

DE8850 Series

Fiber Optic Inspection Scope

Video Microscope

User's Guide



Overview

Manufactured by Domaille Engineering, LLC, the DE8850 Series Video Microscopes are designed for high quality visual end-face inspection of fiber optic connectors in a research or production environment. This scope has a unique stage with inverted optics, allowing the operator to inspect connectors, without removing them from the polishing fixture thereby increasing throughput during inspection.

Printing History

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Parts & Functions



Features:

- High Resolution video and CCD camera
- Four Position Nosepiece
- Long Working Distance Optics for UPC and APC inspection
- An extensive range of inserts, reference page 14
- Precision Illumination and focus controls
- X,Y, Z Stage for easily finding connectors in fixture

Initial Setup

After unpacking the DE8850 series microscope and accessories, setup can be quickly achieved through a few simple connections.

First set the DE8850 microscope base on a solid tabletop and find the power adaptor (ME-12305) shipped with the system. These two items (including the LED controller integrated into the base) are connected together to power the microscope camera and illumination system.

The power adaptor has an input voltage range of 90-240VAC, 50-60Hz (for worldwide use) and output of +12VDC. It should be accompanied by the correct input AC cord and also has a permanent wired output cord to plug into the LED controller (ME-12300.) After finding the items connect the output cord of the power adaptor to the input labeled +12-24VDC on the LED controller (if not already connected.) When done then connect the supplied AC cord to the power adaptor input receptacle.

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.

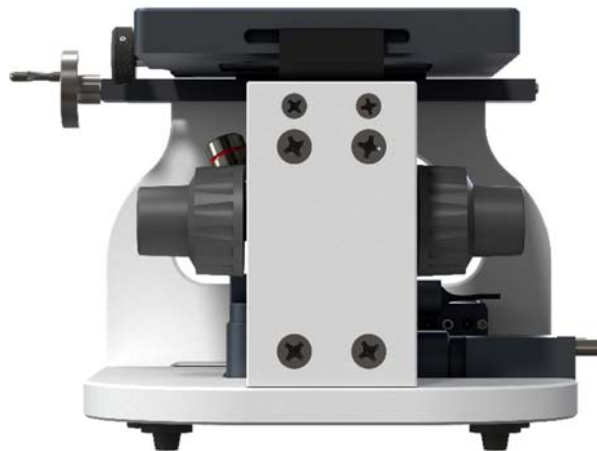
Operation

Focusing and Focus Tension Adjustments

The Focus Adjustment Knob on the DE8850 series is conveniently located on each side of the base. Both course and a fine adjustment are provided. A tension adjustment is also located on the right side of the scope.

Clockwise = Focuses the Stage Out

Counter-clockwise = Focuses the Stage In



Lighting

The illumination can be controlled using the “On/Off LED Intensity” control knob (Blue Knob) located on the ME-12300 LED controller. This allows the operator to control the brightness of the image when inspecting the dark fiber cladding and highly reflective metal or ceramic ferrules. A dimmer switch button is also provided to switch between darker and lighter objects

Clockwise = Increases Illumination

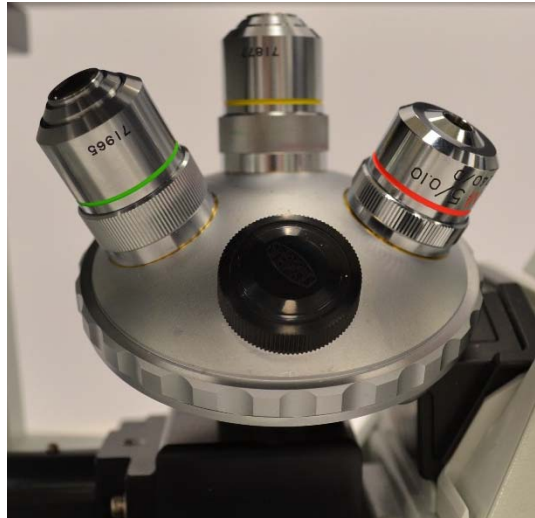
Counter-Clockwise = Decreases Illumination



Changing Magnifications

Each DE8850 model is equipped with three objective lenses: 5x, 10x, and 20x. The objective lenses are mounted to a typical microscope turret or nosepiece allowing the operator to quickly change magnifications when inspecting connectors. Optional objective lenses are also available

in 3.3x and 40x.



