part Number 1718-10-26-7 and has three connectors (two are black and one is gray).

- (1) Before Turning System OFF, Make Sure Shadowing is OFF
Before you power down the system, exit all software and go to the DOS prompt. When you installed the GSI-ISA controller board, that board's manual advised you to use either the system CMOS or a memory manager to shadow the GSI BIOS region (for more on shadowing, refer to that manual). If you were using the system CMOS to shadow the GSI-ISA board, you must disable or turn off that shadowing at this time. Just re-boot the system and go into the Advanced System CMOS Setup and make sure that the GSI-ISA board's BIOS region is NOT being shadowed. Once you have confirmed this, power down the system and remove the system cover.



CAUTION! Let disk drives stop before working on the computer. All electronic equipment is sensitive to **static electricity** at levels far below those that humans notice. Take care to **touch the metal case parts before** touching the electronics.

- (2) Move the IDE Data Cables from the GSI-ISA boards to the VESA
The IDE data cables that were attached the GSI-ISA controller's J6 IDE connectors should be removed from those connectors and attached to the VESA Extender Module's J6 and J7 connectors. On the VESA Extender, the J6 connector represents the first channel (primary IDE controller) and J7 represents the second IDE channel.

The colored band on the cable edge indicates the Pin-1 side and the Pin-1 side should be matched to the Pin-1 on the VESA Extender (marked with an arrow on the black shrouded header). You should leave the other end of the cable attached "as is" to the drives. **The HARD, TAPE or CD-ROM drive JUMPER SETTINGS and cable position DO NOT CHANGE.**

3.0 INSTALL OPTION #3 (CONT.)

(3) Connect the GSI-ISA controllers to the VESA Extender

Use the ISA-to-VESA attachment cable (GSI Part Number: 1718-10-26-7) to connect the two GSI-ISA controllers to the 1645-V2 VESA Extender. There are three connectors on the attachment cable. The end connector (colored **black**) should be connected to the VESA Extender's J1 10-pin connector. The middle connector (also colored **black**) connects to the GSI-ISA controller running in PRIMARY mode. The end connector (colored **gray**) connects to the GSI-ISA controller running in SECONDARY mode. The connectors are *keyed*, meaning they should only fit one way.

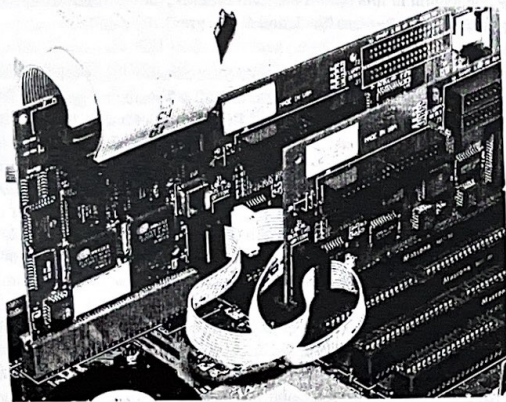


Figure 3.1
Attaching the VESA Extender to the GSI-ISA controllers

(4) Install the GSI VESA Extender Module

As mentioned earlier, one GSI-ISA controller should be installed in a VESA bus slot and the other in an ISA bus slot (preferably the closest one). Install the GSI VESA Extender Module into the VESA connector in the same bus slot as one of the GSI-ISA controllers. Make sure to keep the cables connected.

(5) Once cables are all attached, close the case and Power ON

(6) System CMOS Setup — NO CHANGES

Do **not** go into the system CMOS and make changes.

3.0 INSTALL OPTION #3 (CONT.)

(7) GSI-ISA Flash BIOS VESA-Support Check

Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 9.

(8) GSI-ISA Flash BIOS Update Procedure

To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the VESA Extender's Serial Number is located on a bar-code label on the back side of the board!

(9) Complete the boot-up sequence — watch for GSI Banner

The GSI VESA Extender's *ghost* BIOS will configure itself for the installed IDE drives, reading their parameters and saving them in the ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.

(10) Test each hard, tape and/or CD-ROM drive for proper operation

(11) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing

Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.

Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #3

4.0 INSTALL OPTION #4

This installation option is for installing the dual channel GSI VESA Extender (1645-V2) with two GSI-ISA controllers that are both *Pre-VESA-Ready*.

For this installation option we will use the example: a GSI Model 21 (Pre-VESA-Ready, running in *primary* mode) and a GSI Model 18 (Pre-VESA-Ready, running in *secondary* mode). This setup requires two bus slots: one VESA and one ISA. The Model 21 should be in the VESA slot and the GSI Model 18 in the ISA slot. The VESA Extender will be installed into the 32-bit portion of the VESA bus slot.

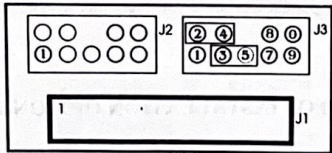
The special GSI Legacy Adapter is *needed* for this configuration, one for EACH Pre-VESA-Ready GSI-ISA controller.

Configuring the GSI Legacy Adapter boards- IMPORTANT!!!

For this install option, you will need to use the two GSI Legacy Adapter boards (marked 1691-PC-02-X on the board), included with the 1645-V2 VESA Extender Module. There are three connectors on the GSI Legacy Adapter, labeled J1, J2 and J3. Connector J1 (on each GSI Legacy Adapter) connects to the ISA board's (i.e. GSI Model 18 & Model 21) IDE connector (where the data cable *used* to be connected). For connectors J2 and J3, read below.

Use the first GSI Legacy Adapter board ("Adapter A" for this example) on the GSI-ISA controller running in *Primary Mode*. On Adapter A, connector J2 is used to connect to the VESA Extender Module's J1 connector. Connector J3 connects to the GSI-ISA controller running in secondary mode. This controller will also have a GSI Legacy adapter ("Adapter B" for this example). Connector J3 on Adapter A will connect to Adapter B's J2 connector. It is very important to match the Pin-1 marking on the cable (the side with the red coloring) to the Pin-1 marking on each board.

