Gen-Eye USB, USBW, & USBP®
Video Pipe Inspection/Location Systems
Operating Instructions

Your Gen-Eye USB, USBW, or USBP Video Pipe Inspection/Location System is designed to give you years of trouble-free, profitable service. However, no machine is better than its operator.

Read, understand and follow all safety warnings and instructions provided with the product. Failure to follow the warnings and instructions may result in electric shock and/or serious injury. Save all warnings and instructions for future reference.

SAVE THESE INSTRUCTIONS!

General
PIPE CLEANERS

⚠ WARNING

Read and understand operator's manual before using this machine. Failure to follow operating instructions could result in death or serious injury.

WARNING! Read and understand all instructions. Failure to follow all instructions listed below may result in electric shock, fire and/or serious personal injury. Replacement manuals are available upon request at no charge, or may be downloaded from our website, www.drainbrain.com. Instructional videos are available for download on our website, and may be ordered. If you have any questions or problems, please call General's customer service department at 412-771-6300.

SAVE THESE INSTRUCTIONS!

These instructions are intended to familiarize all personnel with the safe operation and maintenance procedures for the Gen-Eye USB, USBW, and USBP Video Pipe Inspection/Location Systems.

SAFETY SYMBOLS

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazard with a low level of risk which, if not avoided, will result in minor or moderate injury.

⚠ WARNING

Electric shock resulting in death can occur if you plug this machine into an improperly wired outlet. If the ground wire is electrified, you can be electrocuted by just touching the machine, even when the power switch is off. A ground fault circuit interrupter will not protect you in this situation. Use a UL approved tester to determine if the outlet is safe.

Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Power tools create sparks which may ignite the dust or fumes.

Always wear safety glasses and rubber soled, non-slip shoes. Use of this safety equipment may prevent serious injury.

GENERAL SAFETY RULES

⚠️ **WARNING**

Read and understand all instructions. Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.

SAVE THESE INSTRUCTIONS!

Work Area

1. **Keep work area clean and well lit.** Cluttered benches and dark areas invite accidents.

2. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.

3. **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.

Electrical Safety

1. **Grounded tools must be plugged into an outlet, properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.** If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.

2. **Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.

3. **Do not expose power tools to rain or wet conditions**. Water entering a power tool will increase the risk of electric shock.

4. **Do not abuse the cord**. **Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.

5. **When operating a power tool outside use an outdoor extension cord marked "W-A" or "W".** These cords are rated for outdoor use and reduce the risk of electric shock.

6. **Keep all electric connections dry and off the ground**. Reduces the risk of electric shock.

7. **Do not touch plugs or tools with wet hands.** Reduces the risk of electric shock.

Personal Safety

1. **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.

2. **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.

3. **Remove adjusting keys or switches before turning the tool on.** A wrench or key that is left attached to a rotating part of the tool may result in personal injury.

4. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.

5. **Always wear safety glasses and rubber soled, non-slip shoes**. Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

6. **Rubber glove inserts should be worn for health and safety reasons.** Sewer lines are unsanitary and may contain harmful bacteria.

7. **Check to make sure pipes are not electrically hot.** In some cases, ground circuits may be returned to cast iron pipes causing them to be electrically charged. Care should be taken to check the entire length on any pipe you are going to inspect.

8. **Prevent object and liquid entry.** Never push objects of any kind into this product through the openings as they may touch dangerous voltage points or short circuit to parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

Tool Use and Care

1. **Use clamps or other practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.

2. **Do not force tool**. **Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.

3. **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.

4. **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventative safety measures reduce the risk of starting the tool accidentally.

5. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.

6. **Maintain tools with care.** Keep cutting tools sharp and clean. Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.

7. **Inspect for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool's operation**. If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.

8. **Only use accessories that are recommended by the manufacturer for your model**. Accessories that may be suitable for one tool may become hazardous when used on another tool.

Service

1. **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified repair personnel could result in injury.

2. **When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

SPECIFIC SAFETY RULES

1. **Do not use tool if switch does not turn it ON or OFF.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.

2. **Be sure that the unit is plugged into a properly grounded receptacle.** If in doubt, check receptacle before plugging in machine. Check the power cord to see that there are no cuts or frays, and that the grounding prong on the plug is still in place.

3. **If the power cord supplied with the machine is not long enough, be sure to use a 16 gauge heavy duty extension cord no more than 50 feet long and in good condition.** Using lighter cords can result in severe power loss and motor overheating.

4. **Be careful when cleaning drains where cleaning chemicals have been used.** Avoid direct contact with corrosive drain cleaners. Drain cleaning chemicals can cause serious burns, as well as damage the cable. Neutralize or remove corrosive drain cleaners in the drain before starting the job.

5. **Do not operate machine if operator or machine is standing in water**. Will increase risk of electrical shock.

6. **Wear safety glasses and rubber soled, non-slip shoes.** Use of this safety equipment may prevent serious injury.