Determining Actual Magnification

The best method to calculate the exact “total” magnification used on the DE8850 series is to measure the diameter of the fiber, cladding on the video display. Take the measurement in millimeters and divide that amount by the actual size of the fiber cladding, typically 125 micron. 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 DE8850 on a monitor to be approximately 53.49mm.

*Actual size on display/cladding diameter in mm = total magnification
 $53.49\text{mm} / .125\text{mm} = 427.92X$*



Linear Stage Adjustments

The stage on the DE8850 has three adjustments. The polishing fixture insert rotates to view new connectors mounted on the polishing fixture. Most inserts feature detents that allow the operator to stop rotating precisely over the next connector.

Y-axis travel is provided to scan multiple fiber style connectors and an X-axis adjustment is provided to center the image on the monitor.



Changing Inserts

All inserts, except DE8134, simply lift up and out of the stage assembly. This enables operators to quickly change inserts to accommodate different types of connectors when inspecting jumpers with different types of connectors.

The DE8134 12 position insert for Domaille and Seikoh Giken 510 polishers is fixed directly to the stage assembly. Use a hex wrench to loosen the release screw in the side stage.



Preventive Maintenance

Caution:



The following instructions should only be performed by qualified service personnel.

Warning:



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-12300 LED Controller. All equipment requiring repair should be sent back to the manufacturer or an authorized dealer.

Note: The DE8850 series microscopes are relatively low maintenance. Basic care and precaution in using the instrument is required. Depending upon the cleanliness of the general working area as well as the age of the equipment, we would suggest at least semi-annual service and maintenance.

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. The Kodak 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

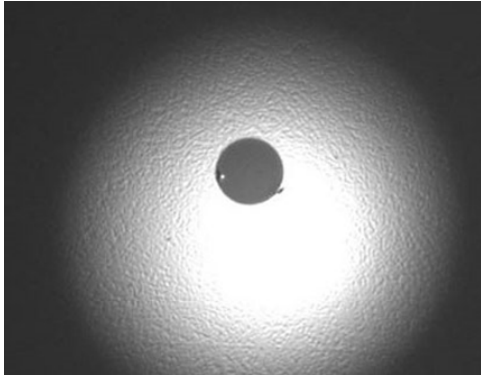
Centering the illumination of the DE8850 is critical in order to maximize performance of the microscope. All scopes are set up from the factory, but periodic cleaning may require the operator to re-center the illumination.



1. Move image to center of screen.
2. Using a 3/32" hex wrench, loosen the four screws on either side of the light source mount.

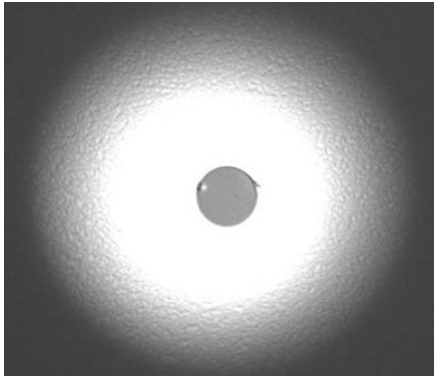
3. While viewing a fiber on the monitor, slide the light block around until the greatest amount of light is over the cladding area of the fiber.
4. Re-tighten the two screws.

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



Incorrect Illumination:

Notice how the light is towards the bottom of the screen.



Correct Illumination:

Notice how the light surrounds the cladding. Light scratches can now be easily detected.

