



SnakeEye™ II

VIDEO
DIAGNOSTIC
TOOL

Operator's Manual



"Lets your eyes travel where you can't!"

Rev H 050830

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Symbol Legend



Caution



Electric Shock

I. INTRODUCTION

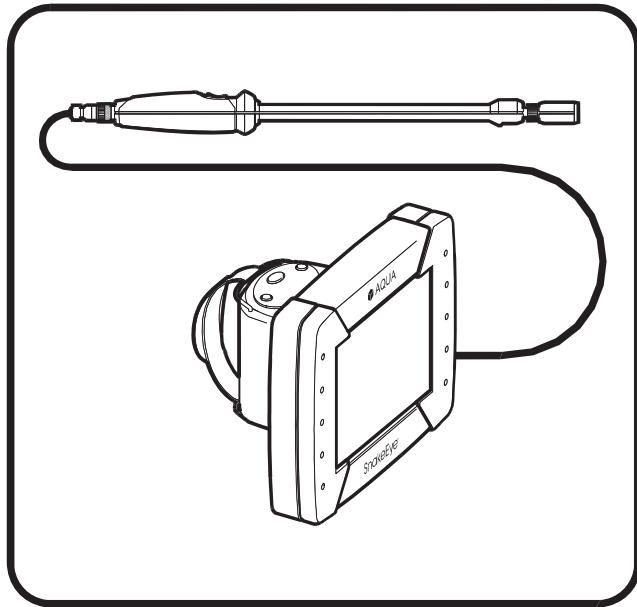
Congratulations on your purchase of SnakeEye™ II .

This sophisticated diagnostic tool incorporates the latest in remote visual technology and will provide years of reliable service when properly operated and maintained.

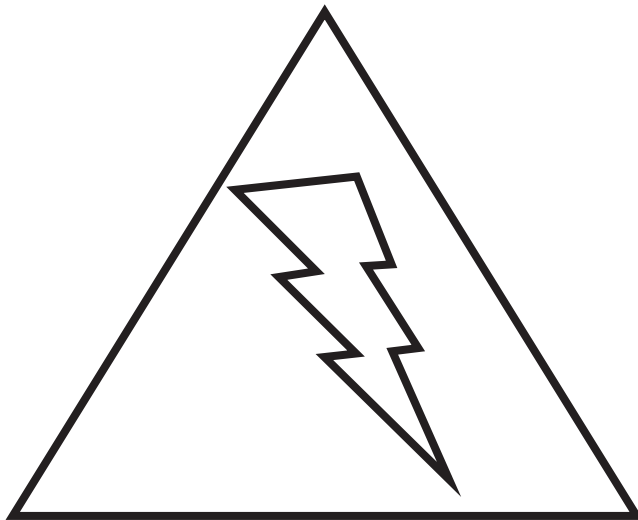
Important Note:



Failure to operate and maintain SnakeEye™II in accordance with the instructions in this manual may result in damage to the unit, damage to other personal property or personal injury.



Read this manual carefully before operating SnakeEye™II and keep the manual on file for future reference.



Caution: This device is sensitive to high voltage energy. If the display unit or camera is exposed to high voltage fields, permanent damage may result. Electrostatic or any other high voltage sources should be avoided.

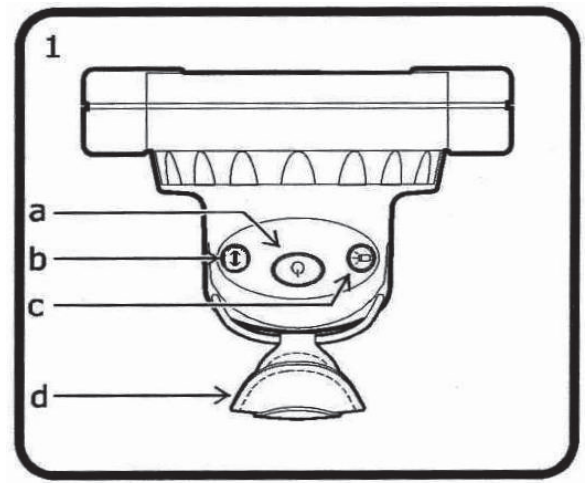
II. GETTING STARTED

Please take a moment to familiarize yourself with the various components that comprise SnakeEye™II.

Each of the following items is stored in an individual compartment within the portable carrying case. Each compartment is designed to accommodate and protect a specific component and the components should always be stored in the appropriate compartment when not in use.

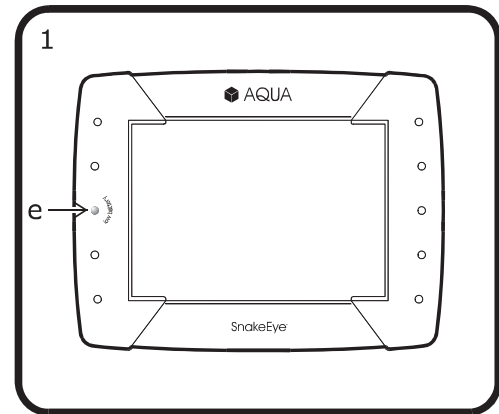
1. Monitor

- a. Monitor Power ON/OFF Button (Green)
- b. Image Flip 180° Top-Bottom (Blue)
- c. Camera Head Light ON/OFF Button (Red)
- d. Adjustable Hand Strap
- e. Low Battery Indicator
- f. Battery Pack Compartment
- g. Monitor Connector Cable Port
- h. Video IN/OUT Port
- i. DC Power Port