7. **Protect against lightening.** For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power surges.

8. **Protect against excessive heat.** The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

FEATURES

10.4" LCD Color Monitor (sun-readable on USBP)

Padded Case

Monitor Power ON/OFF

Audio/Video Out Jacks

USB Port

Voice Over Microphone

Camera Test Port

Fuse

Reel Connector

AC Power Input

USB Keypad

DC Power Input

Main Power ON/OFF

Battery Charger Power ON/OFF (USBP only)*

Reel Size Switch

Full Keyboard

Battery Strength Indicator (USBP only)*

*4 hr. battery not shown (USBP units only)

ABOUT THE INSPECTION CAMERA

The Gen-Eye video pipe inspection and location system is manufactured for harsh environments, however, it should handled with care. Use the Gen-Eye as an inspection tool only, never as a drain cleaning tool. Damage may occur if the camera head is dropped or "butted" severely against the pipe or any other hard surface. Once you see the obstruction, remove the camera head from the line and use the proper tool to clear the stoppage.

The stainless steel camera housing is made to protect the camera and internal electronics. However, it can be damaged by severe impacts which could cause failure of the O-ring seals or the electronics within. The camera, housing, and lens should be checked thoroughly after each use for signs of damage and, if required, should be corrected prior to further use.

GEN-EYE USB, USBW, & USBP COMMAND MODULE

The Command Module should not be used in wet locations or in the rain, as moisture may cause damage to the unit.

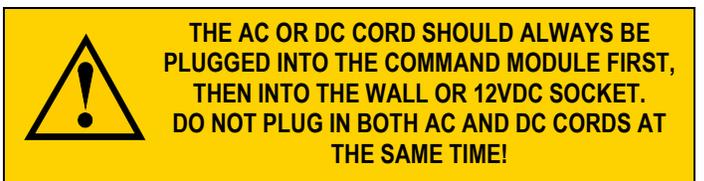### LCD COLOR MONITOR (10.4")
(Sun-Readable on USBP systems)

Be sure that "Video 1" is selected. Press the PC/AV button on monitor to change input selection.

AC POWER INPUT

Plug the socket end of the AC cord into the AC socket on the panel of the Command Module. When using 120 volts AC, care should be taken to ensure that it is plugged into a properly grounded receptacle to prevent damage to the unit.

DC POWER INPUT

Plug the socket end of the DC cord into the DC socket on the panel of the Command Module. When using 12 volts DC, the unit plugs into a vehicle's cigarette lighter. For 12VDC, the vehicle engine must be running to operate the camera system. While the DC power cord will provide power for operation, **it is not used to recharge the internal battery on USBP units.** (See Battery Charger section for charging instructions—USBP units only.)

> ⚠ **THE AC OR DC CORD SHOULD ALWAYS BE PLUGGED INTO THE COMMAND MODULE FIRST, THEN INTO THE WALL OR 12VDC SOCKET. DO NOT PLUG IN BOTH AC AND DC CORDS AT THE SAME TIME!**

FUSE

The 3 amp line fuse is located on the panel. Should replacement become necessary, replace only with the same value and type as the original. Never substitute fuses as damage may occur and will void your warranty. If the fuses continue to trip for no apparent reason, please consult the factory. Do not use the system until the problem has been corrected.

VOICE OVER MICROPHONE

This unit includes an internal microphone so you can add commentary to your videos. Press the MIC button to activate the Microphone. A light will illuminate when the Mic is "live". Press the MIC button again to MUTE the microphone. If you hear audio feedback (a screeching sound) when trying to use the microphone, it is because the volume control on the monitor is turned up too high.

VIDEO/AUDIO OUT JACKS

Video and audio can be recorded on an external device. Use the jacks located on the control panel to connect to the external device.

CAMERA TEST PORT

Use this connector to troubleshoot video and light problems in the field. (See "Camera Removal" in Maintenance Section.)

REEL CONNECTOR

Connect the interface cord from large or mini-reel to Reel Connector, located on the control panel.

MENU BUTTON

Press the MENU button for help.

LED DIMMER CONTROL

You can adjust the camera LED light level by using the camera light buttons located on the Keyboard. Press the UP button to increase the camera light level, and the DOWN button to decrease light level.

REEL SIZE SWITCH

To insure the footage counter is as accurate as possible, be sure the Reel Size switch is set to match the reel you are using - Standard or Mini-Reel.

BATTERY STRENGTH INDICATOR (USBP ONLY)

The USBP includes a rechargeable battery for operating in a remote location far from a power source. The battery lasts up to 4 hours.

To view the battery strength status, press and hold the ON/OFF button beneath the indicator lights. The number of illuminated indicator lights reflects battery power level. For example, when all five indicator lights are illuminated, the battery is fully charged. When only one indicator light is illuminated, the battery is almost depleted.

BATTERY CHARGER (USBP only)

Recharging time is approximately 3 hours, but varies depending upon air temperatures and the condition of the battery. The battery does not have to be deep cycled, but the battery may have to be replaced over time depending on usage and conditions.

