VIEW Micro-Metrology

Benchmark™ 250
Installation Manual

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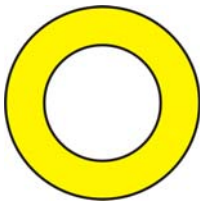
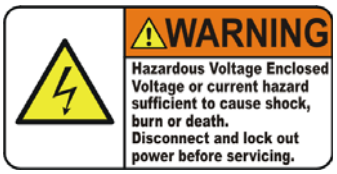
Benchmark™ 250
Installation Manual

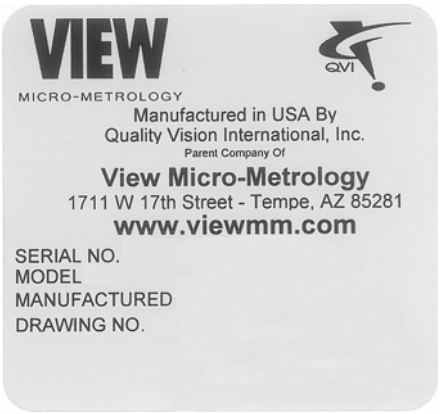
Part No. 799030, Revision E, 03/12

Benchmark equipment is made in the U.S.A.

Table of Contents

Important System Labels

Label:	Location:	Definition:
	Around the remote E-Stop	(Yellow ring around red switch) Emergency stop
	Left and right sides of the stage, on the substage	Do not lift
	Front surface of the electronics tower	Pinch hazard
	Top of rear door Lower rear panel, above power cord receptacle	Hazardous voltage present; disconnect power before servicing to avoid electrical shock
	Lower-left corner of Main System ID label	System meets the requirements of the European Union (EU)

Label:	Location:	Definition:
	Front surface of the electronics tower	System model and serial number
	Rear door, above lower rear panel	Main system ID
	Front surface of the electronics tower	Exercise caution near this area
	Right side of the laser (if equipped)	International laser symbol
	Right side of the laser (if equipped)	Indicates that the laser meets Class 2 requirements of the IEC-825 European standard

Label:	Location:	Definition:
	Right side of the laser (if equipped)	Indicates that the laser meets Class II requirements of the CFR 21 standard
	Right side of the laser (if equipped)	Identifies the laser emitting aperture

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About This Manual

Chapter 1

1.1 What This Chapter Contains

This chapter covers the following:

- Who should read this manual
- What knowledge you must possess in order to use this manual
- What this manual contains
- Where to get help

1.2 Who Should Read This Manual

Read this manual if you will be performing any of the following tasks related to the Benchmark 250 system:

- unpacking and installing the system
- powering up and/or shutting down the system
- running part inspection programs

For information about using the VMS software, refer to the *VMS Reference Guide* (P/N 790411) or the *VMS Fast Start Guide* (P/N 790438).

1.3 Required Knowledge

To use this manual, you should be familiar with:

- fundamental computing concepts
- non-contact measurement concepts

1.4 What This Manual Contains

This manual will help you unpack, install, set up, and power up the Benchmark 250 video metrology system. Important safety information is also included.

1.5 Where to Get Help

For help, contact the Customer Support HelpDesk at:

VIEW Micro-Metrology
1711 West 17th Street
Tempe, AZ 85281 USA

Phone:	480-295-3150 480-295-3170 (service)
Toll Free:	877-767-VIEW 800-SOS-VIEW (service)
Fax:	480-889-9059
E-mail:	info@viewmm.com
Website:	www.viewmm.com

Be prepared to provide the following information when contacting us:

- Model and serial number of your system
- Nature of the problem
- Steps you have taken
- Your phone and fax numbers
- Case number if you are calling about an issue that has already been reported

System Overview

Chapter 2

2.1 What This Chapter Contains

This chapter covers the following:

- What Is Benchmark 250?
- System Components
- How the System Operates

2.2 What Is Benchmark 250?

The Benchmark 250 is a benchtop, high-accuracy, non-contact, dimensional measurement system. In Quality Assurance applications, Benchmark 250 moves dimensional inspection out of the lab and onto the production floor. Benchmark 250 is fully automatic and can run part inspection programs, collect data, print results, and send the results to a Statistical Process Control (SPC) program without any manual intervention.

Based on the Windows™ XP operating system, the Benchmark 250 system comes with the VMS metrology software, which provides an easy-to-use graphical user interface and a full range of dimensional measurement tools.

The Benchmark 250 system has precision dual magnification or single magnification optics, coaxial and backlight illumination, and patented autofocus circuitry for high-accuracy Z-axis measurements over a variety of surface textures, finishes, and colors. The patented LED Programmable Ring Light (PRL) is optional.

Refer to the *Benchmark 250 Technical Data Sheet* (part number 799002) for more technical information.

2.3 System Components

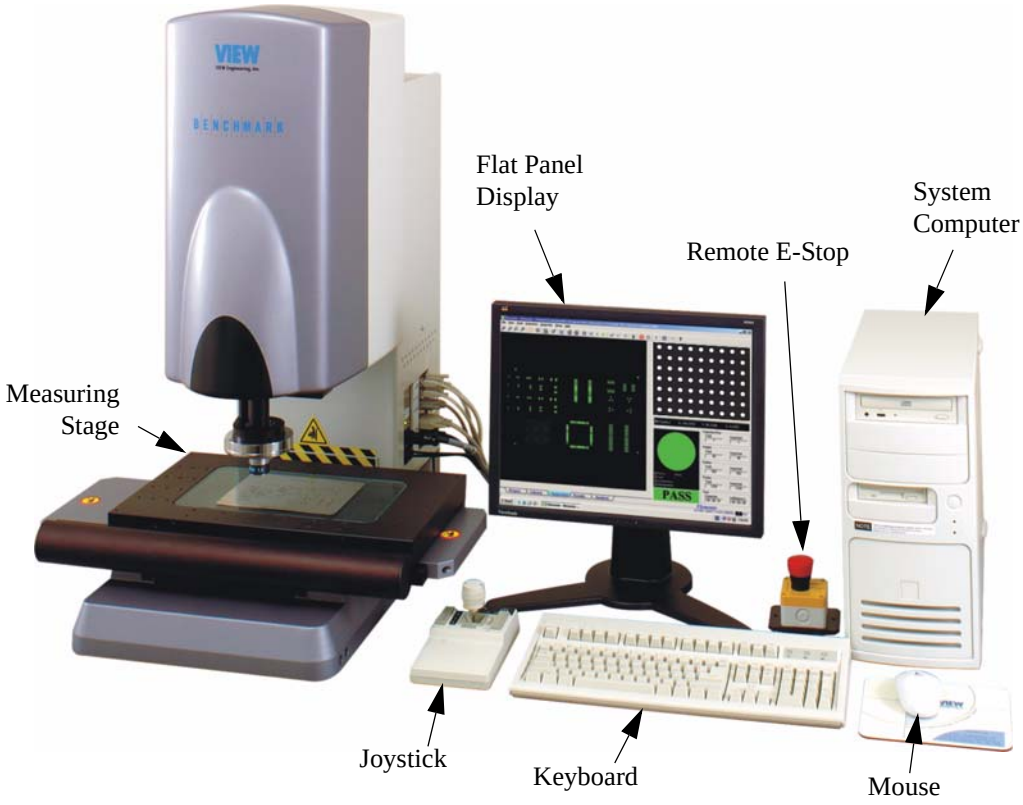

Figure 2-1 Benchmark 250 System Components

2.4 How the System Operates

Based on the Windows XP operating system, the Benchmark 250 system comes installed with its own proprietary application software, image processing hardware, an easy-to-use graphical user interface, and a full range of dimensional measurement tools. The following describes a typical processing operation.