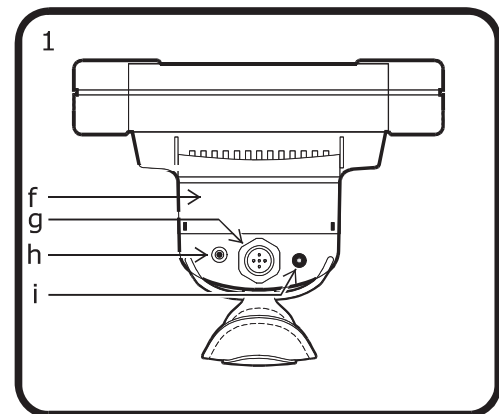


Top View

Top View

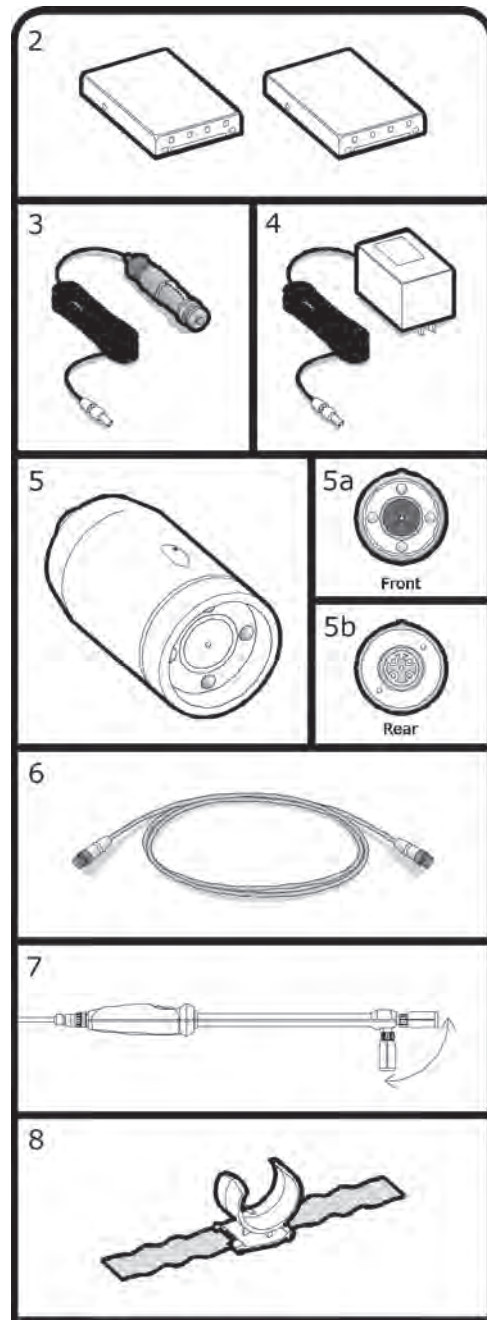


Front View



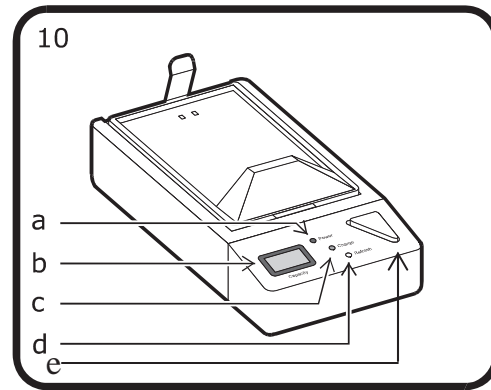
Bottom View

2. **Internal Battery Packs (2)**
3. **12 Volt DC Power Cord & Adapter**
4. **AC/DC Power Cord & Transformer**
5. **Standard Camera Head (LED)**
 - a. Camera Head Lights
 - b. Camera Head Connector Cable Port
6. **Monitor/Camera Head Connector Cable**
7. **Camera Head Extension Wand & Swivel Mount**
8. **Adjustable Camera Head Finger Strap**



10. Battery Charger

- a. Power ON Indicator Light (Red)
- b. Charging Indicator Gauge
- c. Charging Indicator Light (Green)
- d. "Refresh" Indicator Light
- e. "Refresh" Button



III. PUTTING IT TOGETHER

There are two methods of connecting the Monitor (#1) to the Camera Head (#5).

Each method utilizes the supplied four foot Connector Cable (#6) or optional thirty foot cable (See "Optional Accessories"). One end of the cable connects directly to the Monitor, the other end connects either directly to the Camera Head or indirectly to the Camera Head through the supplied Extension Wand (#7).

Monitor Connection

- Insert the male end of the Connector Cable into the female Cable Connector Port (#1g) on the Monitor.
- Hand tighten the cable nut in a clockwise direction until the connection is secure.

Camera Head Connection

- Make certain the Connector Cable has been properly connected to the Monitor.
- Insert the female end of the Connector Cable into to the male Connector Port (#5b) on the Camera Head.
- Hand tighten the cable nut in a clockwise direction until the connection is secure.



- **NEVER TURN THE CAMERA TO TIGHTEN.** Turning the camera will damage the connector. This type of damage will **not** be covered under the warranty.
- **Do not remove lens cover except for replacing a scratched lens cover.** The camera is a sealed unit and the inside of the lens cover does not need to be cleaned except when replacing with a new lens cover.

Extension Wand Connection

The Extension Wand is designed to extend the effective operating range of the unit. This accessory comprises a rigid handle, unidirectional swivel mount and a sliding button which controls the angle of the Camera Head in the swivel mount.

Under most conditions, the Extension Wand provides the greatest operating flexibility.

- Make certain the Connector Cable has been properly connected to the Monitor.

- Insert the female end of the Connector Cable into the male Connector Port on the Extension Wand.
- Hand tighten the cable nut in clockwise direction until the connection is secure.
- Place the Camera Head in the swivel mount at the end of the Extension Wand.
- Hand tighten the cable nut in a clockwise direction until the connection is secure.