Attach the other GSI Legacy Adapter (Adapter B) to the GSI-ISA controller running in *Secondary Mode*. The connector J2 on this board will connect to the Adapter A connected to the primary controller. Connector J3 is used as a jumper block, configure Adapter B as follows:



4.0 INSTALL OPTION #4 (CONT.)

Once you have the GSI Legacy Adapters configured for each GSI-ISA controller, you can begin the installation process.

(1) Before Turning System OFF, Make Sure Shadowing is OFF

Before you power down the system, exit all software and go to the DOS prompt. When you installed the GSI-ISA controller board, that board's manual advised you to use either the system CMOS or a memory manager to shadow the GSI BIOS region (for more on shadowing, refer to that manual). If you were using the system CMOS to shadow the GSI-ISA board, you must disable or turn off that shadowing at this time. Just re-boot the system and go into the Advanced System CMOS Setup and make sure that the GSI-ISA board's BIOS region is NOT being shadowed. Once you have confirmed this, power down the system and remove the system cover.



CAUTION! Let disk drives stop before working on the computer. All electronic equipment is sensitive to **static electricity** at levels far below those that humans notice. Take care to **touch the metal case parts before** touching the electronics.

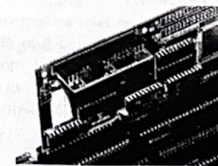
(2) Move the IDE Data Cables from GSI-ISA to VESA

The IDE data cables that were attached to both GSI-ISA controller's J6 IDE connectors should be removed from those connectors and attached to the VESA Extender Module's connectors (J6 for primary IDE, J7 for secondary IDE). The colored band on the cable edge indicates the Pin-1 side and the Pin-1 side should be matched to the Pin-1 on the VESA Extender (marked with an arrow on the black shrouded header). The HARD, TAPE or CD-ROM drive **jumper settings** and cable position **DO NOT CHANGE**.

(3) Attach GSI Legacy Adapters to GSI-ISA Controllers

After you have set the jumpers on the GSI Legacy Adapters for each GSI-ISA controller (as per the first part of this section), you can now attach that adapter to the GSI-ISA controllers. Match the Pin-1 of the J1 connector on the adapters to Pin-1 of the GSI-ISA controllers and attach the adapters snugly. The adapters are needed to route the proper signals to the VESA Extender.

Figure 4.1
Attaching the GSI
Legacy Adapter



4.0 INSTALL OPTION #4 (CONT.)

(4) Connect the GSI-ISA controllers to each other and to the VESA Extender

Once the GSI Legacy Adapters are attached, you can now use the ISA-to-VESA attachment cables (GSI PN:1718-10-26-7 and PN:1718-10-06-4) to connect the three boards. First, using cable PN:1718-10-26-7, connect the black connector on the end to the VESA Extender Module (connector J1). Connect the black connector in the middle to the controller running in primary mode (or it's Adapter A board's J2). The *gray* connector on the *end* is NOT USED.

Next, using cable PN:1718-10-06-4, connect one end to the to the GSI-ISA controller in secondary mode (or it's Adapter B's J2 connector) and the other end to the primary GSI-ISA controller (or it's Adapter A's J3). Make sure all Pin-1 markings are aligned. The following diagram further shows how the boards and cabling are configured:

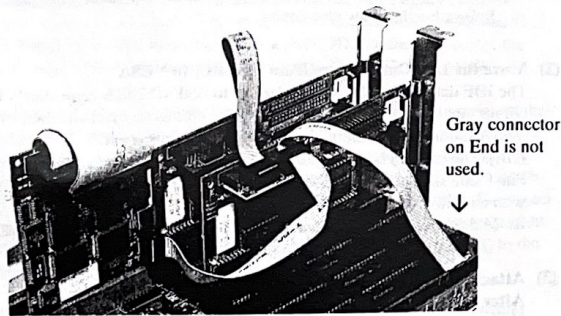


Figure 4.2

1645-V2 with Two GSI Pre-VESA-Ready ISA controllers

(5) Install the GSI VESA Extender Module

One of the GSI-ISA controllers in your system should be installed in a 16-bit ISA slot or the 16-bit portion of a VESA local bus slot. If one is not in the 16-bit portion of the VESA local bus slot, move one of the GSI-ISA controllers to an open VESA slot and install it in the 16-bit portion of that slot. Install the GSI VESA Extender Module into the VESA connector in *that same bus slot*. Make sure to keep the cables connected.

4.0 INSTALL OPTION #4 (CONT.)

(6) GSI-ISA Flash BIOS VESA-Support Check

Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. **If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 8.**

(7) GSI-ISA Flash BIOS Update Procedure

To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the **SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready** and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. **If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the VESA Extender's Serial Number is located on a bar-code label on the back side of the board!**

(8) Complete the boot-up sequence — watch for GSI Banner

The GSI VESA Extender's *ghost* BIOS will configure itself for the installed IDE drives, reading their parameters and saving them in the GSI-ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.

(9) Test each hard, tape and/or CD-ROM drive for proper operation

(10) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing

Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.

Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #4

5.0 INSTALL OPTION #5

This installation option is for installing the dual channel GSI VESA Extender (1645-V2) with two GSI-ISA controllers: one that is *Pre-VESA-Ready* running in *primary mode* and the other is *VESA-Ready* running in *secondary mode*.

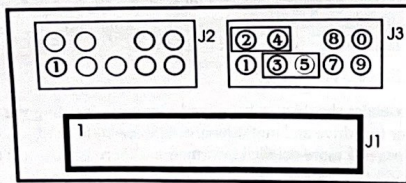
For this installation option we will use the example: a GSI Model 21 (*Pre-VESA-Ready*, running in *primary mode*) and a GSI Model 18 (*VESA-Ready*, running in *secondary mode*). This setup requires two bus slots: one VESA and one ISA. The Model 21 should be in the VESA slot and the Model 18 in the ISA slot. The VESA Extender will be installed into the 32-bit portion of the VESA bus slot.

The special GSI Legacy Adapter is *needed* for this configuration, for the Pre-VESA-Ready GSI-ISA controller.

