



Setup, Use and Care Guide

XL1 / XL1s Housing

Dear Gates Customer,

Welcome to the Gates family! You now own one of the finest underwater housings available, and we thank you for choosing Gates. For over 33 years Gates has crafted the most **reliable, durable** and **dependable** housings to suit many needs, from recreational diving to treasure hunting, marine research and Hollywood productions to U.S. Navy programs.

You see, at Gates, your selection of our product is only the beginning. We are here to service you, the customer, for as long as you own our product. Our Customer Service is second to none. We'll make every reasonable effort to support you wherever your adventures land you, including remote corners of the globe. Anytime you need advice, parts, overhaul, or repair, Gates will take care of you promptly and to your satisfaction.

Please read through all the documentation contained in this package to become familiar with your Gates housing **before** diving. It contains important and valuable information to make using your new housing easy to learn and use. Soon you'll be capturing images and showing your friends and colleagues the splendor of the undersea realm.

Complete and return the warranty card enclosed in this package to activate your 2-year renewable warranty. You'll receive 2 years of warranty coverage for your investment and unprecedented peace of mind, only from Gates.

Gates wishes you the greatest success in your diving adventures. May you capture the memories of a lifetime and the envy of your friends. And remember.....

Don't take a chance...Take a Gates!

Sincerely,

John Ellerbrock
President and General Manager

Gates Housing Setup and Use

For Canon XL1/XL1S Cameras

Congratulations on owning a new **Gates housing**! You've selected a product that will provide years of value and reliable service. This housing was custom designed for the Canon XL1/XL1S video cameras for the underwater imaging professional. Please read through this entire guide to become familiar with the Gates XL1/XL1s housing. The following setup guidelines will explain how to prepare and use your camera and housing so you'll get the best results from your video endeavors.

Before You Begin

Every Gates housing is pressure tested before leaving the factory to assure a watertight seal. As a precaution, however, **it's a good idea to first setup and dive the housing without your Canon camera inside.** Rough or abusive handling during shipment could have caused unnoticed damage after leaving the factory. In addition, you can get a good feel for the use of an underwater housing without worrying about getting a good shot. You can simply concentrate on the technique of holding a camera in position while fine tuning your buoyancy.

Camera and Housing Setup

After removing the housing from its shipping container or Gates Pak, carefully inspect for any damage that may have occurred during shipment. If you discover any, contact Gates or your dealer immediately for assistance.

Preparing the Canon XL1/XL1S Camera

Your Canon camera will need some preparation before placement into the housing.

- ✓ **Remove any lens hood, cap or filters** from the lens.
- ✓ **Display information.** The XL1/XL1s camera must be set to display information through the external monitor. This is done by entering the menu of the camera and selecting as follows:
Menu → Display → TV Screen → On
Pressing the EVF button will now toggle information on / off in the external monitor
- ✓ **Remove the electronic viewfinder (EVF) and microphone boom** completely from the camera.



- ✓ **Install manual focus gear** onto focus ring of the camera lens. Place the focus gear over the front of the lens and slide it onto the focus ring with the gear teeth toward the rear (see photo). It may be a snug fit. Align the focus gear over the center of the lens focus ring. **Note: different focus gears are used for the 3X and 16X lenses**, so ensure the proper gear is mated to its corresponding lens. They are marked 3X and 16X, respectively.
- ✓ **Install the Power Ring** as shown in the photo. The slot in the ring will align with the "Off" marker on the camera.
- ✓ **Install the White Balance adapter** over the white balance knob on the camera. Orientation is not important.
- ✓ **Install a tape**, memory card, and charged battery.