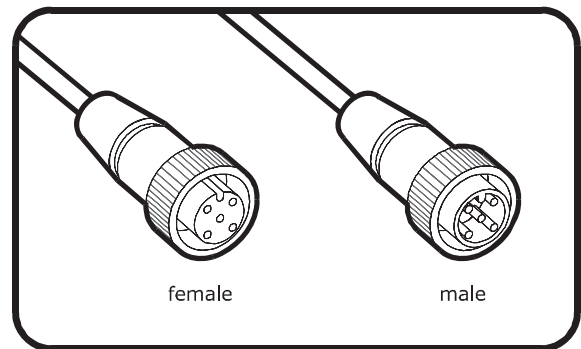
Note:

We recommend that you take a moment to familiarize yourself with the swivel mount control button before operating SnakeEye™II with the Extension Wand.

Cable Nuts

Before proceeding, make certain all connections have been properly made. The cable connectors must be properly seated and the cable nuts properly tightened in order to effect a proper connection.

When properly made, these connections are water proof. Also, failure to make these connections properly may result in poor picture quality or in intermittent interruption of the video signal.

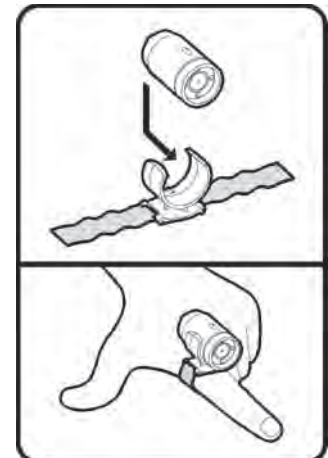


As you will note, the cable nut connectors are precision machined and are designed to be hand tightened only. Never use a tool to tighten these connections. Doing so may cause damage to the connections and will void our warranty.

Adjustable Camera Head Finger Strap

This accessory (#8) is designed for use when the area to be inspected is "hand accessible."

- Make certain the Camera Head has been properly connected to the Monitor.
- Attach the Camera Head to the Finger Strap by sliding the Camera Head into the semicircular notch until the slot on the bottom of the Camera Head engages the raised ridge on the bottom of the Strap.
- Slide the Strap over the selected finger and adjust the Strap as necessary.



IV. POWERING UP

SnakeEye™II is powered by a 6 volt DC Battery Pack (#2).

SnakeEye™II also is designed to operate on standard 12 volt DC current supplied directly by the DC Auto Power Cord Adapter (#3) or supplied through the AC to DC Power Transformer power cord supplied with the SnakeEye II Kit (#4).



Caution

The supplied AC/DC Transformer is designed specifically for use with Snake Eye™. Other transformers may vary either in power output or in connector polarity. Use of any other transformer may cause serious damage to the unit and will void the warranty.

Internal Battery Pack

SnakeEye™II is supplied with two interchangeable, rechargeable Nickel Metal Hydride (NiMH) Battery Packs.

Installing The Battery Pack

The Battery Pack Compartment (#1f) is located at the bottom of the Monitor.

- Pull the compartment cover firmly downward to access the compartment.
- Insert the Battery Pack into the compartment, "contact end" first.
- Push the Battery Pack down until it is engaged by the retaining latch.
- Press the compartment cover down until it "snaps" into place.

Battery Charger

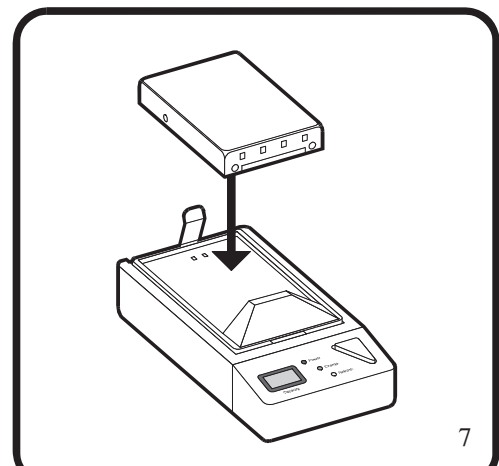
SnakeEye™II is shipped with two Nickel Metal Hydride Battery Packs. Nickel; Metal Hydride batteries lose up to 5% of their charge per day when "sitting idle". The battery packs must be conditioned when new and after extended periods of non use. To condition the batteries fully charge and discharge the batteries two to three times.

In situations where fully charged batteries are required to be on hand at all times a battery maintenance program must be employed. Sets of batteries should be charged once a week and rotated to insure fully charged battery availability. Another alternative is to use the extended capacity POWERPAC® option that can allow up to 5 hours run time and holds its charge for several months under ideal conditions.

The Battery Charger (#10) operates on 12 volt DC current when used with supplied 12 volt DC Power Cord & Adapter (#3) or standard household AC current when used with supplied AC/DC Power Cord & Transformer (#4).

To Charge The Battery Pack:  

- Place the Battery Pack in the Battery Charger with the contacts facing the display panel.
- Push gently downward on the Battery Pack until it "snaps" into place.
- Insert the selected power cord adapter into the DC Power Port on the Battery Charger.



- Plug the male adapter on the DC Power Cord into the cigarette lighter socket in your vehicle or independent 12 volt DC power source, or the Transformer on the AC/DC Power Cord into any standard household AC outlet.

The Red Power ON Indicator Light (#10a) will illuminate confirming the Battery Charger is receiving power from the selected source.

The Green Charging Indicator Light (#10c) will illuminate indicating the Battery Pack has been properly seated and is being charged.

Fully charging a completely depleted Battery Pack takes approximately two hours. The Charging Indicator Gauge (#10b) provides a continual reading of the charging status. When the Battery Pack has reached a full charge, an audio signal will emit five short "beeps," the Green Charging Light will "blink" and the Charging Indicator Gauge will read solid black.