Configuring the GSI Legacy Adapter Board - IMPORTANT!!!

For this install option, you will need to use **one** GSI Legacy Adapter Board (marked 1691-PC-02-X on the board), that is included with the 1645-V2 VESA Extender Module. There are three connectors on the GSI Legacy Adapter, labeled J1, J2 and J3. Connector J1 connects to the Pre-VESA-Ready, ISA board's (Model 21 in this example) IDE connector (where the data cable *used* to be connected). For connectors J2 and J3, read below.

Use the GSI Legacy Adapter on the GSI-ISA controller running in **Primary Mode**. Connector J2 is used to connect to the **VESA Extender Module's J1** connector and the VESA-Ready controller running in secondary mode. More on how to cable that will follow. For now, connector J3 is used as a jumper block and should be configured as follows:



Once you have the GSI Legacy Adapter configured, you can begin the installation process.

5.0 INSTALL OPTION #5 (CONT.)

(1) Before Turning System OFF, Make Sure Shadowing is OFF

Before you power down the system, exit all software and go to the DOS prompt. When you installed the GSI-ISA controller board, that board's manual advised you to use either the system CMOS or a memory manager to shadow the GSI BIOS region (for more on shadowing, refer to that manual). If you were using the system CMOS to shadow the GSI-ISA board, you must disable or turn off that shadowing at this time. Just re-boot the system and go into the Advanced System CMOS Setup and make sure that the GSI-ISA board's BIOS region is **NOT** being shadowed. Once you have confirmed this, power down the system and remove the system cover.



CAUTION! Let disk drives stop before working on the computer. All electronic equipment is sensitive to **static electricity** at levels far below those that humans notice. Take care to **touch the metal case parts before** touching the electronics.

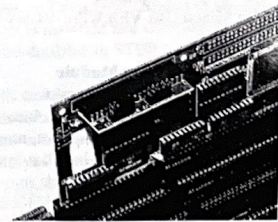
(2) Move the IDE Data Cables from GSI-ISA to VESA

The IDE data cables that were attached to both GSI-ISA controller's J6 IDE connectors should be removed from those connectors and attached to the VESA Extender Module's connectors (**J6** for primary IDE, **J7** for secondary IDE). The colored band on the cable edge indicates the Pin-1 side and the Pin-1 side should be matched to the Pin-1 on the VESA Extender (marked with an arrow on the black shrouded header). The hard, tape or CD-ROM drive jumper settings and cable position do **NOT CHANGE**.

(3) Attach GSI Legacy Adapter to GSI-ISA Controller

Once you have set the jumpers on the GSI Legacy Adapter for the *Pre-VESA-Ready* controller (as per the first part of this section), you can now attach that adapter to the GSI-ISA controller. Match the Pin-1 of the J1 connector on the adapters to Pin-1 of the GSI-ISA controllers and attach the adapters snugly. The adapter is needed to route the proper signals to the VESA Extender.

Figure 5.1
Attaching GSI
Legacy Adapter



5.0 INSTALL OPTION #5 (CONT.)

(4) Connect the GSI-ISA controllers to each other and to the VESA Extender

Once the GSI Legacy Adapter is attached, you can now use the GSI-ISA to VESA attachment cable (GSI PN: 1718-10-26-7) to connect the three boards. The **black connector on the end** attaches to the VESA Extender module's J1 connector. The **black connector in the middle** connects to the GSI controller running in primary mode on its GSI Legacy Adapter's J2 and the **gray connector on the end** connects to the GSI controller in secondary mode on its GSI Legacy Adapter's J1 connector. Make sure all Pin-1 markings are aligned. Pin-1 on the VESA Extender is marked with an arrow on the black shrouded header.

The following diagram further shows how the boards and cabling are configured.

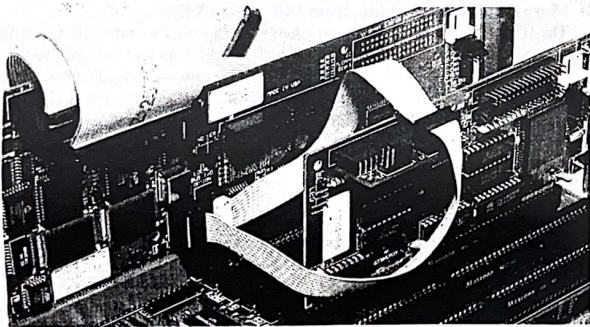


Figure 5.2

1645-V2 with Mixed GSI VESA/Pre-VESA-Ready Controllers

(5) Install the GSI VESA Extender Module

One of the GSI-ISA controllers in your system should be installed in a 16-bit ISA slot or the 16-bit portion of a VESA local bus slot. If one is not in the 16-bit portion of the VESA local bus slot, move one of the GSI-ISA controllers to an open VESA slot and install it in the 16-bit portion of that slot. Install the GSI VESA Extender Module into the VESA connector in that same bus slot. Make sure to keep the cables connected.

5.0 INSTALL OPTION #5 (CONT.)

(6) Once cables are all attached, close the case and Power ON

(7) System CMOS Setup — NO CHANGES

(8) GSI-ISA Flash BIOS VESA-Support Check

Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 10.

(9) GSI-ISA Flash BIOS Update Procedure

To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the VESA Extender's Serial Number is located on a bar-code label on the back side of the board!

(10) Complete the boot-up sequence — watch for GSI Banner

The GSI VESA Extender's *ghost* BIOS will configure itself for the installed IDE drives, reading their parameters and saving them in the GSI-ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.

(11) Test each hard, tape and/or CD-ROM drive for proper operation

(12) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing

Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.

Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #5

6.0 INSTALL OPTION #6

This installation option is for installing the dual channel GSI VESA Extender (1645-V2) with two GSI-ISA controllers: one that is *VESA-Ready* AND running in *primary mode* and the other is *Pre-VESA-Ready* running in *secondary mode*.