Preparing the Housing

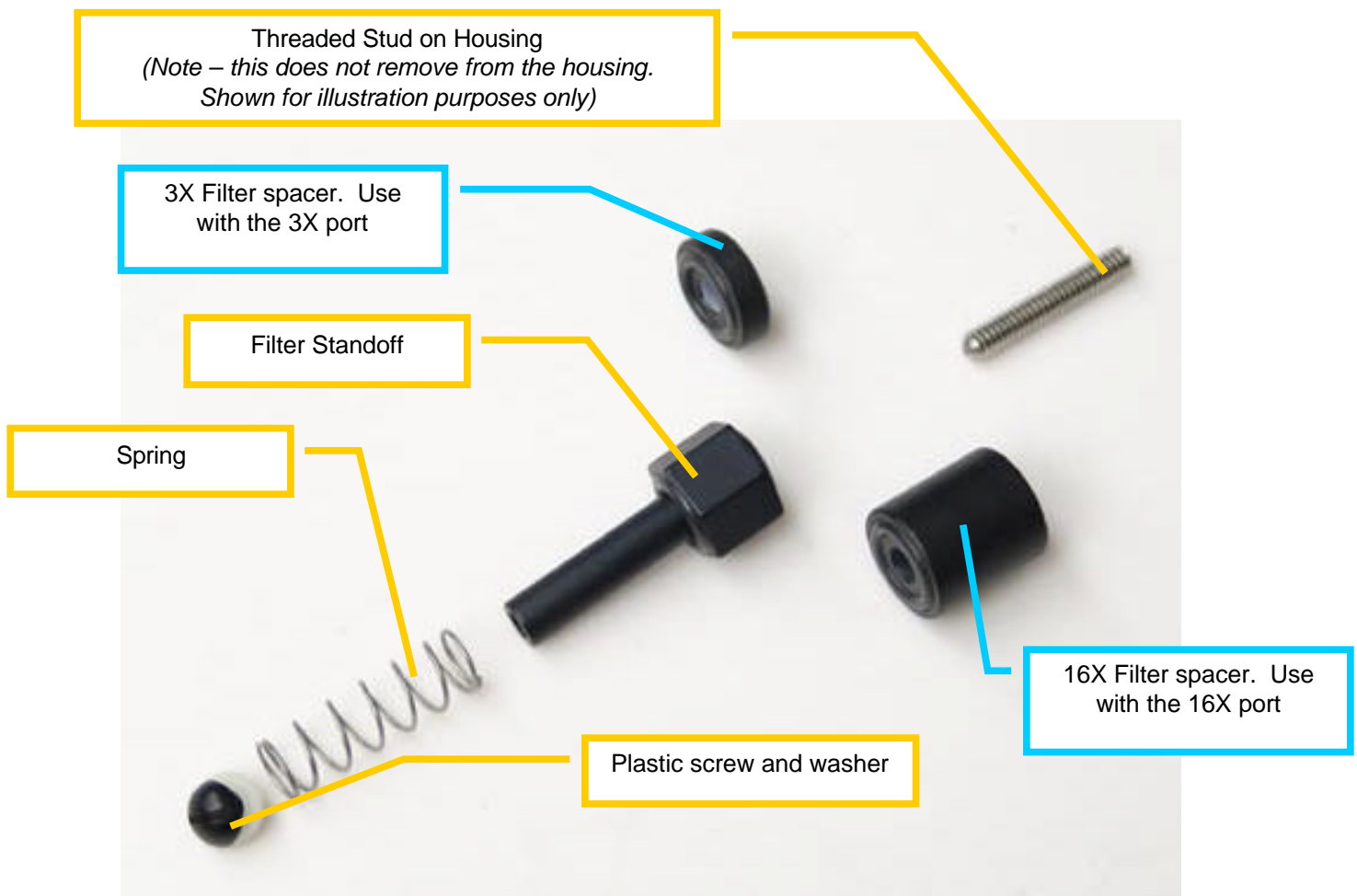
- ✓ **Release the latches.** Three stainless steel safety latches secure the housing halves. **They have a positive locking feature**, so to open them you must first depress the center bar release while lifting the rear lever. Depress the bar and lift the rear lever on the top latch, then undo it from its catch hook. Remove the two side latches in a similar fashion.
- ✓ **Open the housing.** Separate the rear half of housing from the front.
- ✓ **Remove the camera mount plate** from the housing. The plate is held in place by two small screws underneath. Use a screwdriver or small coin to remove.
- ✓ **Mount the camera** to mount plate using supplied screw. Note that the camera will seat against the alignment rail on the right side to properly position the camera for control access and port alignment.
- ✓ **Secure the camera** to the camera mount plate with the small pan head screw and a small coin or screwdriver. Tighten snug, but do not overtighten.
- ✓ **Pull out all controls** as far as they will go on the front of the housing (Controls will be discussed in greater detail in a subsequent section).
- ✓ **Double Check the Port.** The 3X port and 16X port must be used with their respective camera lenses. Double check to ensure proper match. The 3X port is 2.1in / 5.3cm total depth, and the 16X port is 2.8in / 7.2cm total depth.



- ✓ **Double Check the Filter Spacer.** The 3X port and 16X port utilize different spacers at the base of the filter assembly. Assemble the proper spacer at the base of the filter assembly. The shorter spacer is for the 3X port, the longer for the 16X port. See the photo below for further details.

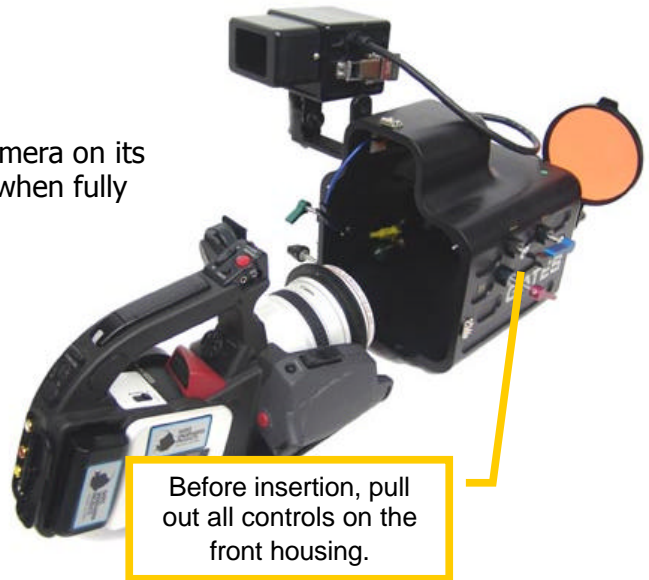
First, remove the plastic screw and washer, then the spring and filter. Using a wrench if necessary, unscrew the filter standoff from the threaded stud on the housing. The filter spacer can now be removed and changed. Re-assembly is the reverse process.

NOTE: The threaded stud does not come off the housing.



Installing the Canon camera.

