

DE8800 Series

Fiber Optic Inspection Scope
User's Guide



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DE8800 Series Fiber Optic Inspection Scope

User's Guide

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Overview

Manufactured by Domaille Engineering, LLC, the DE8800 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.

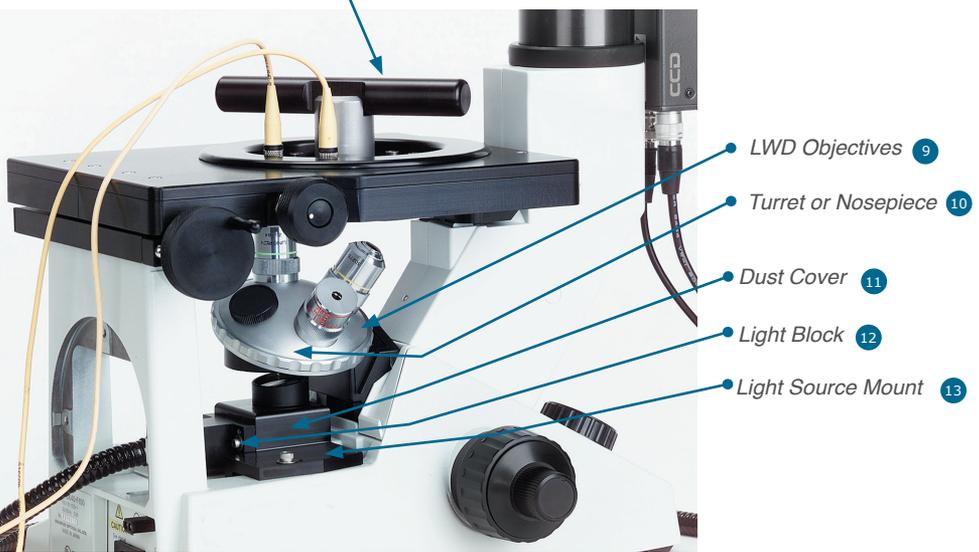


Printing History

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Parts and Functions



1	U-Bend Adapter	Mounts the camera to the microscope base by bending it out of the way of the operator.
2	CCD Camera	High resolution monochrome which are standard components of the DE8800 series microscope. Additional camera options available, contact Domaille Engineering for details.
3	X-Y Stage Assembly	Provides a centering adjustment for the polishing fixture and allows transvering of Multiple Fiber Connectors.
4	X-Axis Fine Adjustment	Slight X-axis adjustment that moves the image up and down on the monitor's screen.
5	Y-Axis Adjustment and Slide	Provides a side to side centering adjustment on the monitor and allows the operator to quickly scan MT style connectors for defects.
6	Light Block Assembly	Transmits light from the light source to the vertical illuminator.
7	Focus Knob	A course and fine focus adjustment are located on each side of the focus unit. Turning this knob towards the operator will bring the optics closer to the stage.
8	Stage Insert	A variety of inserts are available to fit a wide range of polishing fixtures from several different manufacturers.
9	LWD Objectives	High quality Long Working Distances Lenses are the primary factor when determining magnification and resolution. Standard models are equipped with: ME-12006 5x ME- 12007 10x ME- 12008 20x Optional 40x and 3.3x objectives are also available.
10	Turret or Nosepiece	Mounts the objectives to the base of the microscope. By turning the nosepiece the operator may quickly change the magnification of the microscope.
11	Dust Cover	Protective covering that prevents dust and debris from obstructing the optics.
12	Light Block	Mounts the Fiber Optic Bundle to the Light Source Base. Also mounts the beamsplitter which directs the light toward the stage.
13	Light Source Mount	Mounts all the light components. Two screws located on the sides provide centering adjustment.

Features

- High Resolution video and CCD camera, digital cameras also available.
- Four Position Nosepiece with 5x, 10x, and 20x LWD objectives.
- Long Working Distance Optics for UPC and APC inspection.
- An extensive range of inserts, reference pages 14-15.
- Precision illumination Control.

Initial Setup

After unpacking the DE8800 series microscope and accessories, set up can be quickly achieved through a few simple connections. There are three main components to the microscope system, the microscope, power supply/LED Controller, and monitor (or personal computer using a frame grabber or digital camera).