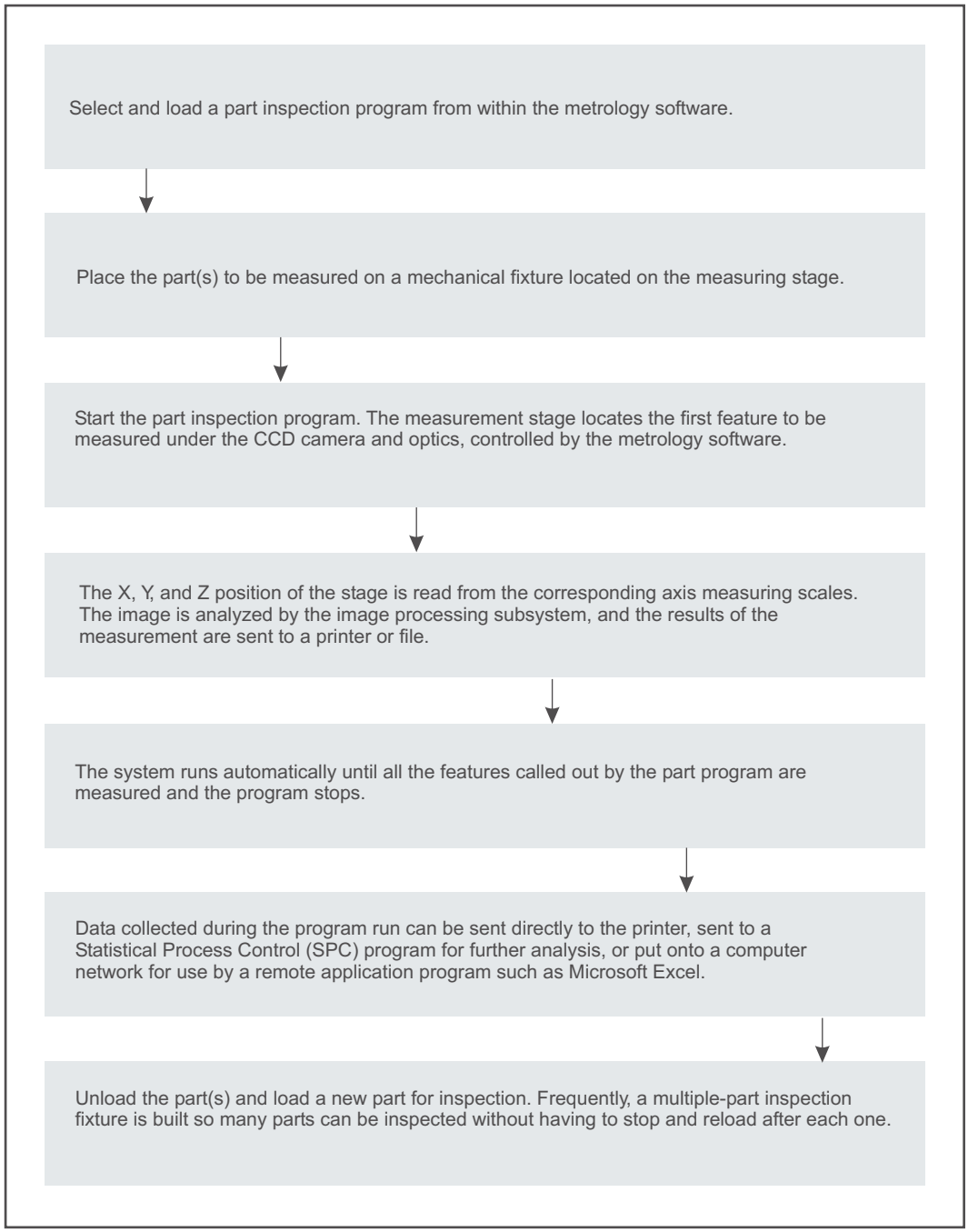

Figure 2-2 Benchmark 250 Operation

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Safety Information

Chapter 3

3.1 What This Chapter Contains

This chapter covers the following:

- Emergency Stop
- System Status LEDs
- System Power
- System Lockout
- Safety Guidelines

Also, be sure to review the information on Important System Labels on page iii.

3.2 Emergency Stop

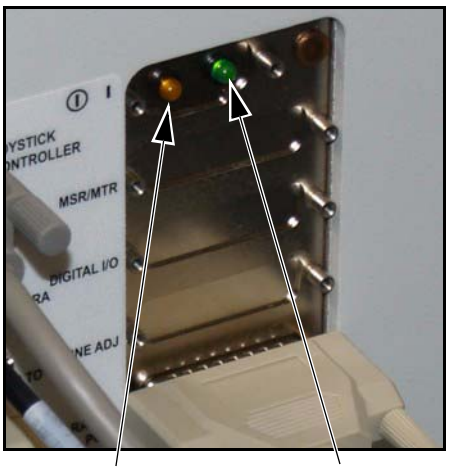
The emergency off (EMO) circuit is activated by pressing the remote E-Stop on the workstation.

Figure 3-1 Remote E-Stop

The EMO circuit is responsible for disabling system motion in case of an emergency. The EMO circuit places the system in a safe (shutdown) condition, which cuts power to the motors.

3.3 System Status LEDs

The system status LEDs are located on the interconnection panel on the right-hand side of the machine. The green LED is the Power On LED and the yellow LED is the Stop LED.



The following table includes information regarding the status of the Stop LED and provides instructions for recovering from different Stop conditions.

Stop LED Status	Description	Cause	How to Recover
Off	System is in normal operation	—	—
On	Recoverable stop	Occurs during the normal power-up sequence until the Stop/Start button on the joystick is pressed	When prompted, press the **Stop/Start** button on the joystick.
		Occurs when the XY stage or Z-axis transport encounters an end-of-travel limit	Move the axis off of the limit, and then press the **Stop/Start** button on the joystick
		Occurs when servo parameter settings are incorrect	Check LED DS7 on the DSP Multi Axis PCBA for the source of the E-Stop.
		Occurs when the remote E-Stop is pressed	Reset the remote E-Stop by twisting the knob in the direction of the arrows, and then press the **Stop/Start** button on the joystick.

3.4 System Power

The system comes with an IEC power strip (P/N 037545) and three identical power cords (P/N 019978) that connect the monitor, system computer, and machine to the power strip. An external power cord connects the power strip to the external power source (outlet). External power cord characteristics vary depending on the country of installation, as outlined in the table below.

Warning: Always use the IEC power strip and the external power cords provided with the system. Use of an inappropriate power connection could lead to equipment damage and/or electrical shock.

Country	Power	Part Number	Type	AWG (US)	Wire Cross Section (CE)
United States	120 VAC, 50/60 Hz	019938	3-Conductor	18	0.82 mm^2
Japan	100 VAC, 50 Hz	019938	3-Conductor	18	0.82 mm^2
United Kingdom	240 VAC, 50 HZ	019971	3-Conductor	18	1.00 mm^2
Italy	220 VAC, 50 HZ	019972	3-Conductor	18	1.00 mm^2
Denmark	220 VAC, 50 HZ	019974	3-Conductor	18	1.00 mm^2
Switzerland	220 VAC, 50 HZ	019975	3-Conductor	18	1.00 mm^2
Other European Countries	220 VAC, 50 HZ	019973	3-Conductor	18	1.00 mm^2

The main power fuse is located in the fuse holder that is part of the machine power cord receptacle assembly. A fuse label indicating the type of fuse installed in the fuse cartridge is located near the fuse holder.