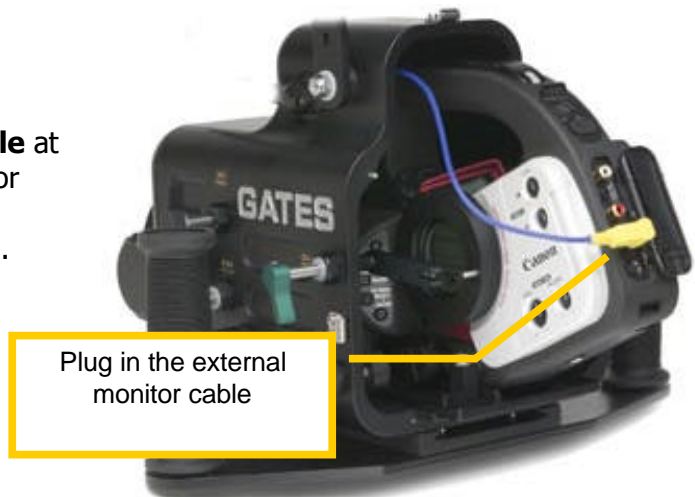
- ✓ **Insert the camera.** Carefully slide the camera on its mount plate into the housing. It will stop when fully inserted.



- ✓ **Secure the camera.** Underneath the mount plate, use the two small pan head screws to secure the camera to the housing (see photo).

- ✓ **Plug in the external monitor cable** at this time. Locate the external monitor cable and plug it into the yellow RCA video jack on the back of the camera.

Note: A subsequent section of this guide details mounting and use of the EM253 External Monitor.

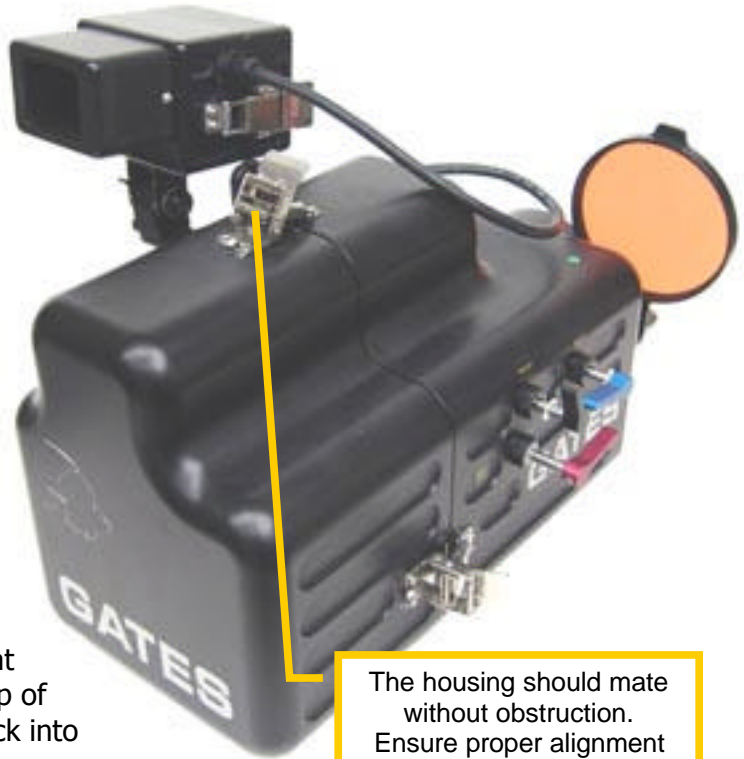


- ✓ **Check controls.** When the camera is installed into the housing front press in each control and confirm proper operation (refer to the next section for more detail on controls). Note specifically:
 - ✓ **The Power On/Off Control arm** will mate with the pin on the power ring.
 - ✓ **The White Balance Control** will mate with the White Balance Adapter.

⚡ **Tip:** with the camera installed you can now get a good view inside the housing and each control. Use a flashlight if necessary to become familiar with the operation and 'feel' of each control in their proper position prior to closing the housing.

Closing the housing

- ✓ **Carefully inspect** the orange o-ring on the back and sealing surface on the front. Make sure they are clean and free of debris or marks that could compromise the seal.
- ✓ **Position controls for mating.** The White Balance Set control should point straight for easy mating of the housing.
- ✓ **Place back housing half** onto housing front. Align holes in back with alignment pins on front. The housing halves should mate easily with no obstructions. If there are any, remove the back housing and identify the problem before trying again.
- ✓ **Align all three latches** -- Each latch should fall over the catch on the front of the housing. Close the two side latches at the same time, then close the latch on top of housing last. Each latch will 'snap' and lock into position when closed.



The housing should mate without obstruction. Ensure proper alignment and secure the latches

⚡ **Caution:** The safety latches must be **closed** and **locked** prior to use to avoid opening underwater. **It is your responsibility to make sure the latches are secure and locked, and in good condition. DO NOT enter the water with a faulty latch. Gates will replace a damaged or faulty latch free of charge.**