The ME-12013 LED/ME-12015 Controller operates from a 24 volt DC output power adapter (ME12015) 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 CCD camera and the illumination of the microscope.

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 DE8800 series is conveniently located on each side of the base. Both course and 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

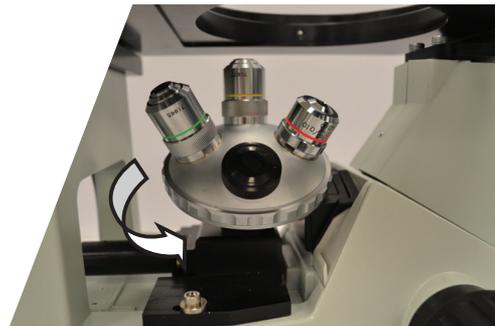
The illumination can be controlled using the "On/Off LED Intensity" control knob (Dark grey knob) located on the ME-12013 power adapter/LED controller. This allows the operator to control the brightness of the image when inspecting the dark fiber cladding and highly reflective metal or ceramic ferrules. A dimmer switch button is also provided for this function.



Clockwise = **Increases Illumination**
Counter-Clockwise = **Decreases Illumination**

Changing Magnifications

Each DE8800 model is equipped with three LWD objective lenses: 5x, 10x, and 20x. The objective lenses are mounted to a 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 DE8800 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 DE8800 on a monitor to be approximately 53.49mm.

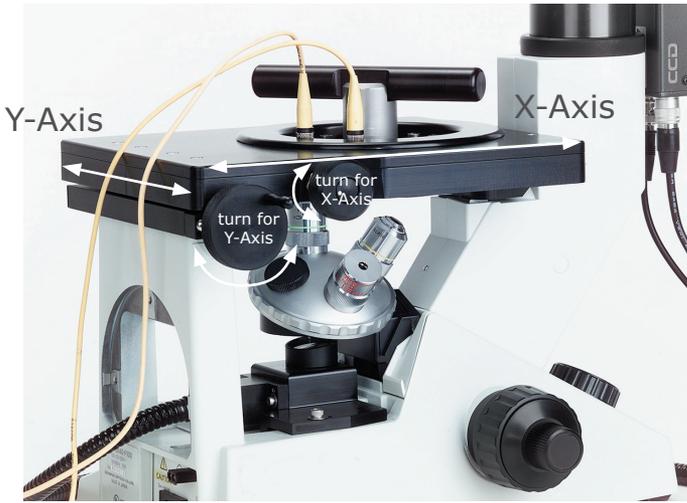
*Actual size on display/cladding diameter in mm = total magnification
 $53.49\text{mm} / .125\text{mm} = 427.92X$*



Linear Stage Adjustments

The stage on the DE8800 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.

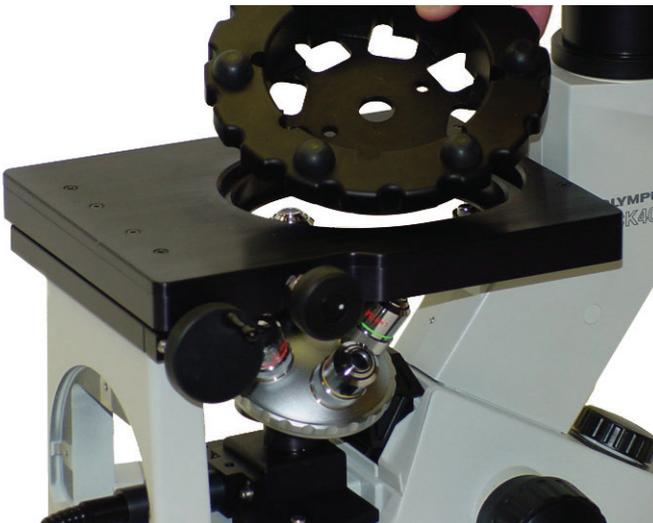
Y-axis travel is provided to scan multiple fiber style connectors and a X-axis adjustment is provided to center the image on the monitor.



