

DE3200 Series Video Microscopes

DE3200 Lab Video Microscope

DE3200-S2 Bare Fiber + Video Microscope

User's Guide

Overview:

Manufactured by Domaille Engineering, LLC, the DE3200 Series Video Microscopes are designed for high quality visual end-face inspection of fiber optic connectors and bare fiber in a research or production environment. Featuring a powerful illumination system and high magnification, it is considered a valuable tool in production facilities and engineering labs.

Utilizing Velmex stages and adapters provides flexibility for operators to move between connector types on the DE3200. The Velmex stage on the DE3200-S2 enables operators to travel along bare fiber as well as moving from bare fiber to a connector. Connector adapters are compatible with the DE2503 and DE2600 OptiSpec® Microscopes.

Within this manual is all the information needed to operate and maintain the DE3200 Series Video Microscopes. Domaille Engineering continues to design innovative new products while maintaining and further developing existing ones.

Printing History

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Features:

DE3200

- High resolution video and CCD Camera
- Five position nosepiece
- Long working distance optics for UPC and APC inspection
- An extensive range of adapters for most connectors
- Precision LED illumination control

DE3200-S2

- High resolution video and CCD Camera
- Five position nosepiece
- Long working distance optics for UPC and APC inspection
- Bare Fiber Adapters
- Rotating stage to view end face and side profile of bare fiber.

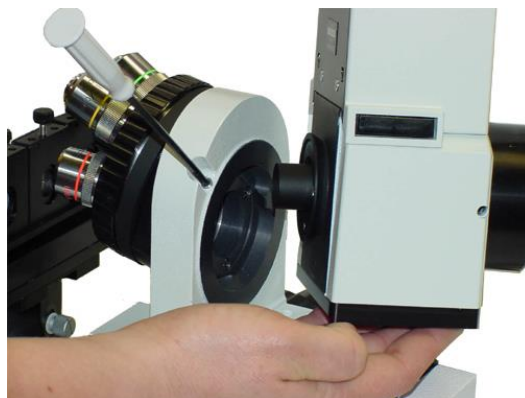
Initial Setup:

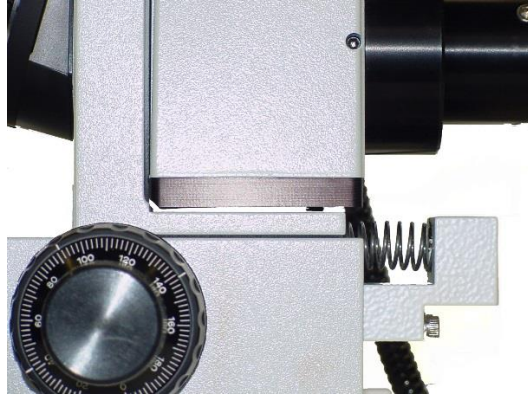
Due to the delicate nature of the optics housed within the DE3200 and DE3200-S2, the microscope must be shipped in a partly un-assembled state to ensure safe delivery.

1. Unwrap the modular focus base and vertical illuminator.
2. Remove the dust cover from the back of the vertical illuminator and the front of the focus base.
3. Using a 3mm wrench, mount the dovetail of the vertical illuminator to the modular focus base. DO NOT overtighten the screw as it could crack or damage the mount.

Make sure that the vertical illuminator is mounted vertically on the focus base. You can check this by looking at the space between the illuminator and the focus base for clearance.

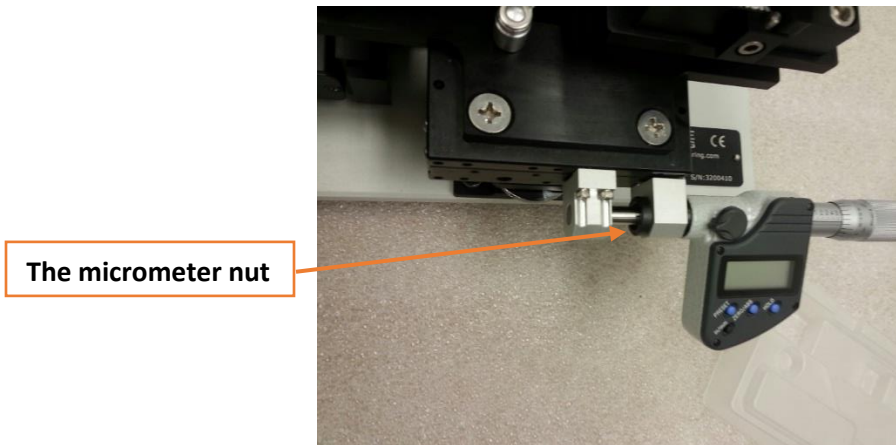
Note: Failure to make sure the vertical illuminator is attached correctly to the focus base may lead to serious resolution problems with the microscope.