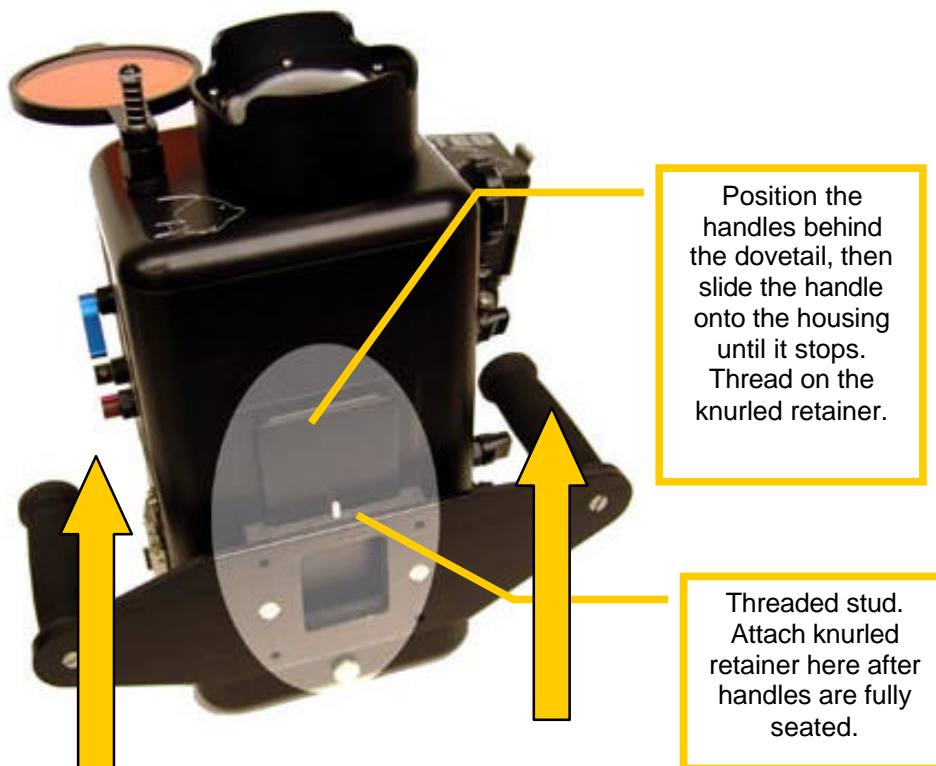
- ✓ **Carefully inspect** parting line between front and rear. If this line is not even and free of gaps all the way around, remove back and find the reason why. (O-ring out of place, hand strap interference, etc.) **FAILURE TO DO THIS MAY RESULT IN A WET CAMERA!**

✓ **Tip:** A simple test of the main seal is to try and slip a piece of paper past the o-ring. A properly sealed housing will have no gaps through which the paper can pass.

- ✓ **Check the Port.** It should be seated flush on the front bulkhead with no uneven gaps. If so, remove the port and re-install per directions in a subsequent section.
- ✓ **Power up camera and check all controls.** Check all controls for the proper operation before entering water. The following section describes each control in detail for proper operation.

Attaching the Handles

- ✓ **Remove the knurled brass retainer** from the handles, then place the handles just behind of the dovetail found on the bottom of the housing (see photo).
- ✓ **Slide the handles** onto the housing dovetail. It may take firm pressure to fully seat the handles until they come to a solid stop.
- ✓ **Attach the knurled retainer** to secure the handles onto the housing.



Controls

General Information

Your Gates housing utilizes 100% mechanical controls to provide you the most reliable operation possible. They are all rotational in nature: that is, there are no push buttons that can become sticky or depress under pressure. There are no batteries to change and little maintenance to perform.

The housing controls are designed by Gates engineers, to the extent possible, to feel and behave like the camera controls. You can also verify operation on nearly every function in the camera viewfinder or external monitor, if attached. With time and use the housing controls will become quite familiar, and you'll find operating them requires similar skill as the actual camera controls.

To help acquaint you with the housing controls, Gates recommends reviewing each control individually, how it actuates the corresponding camera control, and actually operating it to get a 'feel' for the control. You can view all front housing controls with the housing open. After reviewing all controls, perform a 'simulated' dive by operating the controls as you would in the water.

One final note about controls: when operating any control out of water, **you may need to press the control against the housing, into the position it would naturally find while under water pressure.** The controls will operate properly in this position.

Control Operation

Power (Off/Auto/Manual)