Note:



Always allow the Battery Pack to cool down before recharging. In order to prevent damage to the Battery Pack, the Battery Charger includes a safety feature which prevents charging while the Battery Pack is warm.

Refresh Feature

The Battery Charger includes a "Refresh" (#10e) option. Use of this feature is only required during battery conditioning operations. Pressing "Refresh" will completely deplete the battery charge and start the recharge cycle over again.

12 Volt DC Power  

SnakeEye™II can be powered from any 12 volt DC vehicle battery or independent 12 volt DC power source.

- Insert the female end of the DC Power Cord into the male DC Power Port on the bottom of the Monitor (#1i).
- Plug the male adapter into the cigarette lighter socket in your vehicle or independent 12 volt power source.

Note:

The male socket adapter operates with a supplied, standard 2 amp fuse. When replacing the fuse, access the fuse compartment by turning the tip of the adapter in a counterclockwise direction.

The fuse is spring loaded and caution must be taken to ensure that the spring does not "fly out" of the end of the fuse compartment when it is opened.

Replacement fuses are available at most electronic supply and hardware stores replace only with the same rating.

AC Power

SnakeEye™II can be powered with standard household AC current.

- Insert the female end of the AC Power Cord into the male DC Power Port on the bottom of the Monitor (#1i).
- Plug the AC/DC Transformer into a standard household AC outlet.

Note:

The supplied AC/DC Transformer is designed specifically for use with SnakeEye™II. Other transformers may vary either in power output or in connector polarity. Use of any other transformer may cause serious damage to the unit and will void the warranty.

V. LIGHTS, CAMERA, ACTION™

In order to maintain proper orientation of the Monitor image while SnakeEye™II is in use, the Monitor is designed to rotate to a maximum of 180° in both a clockwise and a counter clockwise direction (total rotation approximately 360°). A small raised dome on the camera body signifies the "12 or 6 O'clock" position of the camera depending on the state of the flip switch on the display monitor.

Once the Monitor has been connected to the desired power source, the Camera Head has been properly installed on the cable or one of the SnakeEye™II options and connected to the display unit, SnakeEye™II is "ready for action."

There are three Buttons on top of the Monitor.

GREEN Power ON/OFF (#1a). Press once, Unit "On" press again Unit "Off".

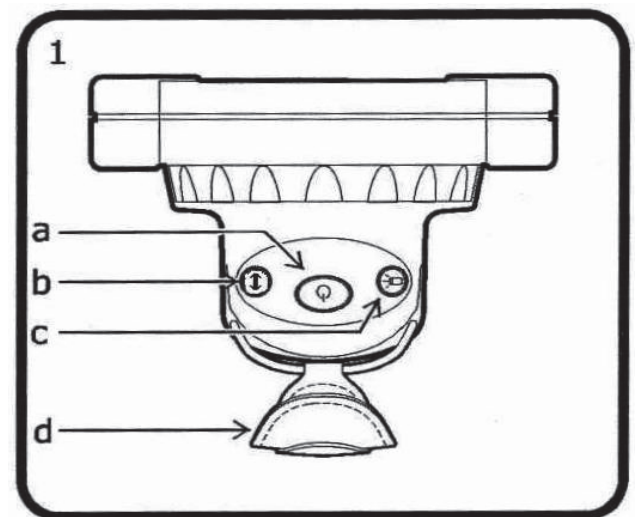
BLUE 180° Flip Button (#1b). This button flips the picture on the screen 180° vertically to aid in picture orientation. When in areas where alpha-numeric information must be read the subject image may be manipulate by either the "Flip" feature or by rotating the screen or both.

RED Camera Head Light (#1c). The Camera Head includes four high intensity perimeter lights. This button turns the Camera Head lights ON and OFF.

Top View

Lights have four states. On, Off and three levels of brightness.

Repeated pressing of the button will cycle through the states, first press "on" , brightness "one", "two", "three" and "off" .



Top View

Low Battery Indicator Light (E) The low battery indicator light is located to the left of the display as viewed from the front. When a battery is fully charged and the unit is powered on the light will be off. When the battery has approximately 5% of its charge left the light will blink and the unit will shut off in 75 seconds.

If a battery with insufficient charge to run the unit is installed and the unit is turned on the low battery light will blink rapidly and the unit will not turn the display on. Replace the battery with one fully charged to resume operation.

Note:



Both the LCD Monitor and the Camera Head are engineered to operate in temperatures ranging from 32°F to 122°F (0°C to 50°C). Operate the unit within these parameters only.

VI. RECORDING

SnakeEye™II outputs Monitor images as standard NTSC (National Television System Committee) video signals, which can be transmitted to any NTSC compatible device. The SnakeEye™II signal output is through a standard female “RCA™” video connector at location “h”.

Note:

Virtually all VCRs sold in the United States are NTSC compatible.

Recording The Image

Recording SnakeEye™II Monitor images on a VCR requires connecting SnakeEye™II to the input connector on the VCR.

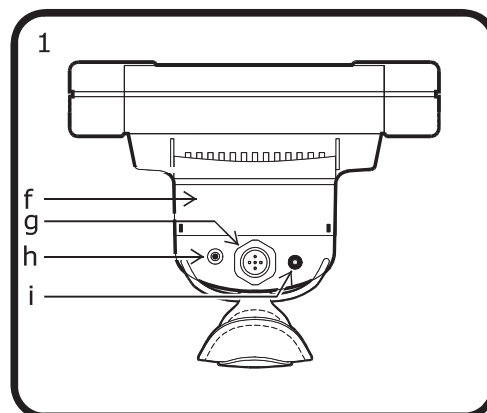
The connection is made by plugging in a standard male to male RCA® connector video cable available at any local electronics supply store.

Plug one end into the SnakeEye™II video connector and the other end into the VCR video input connector.