The battery can be recharged from either an AC outlet, or from an AC inverter outlet in your car or truck.

1. Connect the appropriate cord for your charging method to the command module, then to the power source.

2. Switch the Battery Charger to ON. When the battery is fully charged (as indicated by all five lights illuminated on the Battery Charge Indicator), switch the Battery Charger to OFF and disconnect the command module from the power source.

YOU MUST SWITCH THE BATTERY CHARGER TO OFF BEFORE TURNING THE COMMAND MODULE OFF OR DISCONNECTING THE COMMAND MODULE FROM THE CHARGING SOURCE.

Note: The battery charger power switch must be turned off and then back on each time the unit is turned off or unplugged and then turned back on or plugged back in for the charger function to resume. This is a fail-safe built into the charger.

Do not charge the battery if the air temperature is below 30° F or above 104° F.

TITLER/KEYBOARD

This Gen-Eye Command Module has a built-in full keyboard titler. It gives you nine pages of text to easily add your company name and job location to your inspection videos.

SAVING A PAGE

To save a page to memory, go to the page you wish to save by pressing [PAGE SELECT] followed by 1-9 (i.e. [PAGE SELECT]+[5]). Type text on-screen. Press [SAVE PAGE] to save screen text to the selected page.

SETTING TIME/DATE

Hold [CTRL] and press D. "YYMMDDHHMMSSam" appears on the screen. Type in the correct time and date in this order: Year, Month, Day, Hour, Minutes, Seconds, AM/PM (A for AM and P for PM). If you wish to quit, simply hit the [ENTER] button and date and time entry line will disappear.
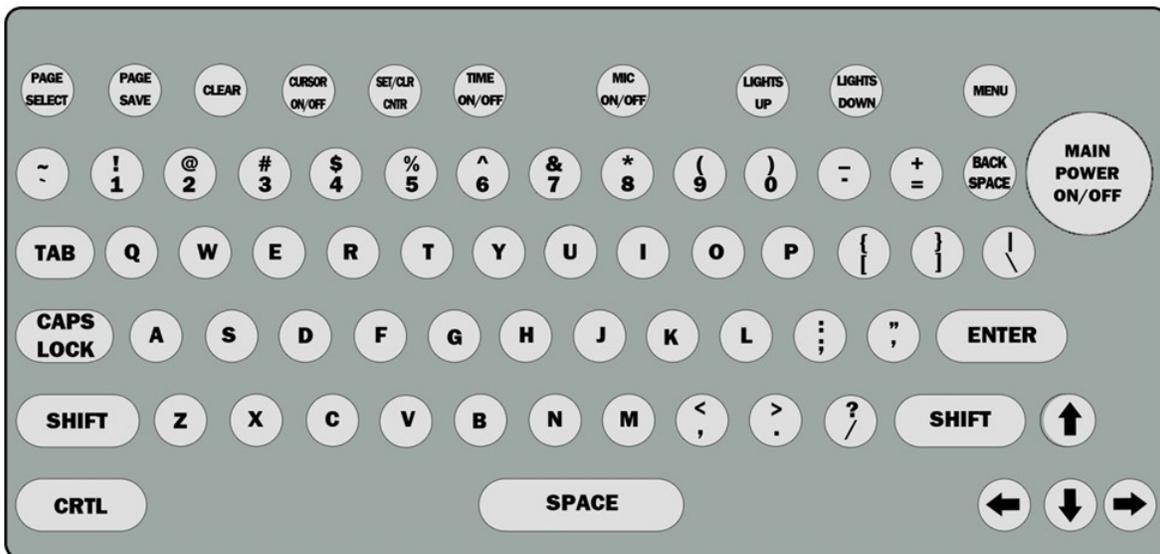

Note: The clock is preset for 12 hour mode (i.e. 01 to 12) if you have an NTSC system. The clock is preset for 24 hour mode (i.e. 01 to 24) if you have a PAL system.

TO SET FOOTAGE COUNTER

To set the footage counter to zero [000.0] before an inspection, press [SET/CLR/CNTR] followed by [ENTER]. To set the footage counter to a preset value, press [SET/CLR/CNTR]. Then press either [+] or [-] followed by 4 digits.

To insure the footage counter is as accurate as possible, be sure the Reel Size switch is set to match the reel you are using - Standard or Mini-Reel.