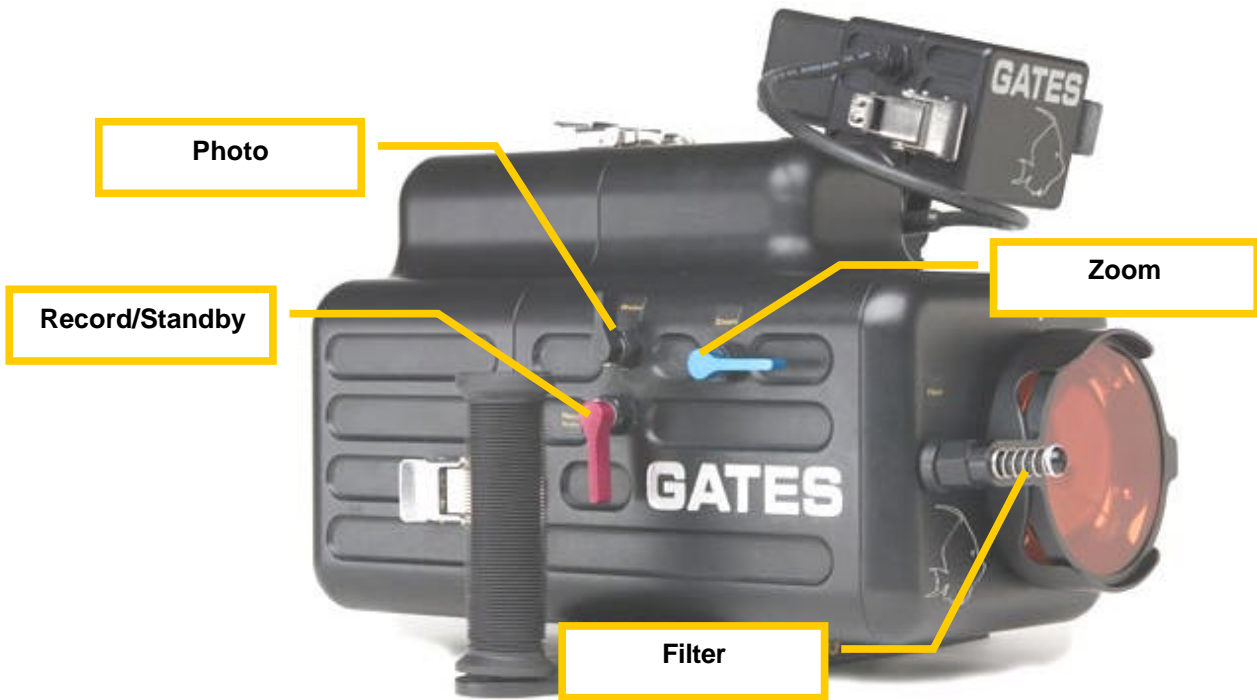
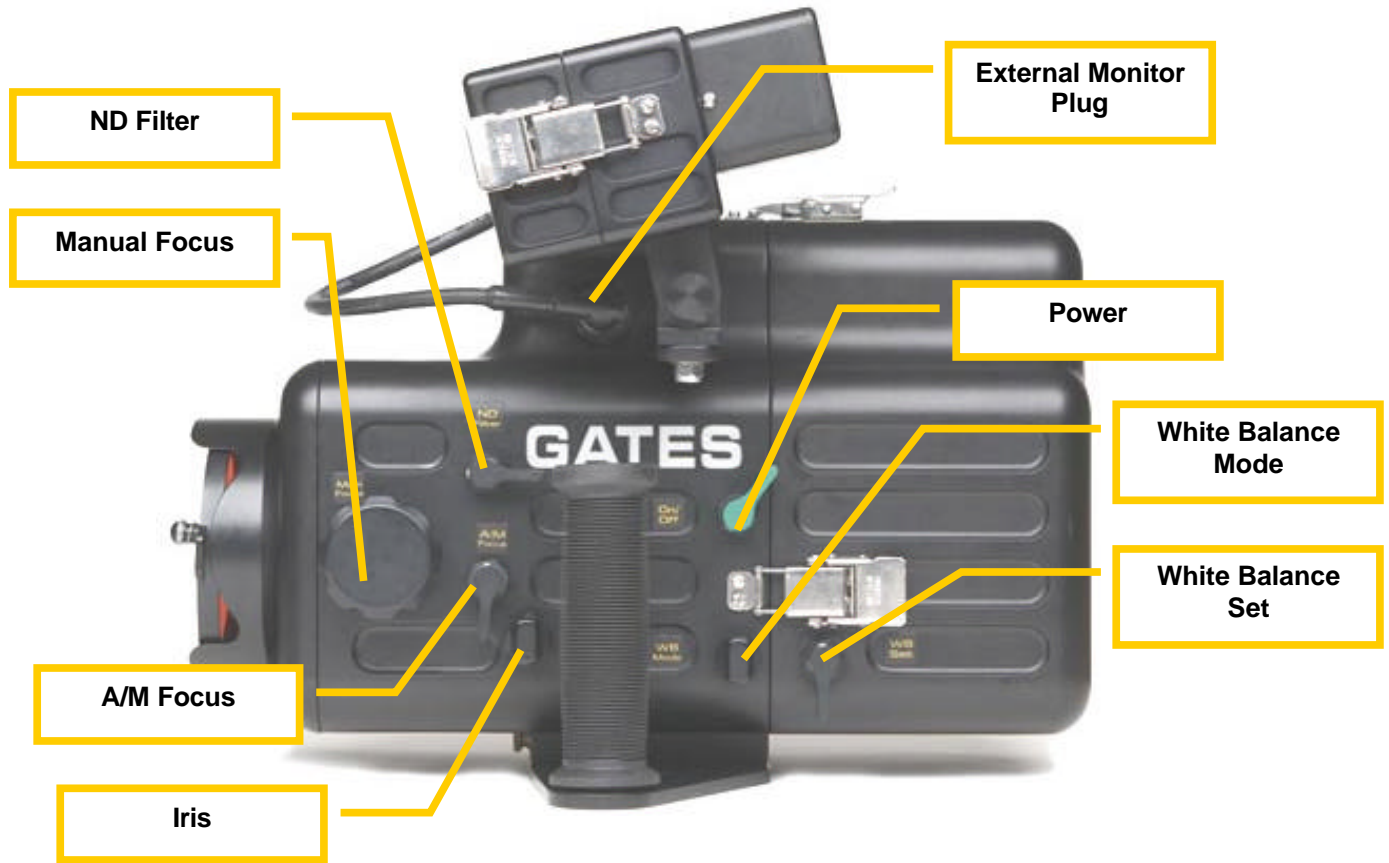
This control is easily identified by the **green** color. The positions for this control are exactly like that found on the camera switch, and you will 'feel' the switch move into each position as it passes the tactile detents. The mode selected will display in the monitor for verification. In the "Off" position the trigger will point straight down.

Record/Standby

The Record Standby control is red, and operates by a short motion clockwise on the lever trigger. Press once to record, press again for Standby. You will "feel" the record/standby button on the camera actuate through the control as it is depressed.

Zoom

The Zoom control is **blue** for quick identification. It operates with a simple rocking motion on the lever trigger. Note that the zoom is variable – that is, the further you move the control, the faster the camera will zoom from wide to telephoto and vice-versa.



Photo

This control operates with a short forward motion on the lever trigger, and you should feel the photo button on the camera depress.

Filter

The color correction Filter is located on the front of the housing. By pulling the entire filter ring away from the housing it can be rotated in front of, or away from, the port. When in use it will seat securely into the shade of the port.



Auto/Manual (A/M) Focus

The A/M Focus control toggles the camera between manual and auto focus modes. When in manual focus, the manual focus wheel can be used to focus on subjects.