- Systems configured for 100/120 volt operation have one 10 Amp, 250 Volt, Slo Blo fuse
- Systems configured for 200/240 volt operation have two 6.3 Amp, 250 Volt, Slo Blo fuses

3.5 System Lockout

Before servicing the system, you must unplug the power cord and lock out the system. This will protect you and others from unintended machine operation, which could cause personal injury. No one should attempt to defeat a lockout while the machine is being serviced.

Most companies have a safety department and written procedures for locking out the system. These procedures typically have the following features as a minimum:

- Each operator, supervisor, and maintenance person who may be required to work on the machine shall have a key operable lock.
- If more than one key exists for the lock, the owner of the lock shall have possession of all of the keys.
- Each lock shall be labeled with the owner's name, or the owner shall be supplied with an identity tag that may be attached to the lock when it is applied to the machine.

To lock out the system:

1. Close all programs and shut down Windows.
2. Power down the machine.
3. Power down the monitor.
4. Press the remote E-Stop.
5. Unplug the main power cord from the power source and lock the plug into an appropriate energy isolating device.
6. Perform the required service and/or maintenance.

Note: Each person performing maintenance or making adjustments to the system should have their own lock attached to the energy isolating device. There are commercially available multi-lock devices to allow this.

To resume normal operation:

1. After determining it is safe, have each person remove his/her own lock.
2. When all locks are removed, reconnect the power cord to the main power source.
3. Reset the remote E-Stop by twisting the knob in the direction of the arrows.
4. Power up the system and resume normal operation.

3.6 Safety Guidelines

For your personal safety, observe the following safety precautions and guidelines. They are provided for your protection and to help prevent damage to the system.

General Precautions:

- The system is intended to be used by personnel who recognize the hazards associated with electrical shock and computer-controlled mechanical motion.
- The system is intended to be used for metrology applications only; other use may void your warranty.
- To prevent the accidental pinching of your hands, do not approach or touch the machine during operation.
- To avoid personal injury, never attempt to manually move the Z-axis slide with power applied to the machine.
- To avoid personal injury, always mount the part(s) you are measuring or inspecting in a fixture that is attached to the stage. The stage moves quickly and parts that are not fixtured properly could be thrown from the stage.
- Always power down and lock out the system before servicing it.

Power and Grounding:

- The source of power connected to the system shall not apply more than the rated voltage (specified on the machine identification label) between the supply conductors or between either supply conductor and ground.
- The system is grounded through the power cord. To avoid electrical shock, connect the power cord to a properly wired receptacle with an earth ground connection.
- Connect the system to a dedicated circuit.

Power Cord:

- Only use the power cord and connector specified for the system.
- Do not operate the system if the power cord is damaged.
- Position the power cord so it will not be a trip hazard or come in contact with a hot surface.

Miscellaneous:

- To avoid a fire hazard, only use fuses that meet all type, voltage, and current requirements as specified by VIEWMM.
- Do not operate the system without all covers and panels installed properly.
- Keep water and other liquids away from the system to reduce the risk of spillage and electrical shock.
- Do not use any accessory attachments other than those provided or approved by VIEWMM. Improper accessories can cause fire, electrical shock, and/or personal injury.
- Do not drop anything on the stage glass.

Installation

Chapter 4

4.1 What This Chapter Contains

This chapter covers the following:

- Choosing an Installation Site
- Unpacking the Machine
- Removing the X, Y, and Z Restraints
- Installing the Stage Glass
- Arranging and Connecting the System

4.2 Choosing an Installation Site

Before installing the system, choose a site that meets the following criteria:

Specification	Requirement:
Temperature	Recommended operating range: 17° to 33°C Rated environment: 18° to 22°C
Humidity	30% to 80% non-condensing Condensation can cause corrosion
Vibration	<0.0015g below 15Hz In order to maintain system accuracy, do not locate the system close to production equipment susceptible to vibration (for example: stamping presses, mills, or lathes).
Weight	Crated: 286 kg (630 lbs) Uncrated: 155 kg (340 lbs)
Electrical Requirements	115/230 VAC, 50/60 Hz, 700 watt
Workbench Requirements	Weight: 240 kg (535 lbs)—must be capable of fully supporting the weight of the machine, system computer, monitor, test fixtures, accessories, parts being measured, and everything else on its surface Dimensions: (W x D): 183 x 92 cm (72" x 36")
Dimensions (W x D x H)	Machine: 72.0 x 77.5 x 87.3 cm (28.3" x 30.5" x 38.3") Computer workstation (opt): 76 x 74 x 152 cm (30" x 29" x 60") Make sure there is adequate space for an operator to spread out materials and use the system comfortably.
Service access	Allow 61-91 cm (24-36") on each side and in the rear of the machine for cables and service access.

4.3 Unpacking the Machine

When you receive the system, the shipment will include a pallet that contains the machine, computer equipment, and any optional accessories.

Note: The specific packing of your system may vary from the following instructions. The procedure outlined on the following pages provides general unpacking instructions.

Note: Before unpacking the machine, be sure to review the table on the previous page for information about equipment dimensions, space requirements, workbench requirements, and environmental considerations.

Tools Required

Forklift or pallet jack
Large diagonal cutters
Secure workbench(es)
Power or manual hoist
Set of Metric Allen wrenches
Phillips-head screwdriver

1. Using a forklift or pallet jack, move the shipping carton as close as possible to the final location where the system will be installed.

2. Using a pair of large diagonal cutters, cut and remove the metal bands that secure the shipping carton to the pallet.

3. Remove the top of the shipping carton and then remove the cardboard sleeve (Domestic installations—*United States, Canada, and Mexico*) or disassemble the crate (International installations—*all other countries*).

4. Carefully remove the plastic covering the machine.

5. Remove the front cover of the machine by lifting it straight up, off of its guides. Set the cover aside.

Note: The machine is now fully exposed, resting on a foam insert. Note the lifting straps (2), wooden stabilizer, and lifting eyebolts (2) attached to the machine (see Figure 4-2 on the next page).