KEYBOARD/COUNTER OPERATING INSTRUCTIONS

KEY	FUNCTION
Page Select	[Page Select] followed by 1-9 recalls saved pages on-screen.
Page Save	Save current on-screen text to memory page.
Clear	Clear Screen and place cursor at home position (i.e. top left corner).
Cursor ON/OFF	Cursor ON/OFF toggle.
SET/CLR/CNTR	To set counter, press [SET/CLR/CNTR] followed by [+] or [-] and 4 digits. Press [Enter] to confirm.
Time ON/OFF	Time and Date ON/OFF toggle
Mic ON/OFF	Microphone ON/OFF toggle. Light indicates Mic is on.
Lights Up	Raise the intensity of the camera lights.
Lights Down	Lower the intensity of the camera lights.
Menu	Help menu
Back Space	Back Space erases letter and goes back one position.
Main Power ON/OFF	Turns the main power on and off for the entire system.
Enter	Move cursor to the next line.
[CTRL]-D	Set Time/Date. [ENTER] to quit
[CTRL]-C	Reposition counter in one of the four corners and the bottom center of the screen
[CTRL]-B	Type black characters with white border
[CTRL]-F	Turn flashing characters ON
[CTRL]-N	Turn flashing characters OFF
[CTRL]-W	Type white characters

CAMERA AND REELS

Table 1—Reel Selection Guide

Reel Type	Pipe Sizes	Lengths Available
Standard Reel	3" to 10" (75 to 250mm)	200, 300, or 400 ft. (60, 90 or 120m)
Mini Reel	2" to 3" (50 to 75mm)	100 or 200 ft. (30 or 60m)

SELF-LEVELING COLOR CAMERA

The self-leveling color camera automatically keeps the picture right side up as the camera glides though the line. You always have an upright picture on the monitor, making it easier for you and your customers to follow the action. Available on Standard size reels only.

COLOR CAMERA

Color camera provides a crisp, clear picture. Available on standard and mini-reels.

CAMERA TRANSMITTER (512HZ)

The camera assembly includes a 512 Hz transmitter, located safely in the spring behind the camera head. When the Command Module is turned on, the transmitter is automatically activated.

NOTE: CARE SHOULD BE TAKEN WHEN GUIDING THE CAMERA IN THE LINE AS EXCESSIVE BENDING AND TWISTING MORE THAN 180 DEGREES MAY DAMAGE ELECTRONICS IN THE SPRING.

SKIDS

It is highly recommended that you use a skid at all times to protect the camera head from abrasion in the pipe. Skids lift the camera off the bottom of the pipe and center it in the line for a better view and to allow the camera to glide more easily though the line.

The standard reel comes with 2", 3", and 6" trap skids. Other optional skids are available for 6", 8" and 10" lines:

GL-SK   GL-URS-1

To attach the skid, slide it over the front of the camera head, with the lip of the skid at the front. Make sure the camera body is clean and the set screws are tightened only until they touch the camera body. Do not over tighten, as you may damage the camera housing.

DOCKING ARM

The Docking Arm combines the reel and monitor into one portable unit. It lets you adjust the height, axis, and angle of the Command Module to suite each inspection location. Once the Docking Arm is assembled, you can easily remove the Command Module to store the unit indoors at night or protect it in the front of your truck. To assemble the Docking Arm:

1. Place the Command Module upside down on a flat surface.

2. Line the pin in the block of the upper Docking Arm with the guide hole in the bottom of the Command Module case, and tighten the knob to secure.

3. Swing the tube so it's 90 degrees from the surface on the case and tighten the knob.

4. Pick up the Command Module, flip it over so the tube is below it, then slide the tube into the lower Docking Arm Assembly.

5. Tighten the knob on the lower Docking Arm to secure.

SET UP

Pre-Inspection Procedure

1. Upon arrival to the job site, set up the Gen-Eye USB in an easily viewable position where it will not interfere with the inspection.

2. Unwind the interface cord from the side of the reel and plug it into the Reel Input Connector on the panel of the Command Module. Insure the connector is properly aligned and then tighten.

3. Plug the AC cord into 120VAC input (or DC cord into 12VDC input) on the Command Module panel, before plugging it into a power source. Be sure the AC power source is properly grounded.

   DO NOT PLUG IN BOTH AC AND DC CORDS AT THE SAME TIME!

4. Press the POWER button on the Keyboard to activate the Command Module. Press the POWER button on the monitor to activate the screen.

OPERATION

1. Release the reel lock and loosen the drag break on the side of the reel.

2. Slide the camera into the line. Be sure that the push rod is rated for the size pipe you are inspecting. Be careful not to force the camera around tight bends. **If you see an obstruction, <u>stop</u>**. Do not attempt to clear the pipe by using the camera head. Always use the proper tool for the job.

3. Once the camera is in the pipe, adjust the lights to a level which produces the best picture with the least amount of light. This will vary depending on pipe conditions. You may also adjust the brightness and contrast controls on the monitor. In some cases white or lighter colored objects may cause the picture to "flare" or "wash out". If this happens, simply adjust the light level until a good picture is achieved.

4. Push the camera slowly and carefully during the inspection - taking note of the pipe condition for possible hazards that may entangle or damage the camera on entry or retrieval.

5. When negotiating a corner, care should be taken not to butt the nose of the camera against the sidewall with any force. It would be better to let the camera "work" its way around the corner.

