

FIBER VANGUARD

—— FVO-600A-V Fiber Microscope



AusBest USER MANUAL

Thank you for purchasing the FVO-600A-V microscope.

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Please read carefully the user manual before operating, which can be of great help.



This product is controlled by microprocessor, improper use may cause the monitor stop operating. Please read the manual carefully to enjoy the performance.

If battery is not fully charged, this may cause serious system error when recording and transferring video files



Do not open the cover!

It may cause electrical shock

Touch DC convert parts may cause electrical shock

In order to prevent improper operation of DC converter, please read user manual carefully.

Prevent this product from water and liquid, otherwise, electrical shock and fire danger may occur.

For you safety, please use only the DC converter provided. (The manufacturer will not responsible for any losses caused by DC converter not provided by the manufacturer)

!! Important !!

Please only use the socket matched with DC converter. Use of improper socket may cause electrical and fire damage.

Please firmly plug the DC converter into the AC socket panel.



- A. Do not use damaged battery
- B. Do not use battery over the specified time period
- C. First use or the battery has not been for past several months, please recharge the battery before use.
- D. In order to protect your battery, please fully charge the battery before use. The battery must be fully discharge it before you charge it again.
- E. Over charge and over discharge will shorten the life of battery
- F. If the usage period of fully charged battery is shorten than new battery, you need to change your battery
- G. Battery is consumable item, its life will be shorten from the time it is being used.
- H. Don't let the DC converter with conductors have short circuit, otherwise electrical or fire damage may occur.

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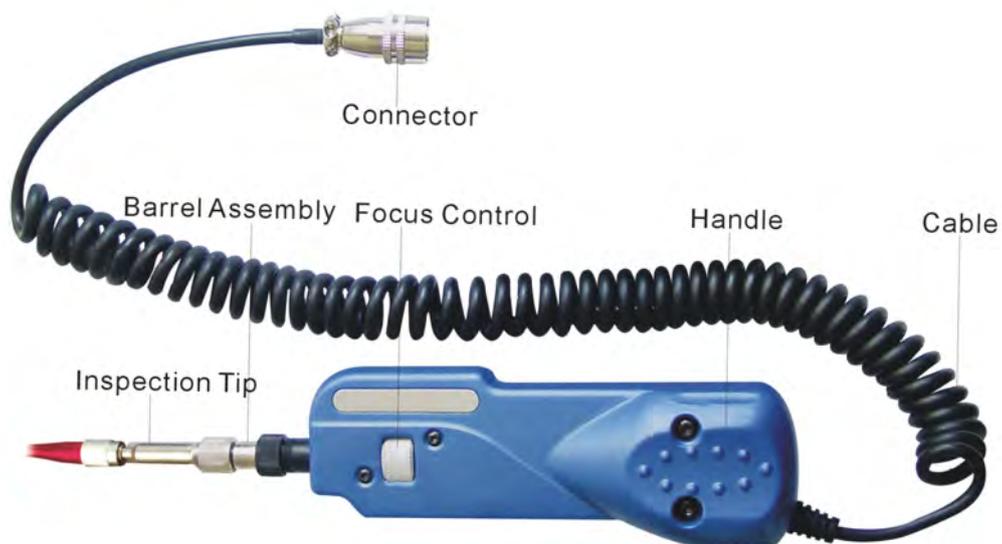
FVO-600A Probe Microscope Overview



FVO-600A video microscope is used to inspect end-face of fibers and check the optic connectivity. It magnifies fibers of 125um diameter 650 times, enlarging picture through a video signal to the display where the status of fiber end-face is showed clearly in the end.

Not only portable, easily in-hand, FVO-600A microscope is also multi-functional. It can detect simplex and ribbon fiber ends located in both male and female connectors, as well as other fiber units. Also, working comfortably is it's another feature. Eliminating the need to finding solutions for hard-to-reach areas inspection, FVO-600A microscope can detect connectors even installed on the backside of patch panels or inside hardware devices, providing you a completely convenience for checking.

Components Introduction



Major Structure

- A. Handle Body: the handle houses many things, like CCD camera, ray apparatus structure, optical routine system, coaxial lamp-house, focus control, video output and power supply system et. Also have a PAL signal system.
- B. The Inner Structure of Handle is so compact and complex that, if long time work it will cause a fever. This isn't the mechanical faulty but normal phenomena. It may cause damage if disassemble without permission, which you may also fail to have troubleshooting.