Manual Focus Wheel

The Manual Focus Wheel is located just forward of the A/M focus control, and provides fine control of focus. The A/M focus control must be used to set the camera into manual focus mode to utilize this control.

White Balance Mode

This control is rotated to move through different white balance modes. Manual white balance is set by selecting 'manual' with this control, and then 'set' with the White Balance Set control.

White Balance Set

Manual white balance is set using this control. A short counter-clockwise motion will actuate the white balance set button on the camera.

Iris

The iris, or aperture, is changed by simple rotation of this control.

Neutral Density (ND) Filter

The ND Filter Control is a simple rotation to toggle between different ND filter modes.

Ports

Change

The ports for the XL1/XL1s housing are attached with a bayonet-style mount. Port changes are easy and straightforward:

- ✓ **Inspect the o-ring** -- Before installing a port, perform an inspection and lubrication of the sealing o-ring. See "O-ring Care and Maintenance" in this Use and Care Guide for specific details.
- ✓ **Insert the port** with the small 'flat spots' on the port aligned top and bottom of the housing to mate with the bayonet tab on the inside of the front bulkhead. Press the port onto the housing until it is flush with the front bulkhead. Then turn the port 90 degrees either direction so the silver dot on the port is aligned with the silver dot on the top of the housing.
- ✓ **Install the proper filter spacer** for the port you will be using. See details and photo in a previous section of this guide.
- ✓ **To remove a port**, reverse this procedure by rotating the alignment dots 90 degrees apart from each other, then pull the port away from the housing. If you have trouble, look inside the front housing and ensure the bayonet tabs are lined up with the small 'flat spots' on the port.

⚡ Caution: Perform a final check after installing a port to ensure it's flush with the front bulkhead of the housing. If not, remove the port and reinstall. Failure to do so may result in flooding.

Insert the port with alignment dots 90 degrees, or ¼ turn away from each other, and fully seat on the housing. Then turn until dots align.



Use of Diopters

The SP40X16 and XP40X3 (for the 16X and 3X lenses, respectively) allow the use of a single diopter mounted directly on the camera lens.

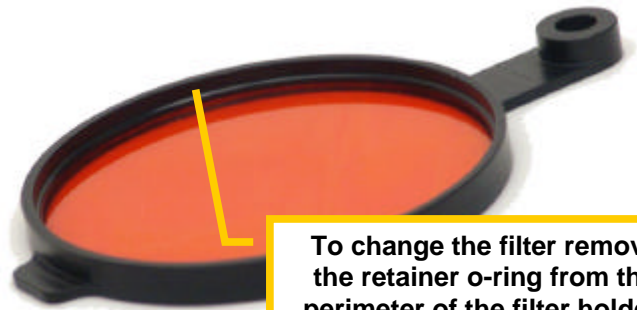
The XP40XFP Flat Port is designed specifically for macro video using the 16X lens with multiple diopters mounted to the lens.

Installing a +1 or +2 diopter on the 3X lens provides a good combination of wide angle and telephoto capability with the 3X lens/port combination. The field of view will narrow slightly at wide angle, but zoom through capability will significantly increase.

Use of the Color Correction Filter

The external color correction filter is specially designed by UR Pro to correct for color loss underwater. A "blue water" version (orange in color) is provided standard with the XL1/XL1s housing, however a "green water" version (pink in color) is available as an option.

Changing the filter is accomplished by removing the retainer o-ring found on the inside of the filter holder. The filter is readily removed and replaced, then secured again with the retainer o-ring.



To change the filter remove the retainer o-ring from the perimeter of the filter holder.


✦ **Tip:** You may notice dark corners, or vignetting, when using the external color filter with the 3X lens and port. This is due to the extremely wide field of view of the 3X lens, a field of view beyond the range of the external filter to completely cover. There are several options available to eliminate any dark corners:


- Zoom slightly until the dark corners disappear. The field of view will narrow just a little.
- Use the white balance instead of the color correction filter. White balance corrects for color loss as well. Not using the filter has two added advantages: 1) more light is available to the camera (the color filter reduces available light by up to 2 f-stops) and 2) there is one less source of possible distortion to your images.
- Use a +1 or +2 diopter. This will narrow the field of view slightly underwater however diopters significantly increase the zoom-through capability of the 3X lens and port combination.
- Install a 72mm color correction filter directly to the 3X lens. With this option the filter will be in place during the entire dive, and can only be changed above water. 72mm UR Pro filters (both blue and green water versions) are available as accessories from Gates.

Cleaning Ports

Gates ports can be cleaned readily by following these simple guidelines.

- ✓ **Dust or Lint** can be blown with compressed air, preferably from a can. **Do not clean the surfaces if it is unnecessary.**
- ✓ **Salt deposits or sand** may also be removed with compressed air. Use a soft lens brush if necessary to brush away foreign material that remains.
- ✓ **If necessary, rinse fresh water** over the outside of the port to loosen any residual salt or sand that may remain. Do this with the **port sealed** on your housing to keep water away from the rear of the port.
- ✓ **Only if necessary, clean the port** using a mild glass cleaning solution and a non-abrasive, lint free cloth. **Use light circular strokes** when wiping away cleaning solution and any foreign material. Excessive pressure used when cleaning dirty lenses (e.g., rubbing sand into the lens surfaces) may damage coatings. Use a light touch.

 **Caution:** Not all cloths are lint free and non-abrasive! Use of an abrasive material (such as cotton balls and cotton fabric) may scratch the glass and/or coating of Gates ports, and will void the warranty.