6. Should resistance become extreme, or the camera gets entangled or stuck, slowly push and pull back and forth to free it. Sometimes rotating the push rod may also help.

RECORDING THE INSPECTION
USB Recorder Keypad

ESC	Escape a Menu or Stop Recording
MENU	Call Up A Menu, Confirm Menu Entry
▲	Up
OK	Press To Take A Snapshot
▼	Down
REC	Record—Press once to start recording. If pressed while recording it will pause. Press again to resume recording.

TO RECORD A VIDEO

1. Make sure the USB flash drive has been inserted into the USB slot above the keyboard. The recorder will accept USB flash drives up to 128 GB. Using larger capacity flash drives may produce unstable results.

2. To record a video, press the REC button on the Keypad. A red box will appear on the top left corner of the monitor screen to indicate the unit is recording.
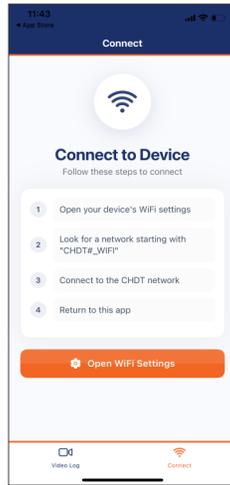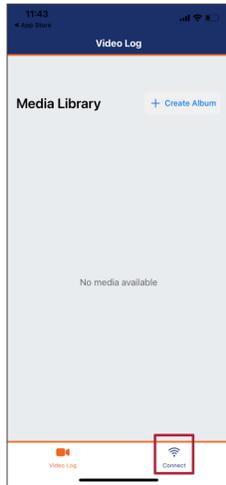
3. To pause the recording, press REC. Press the REC button again to resume the recording.

4. To end the recording, press the ESC button. Note: If you remove the USB flash drive from the port before you stop recording, your recording will not be saved.

TO TAKE A PHOTO

1. To take a photo, press the OK button on the Recorder Keypad. The photo will be stored in the same location as your video. A yellow box will appear briefly on the screen to notify you that a photo has been taken.

TO PLAYBACK VIDEO—Stored as .mp4 files

1. To playback video, press the MENU button on the recorder keypad and use the arrow buttons to navigate to PLAY VIDEO. Press MENU to enter the playback menu.

2. Using the arrow buttons, select the video you wish to review. Press OK to start playback. Press ESC to stop.

TO VIEW SNAPSHOTS

1. To view snapshots, press the MENU button on the recorder keypad and use the arrow buttons to navigate to VIEW SNAPSHOTS. Press MENU to enter the snapshots menu.

2. Using the arrow buttons, select the image you wish to review. Press OK to view. Press ESC to exit.

FILE MANAGEMENT

Selecting FILE MANAGEMENT brings up the following selections:
> Copy video from external
> Copy snapshots from external
> Delete files from external

RECORDER MENU SETTINGS

The settings and configuration of the recorder can be accessed by pressing the MENU button while a live picture is displayed on screen. This manual does not cover the scope of the different menu settings. It is highly recommended that you do not change any setting found on the setting menu as they are factory set for optimal recording and playback.

How to Set-Up the Wi-Fi Feature for Gen-Eye USB Camera Systems On an Apple device

1. Make sure the Command Module is turned ON and you are next to the unit.

2. On your cell phone, tablet, or other Wi-Fi enabled device, go to the App Store. **NOTE:** You must have an Apple account set up before proceeding.

3. Search for and download: "General Pipe Cleaners App". iOS icon

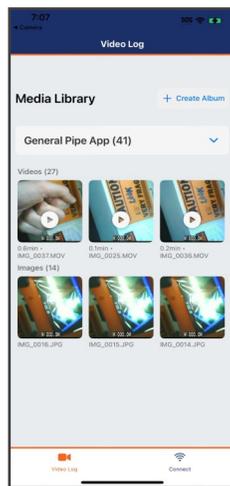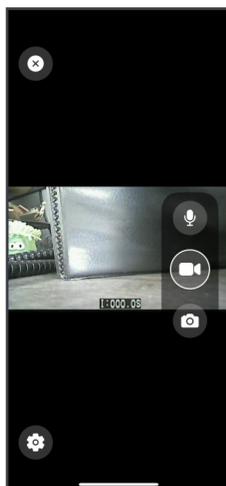4. Upon opening the App, you will be routed to the Media Library Screen.
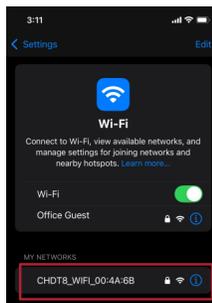
Icon Key:
Settings—*Allows you to adjust the brightness and contrast.*
Microphone—*Tap to record audio. *NOTE to include audio in your recording, you must tap the microphone first, then tap the video camera icon to begin recording.*
Video Camera—*tap to begin/end recording.*
Camera—*tap to take screenshots.*

The number of photos and/or the length of video you can shoot will depend on the amount of storage available on your device.