Inspection Lens

- A. Optical magnification system locates in the front of handle body, the beginning of which comes a lens-bar.
- B. The Barrel Assembly, mounted on body outside the lens-bar, can match different types of tips. The lens-bar will be adjusted according to the focus control.

Note: It may cost a lot if the lens or lens-bar is damaged, which have the image formed and be the cores of probes.

Barrel Assembly

Barrel Assembly plays a vital role in connecting or matching different types of tips.

Note: It will have a serious effect on the image performance once the inner conical surface from the barrel assembly is hit or impacted.

Inspection Tips

There are specific tips interchangeable for different types of connectors, which allow you to inspect the fiber surface whether on the backside of the patch panels or inside hard devices such hard-to-reach areas.

We provide tips of standard and optional types as follow:

Standard Tips:



2. 5PC-M



LC/MU-F



FC-F



SC-F

Optional Tips:



2. 5APC-M



SC-APC-F

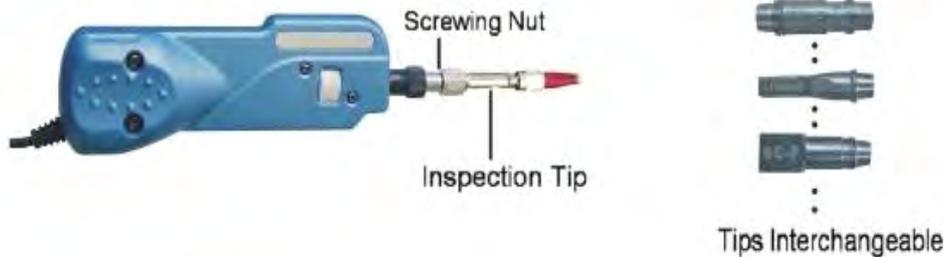


FC-APC-F

More optional tips can be provided as the following table:

Tips	Description
FC/SC-F	to inspect female fiber ends through FC/SC adaptors
LC/MU-F	to inspect female fiber ends especially in the high-density connector through LC/MU adaptors
FC-APC-F	to inspect APC female fiber ends through FC adaptors
SC-APC-F	to inspect APC female fiber ends through SC adaptors
ST-F	to inspect female fiber ends through ST adaptors
MU-F	to inspect female fiber ends through MU adaptors
E2000-F	to inspect female fiber ends through E2000 adaptors
2.5PC-M	to inspect PC fiber ends of 2.5mm ferrules directly (normally SC,FC,ST , E2000 four types)
1.25PC-M	to inspect PC fiber ends of 1.25mm ferrules directly
2.5APC-M	to inspect APC fiber ends of 2.5mm ferrules directly

Tips Installation Note:



- A. Conical surfaces of tips should be well protected, if crushed or hit, can't be used again.
- B. Make sure conical surfaces of tips are clean enough prior to installation.
- C. Have a strong tip attachment during installation.
- D. Have a proper screw on the nuts during installation.
- E. Mind the tip before removal of the nut during disassembly.

Key Features & Specification

Magnification

The optical and picture magnification can reach up to 12× and 650× respectively. Different size displays have correspondingly different magnifications, the table of magnification is as below:

Display Index	2.5 IN.	3.5 IN.	5.6 IN.	9 IN.
Diameter	1.857	2.5	4.5	8.1
Magnification	150	200	360	650

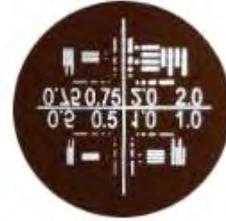
Note: 1. The size of the enlarged picture is measured directly based on the 1.25μm resolution.

2.The magnification is calculated by the following equation:

$$\text{Enlarged size (um)} \div 1.25\text{um} = M$$

Resolution

The resolution of the probe can reach up to 1.25um whereas the national standard is only 2um.



Standard Noyes Fiber Calibrated Scale

Enlarged Zones

The enlarged size for the ferrule diameter can reach up to 0.30*0.28mm, Also the most visible area can reach up to 0.6*0.57mm when adjusting the probe.