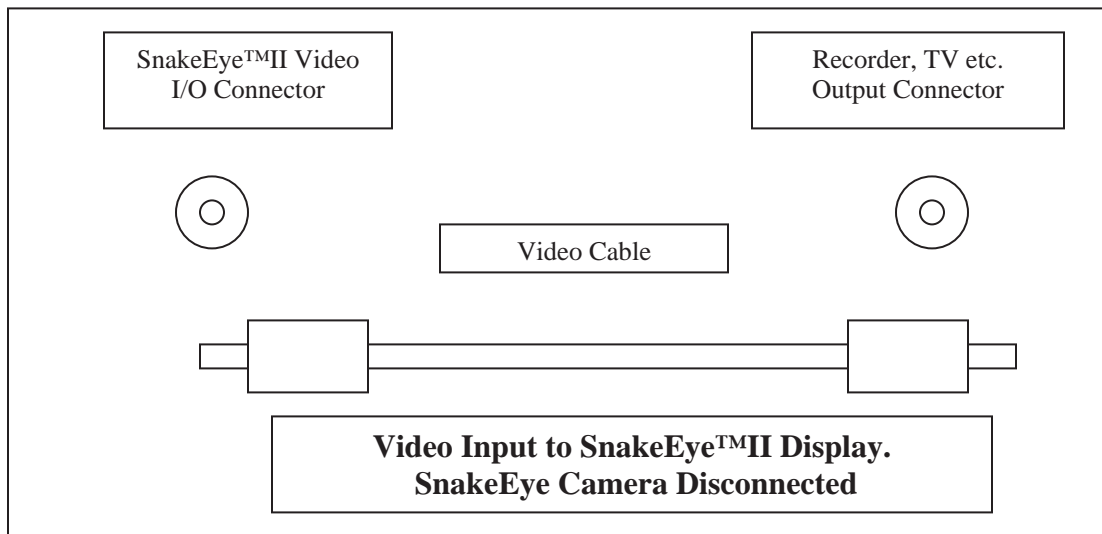
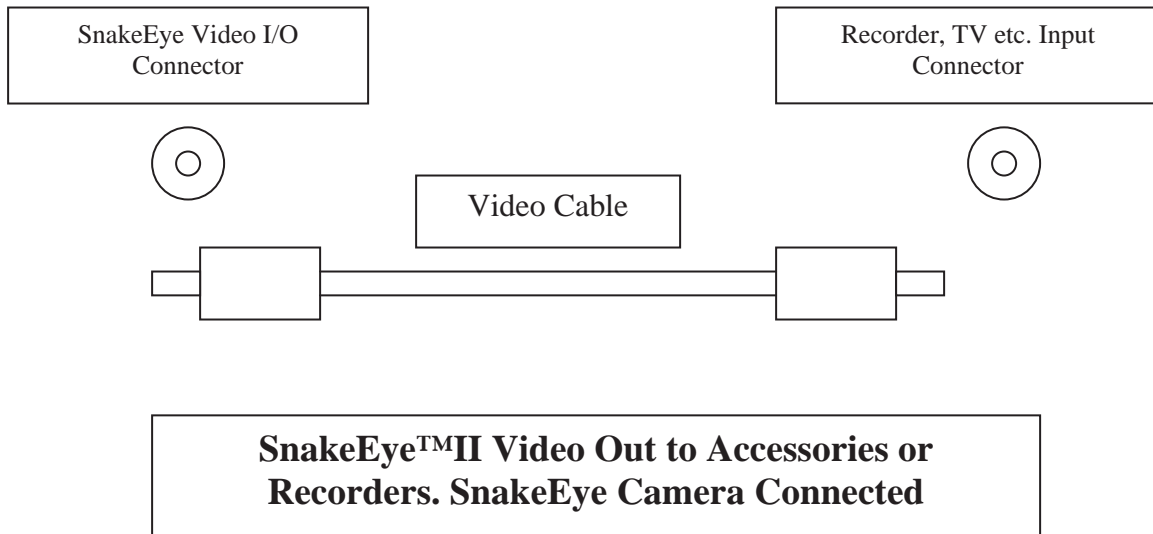
Simply follow the VCR recording instructions with your equipment and any image seen on the SnakeEye™II will be recorded.

Playback

Play back on the SnakeEye™II monitor can be accomplished by disconnecting the SnakeEye™II camera from the unit and attaching the video cable to the video output on the VCR.



Any analog NTSC video signal can be displayed on the SnakeEye™II monitor. The monitor can however only process one video signal at a time and therefore the SnakeEye™II camera must be disconnected during this operation.



VII. MAINTENANCE

Clean the Camera Head and all other parts and accessories only with a clean, damp cloth.

VIII. TROUBLESHOOTING

Although the SnakeEye™II is a technologically sophisticated tool, most operating problems are simple to identify and resolve. Should you encounter a problem, please refer to the following guide before contacting us.

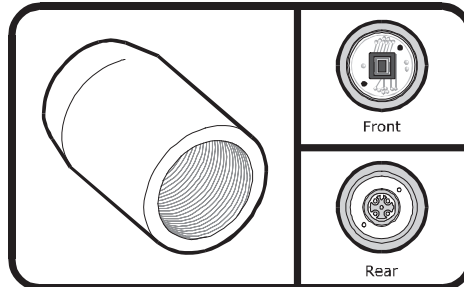
As you will note, the majority of operating problems are Battery Pack or "connection" related.