1. You are now ready to record video or take snap shots.

2. To include audio in your video recording, tap the microphone icon first, then tap the video camera icon to begin recording with audio.

3. To start recording video, tap the video camera icon. (Tap it again to end recording).

4. To adjust the brightness, contrast, tap the settings icon and select your desired settings.

5. To view your snap shots and recordings, navigate to Library or the photo/video gallery application on your device. You can view your photos/videos in your device's gallery.
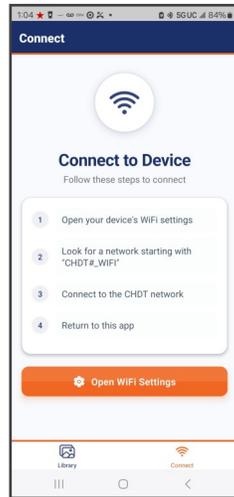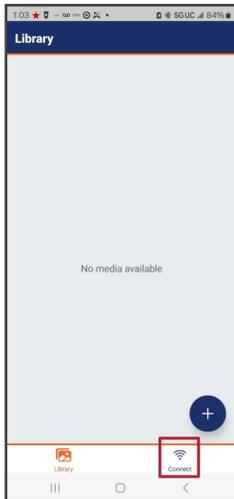
5. From the Media Library screen, select "Connect".

6. From the connect screen, select "Open WiFi Settings".

7. Open your device's WiFi Settings. Look for a network starting with "CHDT#_WIFI". Connect to the CHDT Network. **Password: 12345678**

8. Return to the General Pipe Cleaners App.

9. When the app opens, you should see the image transmitted by the camera on your screen.

10. Grant the General Pipe Cleaners App access to your devices microphone, camera, and photo gallery when prompted.

How to Set-Up the Wi-Fi Feature on Gen-Eye USB Camera Systems
On an Android device

1. Make sure the Command Module is turned ON and you are next to the unit.

2. On your cell phone, tablet, or other Wi-Fi enabled device, go to the Play Store (Android). **NOTE:** You must have a Google account set up before proceeding.

3. Search for and download "General Pipe Cleaners App". Android icon

4. Upon opening the app you will be routed to the media library.

5. From the media library screen, select "Connect".

6. From the Connect screen, select "Open WiFi Settings".

7. Look for a network starting with "CHDT#_"WIFI". Connect to the CHDT network. **Password: 12345678**

8. Return to the General Pipe Cleaners App.

9. When the app opens, you should see the image transmitted by the camera on your screen.

10. Grant the General Pipe Cleaners App access to your devices microphone, camera, and photo gallery when prompted.

Icon Key:

Settings—*Allows you to adjust the brightness and contrast.*

Microphone—*Tap to record audio. *NOTE to include audio in your recording, you must tap the microphone first, then tap the video camera icon to begin recording.*

Video Camera—*tap to begin/end recording video.*

Camera—*tap to take snap shots.*

The number of photos and/or the length of video you can shoot will depend on the amount of storage available on your device.
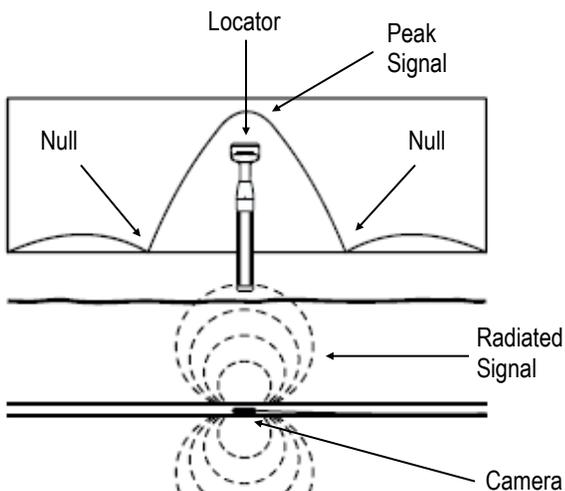
1. You are now ready to record video or take snap shots.

2. To include audio in your video recording, tap the microphone icon first, then tap the video camera icon to begin recording with audio.

3. To start recording video, tap the video camera icon. (Tap it again to end recording).

4. To adjust the brightness, contrast, tap the settings icon and select your desired settings.

5. To view your snap shots and recordings, navigate to Library or the photo/video gallery application on your device. You can view your photos/videos in your device's gallery.

CAMERA LOCATION

1. Turn on Gen-Eye Camera system by plugging in and turning on monitor.

2. Press and hold the Hot Spot Locator On/Off button. Check battery strength on display.

3. Press MODE icon until indicator displays Sonde/Camera Head mode.

4. Press Antenna Select icon until indicator displays Total Field configuration.

5. Set Locator to 512Hz by pressing FREQ button until 512 Hz appears on display.

6. Press up arrow button to increase GAIN to maximum sensitivity.

7. Push camera head/Sonde only 10 to 15 feet into the line before starting the location process.

8. Stand near pipe entrance and hold the Gen-Eye Hot Spot Locator so that the blade is pointed at 45 degree angle, out and down towards the ground at the approximate distance of the transmitter.