Specification

Size	18.6*5.2*5.0MM
Weight	170.00G
Resolution	1.25μm
Optical Magnification	12X
Viewable area	0.3MM*0.28MM
Electronic viewfinder	1/3IN black-and-white CCD
Light Source	BLUE-LED (100000hrs above)
Focus Control	Manual coaxial focus
Connector	4PIN
Operating Temperature	-20℃--50℃
Guarantee period	One year

Major Function

To inspect fiber ends of both simplex and ribbon types

1. To inspect male fiber ends, which refer to the end of patch cords or pigtails.
2. To inspect female fiber ends, which refer to the end of port through adapters or inside devices.
3. To inspect ferrules of both 2.5 mm and 1.25mm diameters, fixed in the middle of the fiber. Exposed ones are excluded in the test.

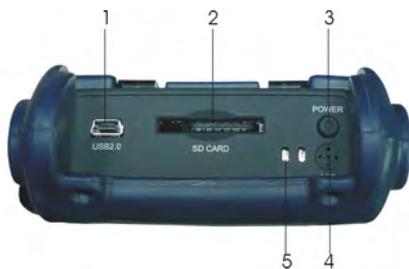
To output PAL or NTSC video signal of the enlarged fiber image

VSM-360 Display Overview

Component Introduction

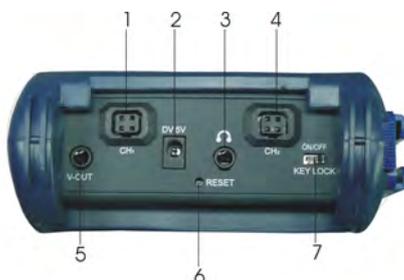
Panel of Display

1. Up key: press when option
2. Down key: press when option
3. Left key: press when option
4. Right key: press when option
5. Enter: operation function, control brightness and contrast
6. Back: back to the previous interface
7. Delete: delete or copy
8. Record: video recording
9. Switch: switch for CH1/CH2 image channels
10. Monitor slot: to mount probe easily, convenient for operating
11. Rubber boot: PVC material, High falling-proof



Top end of Display

1. USB2.0 Connector: output port, to connect OTG/U desk or computer directly (only operational when entering).
2. SD card socket: to house SD card where the standard allocation is 2G, Maximum memory support can reach to 16G.
3. Power on/off: 3 seconds Pressing for power on or off.
4. Microphone recording: press for voice recording, used for clarifying or compiling fiber images.
5. Indicator: yellow light indicates open-state while red light indicates charged-state.



Bottom end of Display

1. CH1 Image Input: Connector: press CH1/CH2 key to display CH1 image.
2. Charger Connector.
3. Earphone Connector: adjust the volume via up/down keys.
4. CH2 Image Input Connector: press CH1/CH2 key to display CH2 image.
5. Video Output: connect to have voice output.
6. Reset: can put slim sticks in the hole for recovery from dead halt.
7. Key lock: can't operate when locked.

Specification & Performance

Parts Specification

Video	Frequency	FM 2.4MHz
	2.5 Inch Display	960x240 LCD
	Output Mode	NTSC / PAL
	Video Mode	NTSC / PAL
	Resolution	640*480 / 320*240
	Compressed Video Format	MPEG-4/AVI
	Playing Format	MPEG-4/ AVI/ASF/MOV
Audio	Frequency Range	20HZ-20KHz
	Output Channel	Stereo
	Earphone Output	L 20MW+R 20mW [16O](Max volume)
	Play Format	MP3/WAV/MPEG-1
Storage	Size	128MB/1GB
	Storage Media	SD/MMC/U disk
Operation Interface	IBM-PC	Windows 98SE.ME.2000,XP
	USB	USB 2.0; USB OTG2.0
	Disk File Format	FAT32
	Language	Chinese/English
Power Source	Power Supply	DC 5V 2A
	Inner Battery	Lithium battery 1800Mah
	Media	≥8 hours

High Performance

1. 960 x 240 definition , 2.5inch LCD monitor
2. Image recording, timing display
3. Two channels for image signal input CH1/CH2, manually switching
4. Sensitive microphone installed for sound recording
5. Functions of key-locked ,stand-by and recording
6. Storage (128MB internal memory、 SD card optional provided),16G support
7. Mobile disk optional provided
8. Can upload files of music and video or other kinds through USB 2.0
9. Earphone interface, sound output support
10. Battery safe and high volume, ≥9 hours continuous working time, 7 hours continuous recording time.
11. Dual version for interface (English/Chinese)

Operating Guideline

Mode Introduction

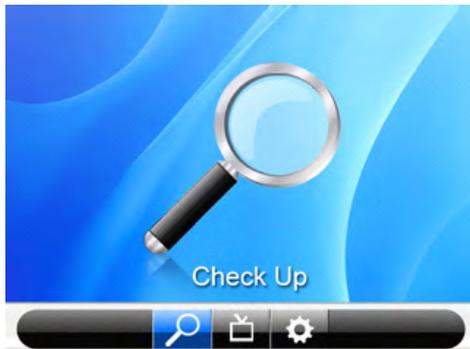
Hold the Power button  On/Off for 3 Seconds to turn on or off the monitor and enter the interface.