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 Dommille and Seikoh Giken 510 polishers is fixed directly to the stage assembly. Use a hex wrench to loosen the release screw in the back 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-12013 LED controller. All equipment requiring repair should be sent back to the manufacturer or an authorized dealer.

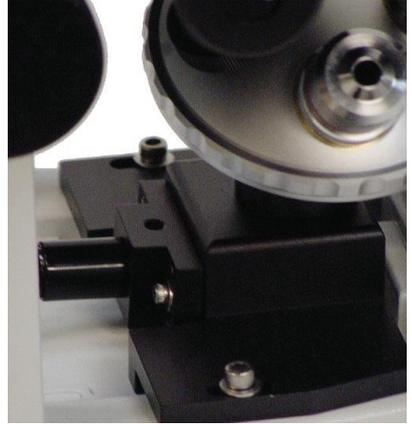
Note: The DE8800 series microscopes are relatively low maintenance. Basic care and precaution in using the instrument is required. Depending upon the cleanliness of the general working area as well as the age of the equipment, we would suggest at least semi-annual service and maintenance.

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. 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.

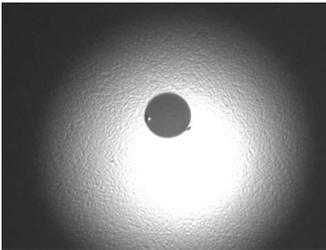
Centering the Illumination

Centering the illumination of the DE8800 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.



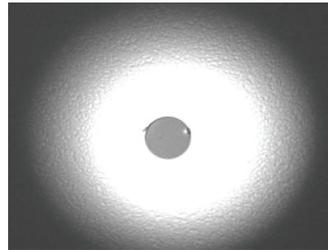
1. Using a 3/32" hex wrench, loosen the two screws on either side of the light source mount.
2. While viewing a fiber on the monitor, slide the light block around until the greatest amount of light is over the cladding area of the fiber.
3. Re-tighten the two screws.

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 DE8800.

1. Power off the unit and remove the light block assembly from the fiber optic light source.
2. Using a 9/64" hex wrench, remove the Light Source Mount by unscrewing the screws located on each side, slide the sub-assembly out of the side of the unit.
3. Try to blow large particles off of the dust cover using compressed air.
4. 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.
5. Replace the light source mount and re-connect the light block assembly to the fiber optic light source.
6. Follow instructions on centering the illumination.



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 DE8800 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.



Changing the Detent Tension

To adjust the indexing tension, locate the hole at the side of the stage. Using a flat head screw driver, adjust the ball plunger inside the stage. Turning the screw clockwise increases tension.



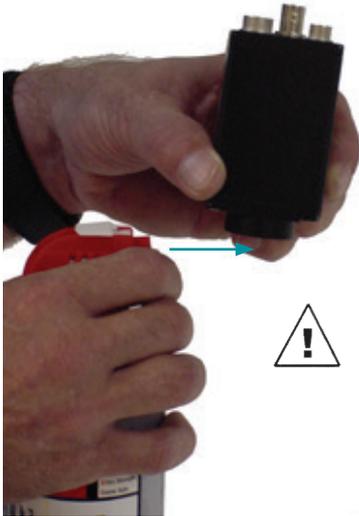
Cleaning the CCD Camera

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 the camera for dirt.
6. Repeat this process until the camera is clean.



Caution!



Blow air across and not directly at the CCD chip 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 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.

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.

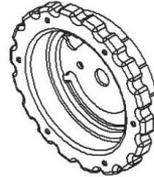
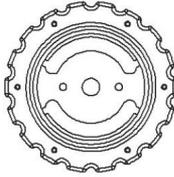
Tighten the side adjustment screw on the connector bracket.

Image is Not Centered Between Objectives

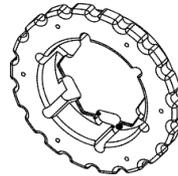
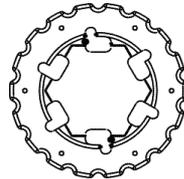
Check that each objective is screwed on tight.