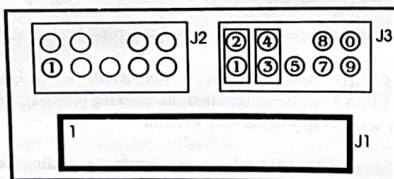
For this installation option we will use the example: a GSI Model 21 (*VESA-Ready*, running in *primary mode*) and a GSI Model 18 (*Pre-VESA-Ready*, running in *secondary mode*). This setup requires two bus slots: one VESA and one ISA. The Model 21 should be in the VESA slot and the Model 18 in the ISA slot. The VESA Extender will be installed into the 32-bit portion of the VESA bus slot.

The special GSI Legacy Adapter is *needed* for this configuration for the *Pre-VESA-Ready* GSI-ISA controller.

Configuring the GSI Legacy Adapter Board - IMPORTANT!!!

For this install option, you will need to use one GSI Legacy Adapter (marked 1691-PC-02-X on the board), included with the 1645-V2 VESA Extender Module. There are three connectors on the GSI Legacy Adapter: labeled J1, J2 and J3. Connector J1 connects to the *Pre-VESA-Ready*, GSI-ISA board's (Model 18 in this example) IDE connector (where the data cable used to be connected). For connectors J2 and J3, read below.

Use the GSI Legacy Adapter on the *Pre-VESA-Ready* GSI-ISA controller running in *Secondary Mode*. Connector J2 is used to connect to the VESA-Ready controller running in primary mode. More on how to cable that will follow. For now, connector J3 is used as a jumper block and should be configured as follows:



Once you have the GSI Legacy Adapter configured, you can begin the installation process.

6.0 INSTALL OPTION #6 (CONT.)

(1) Before Turning System OFF, Make Sure Shadowing is OFF

Before you power down the system, exit all software and go to the DOS prompt. When you installed the GSI-ISA controller board, that board's manual advised you to use either the system CMOS or a memory manager to shadow the GSI BIOS region (for more on shadowing, refer to that manual). If you were using the system CMOS to shadow the GSI-ISA board, you must disable or turn off that shadowing at this time. Just re-boot the system and go into the Advanced System CMOS Setup and make sure that the GSI-ISA board's BIOS region is NOT being shadowed. Once you have confirmed this, power down the system and remove the system cover.



CAUTION! Let disk drives stop before working on the computer. All electronic equipment is sensitive to **static electricity** at levels far below those that humans notice. Take care to **touch the metal case parts before** touching the electronics.

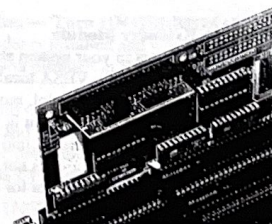
(2) Move the IDE Data Cables from GSI-ISA to VESA

The IDE data cables that were attached to both GSI-ISA controller's J6 IDE connectors should be removed from those connectors and attached to the VESA Extender Module's connectors (J6 for primary IDE, J7 for secondary IDE). The colored band on the cable edge indicates the Pin-1 side and the Pin-1 side should be matched to the Pin-1 on the VESA Extender (marked with an arrow on the black shrouded header). The hard, tape or CD-ROM drive jumper settings and cable position do **NOT CHANGE**.

(3) Attach GSI Legacy Adapter to GSI-ISA Controller

Once you have set the jumpers on the GSI Legacy Adapter for the *Pre-VESA-Ready* GSI controller (as per the first part of this section), you can now attach that adapter to the GSI-ISA controller. Match the Pin-1 of the J1 connector on the adapters to Pin-1 of the GSI-ISA controllers and attach the adapters snugly. The adapter is needed to route the proper signals to the VESA Extender.

Figure 6.1
Attaching the GSI
Legacy Adapter



6.0 INSTALL OPTION #6 (CONT.)

(4) Connect the GSI-ISA controllers to each other and to the VESA Extender

Once the GSI Legacy Adapter is attached, you can now use the GSI-ISA-to-VESA attachment cable (GSI Part Number: 1718-10-26-7) to connect the three boards. The **black connector on the end** attaches to the VESA Extender module's J1 connector. The **black connector in the middle** connects to the GSI controller running in primary mode (to it's J1 Legacy Adapter connector) and the **gray connector on the end** connects to the GSI controller in secondary mode (or it's Legacy Adapter's J12 connector). Make sure all Pin-1 markings are aligned.

The following diagram further shows how the boards and cabling are configured.

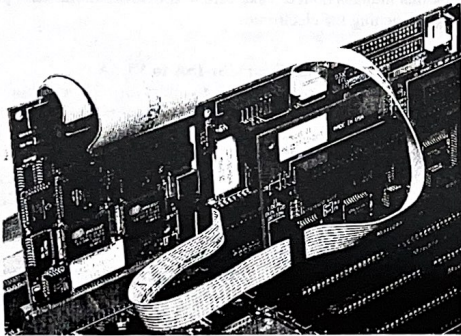


Figure 6.2
1645-V2 with Mixed GSI VESA/Pre-VESA-Ready Controllers

(5) Install the GSI VESA Extender Module

One of the GSI-ISA controllers in your system should be installed in a 16-bit ISA slot or the 16-bit portion of a VESA local bus slot. If one is not in the 16-bit portion of the VESA local bus slot, move one of the GSI-ISA controllers to an open VESA slot and install it in the 16-bit portion of that slot. Install the GSI VESA Extender Module into the VESA connector *in that same bus slot*. The VESA Extender does not have to be in the same slot as a GSI-ISA board, but it usually makes for easier cabling. Make sure to keep the cables connected.

6.0 INSTALL OPTION #6 (CONT.)

(6) Once cables are all attached, close the case and Power ON

(7) System CMOS Setup — NO CHANGES

(8) GSI-ISA Flash BIOS VESA-Support Check

Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. **If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 10.**

(9) GSI-ISA Flash BIOS Update Procedure

To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the **SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready** and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. **If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the VESA Extender's Serial Number is located on a bar-code label on the back side of the board!**

(10) Complete the boot-up sequence — watch for GSI Banner

The GSI VESA Extender's *ghost* BIOS will **configure itself for the installed IDE drives**, reading their parameters and saving them in the GSI-ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.