Cleaning the Dust Cover

Depending the type of production environment, the dust cover will need periodic cleaning to remove dust, debris and polishing material from the optical system. Since the illumination and optical path travels through the dust cover it is essential to keep this surface clean in order to ensure maximum performance of the DE8850.

1. Try to blow large particles off of the dust cover using compressed air.
2. Using a lens cleaner and a soft lens cloth, in a circular motion, carefully wipe the surface of the dust cover starting from the center and working towards the edges.



Cleaning objective lenses

Oils, dirt, and finger prints may reduce the resolving power of the objective lenses. To ensure maximum levels of performance of the DE8850 series, 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.



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, then it most likely is 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.



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

Troubleshooting Advice

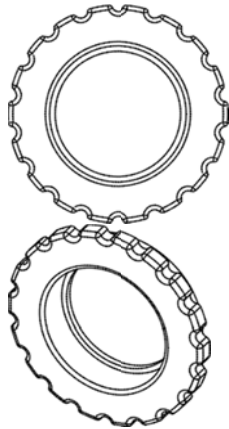
Image is not clear	Try adjusting the focus mechanism to bring the image into focus.
	Increase or decrease the light intensity on the fiber optic light source.
	Adjust to 5x objective and verify fiber is in the field of view.
No Illumination	Check the set-up, confirm that all connections are made and 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 1/3 power, too much light will bleed out the image resulting in an all-white screen.
	Try adjusting the focus in and out.
Image is 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
	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.

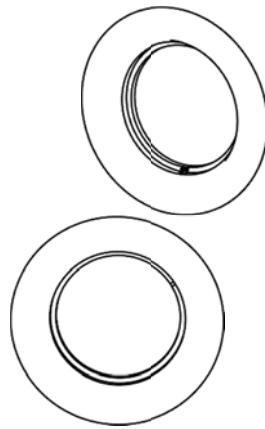
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Polishing Fixture Inserts

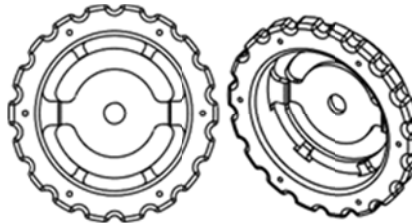
DE8121: 12 position
Insert
Domaille
Seiko Giken 510



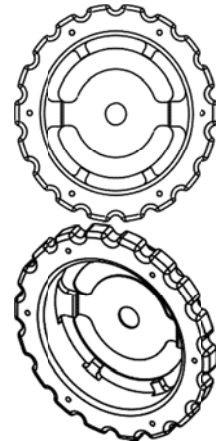
DE8134: 12
position Insert with
indexing
Domaille
Seiko Giken 510



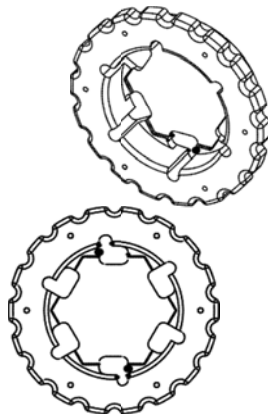
DE8153: 10 position MT PC and
APC Insert
Domaille



DE8153-N: 10
position MT PC and
APC Insert
Domaille

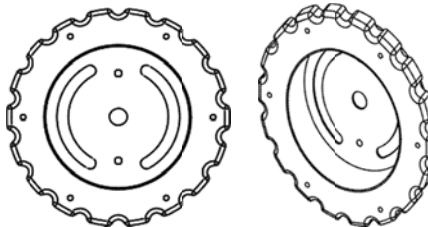


DE8166: 6 position
MT-RJ insert with
indexing
Domaille



Domaille
Engineering
specializes in
engineering
solutions for
unique insert
requirements

DE8180: PF—0.0625 – 2.0-DCL-12
Domaille



DE8182: 12 position
MT EZ
Domaille