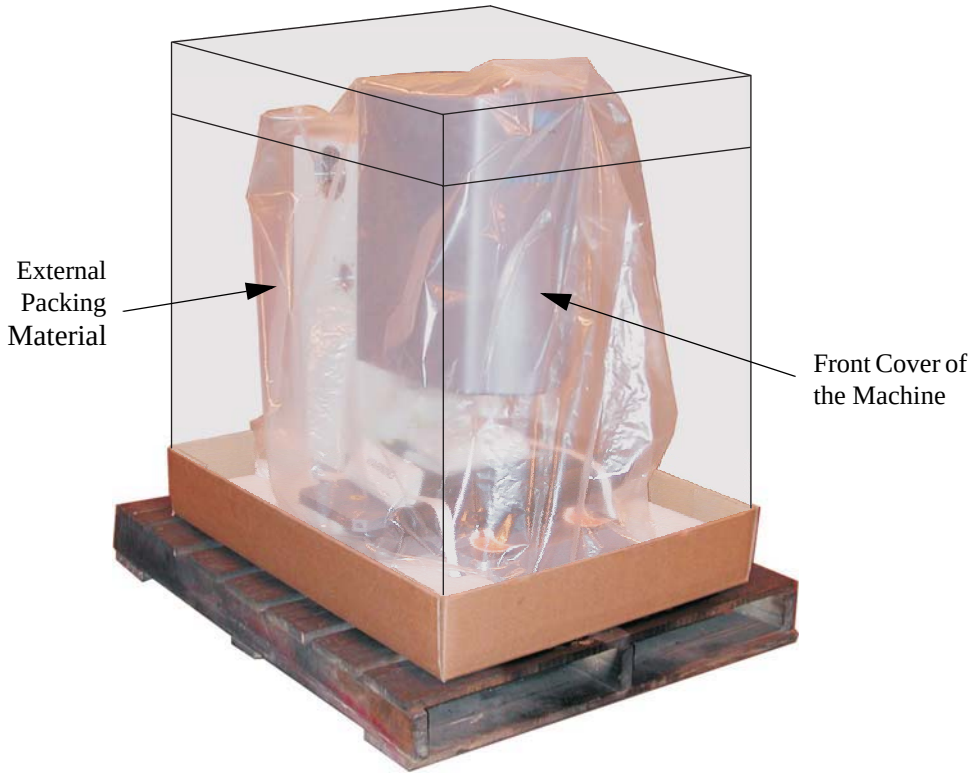


Figure 4-1 External Packing Material

Warning: The machine weighs approximately 155 kg (340 lbs). To prevent personal injury, always lift the machine with a power or manual hoist; we do not recommend lifting the machine by hand.

6. Verify that the lifting eyebolts are installed and the lifting straps are securely attached to the eyebolts (see Figure 2-2).

7. Attach the lifting straps to the hook of a power or manual hoist.

8. Insert the metal plate attached to the wooden stabilizer into the slot on top of the machine.

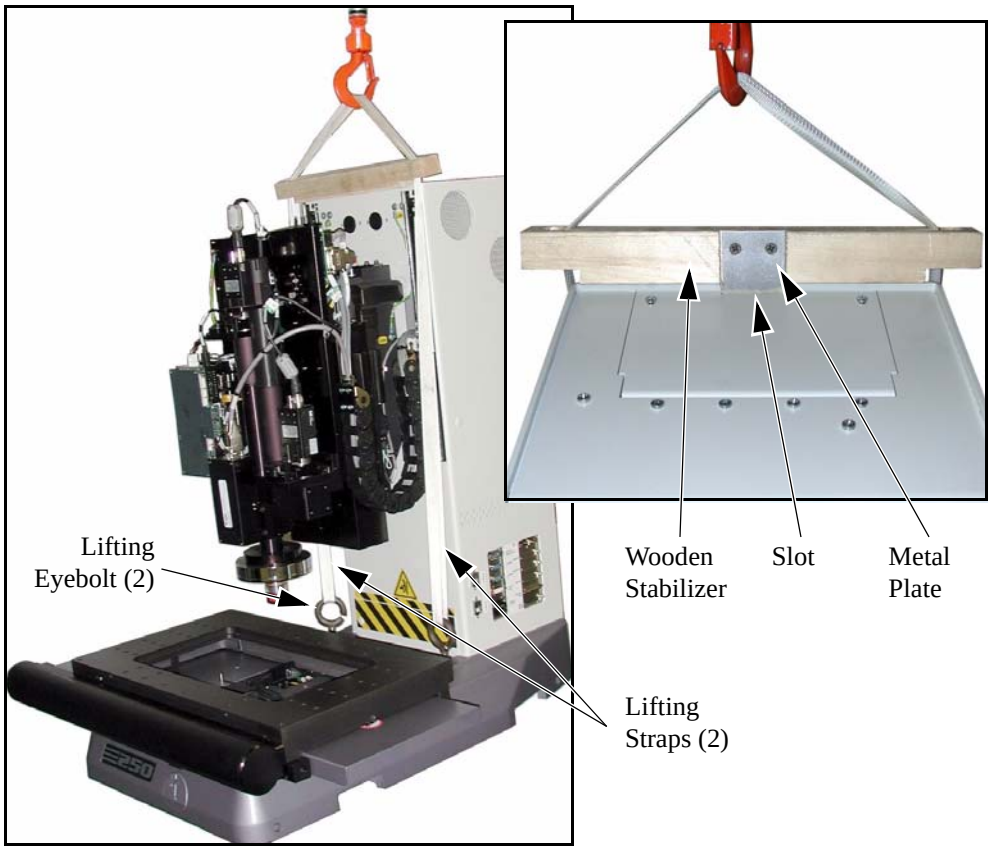


Figure 4-2 Lifting the Machine

Warning: When lifting the machine, keep the weight of the machine balanced equally beneath the lifting straps, steadying it manually at all times. Failure to steady the machine could result in the machine tipping over.

9. Position two people next to the machine, one on each side, and slowly lift the machine with the hoist. Move the machine to the final operating location, and slowly lower it into position on a workbench capable of bearing the full weight of the machine.

10. Remove the wooden stabilizer, lifting straps, and lifting eyebolts. Store all lifting materials for future use.

Note: Do not lose the lifting materials. You will need them if you ever need to relocate the machine.

11. Remove any remaining packing material from around the machine.

4.4 Removing the X, Y, and Z Restraints

After unpacking the machine and moving it to the final operating location, you must remove the X-, Y-, and Z-axis shipping restraints. The shipping restraints have caution tags attached to them to show their locations.

Caution: Do not attempt to move the XYZ transports with the shipping restraints installed.

Note: If you relocate the machine after initial installation, be sure to re-install the shipping restraints before moving the machine.

Tools Required

Set of Metric Allen wrenches
Large, flat-head screwdriver

1. Locate the X-axis shipping restraint, which is attached to the back-left corner of the stage (see Figure 2-3).

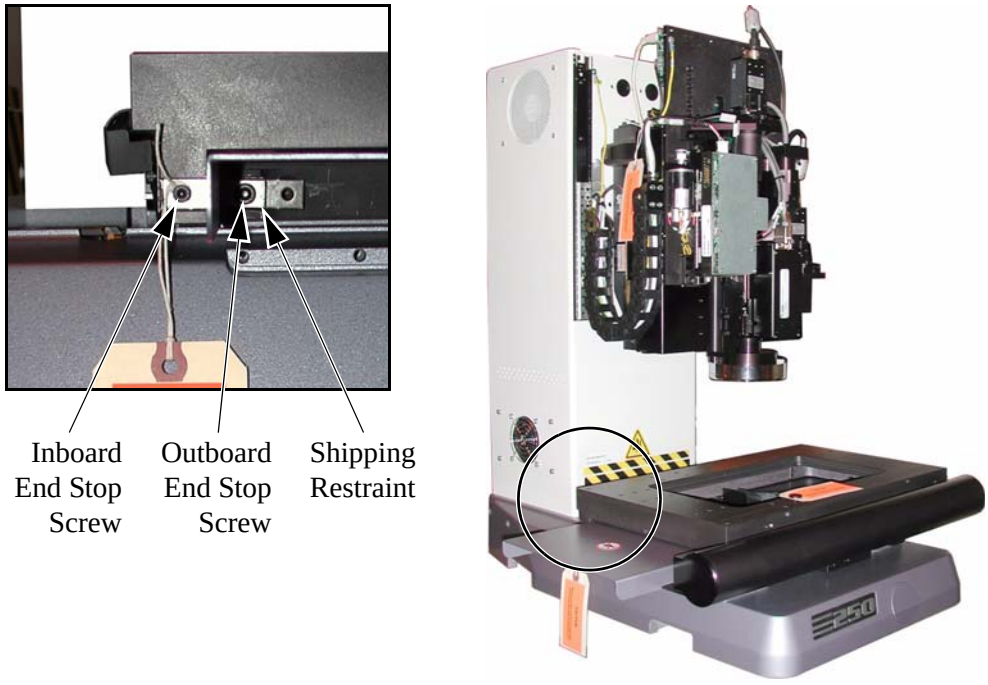


Figure 4-3 Removing the X-Axis Shipping Restraint

2. Using a 3 mm Allen wrench, remove the inboard X-axis end stop screw.

3. Using a 4 mm Allen wrench, remove the outboard X-axis end stop screw.

4. Remove the shipping restraint and store it for future use.

Caution: If the small, black X-axis ball retainers (under the shipping restraint) fall out, put them back in place before continuing.