(11) Test each hard, tape and/or CD-ROM drive for proper operation

(12) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing

Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.

Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #6

7.A INSTALLING THE GSI MODEL 4C

The Model 4C is, in essence, four GSI Model 18 (or single channel) controllers integrated into one controller board. There are four channels, each supporting two (E)IDE drives. The rules for the first two channels (configured as primary and/or secondary) are the same as Install Option #2 (if only one channel in use as primary or secondary) or Install Option #4, where both channels are in use. The Model 4C is *Pre-VESA-Ready* and requires the use of the GSI Legacy Adapter board(s).

The other options are for the tertiary and quaternary channels (or CH3 & CH4):

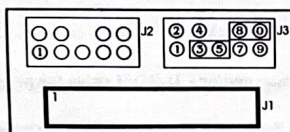
Option	Channel	Mode	VESA Extender
7A	CH3	Tertiary	1645-V1
7B	CH2	Secondary	1645-V2
	CH3	Tertiary	
7C	CH3	Tertiary	1645-V2
	CH4	Quaternary	

No other configurations other than the above are available.

The special GSI Legacy Adapter is *needed* for each configuration, one for EACH Model 4C channel connecting to the VESA Extender.

Install Option 7A

This option, using one channel (CH3, set as tertiary) and the 1645-V1 VESA Extender Module is similar to Install Option #2, except that the jumper settings on the GSI Legacy Adapter need to be set as follows:



Once the Adapter's J3 jumper block has been set to the above settings, follow the install directions in **Install Option #2** for cabling and physical installation.

Install Options 7B and 7C are for using two channels on the Model 4C and the 1645-V2 VESA Extender. Following are the installation procedures for each option.

END OF INSTALLATION OPTION #7A

7.B INSTALLING THE GSI MODEL 4C

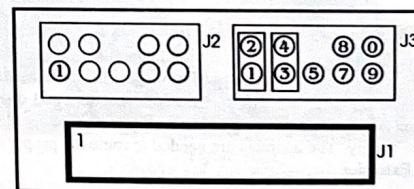
Install Option 7B is for using two of the Model 4C's channels (CH2 and CH3) and the 1645-V2 VESA Extender. Channel CH2 is set for secondary mode and CH3 is configured to tertiary mode.

Configuring the GSI Legacy Adapter boards - IMPORTANT!!!

For this install option, you will need to use **two** GSI Legacy Adapter boards (marked 1691-PC-02-X on the board), included with the 1645-V2 VESA Extender Module. There are three connectors on the GSI Legacy Adapter: labeled J1, J2 and J3. Connector J1 (on each Legacy Adapter) connects to the GSI-ISA board's (i.e. GSI Model 4C's) IDE connector (where the data cable used to be connected). For connectors J2 and J3, read below.

Use the first GSI Legacy Adapter board (Adapter "A" for this example) on the Model 4C's CH2 connector. On Adapter A, connector J2 is used to connect to the VESA Extender Module's J1 connector. Connector J3 connects to the Model 4C's CH3 adapter board. The Model 4C's CH3 connector will also have a GSI Legacy Adapter (Adapter "B" for this example). Connector J3 on Adapter A will connect to Adapter B's J2 connector. It is very important to match the Pin-1 marking on the cable (the side with the red coloring) to the Pin-1 marking on each board.

Attach the other GSI Legacy adapter (Adapter B) to the Model 4C's CH3 connector. The connector J2 on this board will connect to the Adapter A connected to the Model 4C's CH2. Connector J3 is used as a jumper block, configured as follows:



Adapter "B" Jumper Settings

Once you have the GSI Legacy Adapters configured for each Model 4C channel, you can begin the installation process.

7.B INSTALLING THE GSI MODEL 4C (CONT.)

(1) Before Turning System OFF, Make Sure Shadowing is OFF

Before you power down the system, exit all software and go to the DOS prompt. When you installed the GSI-ISA controller board, that board's manual advised you to use either the system CMOS or a memory manager to shadow the GSI BIOS region (for more on shadowing, refer to that manual). If you were using the system CMOS to shadow the GSI-ISA board, you must disable or turn off that shadowing at this time. Just re-boot the system and go into the Advanced System CMOS Setup and make sure that the GSI-ISA board's BIOS region is NOT being shadowed. Once you have confirmed this, power down the system and remove the system cover.



CAUTION! Let disk drives stop before working on the computer. All electronic equipment is sensitive to **static electricity** at levels far below those that humans notice. Take care to **touch the metal case parts before** touching the electronics.

(2) Move the IDE Data Cables from GSI-ISA to VESA

The IDE data cables that were attached to the Model 4C's CH2 & CH3 IDE connectors should be removed from those connectors and attached to the VESA Extender Module's connectors (J6 for the cable that was attached to CH2 and J7 the cable that was attached to CH3). The colored band on the cable edge indicates the Pin-1 side and the Pin-1 side should be matched to the Pin-1 on the VESA Extender (marked with an arrow on the black shrouded header). The hard, tape or CD-ROM drive jumper settings and cable position do **NOT CHANGE**.

(3) Attach the GSI Legacy Adapters to Model 4C Channels

Once you have set the jumpers on the GSI Legacy Adapters for each Model 4C Channel (as per the first part of this section), you can now attach that adapter to the channel it was configured for. Match the Pin-1 of the J1 connector on the adapters to Pin-1 of the Model 4C connector and attach the adapters snugly. The adapters are needed to route the proper signals to the VESA Extender.

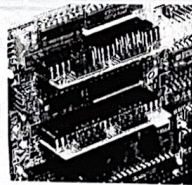


Figure 7B.1
Attaching the GSI
Legacy Adapter

7.B INSTALLING THE GSI MODEL 4C (CONT.)

(4) Connect the Model 4C Channels to each other and to the VESA Extender

Once the GSI Legacy Adapters are attached, you can now use the GSI-ISA-to-VESA attachment cables (GSI PN: 1718-10-26-7 and 1718-10-06-4) to connect the two boards. First, using cable PN:1718-10-26-7, connect the black connector on the end to the VESA Extender module (connector J1). Connect the black connector in the middle to the Model 4C's CH2 (or it's Adapter A board's J2). The **gray** connector on the **end** is NOT USED.