Attaching the Micrometer (DE3200-S2)

The micrometer is packaged separately to prevent damage during shipping. To reduce wear on the battery, it has been inserted backwards for shipping.



1. On the back on the micrometer remove the battery plate. Flip battery and replace battery plate.
2. Remove the nut from the micrometer.
3. Insert the micrometer into the first holder, but not through the second.
4. Place the nut back onto the micrometer.
5. Read the micrometer instruction manual prior to use.

Once the vertical illuminator and micrometer have been installed, the remaining set up can be quickly achieved through a few simple connections. There are three main components to the microscope system: the microscope, power adapter/LED Controller, and monitor (or computer if using a digital camera or frame grabber).

The ME-12013 LED Controller operates from a 24 volt DC output power adapter (ME-12015) with switching transformer to accept AC voltage 90-240 volt, 50-60Hz for domestic or international use. This unit is used to power both the camera and the illumination of the microscope.

Currently we provide two different monitor types, in several different sizes. These monitors are high resolution monitors specifically chosen to provide the best solution for inspecting connector end-faces. We do not recommend any of the lower priced security type monitors as the resolution and image quality are not sufficient. A computer may also be used to capture images, contact Domaille Engineering for more information on digital camera options or video frame grabbers.

Operation:

Focusing and Focus Tension Adjustments

The focus adjustment knob on the DE3200 series is conveniently located on each side of the Modular Focus Base. Both coarse and a fine adjustment are provided. A tension adjustment is also located on the right side of the scope.

Clockwise = Focuses the Stage In

Counter-Clockwise = Focuses the Stage Out



Lighting:

The illumination can be controlled using the intensity control knob located on the fiber optic light source. This allows the operator to control the brightness of the image when inspecting the dark fiber cladding and highly reflective metal or ceramic ferrules.



Clockwise = Increases Illumination

Counter- Clockwise = Decreases Illumination

Changing Magnifications:

Each DE3200 and DE3200-S2 model is equipped with four objective lenses: 5x, 10x, 20x, and 40x. Mounted to a typical microscope turret or nosepiece allows the operator to quickly change magnifications when inspecting connectors. Optional 3.3x, 10x interferometer, 20x interferometer objectives, and fiber pointer are available. The fiber pointer helps align bare fiber quickly.

For more information on magnification or calibration, please visit our website at www.domailleengineering.com



Illumination Set up:

For maximum contrast, alignment of the field diaphragm is critical in maximizing performance of the DE3200 Series. Once set, no further adjustment should be necessary.

1. Set up an image with the fiber in the center of the monitor screen.
2. Set the magnification using the 40x objective.
3. Close the field diaphragm by sliding the knob to the left.
4. This will close the diaphragm and appear as a hexagon silhouette.
5. Use the centering knobs on each side of the Vertical Illuminator to move the silhouette of the diaphragm so that it is centered around the image of the fiber.

Determining Actual Magnification:

The best method to calculate the exact “total” magnification used on the DE3200 series is to measure the cladding on the video display. Take the measurement in millimeters and divide that amount by the 125 micron cladding. The result is the “total” optical and video magnification being used.

For example: Taking a set of calipers, we measured the diameter of the ferrule viewed through DE3200 on a monitor to be approximately 53.49mm.