Caution: Do not remove or discard the end stops. They are essential to the operation of the X-axis transport.

Note: Do not discard the X-axis shipping restraint. You will need it to re-secure the X-axis transport if you ever need to relocate the machine.

Caution: Do not move the X-axis transport before performing the next step.

5. Re-install the inboard and outboard X-axis end stop screws. Be sure to tighten the screws completely.

6. Locate the Y-axis shipping restraint, which is attached to the front of the machine (see Figure 2-4).

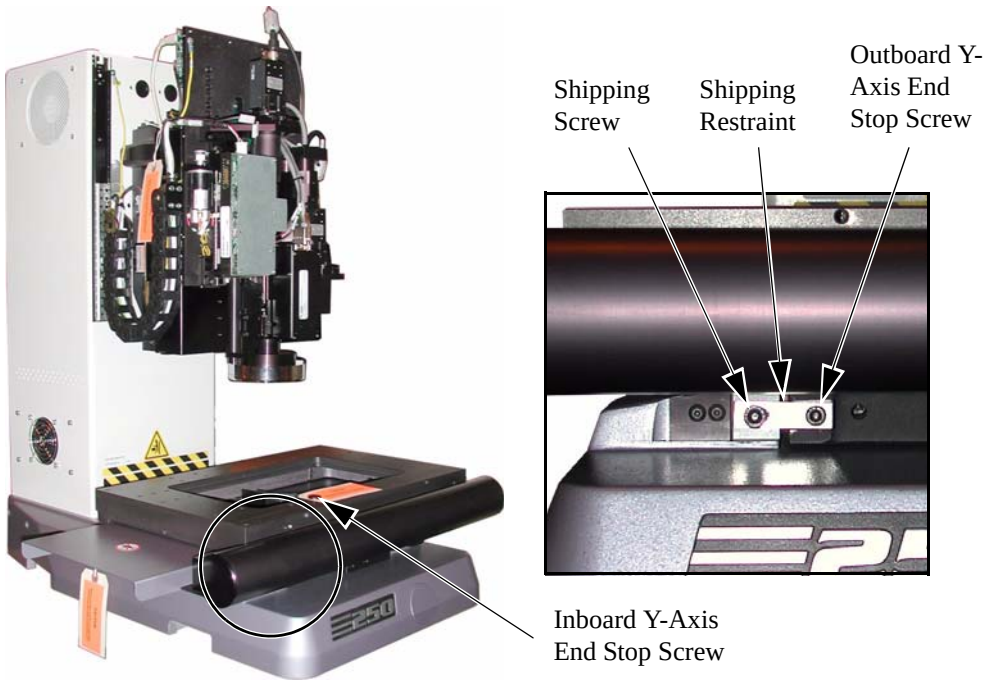


Figure 4-4 Removing the Y-Axis Shipping Restraint

7. Using a 5 mm Allen wrench, remove the shipping screw.

8. Using a 4 mm Allen wrench, remove the outboard Y-axis end stop screw.

9. Remove the shipping restraint and store it for future use.

Caution: If the small, black Y-axis ball retainers (under the shipping restraint) fall out, put them back in place before continuing.

Caution: Do not remove or discard the end stops. They are essential to the operation of the Y-axis transport.

Note: Do not discard the Y-axis shipping restraint or shipping screw. You will need them to re-secure the Y-axis transport if you ever need to relocate the machine.

Caution: Do not move the Y-axis transport before performing the next step.

10. Locate the inboard Y-axis end stop screw, which has a relatively large head and is stored in the top of the stage during shipping (seeFigure 4-4 on page 20).

11. Using a large flat-head screwdriver, remove the inboard Y-axis end stop screw from its storage position, and screw it through the inboard the Y-axis ball retainer and into the hole previously occupied by the Y-axis shipping screw.

12. Re-install the outboard Y-axis end stop screw into the hole that you removed it from in Step 8.

13. Locate the two Z-axis shipping restraints, which are attached to the top of the Z-axis slide (see Figure 2-5).

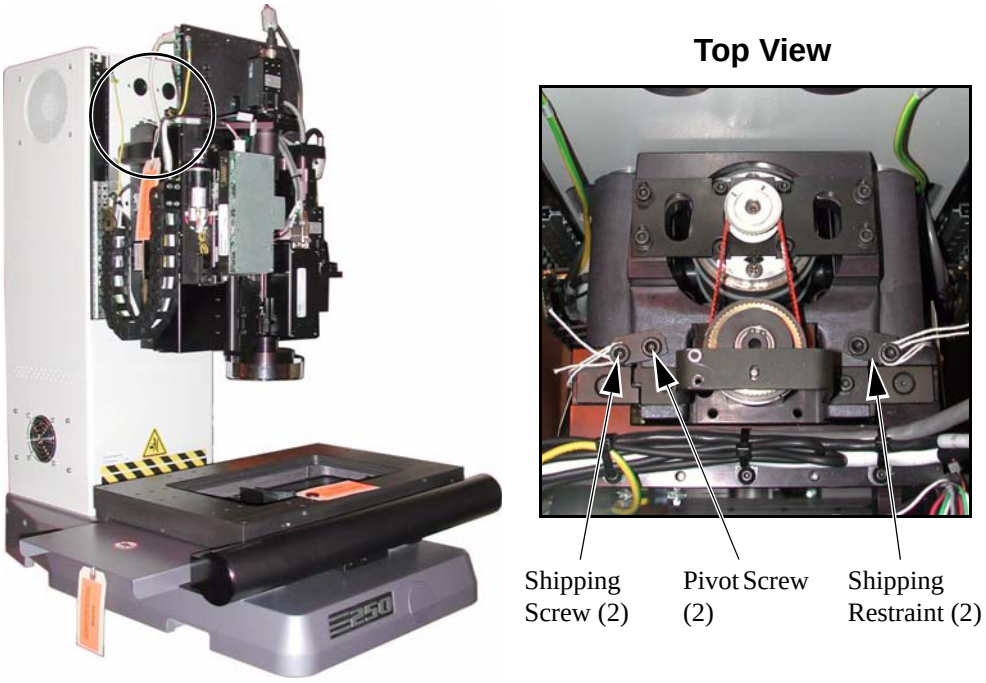


Figure 4-5 Removing the Z-Axis Shipping Restraints

14. Using a 4 mm Allen wrench, remove both Z-axis shipping screws. Store them for future use.

Note: Do not discard the Z-axis shipping screws. You will need them if you ever need to relocate the machine.