Next, using cable PN: 1718-10-06-4, connect one end to the Model 4C's CH3 (or it's Adapter B's J2 connector) and the other end to the Model 4C's CH2 (or it's Adapter A's J3). Make sure all Pin-1 markings are aligned. The following diagram further shows how the boards and cabling are configured:

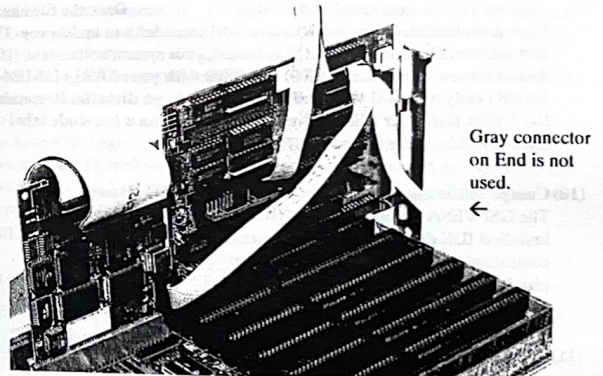


Figure 7B.2
1645-V2 with Model 4C

(5) Install the GSI VESA Extender Module

Install the Model 4C in the 16-bit portion of the VESA local bus slot. Install the GSI VESA Extender Module into the VESA connector *in that same bus slot*. Make sure to keep the cables connected.

7.B INSTALLING THE GSI MODEL 4C (CONT.)

- (6) Once cables are all attached, close the case and Power ON
 - (7) System CMOS Setup — NO CHANGES
 - (8) GSI-ISA Flash BIOS VESA-Support Check
Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 10.
 - (9) GSI-ISA Flash BIOS Update Procedure
To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the VESA Extender's Serial Number is located on a bar-code label on the back side of the board!
 - (10) Complete the boot-up sequence — watch for GSI Banner
The GSI VESA Extender's *ghost* BIOS will configure itself for the installed IDE drives, reading their parameters and saving them in the ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.
 - (11) Test each hard, tape and/or CD-ROM drive for proper operation
 - (12) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing
Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.
- Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #7B

7.C INSTALLING THE GSI MODEL 4C

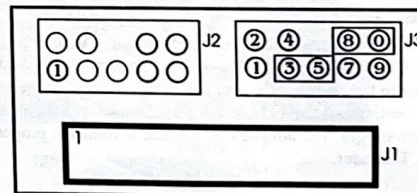
Install Option 7C is for using two of the Model 4C's channels (CH3 and CH4) and the 1645-V2 VESA Extender. Channel CH3 is set for tertiary mode and CH4 is configured to quaternary mode.

Configuring the GSI Legacy Adapter boards - IMPORTANT!!!

For this install option, you will need to use two GSI Legacy Adapter boards (marked 1691-PC-02-X on the board), included with the 1645-V2 VESA Extender Module. There are three connectors on the GSI Legacy Adapter: labeled J1, J2 and J3. Connector J1 (on each Legacy Adapter) connects to the GSI-ISA board's (i.e. GSI Model 4C's) IDE connector (where the data cable used to be connected). For connectors J2 and J3, read below.

Use the first GSI Legacy Adapter board (Adapter "A" for this example) on the Model 4C's CH3 connector. On Adapter A, connector J2 is used to connect to the VESA Extender Module's J1 connector. Connector J3 connects to the Model 4C's CH4 connector. The Model 4C's CH4 connector will also have an GSI Legacy Adapter (Adapter "B" for this example). Connector J3 on Adapter A will connect to Adapter B's J2 connector. It is very important to match the Pin-1 marking on the cable (the side with the red coloring) to the Pin-1 marking on each board.

Attach the GSI Legacy adapter (Adapter B) to the Model 4C's CH4 connector. The connector J2 on this board will connect to the Adapter A connected to the Model 4C's CH3. Connector J3 is used as a jumper block, configured as follows:



Adapter "B" Jumper Settings

Once you have the GSI Legacy Adapters configured for each Model 4C channel, you can begin the installation process.

7.C INSTALLING THE GSI MODEL 4C (CONT.)

(1) Before Turning System OFF, Make Sure Shadowing is OFF

Before you power down the system, exit all software and go to the DOS prompt. When you installed the GSI-ISA controller board, that board's manual advised you to use either the system CMOS or a memory manager to shadow the GSI BIOS region (for more on shadowing, refer to that manual). If you were using the system CMOS to shadow the GSI-ISA board, you must disable or turn off that shadowing at this time. Just re-boot the system and go into the Advanced System CMOS Setup and make sure that the GSI-ISA board's BIOS region is NOT being shadowed. Once you have confirmed this, power down the system and remove the system cover.



CAUTION! Let disk drives stop before working on the computer. All electronic equipment is sensitive to **static electricity** at levels far below those that humans notice. Take care to **touch the metal case parts before** touching the electronics.

(2) Move the IDE Data Cables from GSI-ISA to VESA

The IDE data cables that were attached to the Model 4C's CH3 & CH4 IDE connectors should be removed from those connectors and attached to the VESA Extender Module's connectors (J6 for the cable that was attached to CH3 and J7 the cable that was attached to CH4). The colored band on the cable edge indicates the Pin-1 side and the Pin-1 side should be matched to the Pin-1 on the VESA Extender (marked with an arrow on the black shrouded header). The hard, tape or CD-ROM drive jumper settings and cable position do **NOT CHANGE**.

(3) Attach GSI Legacy Adapters to Model 4C Channels

Once you have set the jumpers on the GSI Legacy Adapters for each Model 4C Channel (as per the first part of this section), you can now attach that adapter to the channel it was configured for. Match the Pin-1 of the J1 connector on the adapters to Pin-1 of the Model 4C connector and attach the adapters snugly. The adapters are needed to route the proper signals to the VESA Extender.