 **Tip:** Gates offers approved cleaning solutions and lint free cloths as accessory items. Use of these materials will not void your warranty.

External Monitor

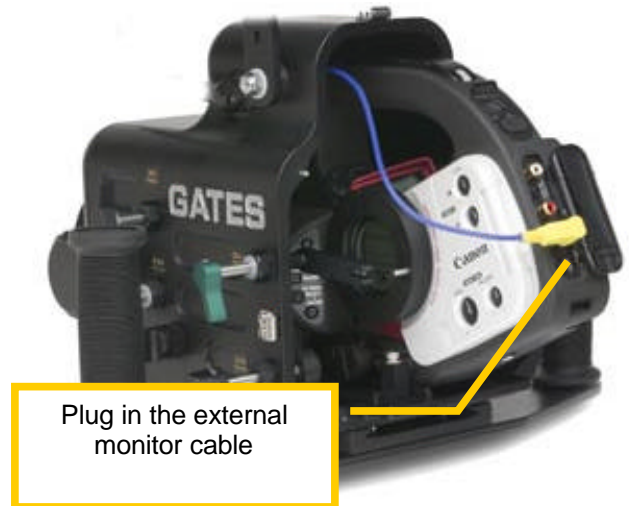
This section covers mounting of the EM253 monitor to the XL1/XL1S housing and connection to the Canon camera. Note that the EM253 has no controls – It will power up automatically when a video signal is present and also senses a PAL or NTSC signal automatically and display a proper image regardless of video format.

Camera Connection and Setup

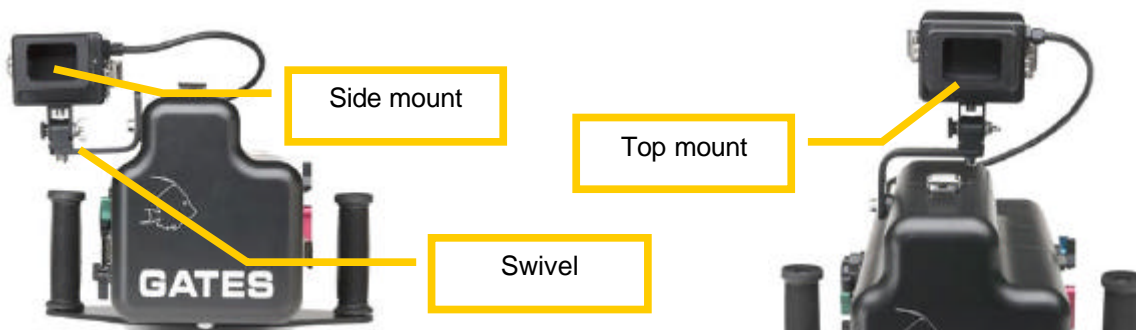
- ✓ **Connect to the Canon Camera** by plugging in the RCA video cable located inside the housing. This step can be done just prior to closing the housing. The video cable will plug into the very back of the Canon camera.

You can verify operation at this time by plugging in the EM253 (see below) and turning on the camera. Note – your Canon camera must be set to display external video, as well as camera information. These settings are made from within the menu as follows:

Menu→Display→TV Screen→On



- ✓ **Attach the monitor bracket** to housing. A threaded stud is located above the left handle on the housing, to which the "L" shaped bracket will secure.



Note that the monitor can be mounted in two ways: offset to the side, and directly on top of the housing (see photo). Determine your preferred mounting method and attach the "L" bracket to the housing appropriately using the 1/4-20 nylock nut and stainless washer. You may have to move the swivel base on the "L" bracket for the different positioning.

- ✓ **Attach the EM253 Monitor** to swivel base. Remove the wing nut and bolt from the monitor swivel yoke, and then mate the male/female swivel together far enough to re-insert the bolt. Tighten until the EM253 moves, but with some resistance.

- ✓ **Plug in the monitor cable** to the XL1/XL1S housing bulkhead connector, which is found just forward of the threaded monitor mounting stud. Mate the cable until fully seated into the bulkhead connector.

Plug in the EM253 cable to the XL1/XL1S bulkhead connector. If necessary, use water or silicone lubricant for easier mating of the connectors.
(Non-XL1/XL1s housing shown for clarity)



⚡ **Caution:** If you are not using the EM253 monitor for any reason, do not plug the RCA connector into the camera.

- ✓ **Verify operation** by turning on the camera. If properly connected, the monitor will automatically turn on and display an image. You may have to wait 3-4 seconds before an image will appear.

Batteries

The EM253 uses 8 AA cells for power. They can be Alkaline or NiMH/NiCad rechargeable. The monitor will operate for ~14 hours on a fresh set of Alkaline cells, and ~10 hours on fully charged NiMH/NiCad cells depending on the capacity.

To change the cells, release the latches on the either side of the monitor and separate the two halves. You will see the battery pack in the front half of the housing.



When closing the EM253 housing, perform a routine inspection of the o-ring for any foreign material or damage. Replace if necessary and clean the o-ring groove before installing the new o-ring.

⚡ **Caution:** Ensure the battery pack wire connection is tucked into the monitor housing prior to closing. Failure to do so could cause the wire to become trapped in the main seal and cause flooding.

⚡ **Caution:** Verify the batteries are installed in the holder in the proper direction. Reversed cells may leak and cause damage to the EM253.