9. Rotate in a circle, listening to the signal strength indicator tone. If you receive full signal strength in every direction, press and release the DOWN ARROW button to reduce the GAIN, or sensitivity of the device. Repeat process until you receive a strong-steady tone from just one direction. Reduce gain further if necessary to clarify exact direction.

10. Hold Hot Spot Locator blade perpendicular to the ground and walk in the direction of the strongest signal.

11. As you walk, reduce gain by pressing and releasing down arrow button as often as necessary to keep signal strength indicator near the 50% level. (Signal Strength levels in the 100% range will erode accuracy. Always aim to keep the signal strength near 50%.)

12. The radio waves propagating from the transmitter look like this:

Notice that there is a PEAK signal over the exact location of the transmitter, and two NULL points on either side of the PEAK, lined up parallel with the lay of pipe.

13. Watch the Gen-Eye Hot Spot monitor display as you approach the transmitter's location.

14. When you reach the vicinity of a NULL point the screen will produce this display:

Simply follow the arrows to find the exact spot. When you are over the NULL point, the screen will produce this display.

15. When you reach the vicinity of the PEAK the screen will produce this display:

Follow the arrow to pinpoint the location of the transmitter. Simply rotate the flat edge of the locator blade relative to the arrows on the outside of the 'compass' to determine the orientation of the transmitter. When the display shows this graphic:

you will have the exact location of the transmitter and the lay of the pipe.

16. Find and mark the location of both the NULL and the PEAK points.

17. Push the camera ahead another 10-20 feet and repeat the process. Duplicate every 10-20 feet until the problem area is visible on the Gen-Eye monitor. At the completion of this process the entire line will be traced and marked.

MAINTENANCE

⚠ **DISCONNECT MACHINE FROM POWER SOURCE BE-FORE PERFORMING MAINTENANCE ON MACHINE!**

CAMERA MAINTENANCE

CAMERA CLEANING

After every use, the camera should be cleaned and checked for possible damage that may have occurred during the inspection. External scuffing of the camera housing is normal and should be of no concern; however, use the trap skid to protect the camera and help it slide around elbows more easily. The camera lens is made of sapphire and should be cleaned with a soft, damp cloth. Grease, dirt, or scratches will affect the quality of the video picture.

CAMERA FOCUS

All Gen-Eye cameras are pre-focused at the factory from approximately 3" to infinity and should not require any focus adjustments. Should focus adjustments be required, please call the factory.

LIGHT HEAD REPLACEMENT

The lights for the Gen-Eye cameras use LED lighting and cannot be replaced by the operator. These lights use very little power. Unless physically damaged or extreme voltage is applied to them, they should last indefinitely. If replacement is necessary, the camera should be returned to the factory. The camera lights are wired in a series/parallel configuration. This means that there are 4 sets of 4 (color camera) each wired together. Each set is wired in series and then the 4 sets are wired in parallel. Therefore, should one lamp burn out in one set, the other sets will still remain lit.

CAMERA REMOVAL

⚠ **TO PREVENT DAMAGE TO THE CAMERA AND/OR SYSTEM, DISCONNECT POWER FROM THE COMMAND MODULE BEFORE REMOVING OR RECONNECTING THE CAMERA TO THE REEL.**

The camera and associated electronics are not user serviceable. Servicing must be done by qualified personnel. Contact the factory to locate a service center near you. To use the Camera Test Terminal (see instructions below) to diagnose a problem, or to return camera to the factory, the following instructions should be used with extreme care.

1. Disconnect the complete camera and spring assembly by removing the 3 screws (4-40 x ½ SSTL) that are countersunk into the cone-shaped aluminum coupler at the end of the push cable. The screws can be removed using the Xcelite allen wrench provided with the unit. Screws should be removed very carefully and simultaneously. Each screw should be turned approximately one (1) full turn alternatively, so as not to damage the connector. While backing out each screw, hold the connector and camera assembly together until all the screws are out and then unplug the camera from the cable reel taking care not to lose the O-ring or screws.

2. After disconnecting the camera assembly, inspect the O-ring for any damage, and if worn, replace it with a new one. Also, when replacing any O-rings, make sure there is no dirt or grit on it, as it may not seal properly. Apply silicone grease or petroleum jelly to the O-ring for proper sealing.

3. To reconnect the camera assembly, carefully align the rear connector on the camera assembly and the push rod connector. When aligned, push the connectors together and replace the screws. (If the connectors do not align properly, turn the camera body slowly while slightly pushing the two connectors together until you feel them align properly together.)

⚠ **DO NOT FORCE THE CONNECTORS TOGETHER. DAMAGE MAY OCCUR TO THE CONNECTORS.**

CAMERA TEST TERMINAL

Use this connector to troubleshoot video or light problems.