Actual size of display/cladding diameter in mm = Total Magnification.

$$53.49\text{mm} / .125\text{mm} = 427.92\text{x}$$



For more information on Total Magnification or differences between optical and video magnification please refer to the Optical versus Video section on our website www.domailleengineering.com

Linear Stage Adjustments:

Centering on the DE3200 Series can be accomplished along three axes.

- The lever in the front of the stage acts as a lock, flipping the lever to the right hand side of the scope “un-locks” the stage while flipping it to the left “locks” the stage. Quickly change positions by “un-locking” the stage and sliding the stage left or right. Use this for coarse adjustment of the X- axis.
- After locking the stage, use the knob on the right for fine adjustment along the x-axis up to 0.5 inches.
- Each adapter bracket has its own individual z- axis adjustment. The DE3200-S2 the bare fiber stage can be adjusted along Z-axis using the thumbwheel towards the bottom of the stage.
- The Y- axis adjustment is controlled by the focus knob on the both sides of illuminator base.

Changing Adapters on the DE3200:

Adapters on the DE3200 Series stage can quickly be changed out by loosening the two thumb screws. When aligning the adapter use the lower powered 5x objective.

Individual adapters can be moved back and forth to align them with others. This is used to “parfocal” the adapters to one another. This minimizes the amount of focusing required when switching connector styles.

Setting APC Adapters on the DE3200:

Use the two end positions on the DE3200 Series stage for setting up APC 2.5 or 1.25mm adapters. A third mounting hole is provided to angle the adapter at 8 degrees. Insert the connector key up on the left hand position and key down on the right hand position.

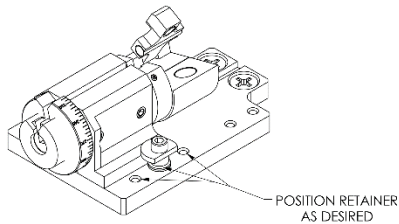
As with setting up any adapter it may be easier to use the low (5x) powered objective first. The angle can then be checked by inserting a connector and making sure the light is centered.

Changing Bare Fiber Adapters on the DE3200-S2:

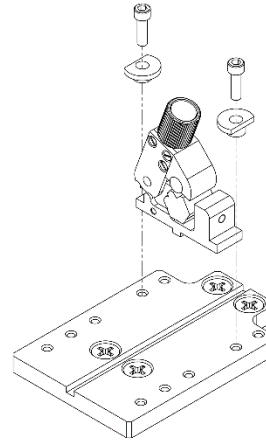
There are a few different bare fiber adapters for the DE3200-S2 to best accommodate your fiber viewing needs. The bare fiber rotator allows the operator to turn the fiber 360°, currently this is only available

for 1.25mm and 2.5mm fibers. The Quick Release V-Groove allows the operator to switch between multiple fiber sizes, this adapter allows for fiber sizes from .125mm to 2.66mm.

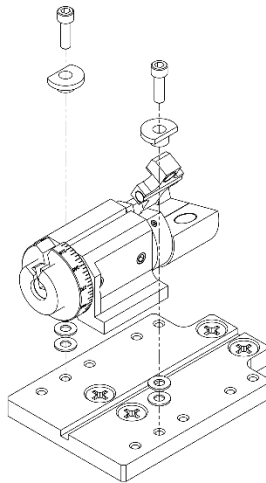
These adapters can be switched out for different applications by following the diagram below:



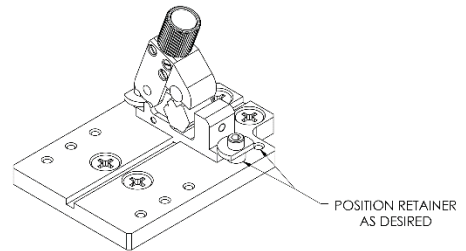
ASSEMBLED w/ FIBER ROTATOR



QUICK RELEASE V-GROOVE REMOVAL/INSTALLATION



FIBER ROTATOR REMOVAL/INSTALLATION



ASSEMBLED w/ QUICK RELEASE V-GROOVE

Preventive Maintenance

Caution:

- The following instructions should only be performed by qualified service personnel.
- If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- There is NO SERVICEABLE EQUIPMENT inside the (ME-12013) LED controller. All equipment requiring repair should be sent back to the manufacturer or an authorized dealer.