Caution: Do not move the Z-axis transport before performing the next step.

15. Using a 4 mm Allen wrench, loosen the two pivot screws.

16. Position both Z-axis shipping restraints so they do not interfere with the movement of the Z-axis slide. Tighten both pivot screws when finished.

17. Install the front cover (removed during the unpacking process).

4.5 Installing the Stage Glass

Tools Required
2 mm Allen wrench
Glass cleaner
Soft, lint-free toweling

1. Locate and unwrap the stage glass. Clean both sides of the stage glass with glass cleaner and soft, lint-free toweling.
2. Remove the tissue paper from the recessed area of the stage and gently set the stage glass into the recessed area.

Note: Orient the stage glass in accordance with the markings on its edges as you install it in the stage.

Caution: Do not overtighten the set screws that secure the stage glass in place. Excessive pressure may damage the stage glass.

3. Using a 2 mm Allen wrench, tighten (but do not overtighten) the two stage glass set screws in the front of the stage (see Figure 2-6).

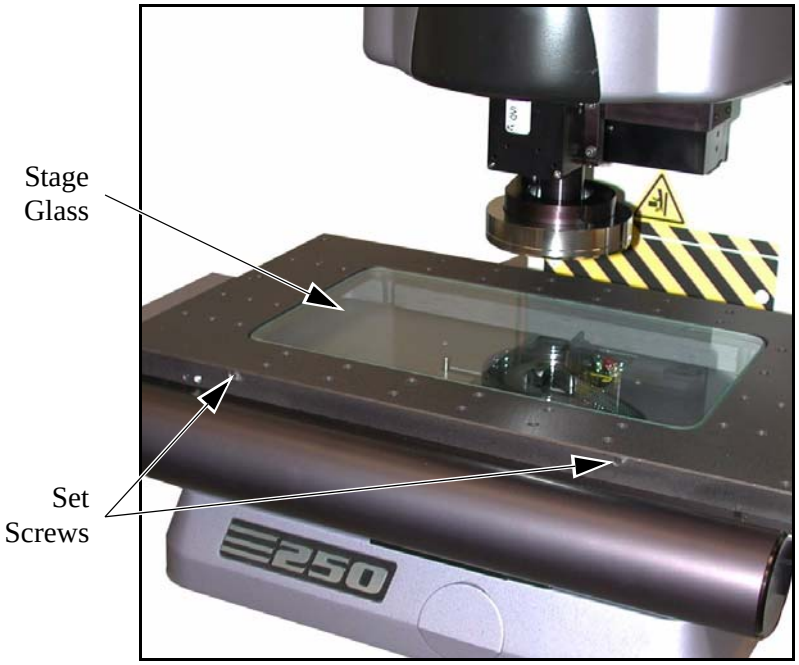


Figure 4-6 Installing the Stage Glass

4.6 Arranging and Connecting the System

Tools Required

Diagonal cutters
Small, flat-head screwdriver

1. Unpack the system computer, monitor, joystick, mouse, keyboard, remote E-Stop, and any other system components and accessories. Place everything in their respective areas on the workstation.

2. Connect the system components. All cables are clearly marked regarding function and where each connects.

   - For systems with the dual magnification optical system, see Figure 2-7 on the next page and Table 4-1 on page 26.
   - For systems with the single magnification optical system, see Figure 4-8 on page 27 and Table 4-2 on page 28.

Note: Be sure to secure all connections by tightening the locking screws (if equipped).

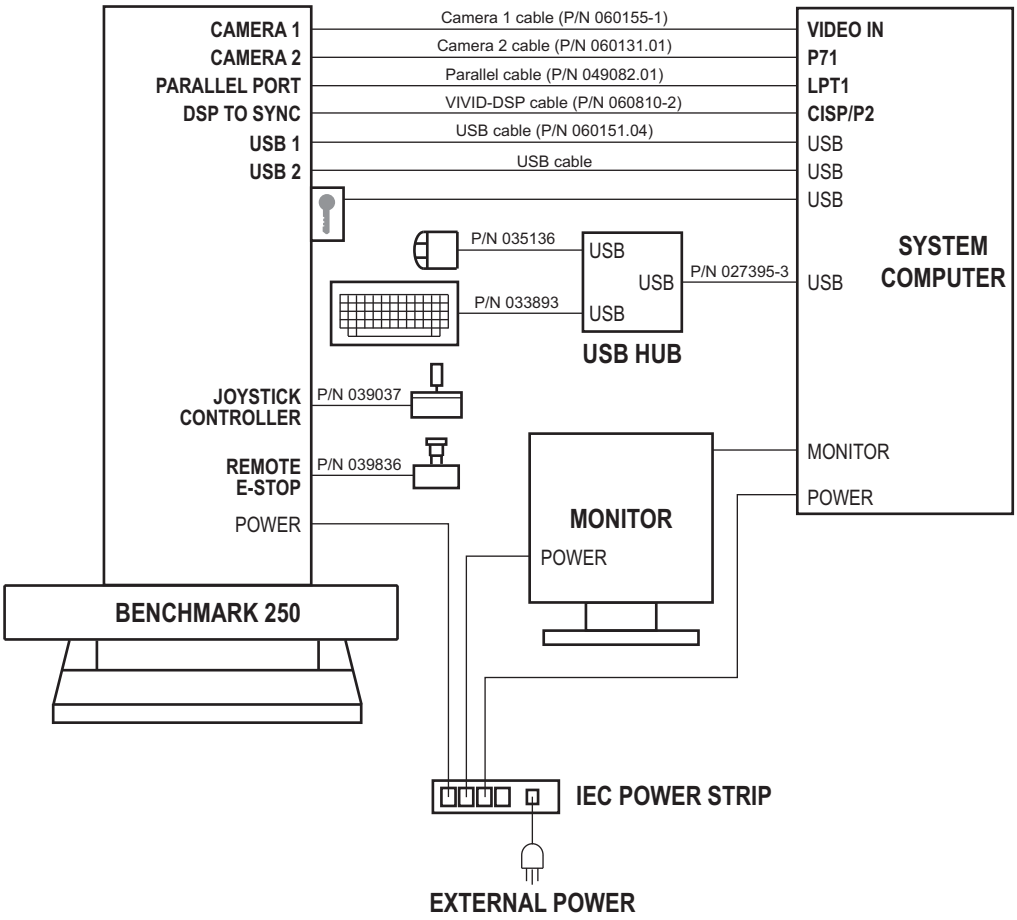


Figure 4-7 System Cabling Diagram (Dual Magnification Systems)

Connect the...	to the...	and the...
Joystick (P/N 039037)	**JOYSTICK CONTROLLER** connector on the machine	—
Remote E-Stop (P/N 039836)	**REMOTE E-STOP** connector on the machine	—
USB cable (P/N 027395-3)	USB connector on the USB Hub	USB connector on the system computer
Keyboard (P/N 033893)	USB connector on the USB Hub	—
Mouse (P/N 035136)	USB connector on the USB Hub	—
Monitor cable	Monitor	**MONITOR** connector on the system computer
VIVID-DSP cable (P/N 060810-2)	**DSP TO SYNC** connector on the machine	**CISP/P2** connector on the system computer
USB cable (P/N 060151.04)	**USB 1** connector on the machine	USB connector on the system computer
USB cable	**USB 2** connector on the machine	USB connector on the system computer
Parallel cable (P/N 049082.01)	**PARALLEL PORT** connector on the machine	**LPT1** connector on the system computer
Camera 1 cable (P/N 060155-1)	**CAMERA 1** connector on the machine	**VIDEO IN** connector on the system computer
Camera 2 cable (P/N 060131.01)	**CAMERA 2** connector on the machine	**P71** connector on the system computer
Software security dongle	Software key box (attached to the machine)	USB connector on the system computer
Monitor power cord	Monitor	IEC power strip
System computer power cord	System computer	IEC power strip
Machine power cord	Machine	IEC power strip
System power cord	IEC power strip	Power outlet

