

FBE Microscope

with HD3 Display

User Manual



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REV 1

CERTIFICATION

Tested Equipment

All pre-qualification tests were performed internally at Westover Scientific, Inc., while all final tests were performed externally at an independent, accredited laboratory. This external testing guarantees the unerring objectivity and authoritative compliance of all test results. Westover Scientific's Commerce and Government Entities (CAGE) code under the North Atlantic Treaty Organization (NATO) is 0L8C3.

FCC Information

Electronic test equipment is exempt from Part 15 compliance (FCC) in the United States.

European Union



Electronic test equipment is subject to the EMC Directive in the European Union. The EN61326 standard prescribes both emission and immunity requirements for laboratory, measurement, and control equipment. This unit has been tested and found to comply with the limits for a Class A digital device.

Independent Laboratory Testing

This unit has undergone extensive testing according to the European Union Directive and Standards.

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INTRODUCTION

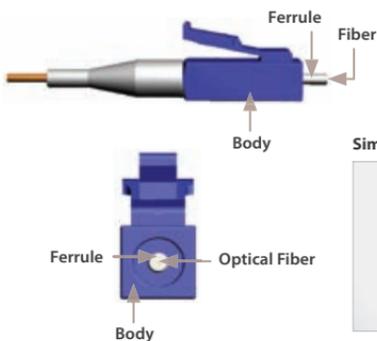
Inspection of fiber optic interconnects is essential for the optimal performance and longevity of fiber optic connectivity. Throughout their lives, fiber connectors must be inspected, analyzed and cleaned to maintain an acceptable level of functionality. By developing and introducing the equipment and software to inspect, analyze and clean fiber connectors, Westover Scientific is able to provide a comprehensive solution for the performance and preservation of fiber optic interconnects.

KEY TERMS & CONCEPTS

Fiber Connectors

Fiber connectors enable fiber-to-fiber mating by aligning the two optical fibers. Fiber connectors come in various types and have different characteristics for use in different applications. The main components of a fiber connector are detailed below:

Fiber Connector (Simplex)



Body

Houses the ferrule that secures the fiber in place; utilizes a latch and key mechanism that aligns the fiber and prevents the rotation of ferrules of two mated connectors

Ferrule

Thin cylinder where the fiber is mounted and acts as the fiber alignment mechanism; the end of the fiber is located at the end of the ferrule

Fiber

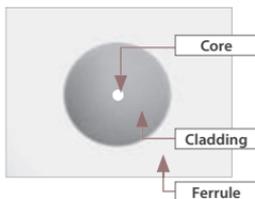
- Cladding

Glass layer surrounding the core, which prevents the signal in the core from escaping

- Core

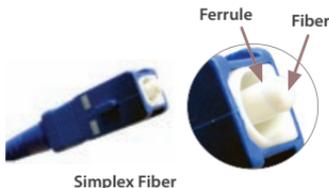
The critical center layer of the fiber; the conduit that light passes through

Simplex Fiber



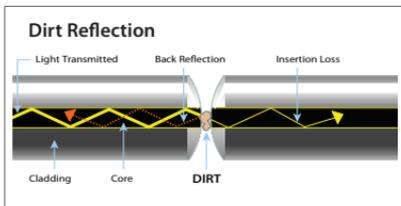
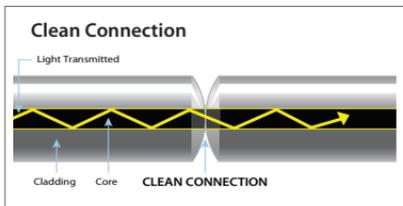
SIMPLEX FIBER CONNECTORS

A simplex fiber connector contains a single fiber located in the center of the ferrule. Common types include SC, LC, FC and ST.



Dirt & Contamination

If dirt particles get on the core surface the light becomes blocked, creating unacceptable insertion loss and back-reflection. Furthermore, those particles can permanently damage the glass interface, digging into the glass and leaving pits that create further back-reflection if mated. Also, large particles of dirt on the cladding layer and/or the ferrule can introduce a barrier that prevents physical contact and creates an air gap between the fibers. To further complicate matters, loose particles have a tendency to migrate.



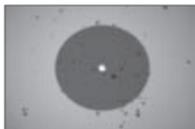
Scratches

Scratches are typically created during polishing, cleaning or mishandling fiber connectors. Scratches that touch the core are problematic because they create back reflection.