Mode Selection:

1. Image Check and Record – Check and Record video signals form CH1or CH2
2. Play Back – Video Recorded File Playback, from Internal Memory, SD Card or Portable Disk etc.
3. Setting – System Preset for Different Functions

Image Check and Record



1. Press [Enter] to check the image from CH1or CH2 detected by the probes. Please be sure
2. Press [Enter] again if necessary to adjust the brightness/ contrast, control the proper range viaup/down keys. Please note that color is no need to adjust.
Brightness: the suitable value will be 6.
Contrast: the suitable value will be 4.
3. When finished, press [Enter] again to exit.
4. Press [Record] to record the being image and timing, When working, voice is recorded at the same time, which can be used as indentifying different files. Press left/right keys to control the recording speed, Press up/down keys to control the volume. When finished, press [Back] to exit (shown as picture above)

Files Playback

1. Press the right key to choose the PLAYBACK mode.
2. Press [Enter] to see the files recorded. (need to pre-set first to choose the files whether from Nandflash(internal memory), SD card or U disk(portable disk). When



5. When finished, press [Back] to exit.(as pictures shown above)

no SD card or U disk, files are shown from system. When having SD card or portable disk but no setting before, files are shown from SD card automatically)

3. When entered, press up/down keys to choose files labeled. When opened, press [Enter] to stop the video to observe, or files will be displayed continuously.
4. Press [Delete] to decide to delete or copy files recorded, Press [Enter] to confirm.



Systems Setting

1. Press [Enter] to choose the setting option.
2. Press arrow keys to make choice.
3. Press [Enter] to confirm and operate.

Setting Options Available

Record Setting– set before record and playback

- NandFlash (internal memory,128MB)
- 2G SD Card
- External HDD (portable disk for option)

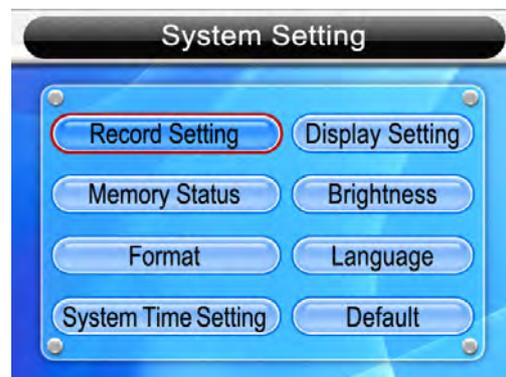
Memory Status – check the memory state

- NandFlash (internal memory)
- SD Card
- External HDD (will not display if no use)

Format – memory formatting

- NandFlash (internal memory)
 - SD Card
- (once confirmed, all the data will be deleted)

System Time Setting– date and time setting
(pre-setting is suggested when first use)



FVO-600A-V Microscope Installation

1. Attach the barrel assembly to the probe.
2. Attach the proper inspection tip to the end of barrel assembly.
3. Insert the probe into repository to inspect the fiber end.
4. Adjust the focus control to centralize the image on the display if necessary.

Note:

Probes can be mounted on the monitor slot right beside rubber boot (as picture shown below), convenient for single operation.



Product Accessories

NO.	Name	Quality
1	DC5V 2A charger	1 pcs
2	User manual	1 pcs
3	USB PC wire	1 pcs
4	AV output wire	1 pcs
5	Earphone	1 pcs
6	Lthium battery (inner) 4500MA	1 pcs

Warranty Information

Thanks for your using, Eternal Co.,Ltd will warrant this equipment against defects in material and workmanship for a period of one year from the date of original shipment.

During the warranty period, any repair, replace for the defective products are free of charge except the damage by unauthorized or non-Eternal personnel.

Also all the product accessories information is subject to the Eternal Co.,Ltd, it may change with need without notice, please contact relevant staffs for consult if necessary.