1. Disconnect the system from the power source.

2. Remove camera from cable assembly and plug into Camera Test Terminal.

3. If the lights are still not working, chances are that one or more of the lights will need replacement. Contact General for service.

This will help isolate where camera video or light problems may be originating. Example: If the lights were not working when the camera was connected through the cable reel, but they do work when you plug directly to the front panel, this indicates a problem with the light wire somewhere in the cable reel. (Always check fuses first.)

PUSH ROD AND REEL ASSEMBLY

CLEANING

⚠ **DO NOT USE A POWER WASHER TO CLEAN THE REEL. WATER MAY GET INTO UNSEALED AREAS, REEL HUB ASSEMBLY AND SLIP RING HOUSING, CAUSING DAMAGE AND VOIDING THE WARRANTY.**

The push rod and reel assembly should be kept clean from dirt. When rewinding the cable back onto the reel after an inspection, it is good practice to use a clean rag to wipe off any debris.

ADDITIONAL MAINTENANCE TIPS

- The camera should always be cleaned and inspected after every use as dirt, grime and grease can cause unnecessary problems such as failure of the camera seals.

- The camera spring is attached to the cable via three (3) 4-40 x ½" stainless steel hex socket cap screws. This connection includes an O-ring sealing the connection from water leakage. This connection should be checked after every use to ensure that the screws have not loosened during the course of the inspection.

- If disconnecting the camera from the push rod, make sure that the O-ring is in good condition and/or replaced when replacing the camera onto the push rod.

- The camera lens, front nose piece and lights should be cleaned and checked after every use for possible damage to the lens or light covers and to prevent a build-up of dirt and grime which may cause a degradation of the video picture.

- Should camera disassembly be required for any reason (for replacing seals, etc.) always ensure the camera has first been cleaned and taken to a clean area for disassembly. Take extra precaution to avoid dirt getting into the camera body and any mating components such as the nosepiece, main body, and connectors.

TROUBLESHOOTING
COMMAND MODULE

No Picture AND No Lights:

- Check to see if the Main Power switch is ON. Check to make sure the power source is "live" (for 120 volt AC) or check to see if the light is lit on the cigarette lighter plug (for 12 volt DC).

- Check that Monitor Power is ON and SOURCE is set to the proper position.

- Check to make sure that the camera lens is not covered or looking at a surface that provides no detail, therefore any image detail.

- Check all connections and connectors from the camera back to the Command Module, including the cable reel.

- Disconnect main power and contact the factory service department.

Picture BUT No Lights:

- Check if Main Power switch is ON.

- Check to see if LIGHT intensity control is turned up.

- Check cable for possible breaks or intermittent open circuits by flexing the cable.

- Disconnect main power and contact the factory service department.

No Picture, Lights OK

- Check Monitor power switch is ON. Check to make sure the power source is "live" (for 120 volt AC).

- Check to see if the power fuse has "tripped". If so, replace with same value.

- Check to see if the monitor brightness and contrast controls are turned up.

- Check the interface cord for possible damage or intermittent problem by flexing the cable.

- Check the cable for possible breaks or intermittent open circuits by flexing the cable.

- Remove the camera from the cable assembly and plug it into the Camera Test Terminal.

- Disconnect the main power source and contact the factory service department.

Dark Picture

- Check to see if the monitor brightness and contrast controls are turned up.

- Check the Light Head to see if it is not supplying sufficient light due to weak, dirty, or burned out bulbs.

- Check to see if the Light Head intensity control is turned up.

- Disconnect the main power source and contact the factory service department.

Bad or Grainy Picture

- Check the camera lens for dirt, grime, scratches or other foreign matter.

- Check the Light Head to see if it is not supplying sufficient light due to weak, dirty, or burned out bulbs.

- Check for external electrical noise being radiated by outside sources, such as a power station, etc.

- Check the cable for possible breaks or intermittent open circuits by flexing the cable.

- Remove the camera from the cable assembly and plug it into the Camera Test Terminal.

- Disconnect the main power source and contact the factory service department.

Not Recording

- Always check record and play functions prior to inspections to ensure that the USB recorder is working properly.

- Check that there is enough memory available on the flash drive.

- Disconnect the main power source and contact the factory service department.

FOR ALL OTHER FUNCTIONS RELATIVE TO THE SD RECORDER OR MONITOR UNIT, PLEASE CONSULT YOUR RECORDER OR MONITOR OWNER'S MANUAL.

Battery Won't Hold Charge (SDP only)

- Allow 3 hours to fully charge battery.

- Cold weather can reduce battery life. Keep unit warm in cold weather.

- Do not charge the battery in extreme weather (temperature is below 30° F or above 104° F).

- When charging via DC, you must use an AC inverter.

- The battery charger power switch must be turned off and then back on each time the unit is turned off or unplugged and then turned back on or plugged back in for the charger function to resume.

- This is a fail-safe built into the charger.

- Battery is worn out and needs to be replaced.

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