Table 4-1 System Cabling (Dual Magnification Systems)

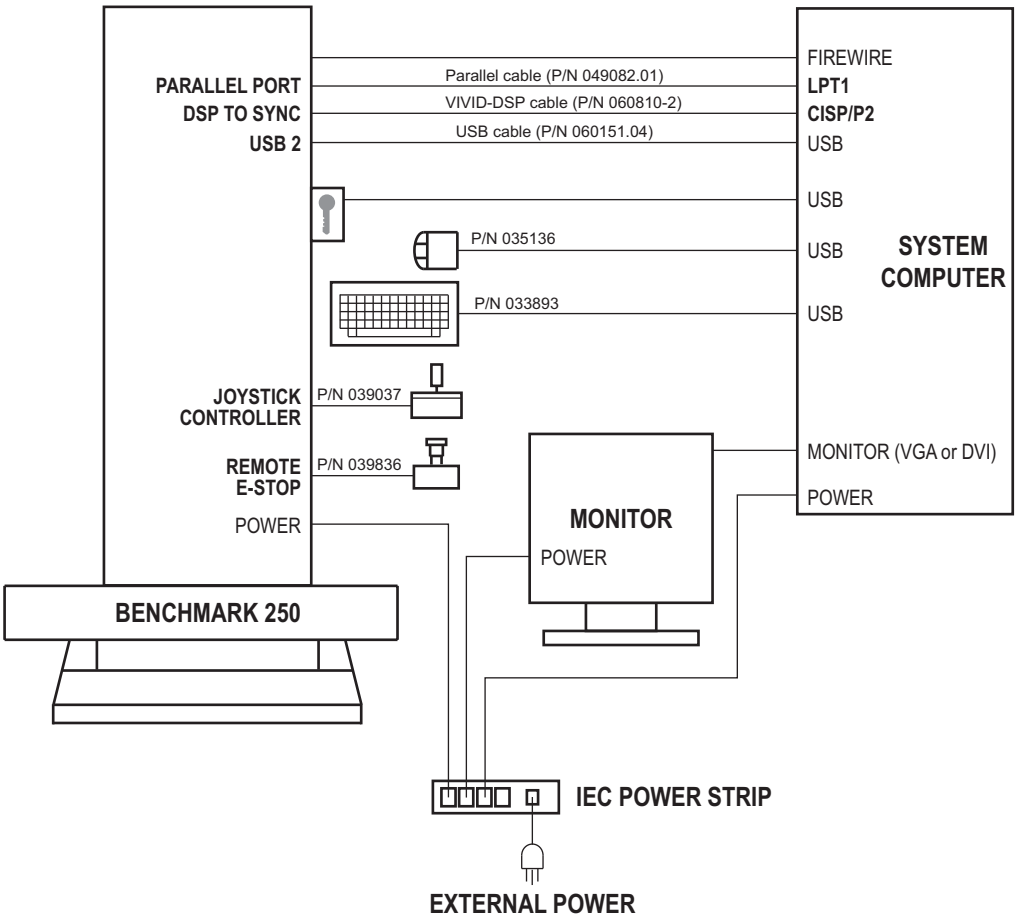


Figure 4-8 System Cabling Diagram (Single Magnification Systems)

Connect the...	to the...	and the...
Joystick (P/N 039037)	**JOYSTICK CONTROLLER** connector on the machine	—
Remote E-Stop (P/N 039836)	**REMOTE E-STOP** connector on the machine	—
Keyboard (P/N 033893)	USB connector on the system computer	—
Mouse (P/N 035136)	USB connector on the system computer	—
Monitor cable	Monitor	**MONITOR** connector (VGA or DVI) on the system computer
VIVID-DSP cable (P/N 060810-2)	**DSP TO SYNC** connector on the machine	**CISP/P2** connector on the system computer
USB cable (P/N 060151.04)	**USB 2** connector on the machine	USB connector on the system computer
Parallel cable (P/N 049082.01)	**PARALLEL PORT** connector on the machine	**LPT1** connector on the system computer
Firwire (video) cable (from machine)	Firewire connector on the system computer	—
Software security dongle	Software key box (attached to the machine)	USB connector on the system computer
Monitor power cord	Monitor	IEC power strip
System computer power cord	System computer	IEC power strip
Machine power cord	Machine	IEC power strip
System power cord	IEC power strip	Power outlet

Table 4-2 System Cabling (Single Magnification Systems)

System Startup & Shutdown

Chapter 5

5.1 What This Chapter Contains

This chapter covers the following:

- Powering Up the System
- Stopping Stage Motion
- Operation Checks
- Running a Part Inspection Program
- Shutting Down the System
- Stage Fixture Mounting Holes

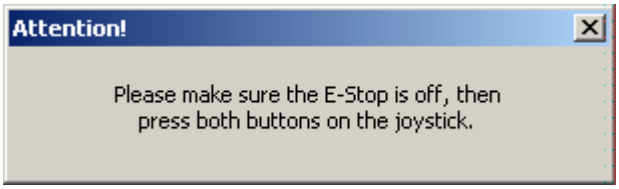
5.2 Powering Up the System

1. Make sure the system components are connected and the main power cord is plugged into an appropriate power source (outlet).

2. Power up the machine, system computer, monitor, and any optional accessories.

3. Wait for the operating system to load, and then double-click on the VMS icon on the Windows Desktop.

   The following prompt appears:



4. Verify that the remote E-Stop is pulled out.

5. Press the **Stop/Start** button on the joystick.

5.3 Stopping Stage Motion

If you encounter an emergency while operating the system, press the remote E-Stop (see Figure 5-1) to immediately cut power to the motors and stop system operation.

Caution: After activating an emergency stop, contact your supervisor to investigate the problem. Do **not** remove power from the computer, which could cause improper shutdown of the software and damage files.

To resume normal operation, reset the E-Stop by twisting the knob in the direction of the arrows. Then press the **Stop/Start** button on the joystick.

Figure 5-1 Remote E-Stop

5.4 Operation Checks

After powering up the system and launching the metrology software, you should verify that it performs as expected. If the system fails any of the following operation checks, verify all connections are correct and secure. If the system still does not perform as described below, contact the Customer Support HelpDesk.

Caution: Before performing any of the following operation checks, verify that no parts, fixtures, or other obstructions are on the stage.