Problem	Possible Cause	Solution
Unit will not operate	Dead Battery	Replace with charged battery
	Battery not properly seated	Make certain Battery Retaining Latch is properly engaged
	AC or DC Adapter not properly connected to the unit or to the power source	Check all connections
Unit turns on but no image appears on Monitor	Camera Head is not properly connected to the Monitor	Check all connections
	Video I/O Adapter Cable is connected	Disconnect cable to re-establish connection between Monitor and Camera Head
Low Battery Indicator on	Weak Battery	Replace with charged battery
Unit will not stay on	Weak Battery	Replace with charged battery
Unit shuts off when Backlight feature is engaged	Weak Battery	Replace with charged battery
Not able to record	Improper connections	Check all connections
Not able to view VCR image on Monitor	Improper connections	Check all connections

IX. OPTIONAL ACCESSORIES

The following SnakeEye™II accessories are available.

C-Mount Camera

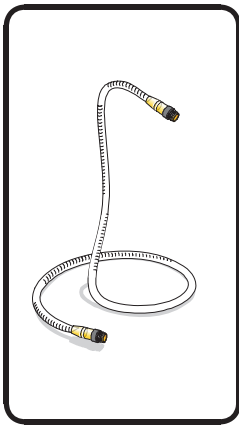


Part Number: OA-1

This accessory adapts SnakeEye™II to bore scopes and fiberscopes, providing visual access to areas as small as 4 mm in diameter.

Whereas inspection through a borescope or fiberscope may be limited to one individual viewing an area through a single eyepiece, this optional configuration allows numerous individuals to view the same area as a full color image on the SnakeEye™II Monitor.

Gooseneck Adapter

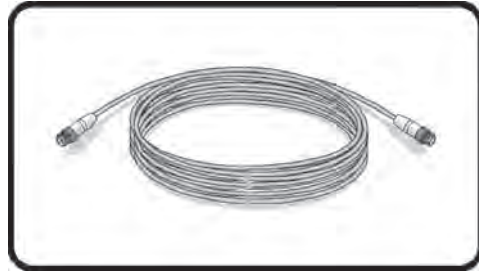


This accessory is utilized in place of the supplied Extension Wand when bending around corners is required.

The Gooseneck is flexible and can be shaped into an infinite variety of configurations enabling insertion of the Camera Head into areas that otherwise might not be accessible. The Gooseneck will retain its shape until it is reconfigured.

Part Number: OA-2

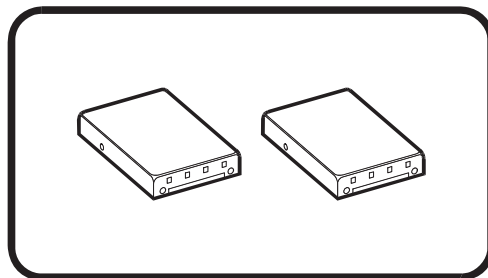
30' & 100' Monitor/Camera Head Connector Cable



Part Number: OA-3

This accessory is used in place of the supplied four foot cable and is designed to provide for "remote" placement of the Monitor.

Replacement Battery Packs (2)

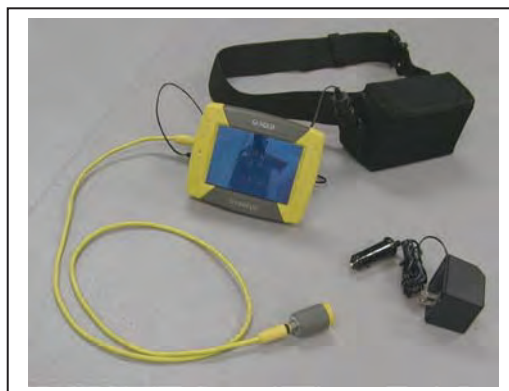


Part Number: OA-4

Replacement Battery Packs (2) are available to replace old batteries that have reduced capacity do to age and usage. All batteries have a finite life which is determined by the number of charge and discharge cycles, storage temperature and age. Eventually all batteries will need to be replaced with new one.

PowerPac+

With POWERPAC+ the continuous operating time for SnakeEye™II can be extended up to 5 hours.

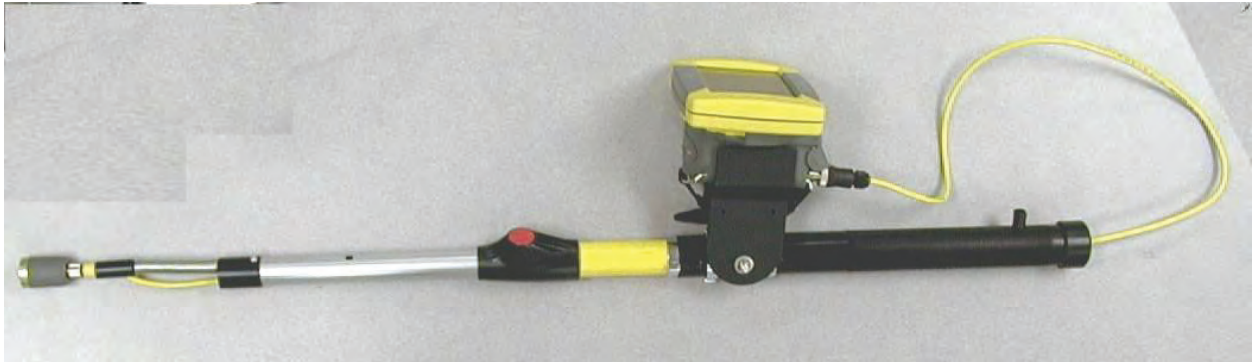


POWERPAC+ consists of a 7Amp hour sealed NiMH battery packaged in a convenient wearable waste pack. It powers SnakeEye through the DC adapter provided in the base SnakeEye™II kit.

Specifications:

- 7Amp hour capacity NiMH battery.
- 24 Hour initial charge time.
- 8 hour charge time to maintain full charge.
- Adjustable belt

Aqua Telescoping Pole



Description:

Camera and Display mounting platform to extend the viewing reach of SnakeEye. Each pole has multiple extension locking positions spaced at six-inch intervals. The pole may be rotated within the handle to give 360° viewing. The camera head may be articulated 130° from the straight position.