Clean Fiber



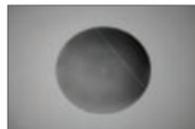
Dirt Contamination



Pit/Chip Contamination



Scratch



FBE PROBE MICROSCOPE

Westover's **FBE Probe Microscope** is a portable video microscope with an integrated HD3 Display that is used to inspect fiber optic connectivity. The FBE Probe is designed to provide an economical solution for inspecting both "male" and "female" (e.g., bulkhead) ends of an optical interconnect. The probe is specially designed to fit and operate comfortably and easily in-hand, allowing the user to inspect hard-to-reach connectors that are installed on the backside of patch panels or inside hardware devices. This eliminates the need to access the backside of patch panels or disassemble hardware devices prior to inspection. The probe is fully assembled and is powered by the display device. The only assembly required by the user is the installation of the appropriate inspection tip.

Focus Control

The **Focus Control** on the probe allows the user to adjust focus of the live fiber end-face image.



Features

- Hardwired to Westover's display
- Recirculating **Focus Control** for adjusting focus on fiber end-face image
- Requires appropriate FBET inspection tip

recirculating focus wheel adjusts focus on the display screen

Probe Specifications	
Dimensions	14.0 cm x 4.6 cm x 4.4 cm
Weight	180 g
Cord Length	240 cm coil
Camera Type	1/3" CMOS Sensor
Video Output	NTSC
Light Source	Blue LED, 100,000+ hr life
Lighting Technique	Coaxial
Power Source	from display device

FBET INSPECTION TIPS

The **FBE Probe Microscope** uses a select group of FBET inspection tips. These tips are interchangeable and allows the probe to interface with different types of fiber connectors. Below are three common types of FBET tips that are available at Westover.

FBET TIP CATEGORIES*



FBET-SC (*Bulkhead*)



FBET-LC (*Bulkhead*)

Standard Bulkhead Tips

Standard bulkhead tips allow the user to inspect the fiber end-face on the “female” ends of the bulkhead (*e.g., inside hardware devices or on the back side of patch panels*).



FBET-U25M (*Patch Cord*)



FBET-U12M (*Patch Cord*)

Standard Patch Cord Tips

Standard patch cord tips allow inspection of “male” ends of a fiber connection (*e.g., patch cords, pigtails, etc.*). “Universal” tips include the **FBET-U25M**, compatible with 2.5mm ferrules (*e.g., FC, SC, ST*) and the **FBET-U12M**, used to inspect 1.25mm ferrules (*e.g., LC, MU*).



FBET-SCA

APC Tips

APC tips are designed with an angle that complements the end-face of an APC polish fiber connector. This allows the entire fiber image to stay in focus during inspection.

* FBE Probes are only compatible with FBET tips.

HD3 DISPLAY

The **HD3 Display** combines performance and value in a small form-factor device. It is designed for ultimate portability and incorporates features that enable comfort and efficiency. It features a 1.8" TFT LCD screen and an innovative GripSwitch™ that saves battery life by providing instant-ON functionality when both sides are pressed and turning OFF when released. A continuous-ON feature is also available for hands-free operation. With its durable design and ruggedized enclosure, the HD3 ensures excellent performance and portability in real-life field applications.



Features

- 1.8" TFT LCD display
- Ruggedized, drop-tested enclosure
- Power-saving GripSwitch™ designed for comfort and efficiency; provides instant-ON when gripped in-hand and turns power OFF to save battery life when released
- Built-in rechargeable NiMH (nickel metal hydride) battery pack
- 3-hour run time on continuous-ON mode, dramatically longer run time when utilizing GripSwitch™ mode
- Low battery warning LED (when lit, remaining battery life is approximately 30 minutes)
- AC adapter (power supply 100–240VAC/12VDC) for alternate power source and for charging NiMH battery

HD3 Display Specifications	
Dimensions	10 cm x 7.2 cm x 4.3 cm
Weight	230 g (w/ FBE Probe)
Video Display	1.8" TFT LCD
Power Source	Built-in rechargeable NiMH (nickel metal hydride), 800mAh battery or AC adapter (100-200VAC/12VDC)
Power Mode	<ul style="list-style-type: none">• ON (continuous ON)• GripSwitch™ (power saving mode)• OFF/CHARGE
Run Time	<ul style="list-style-type: none">• ~3 hours continuous ON• Extended run time with use of GripSwitch™

Charging the Battery



WARNING: Use *ONLY* the AC adapter/charger provided to power the display and charge the battery.

IMPORTANT: Charge the battery for ~4 hours before using the battery power for the first time.