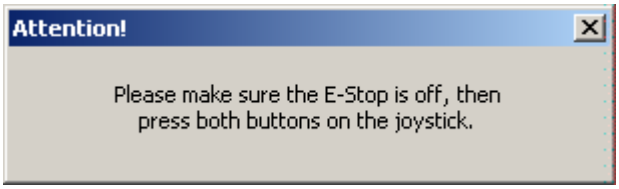
Action	Result
Press the remote E-Stop.	• The system enters E-Stop Mode—the yellow Stop LED on the right side of the machine turns on. • A software message appears on the screen. • The stage does not move when you move the joystick lever. To resume normal operation: 1. Clear the software message. 2. Reset the E-Stop by twisting the knob in the direction of the arrows. 3. Press the **Stop/Start** button on the joystick.
Move the joystick lever in any direction.	The stage moves in the same direction.
Twist the joystick knob CW.	The Z-axis assembly moves down.
Twist the joystick knob CCW.	The Z-axis assembly moves up.
Press the **Stop/Start** button on the joystick.	• The system enters Stop Mode—the yellow Stop LED on the right side of the machine turns on. • A software message appears on the screen. • The stage does not move when you move the joystick lever. To resume normal operation: 1. Clear the software message. 2. Press the **Stop/Start** button on the joystick.
Adjust the illumination levels in the software.	The intensity of the selected illuminator should change as expected.

5.5 Running a Part Inspection Program

Caution: Only fully trained and authorized personnel should operate the system.

1. Launch the VMS metrology software by double-clicking on the VMS icon on the Windows Desktop.

   The following prompt appears:



2. Verify that the remote E-Stop is pulled out.

3. Press the **Stop/Start** button on the joystick.

   The software loads, and the following appears:

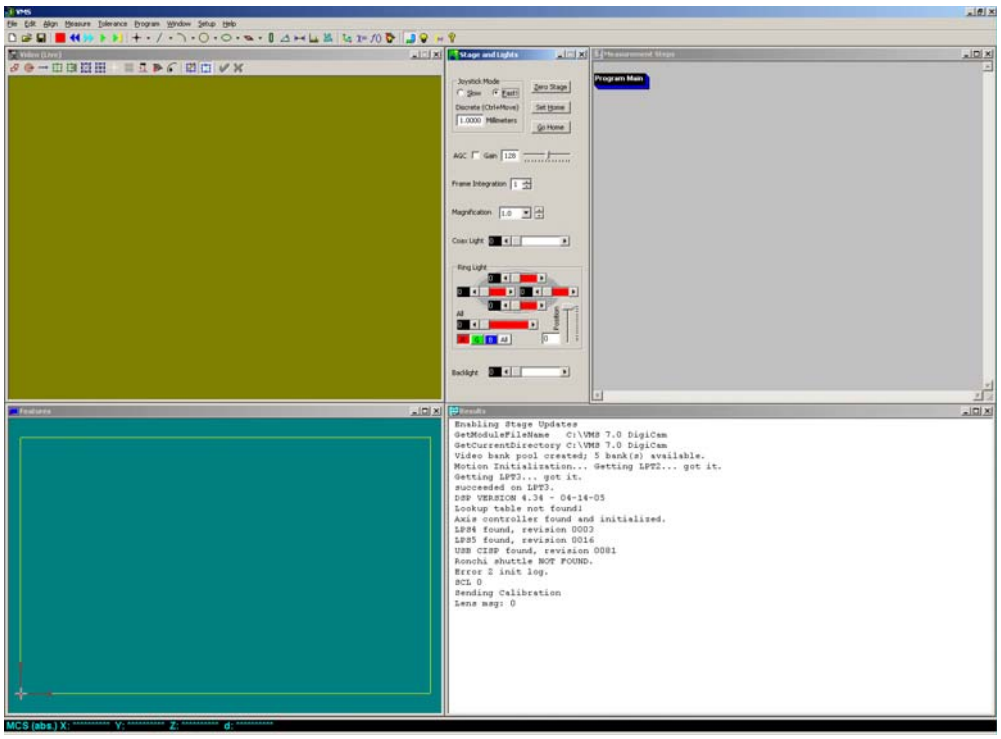


Figure 5-2 Initial VMS Screen

4. Click the **Zero Stage** button in the Stage and Lights window.

   The stages move to their home positions—first the Z-axis, then the Y-axis, and finally the X-axis. After the stage home sequence, the system moves the optical assembly to its original position. Do not place anything on the stage that will interfere with this movement.

5. After the stages are zeroed, joystick control becomes active and the system is ready for use.

6. Click  in the VMS toolbar and open the part program you want to run.

7. Place the part to be inspected on the stage or in a part fixture.

8. If the part has to be aligned manually before running the program, use the joystick to move the stage and follow the movement in the Video window, until the feature is in position in the camera field of view.

9. Click  in the VMS toolbar to run the program automatically.

10. To inspect more parts, using the same program, repeat Steps 7, 8, and 9. Measurement results will be saved in the Results window and can be output if required.

11. To run a different program, go back to Step 6.

12. When the program has finished and you no longer want to run any programs, select **File / Exit** to close the software.

Note: It is OK to leave the system in this condition if it is temporarily not being used. If the system will not be used for an extended period of time, we recommend powering it down as described on the next page.

5.6 Shutting Down the System

Warning: The system must be shut down in an orderly fashion to prevent data loss.

To exit the metrology software, do one of the following:

- Click on the **X** in the upper-right corner of the screen
- Select **File / Exit** from the main menu

To shut down Windows and power down the system, do the following:

1. Close all programs.
2. Shut down the system computer.
3. Power down the monitor and any optional accessories.

5.7 Stage Fixture Mounting Holes

To conveniently mount fixtures to the stage for securing and orientating parts, there are several M6 tapped holes along each side of the stage. Any combination of holes can be used to attach a variety of fixtures.

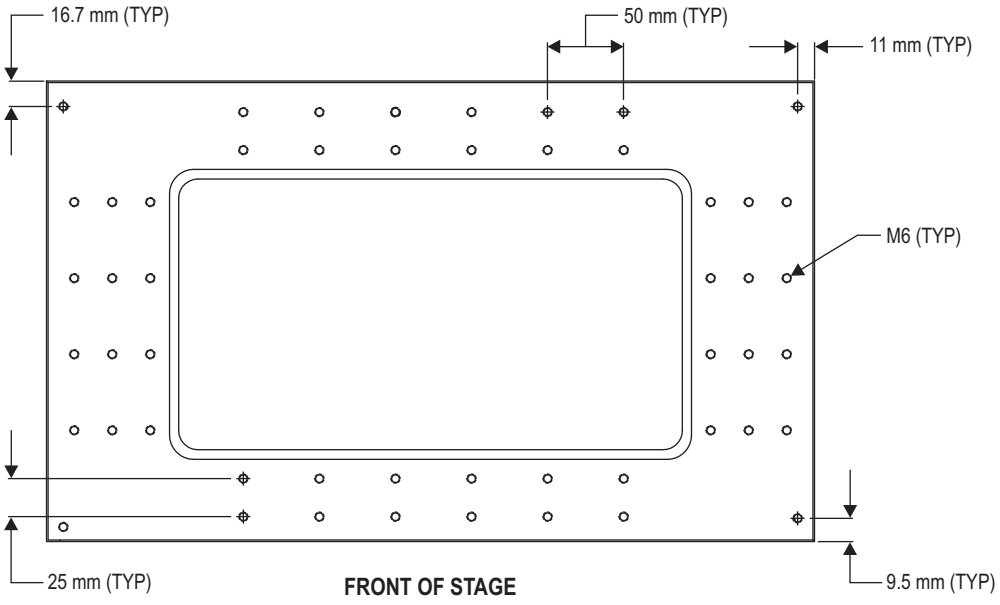


Figure 5-3 Benchmark 250 Stage Fixturing Holes