Polishing Fixture Inserts

DE8182:
12 position MT EZ
Domaille

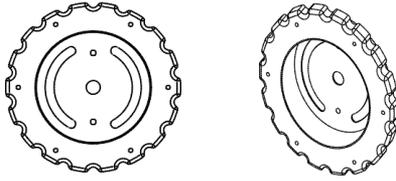


DE8180:
PF-0.0625 -
2.0-DCL-12
Domaille



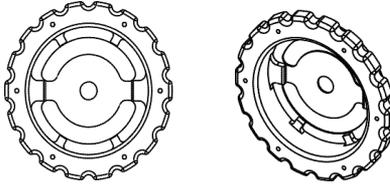
DE8166:

6 position MT-RJ
insert with indexing
Domaille



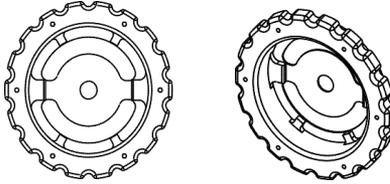
DE8153-N:

10 position MT PC
and APC Insert
Domaille



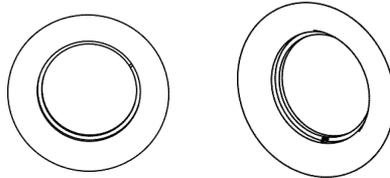
DE8153:

10 position MT PC
and APC Insert
Domaille



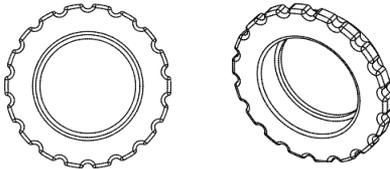
DE8134:

12 position Insert
with indexing
Domaille
Seiko Giken 510



DE8121:

12 position Insert
Domaille
Seiko Giken 510



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 shipping the APM HDC-5200 for warranty repair, back up process data to the memory card, referring to User's Guide for process transfer instructions. Remove and retain memory card, as Domaille will not accept liability for lost data. 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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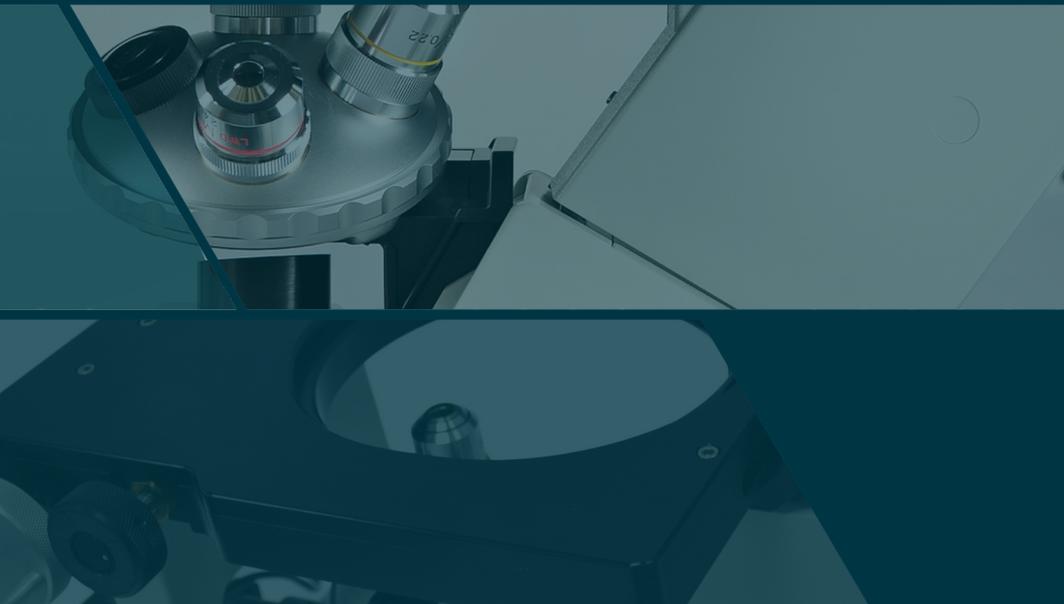
Company Information:

Domaille Engineering, LLC is an precision manufacturer distinguished by the accuracy of our products and services. One of our critical goals is to provide excellent customer service. Please contact us for service, support or input on how we can improve our service to you.

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