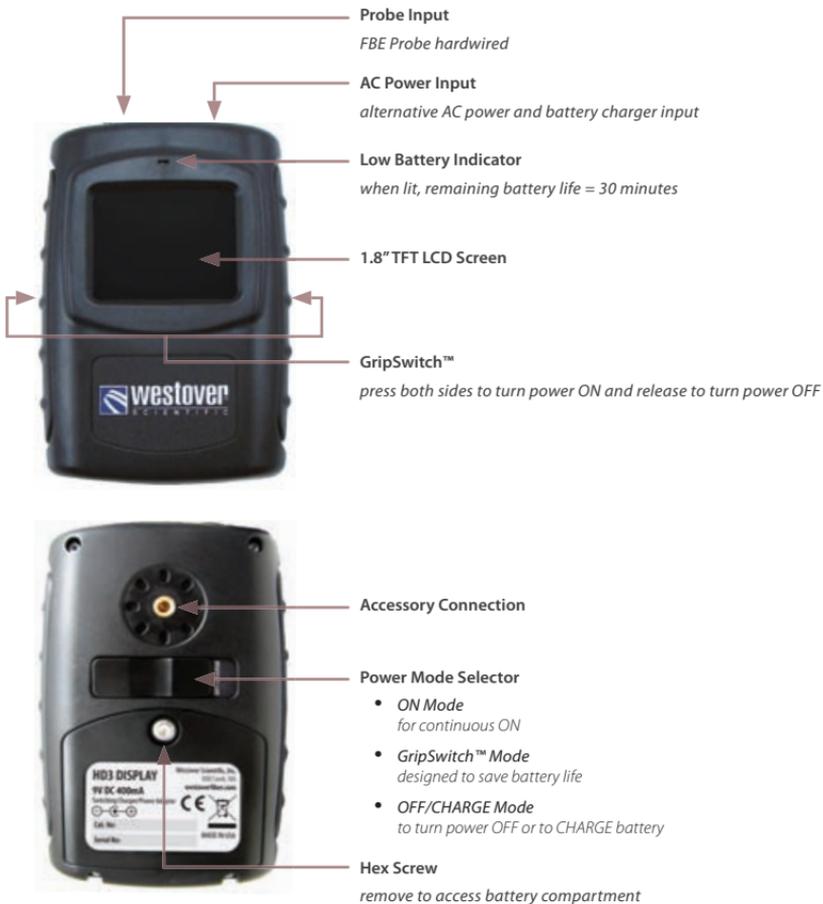
1. Switch the power mode switch to the OFF/ CHARGE position.
2. Connect the AC adapter/charger to the display and plug into wall socket.
3. The LED on the AC adapter/charger will illuminate *red* when charging and *green* when complete.

Changing the Battery



1. Unscrew the hex screw on the battery compartment with the hex key (included).
2. Disconnect and remove the battery.
3. Connect and install the new battery, running the wires *around* the battery.
4. Reattach and secure the battery compartment with the hex screw.

CONTROLS



Power Modes

The **HD3 Display** features 3 power modes for the LCD display:



ON Mode

Continuous ON mode

When the battery is fully charged, the display will stay on for approximately 3 continuous hours.



GripSwitch™ Mode

Battery conserving mode

Press and release the GripSwitch™ feature on both sides of the display to turn the display ON and OFF, respectively.



OFF/CHARGE Mode

OFF or battery CHARGE mode

Switch to OFF/CHARGE mode to turn the display OFF or to recharge the internal battery using the AC adapter (included).

NOTE: *The power mode switch must be in the OFF/CHARGE position for the battery to charge.*

Hanging Accessory (optional)

The **HD3 Display** features a hanging accessory for hands-free operation. It utilizes a hook that allows the unit to be hung and positioned onto a specified location. The accessory is mounted onto the back of the display with a hex tool (included).



Use the hex tool to tighten the hex screw on the accessory and secure onto the back of the HD3 display.

CONTACTING CUSTOMER SUPPORT

Please have the following information available:

For Product Problems:

- Catalog Number and Serial Number (*if applicable*) of the product(s)
- Description of problem

For Software Problems:

- Type of computer you are using
- Operating System you are using
- FiberChek™ software version

Customer Service

TOLL FREE (US & Canada)

▶ Customer & Technical Service **800-304-3202**

Local & International

▶ Customer Service **425-398-1298**

▶ Fax **425-398-0717**

*US Customer Service business hours are 7:00 a.m. – 5:00 p.m.
Pacific Standard Time (PST).*