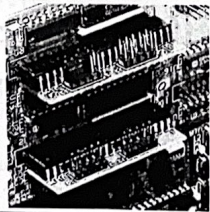


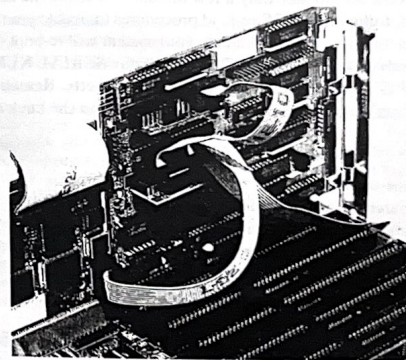
Figure 7C.1
Attaching the GSI
Legacy Adapter

7.C INSTALLING THE GSI MODEL 4C (CONT.)

(4) Connect the Model 4C Channels to each other and to the VESA Extender Module

Once the GSI Legacy Adapters are attached, you can now use the GSI-ISA-to-VESA attachment cables (GSI PN: 1718-10-26-7 and 1718-10-06-4) to connect the two boards. First, using cable PN:1718-10-26-7, connect the black connector on the end to the VESA Extender Module (connector J1). Connect the black connector in the middle to the Model 4C's CH3 (or it's Adapter A board's J2). The **gray** connector on the **end** is NOT USED.

Next, using cable PN: 1718-10-06-4, connect one end to the to the GSI Model 4C's CH3 (or it's Adapter A's J3) and the other end to the Model 4C's CH4 (or it's Adapter B's J2 connector). Make sure all Pin-1 markings are aligned. The following diagram further shows how the boards and cabling are configured:



Gray connector
on End is not
used.
←

Figure 7C.2
1645-V2 with Model 4C

(5) Install the GSI VESA Extender Module

Install the Model 4C in the 16-bit portion of the VESA local bus slot. Install the GSI VESA Extender Module into the VESA connector *in that same bus slot*. It does not have to be in the same slot, but usually makes cabling easier. Make sure to keep the cables connected.

7.C INSTALLING THE GSI MODEL 21 CONTROLLER

- (6) Once cables are all attached, close the case and Power ON
- (7) System CMOS Setup — NO CHANGES
- (8) GSI-ISA Flash BIOS VESA-Support Check
Boot up the system. At this time, your GSI-ISA controller's Flash BIOS may need to be updated. If you have a GSI "VESA-Ready" BIOS already (GSI-ISA BIOS version 4.xx or later) you do not need to update the BIOS and can move on to Step 10.
- (9) GSI-ISA Flash BIOS Update Procedure
To update the Flash BIOS, you will need to download (using a modem) the new BIOS from the GSI Bulletin Board (BBS). Have the SERIAL NUMBERS OF BOTH THE GSI-ISA AND VESA boards ready and call (714) 756-1930. Follow the menu system to download the new BIOS version. This process should take only a few minutes. Once the file has been downloaded, follow the BIOS re-load procedures to update your GSI-ISA adapter. Once the new BIOS is loaded, your system will re-boot. If you do not have a modem, call (800) 486-7800 with your SERIAL NUMBERS ready and GSI will mail you the update on diskette. Remember, the GSI Serial Number is located on a bar-code label on the back side of the board!
- (10) Complete the boot-up sequence — watch for GSI Banner
The GSI VESA Extender's *ghost* BIOS will configure itself for the installed IDE drives, reading their parameters and saving them in the GSI-ISA controller's configuration memory. There is no selection to be made, installation is automatic at this stage. The VESA Extender will identify the highest speed your (E)IDE drive can support and run at that speed.
- (11) Test each hard, tape and/or CD-ROM drive for proper operation
- (12) Advanced CMOS Setup — Turn ON GSI-BIOS shadowing
Once the VESA Extender is installed and working properly, turn back on any BIOS shadowing you disabled in STEP 1.

Your VESA Extender should now be up and running, providing the best performance for that drive and motherboard. The appendices following the last Install Option provide more detailed information. There is a Basic Troubleshooting Section [Appendix C] should you encounter installation difficulties.

END OF INSTALLATION OPTION #7C

A.1 GSI VESA EXTENDER BANNER SAMPLE

A.1.1 GSI Boot-Time Banner (Example)

The GSI Banner appears each time the system is booted. When installed using factory default settings, the banner should appear similar to the following:

GSI BANNER EXAMPLE:

```
GSI Model 21 Enhanced-IDE Adapter-BIOS v4.04 at C800-C9FF (c)1992-95 GSI
GSI Serial# A12345 - in Secondary Mode (IDE-Ch2 IRQ15h I/O-addr=170-77h)

Searching Model 21 (IDE Channel 2) for Hard Drives & IDE-ATAPI Drives -
Found . . .

MASTER: System HD#2 - 535MB IDE Hard Drive (= 561 million bytes)
        *SAMSUNG SHD-30560A (APRO-5) SSI* fw:BF103S sn:SS500900212b
SLAVE:  System HD#3 - 1034MB IDE Hard Drive (= 1084 million bytes)
        *WDC AC31000H* fw:14.12x19 sn:WD-WT2720211939

GSI VESA Extender Module V1 - with VESA BIOS 1.04C          (c) 1994-5 GSI
MASTER Mode: PIO Mode 4      SLAVE Mode: PIO Mode 3
```

The above banner example shows two drives attached to a GSI Model 21 (BIOS version 4.04), one PIO Mode 4 EIDE hard drive and one PIO Mode 3 EIDE hard drive. The Model 21 is running in secondary mode (and there is one hard drive on the primary controller) with the hard drives set as the second and third in the system. The VESA Extender Module has been installed and is working at the proper speed.

A.2 MSDOS AND DOS-BASED APPLICATIONS SOFTWARE

Normal MSDOS software usage rules apply to systems using the GSI VESA Extender Module. Considerable effort has been made to ensure compatibility with the most commonly used DOSs. Common DOS commands like Chkdisk, Copy, Xcopy, Diskcopy and Format should work straightforwardly. Properly programmed DOS applications should be expected to run normally.