General Cleaning

Harsh solvents are not recommended on a regular basis. Typical safe degreaser solvents can be used to clean old grease or grime from mechanical parts. Ordinary lens cleaner (offered at most photo/camera supply stores) is safe to use on the optics of our microscopes. Lens cleaner can be used with a soft lens tissue/ cloth to remove any soil, fingerprints, etc. from the front of the objectives.

Centering the illumination

Centering the illumination of the DE3200 Series is critical in order to maximize performance of the microscope. All scopes are set up from the factory, but replacing lamps or periodic cleaning of may require the operator to re-center the fiber optic bundle over the vertical illuminator.

1. Using a 1/16" hex wrench, loosen the three set screws at the top of the Vertical Illuminator.
2. While viewing a fiber on the monitor, slide the fiber optic bundle and adapter until the greatest amount of light is over the cladding area of the fiber.
3. Re-tighten the three screws.

Note: adjust the light intensity up and down to confirm the light is centered

Cleaning objective lenses

Oils, dirt, and fingerprints may reduce the resolving power of the objective lenses. To ensure maximum levels of performance of the DE3200series microscopes, wipe the lens of the objectives with a lint-free tissue and lens cleaner. Ordinary lens cleaner, available at most photography supply stores works the best. Perform this procedure weekly or as needed, depending on the type of environment inspection is being held.



Adjusting the Magnification

A slight adjustment to the magnification can be made by turning the video coupler. This essentially alters the tube length of the microscope and may cause some of the objectives to loose parfocality, however it is a handy adjustment when calibrating the microscope to specifications that are slowly being introduced into the industry.

This adjustment is relative to the size of the image and will not offer any more or less resolving power to the microscope.

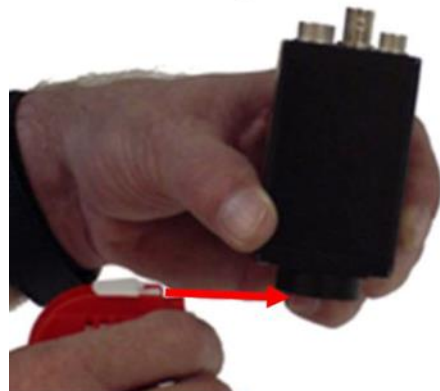
Cleaning the CCD Camera

Use extreme caution when attempting to clean the camera. Any scratches, solvent, streaks or dirt left on the IR filter of the CCD will show up in the field of view of the microscopes.

Before attempting to clean the IR filter on the CCD camera, first confirm that the visible dirt on the monitor is actually on the camera. While viewing the suspected dirt on the video monitor, slowly rotate the CCD camera on the Microscope.

Due to the orientation of the CCD, if the dirt remains in the same spot and does not rotate with the camera, the dirt is most likely on the camera itself.

1. Carefully unscrew the camera from the camera mount.
2. Using clean, compressed air, blow across the surface of the IR filter.
3. Recheck the camera for dirt.
4. If the dirt is still there, use plastic tweezers, soft lens cloth and lens cleaner to carefully wipe the surface of the IR filter. Use a wiping spiral pattern from center of filter out to edges, to remove debris.
5. Re-check the camera for dirt.
6. Repeat this process until the camera is clean.



Caution: Blow air across and not directly at the CCD sensor of the camera.

Adjusting the knob tension on the DE3200 Series

The tension on the X-axis adjustment knob may need adjustment from time to time depending on the frequency of use.

1. Using a .05" hex wrench, unscrew the locking set screw that secures the knob to the drive shaft and remove the knob.

2. Using a spanner or special adjustment tool available from Domaille Engineering, LLC. Adjust the spanner nut clockwise to increase the tension on the knob. Likewise turn the spanner nut counterclockwise to decrease the tension.