Size (Without Camera) and number of locking stops:

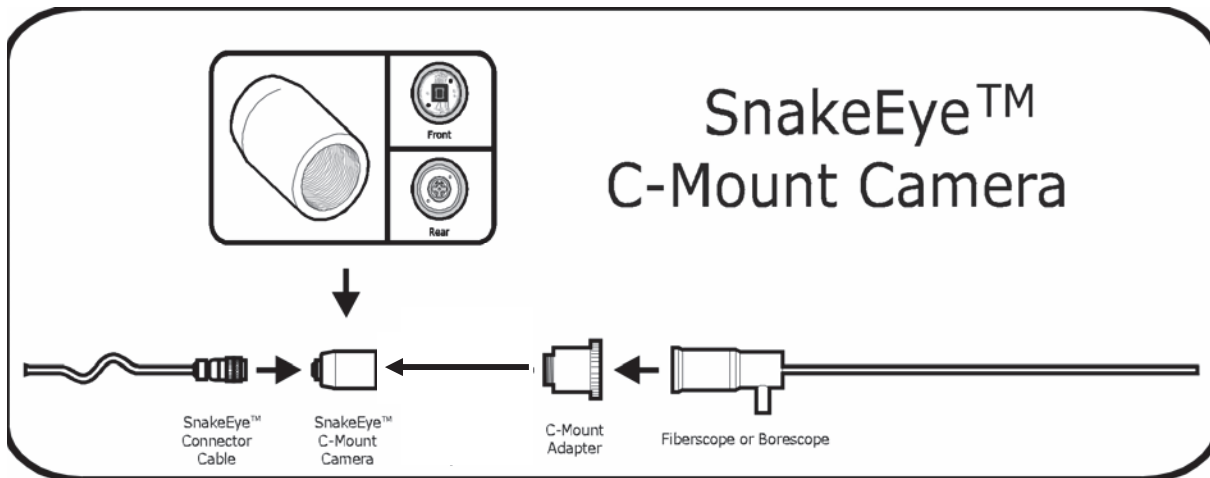
2'-4'.....	30"-46"	4 Stops
4'-7'.....	54"-90"	7 Stops
6-11.....	78"-138"	11 Stops
8-15.....	100"-179.5"	14 Stops

Weight:

2-4.....	2.5 lbs.
4-8.....	4 lbs.
6-12.....	5 lbs.
8-15.....	6 lbs.

X. Accessory Instructions:

C-Mount Camera Instructions



1. Introduction

This optional accessory greatly expands the capabilities of the SnakeEye™II Base Kit by adapting to fiberscopes and borescopes, providing visual access to areas as small as 4 mm in diameter.

Whereas inspection through a borescope or fiberscope may be limited to one individual viewing an area through a single eyepiece, this optional configuration allows numerous individuals to view the same area as a full color image on the SnakeEye™II Monitor.

2. Assembly

A. Insert the female end of the Connector Cable into the male end of the C-Mount Camera.

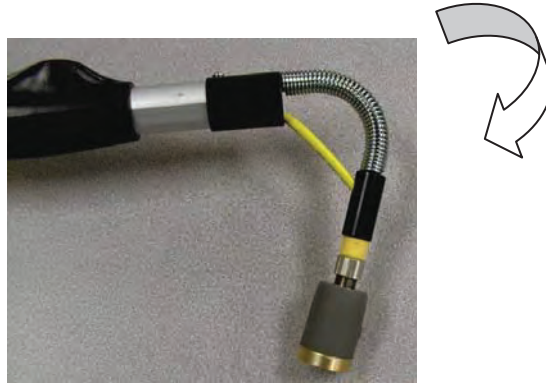
B. Thread C-Mount Adapter (not included) into C-Mount Spacer. Because some fiberscopes and borescopes require a proprietary adapter, consult with the reseller or manufacturer of your fiberscope or borescope (not included) to ensure that you acquire the right part.

C. Connect eyepiece of fiberscope or borescope to C-Mount Adapter.

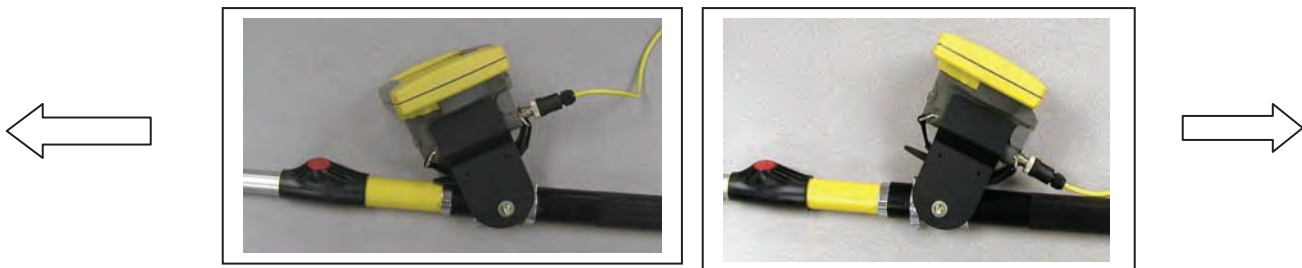
***Refer to SnakeEye™II Manual and Fiberscope/Borescope Manual before powering up.**

Telescoping Pole Instructions:

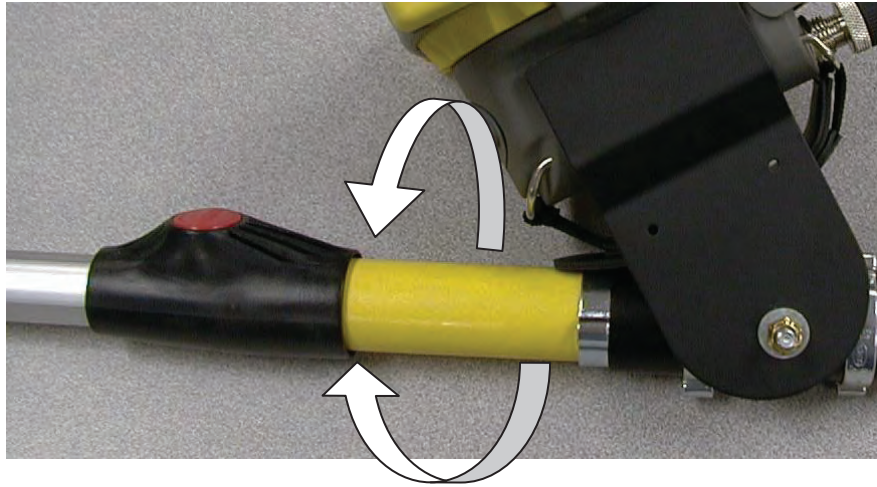
1. The camera may be articulated approximately 135° from its straight-ahead position. Pulling the cable from the bottom of the handle and securing it in the Cable Lock allows you to set the camera at any desired angle and lock it in position.



2. The Display Unit can be tilted for a better viewing angle when the pole is tilted up or down.



3. The Pole can be pivoted within the handle to pan the camera around.



4. Hold the pole beyond the display for best balance and comfort.



Directions for Installing SunShield

1. Attach the supplied self-adhesive Velcro to the front of the SnakeEye™II display as shown in the photograph. Take caution that the Velcro is applied in the correct location as shown in the picture. The sunshield can now be attached.



2. The SunShield is attached by folding into a rectangular shape as shown in the photograph.
3. The SunShield can be folded flat for easy storage inside the carry case after use.



XI. ACCESSORIES, REPLACEMENT PARTS & CUSTOMER SERVICE

If you have questions concerning the operation of your SnakeEye™II or wish to order accessories or replacement parts, please contact your distributor.

When ordering parts or accessories, please be prepared to provide the relevant Part Number (See Below). Our service representatives will provide you with current pricing information as well as parts and accessory availability.

In order to ensure shipment of the appropriate replacement parts or accessories, you must provide us with both the model and serial numbers of your SnakeEye™II. These numbers are imprinted on the Monitor and Camera Head.

Important Note:

Never use replacement parts from a ny unauthorized source" Use of such parts may damage the unit or create hazardous conditions and will void the warranty.

Part Numbers:

PART #	BASE KITS
BK-01W	Base Kit W (Wand and LED Camera)
BK-01C	Base Kit C (C-Mount Camera)
BK-01CW	Base Kit CW (Wand, LED Camera and C-Mount Camera)
OPTIONAL ACCESSORIES	
OA-01	C-Mount Camera
OA-02	Gooseneck Adapter
OA-03	30 ft Extension Cable
OA-04	Battery Pack (2)
OA-05	Neck Strap
OA-06	Sun Shield
OA-07-2	Telescoping Pole 2-4'
OA-07-4	Telescoping Pole 4-7'
OA-07-6	Telescoping Pole 6-12'
OA-07-8	Telescoping Pole 8-4'
OA-08	PowerPac NiMH Battery Pack
REPLACEMENT PARTS	
RP-01	Display Unit
RP-02	LED Camera
RP-03	4 ft Cable
RP-04	Rigid Wand Adapter
RP-05	Finger Adapter
RP-07	Battery Charger
RP-08-01	AC Adapter (120 V)
RP-08-02	AC Adapter (100 V)
RP-08-03	AC Adapter (240 V)
RP-09	DC Adapter
RP-11	Carrying Case

XII. SnakeEye™II LIMITED WARRANTY

"You" or "your" refers to the original owner of the SnakeEye™ unit covered under this warranty. The name of the original owner is to be noted on the enclosed Warranty Card.

We warrant this product against defects or malfunctions in materials and workmanship for ninety (90) days from the date of original purchase. We make no other express warranty or representation of any kind whatsoever concerning SnakeEye™II or the unit you have purchased.

We will honor your rights under this warranty as long as you can prove in a reasonable manner that any defect in materials or workmanship occurred within 90 days of the original purchase date.

The purchase date must be substantiated by a dated sales receipt. Any such defect which is evidenced within 90 days of the original purchase date will be repaired or the defective part or parts replaced at our discretion.

This warranty does not apply:

1. When the product has been serviced or repaired by anyone other than us;

2. When the product has been connected, installed, altered, adjusted or handled in a manner other than as specified in the instructions provided in the Owners Manual;
3. When the serial or model number has been altered or removed; or
4. When any defect, loss or damage has resulted from any accident, misuse or negligence.

Warranty Procedures

In the event of a problem, please consult the "Troubleshooting Guide" in this manual before contacting Aqua Communications.

1. Should it become necessary, please request a Return Authorization (RA) Number and instructions about which components and/or accessories to return to us. When you call, please be prepared to provide both the model and serial numbers of your unit. These numbers are imprinted on the Monitor and Camera Head.
2. Carefully wrap and pack the items to be returned to protect them from damage during shipping. Enclose a copy of your dated sales receipt and a brief note detailing the problem along with your name, address, daytime telephone number and RA Number.
3. Please also include the RA Number on the outside of the shipping carton and make certain the RA Number and shipping address are legible. Shipments which do not include a legible RA Number on the outside of the shipping carton will be returned.

You are responsible for the costs associated with shipments to us.

If we determine that the defect is not covered under the terms of the warranty, you will be obligated to pay all associated repair, replacement and return shipping costs. These costs will be estimated in advance.