A.3 OTHER OPERATING SYSTEM SOFTWARE

The GSI VESA Extender should have no impact on Windows NT™ or Windows® 95 compatibility. It's compatibility comes from the GSI-ISA controller. For compatibility of the GSI-ISA controller, check that product's manual. Similar to Windows, any other operating system like OS/2 Warp, OS/2 Versions 2.1 and 2.0 and UNIX operating systems should work fine as they did with the GSI-ISA controller before installing the VESA Extender Module. For more information on the ISA controller's support of these operating systems, check that product's manual.

Windows® 95 should operate in all modes, including 32-bit file mode. If your hard drive is running in MSDOS compatibility mode, try running the "Add New Hardware" wizard in the control panel. This should enable 32-bit file mode operation.

APPENDIX B — PRODUCT SPECIFICATION

B.1 PRODUCT VERSIONS — BULK & RETAIL

This manual applies to both the 1645-V1 (single channel) and 1645-V2 (dual channel) VESA Extender Modules. The 1645-V1 VESA Extender Module is distributed in two ways: Bulk and Retail Pack. The bulk version has the VESA Extender, the ISA Option Adapter Board (PN:1691-01-02-0), ISA attachment cable (PN:1718-10-06-4), manual and registration card. The Retail Pack includes those items in a GSI Retail box.

The 1645-V2 VESA Extender Module is distributed in retail packs only. This includes the VESA Extender, two ISA Option Adapter Boards (PN:1691-01-02-0), two cables (PN:1718-10-06-4 and PN:1718-10-26-7), manual and registration card.

B.2 PRODUCT SPECIFICATIONS

VESA Extender Board Dimensions: 3.8" x 3.17"

ISA Option Adapter Cable Assemblies:

GSI Part #: 1718-10-06-4: two black connectors

GSI Part #: 1718-10-26-7: two black connectors and one gray connector

ISA Option Adapter (GSI Part #: 1691-01-02-0):

Small PCB to convert pre-"VESA-Ready" GSI-ISA controllers, 40-pin to 10-pin adapter

Bus Slot Requirements:

32-bit VESA-compatible — conforming to VESA VL-Bus™ Standard, Revision 1.0

Power Consumption:

4 watts

(E)IDE Drive Compatibility:

Supports IDE drives which conform to ANSI X3T9.3 ATA (IDE) or ATA-2 specifications

Western Digital (WD) Enhanced IDE Guidelines:

Supports WD-defined Enhanced Drive Parameter Table to handle drives of up to 8.4GB capacity

Drive Ribbon-Cable Connector:

Standard 40-pin (2x20) IDE connector, 3M 3417-7000 or equivalent as defined in ANSI X379.3

Performance Ability:

Supports PIO Mode 3, PIO Mode 4 with I/O Channel Ready

B.3 GSI-ISA CONTROLLER "VESA-READY" BIOS VERSIONS

Your GSI-ISA Controller's Flash BIOS must have support for the new VESA Extender. This enables the controller's BIOS to be "VESA-Ready". The following GSI-ISA controllers must have these Flash BIOS versions to work properly with the new VESA Extender.

GSI-ISA CONTROLLER

VESA-READY VERSION REQUIRED

Model 18

GSI BIOS Version 4.0 or later

Model 21

GSI BIOS Version 4.0 or later

Model 32

GSI BIOS Version 4.01 or later

Model 4C

GSI BIOS Version 4.01 or later

If your GSI-ISA controller's Flash BIOS needs to be updated, simply use a modem to call the GSI Bulletin Board (BBS) at 714-756-1930. Follow the menu system to download a GSI BIOS update program. Another option is to call GSI (800-486-7800) and a BIOS update diskette can be mailed to you.

YOU MUST HAVE THE GSI SERIAL NUMBER FOR BIOS UPDATES!

APPENDIX C — BASIC TROUBLESHOOTING

The following are some basic troubleshooting tips you should read if experiencing problems with your installation. Each problem is followed by some suggestions. For other Troubleshooting symptoms and cures, check with the GSI-ISA Controller's manual as well. Below, SW=software, HD=hard drive, FD=floppy drive & TD=tape drive.

C.1 VESA Extender Notice Not Seen in GSI Banner During Bootup:

- ◆ 'BIOS found — bad checksum' bootup message. Request a GSI BIOS-Update for the GSI-ISA controller from GSI Tech Support Dept. (It re-writes the ISA board's Flash BIOS.)

C.2 Hard Drive(s) Are Not Found by GSI VESA Extender

- ◆ Did you change the Master/Slave jumpers. Restore to original settings.
- ◆ Are data cables connected?

C.3 IDE Hard Drive Performance Not Increased

- ◆ Does your IDE hard drive support read/write multiple? Ask HDD manufacturer.
- ◆ Are you shadowing the GSI-ISA BIOS?
- ◆ Does your IDE hard drive support PIO Mode 3 or Mode 4? Ask HDD manufacturer.

C.4 'Configuration Not set' Message Appears

- ◆ Are you trying to use a special software partitioning package like Disk Manager? If you are transferring a drive from an older controller (and it was partitioned using a Disk Manager-type of software) you must first back up the data and delete those partitions BEFORE using the drive with the GSI controllers.
- ◆ Did you remember to turn OFF shadowing of GSI BIOS while making changes?
- ◆ Did you remember to exclude the GSI-ISA-BIOS Address range with your memory mgr?

During installation, you should take down the following information. This information will be useful should you need to contact technical support. GSI's Authorized Distributors can provide you technical support, or you can contact GSI Technical Support at (714) 261-9744 or by fax (714) 757-1778. When calling either Technical support department, **MAKE SURE TO HAVE THE FOLLOWING INFORMATION AVAILABLE.**

SUPPLIER INFORMATION

Date of Purchase: _____ Invoice #: _____

Product Purchased From: _____

Seller's Tech Support Phone #: _____

GSI PRODUCT INFORMATION

GSI Model V1 Part #: 1645-V _ _ _ _ GSI Model V _ Serial #: _____