Troubleshooting Advice

Image is Not Clear	Try adjusting the focus mechanism to bring the image into focus.
	Increase or decrease the light intensity on the fiber optic light source.
	Adjust to 5x objective and verify fiber is in the field of view.
No Illumination	Check the set-up, confirm that all connections are made and that everything is powered on.
	Increase the light intensity on the fiber optic light source.
	Check the fiber optic light source, replace it if necessary.
No Video Image	Check the set-up, confirm that all connections are made and that everything is powered on.
	Re-set the light intensity to approximately half power, too much light will bleed out the image resulting in an all-white screen.
	Try adjusting the focus in and out.
Image Not Centered	Use the Z-axis stage adjustment and the linear slide knob to bring the fiber to the center of the screen.
	Fine tune the adjustments on the Z-axis using the knobs on top of each bracket.
Spots and/or Lines on the Monitor	Slightly decrease the contrast control on the monitor as this may enhance optical interference with the CCD Chip.
	Check the CCD Camera of dirt and debris.
	Isolate the scope from other electronic devices that may cause video interference.
Loss of Resolution or Image Contrast	Check the objective lenses for dirt, scratches or film.
	Adjust the brightness and contrast controls on the monitor.
	Make sure the impedance switch on the back of the monitor is set to 75Ω.
	Check the CCD camera for dirt and film.(Add period)

	Make sure the shutter on the CCD is set to the OFF position.
Image Drifts In and Out of Focus	Tighten the focus tension knob.
	Tighten the side adjustment screw on the connector bracket.
Image is Not Centered Between Objectives	Check that each objective is screwed on tight.

LIMITED WARRANTY

Domaille Engineering, LLC (“Domaille”) products are warranted by Domaille to be free from defects in workmanship and materials for a period of one-year from the original purchase date. This warranty covers defects in materials or workmanship only and does not include damage due to abuse, misuse, problems with electrical power, problems with compressed air supply, servicing not authorized by Domaille, failure to properly care for and maintain the products, or normal wear and tear. In addition, use of parts, components, or accessories not supplied or approved by Domaille will void this warranty.

Domaille’s sole liability arising from any use of its products and this warranty is limited to repair or, at Domaille’s sole discretion, replacement of defective products or defective component parts thereof. To request warranty service, you must contact Domaille at 7100 Dresser Dr. N.E., Rochester, MN 55906, USA. If warranty service is required, Domaille will issue a Return Material Authorization Number (RMA#). You must ship the products back to Domaille in their original or equivalent packaging, pre-pay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment. Along with your RMA# include your name, telephone number, return address, proof of original purchase date, and a description of the claimed defect. If the defect is covered by this limited warranty, Domaille will repair or replace (at its option) the product or the defective component part(s) and ship them freight prepaid to an address in the continental U.S. Shipments to locations outside of the U.S. that are not the original shipped to location will be made freight collect or will be shipped to the original shipped to location, at the discretion of Domaille.

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Product Summary

Domaille Engineering's mission is to provide our customer with the highest quality solution through the innovative use of technology that allows our customers to gain a competitive edge. Our core competencies in engineering and precision manufacturing provide OEM's and fiber optic customers effective and cost efficient solutions.

From our world renowned APM-HDC-5300 polishing machine to our patented MT EZ AbraSave® fixtures, Domaille Engineering equipment provides the highest yields and throughput in the fiber optic industry.

The Domaille APM-HDC-5300 interface allows user to program a soft ramp of pressure and speed. This feature along with accurate force, speed, and time enables customers to consistently meet the most demanding fiber optic polishing specifications.

Our patented AbraSave® fixture line utilizes Unique Path Technology which reduces polishing time and polishing film costs. The AbraSave® technology delivers the greatest consistent fiber protrusion for the best polishing results in the fiber optic industry.

The OptiSaber™ laser cleaver family is a Domaille solution addressing process variation associated with cracking, which is typical of mechanical cleaving process. Our OS7000M patent pending MT adapter allows users to cleave both UPC and APC ferrules with a few simple adjustments. The OptiSaber OS7000S single fiber laser cleaver has several different single fiber adapters to choose from depending on connector type.

Domaille Engineering proudly offers our OptiSpec® product line of fiber optic microscopes. Our OptiSpec® microscope line offers customers high quality production fiber optic inspection capabilities for both production and laboratory settings.

View all of our products, including the Universal Cure Oven and Air Cleanse System, at www.DomailleEngineering.com.

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