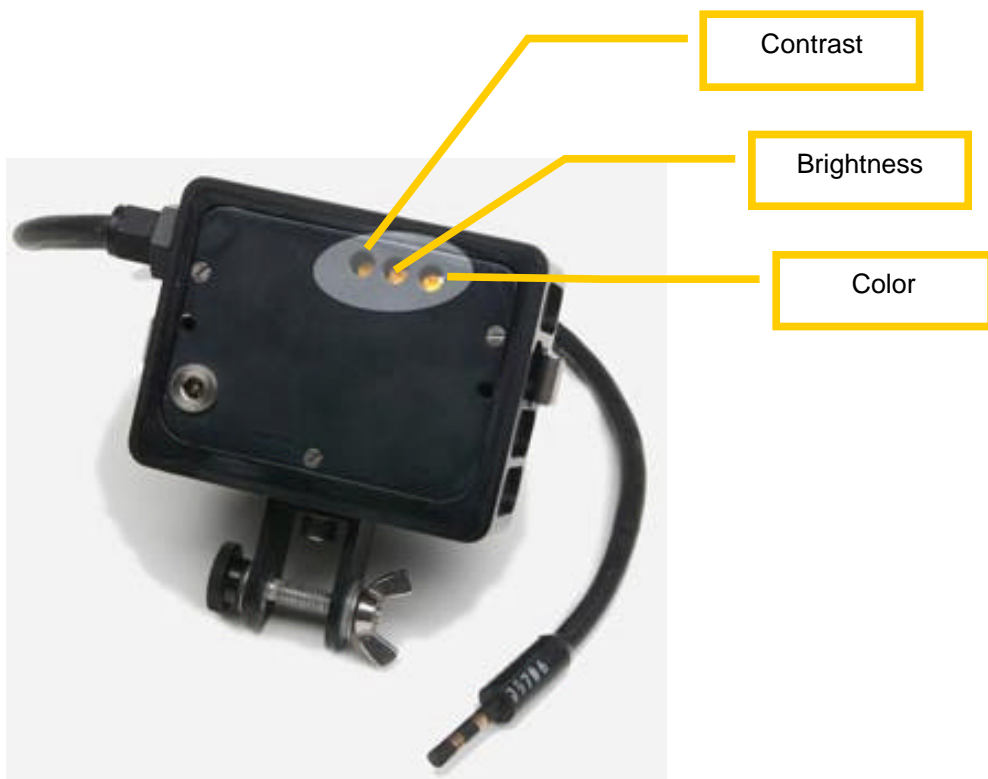
Monitor Adjustment

The EM253 has three adjustments for brightness, color and contrast. These adjustments can be found on the inside rear half of the housing (see photo).

While the monitor is pre-adjusted at the factory, Gates recommends the monitor be further adjusted to match the camera being used. This will ensure a consistent match between the monitor and the image actually being recorded.

Matching the camera and monitor should be done in a darkened area to allow good viewing of both the monitor and the camera electronic viewfinder (EVF).

With the camera on and the monitor plugged in, compare the image on the EVF to the monitor. Separate the monitor halves, make a small adjustment to the brightness, contrast or color control, then mate the halves again and view the results. (It is not necessary to secure the latches. Simply mating the halves should produce an image). Fine tune your adjustments until you are satisfied that the image on the monitor accurately reflects that being seen in the EVF.



Lighting Systems

Your housing comes ready to accept different lighting systems depending on your requirements. The handle is quite versatile and designed to suit most any application.

If you received the NiteRider™ lights with your Gates Pak, you'll find setup instructions in a separate part of this manual. The NiteRider™ system is powerful, lightweight and well suited to the Gates housing for Canon and XL1/XL1S, and perfect for traveling.

For other light systems, the handle assembly has several mounting holes for securing batteries to the bottom of your housing. They will accept many different configurations and are quite versatile. They can be used for other brackets, mounts, arms, etc. The top of each handle has a ¼-20 size threaded hole to mount light arms, monitors, brackets, accessories, or virtually anything necessary for shooting your video.


Housing Care and Maintenance

Proper care of your Gates housing is important to provide you reliable operation and long life. You'll find all the guidelines in the "Housing Care and Maintenance" pages of this document. You can also find it on Gates web site at www.gateshousings.com.

O-Ring Care and Maintenance

Your Gates housing for Canon and XL1/XL1S has 2 serviceable o-rings. One is located between the mating halves of the housing (the large orange one), and the other is located on each Port.

Servicing the o-rings is easy, and covered in the "O-Ring Care and Maintenance" document in this package. You can also find it on Gates web site at www.gateshousings.com.

 **Caution:** Do not lubricate the large orange o-ring! It is a special silicone o-ring and can be damaged by petroleum-based lubricants.

 **Caution:** **Never** use metal tools or objects for removing o-rings!

Customer Support

If you have any questions or require further assistance with your XL1/XL1S housing, contact your dealer or Gates directly and we'll be happy to assist.

Email: Customersrvc@GatesHousings.com
Phone: 858-272-2501
Fax: 858-272-1208

NiteRider™ Underwater Lighting System Setup and Use

If you purchased the NiteRider™ underwater lights with your Gates housing, you have a versatile and effective addition to your video system. Your NiteRider™ lights are powerful, lightweight and have a long “burn” time. They will provide ample illumination for your nighttime underwater shots as well as excellent daylight fill in. The following instructions will guide you through the easy setup and use.

Before You Begin

- ✓ This guide addresses assembly of the NiteRider™ lights to your Gates housing. It does not cover operation of the light, as this is contained in the User Manual included with your NiteRider™ light system.

Light Arm Mounting Links

Your NiteRider™ light system comes with a light arm mounting link(s) that will mount to the handle of your Gates housing. The mounting links resemble a single link of the arm, but with a threaded bolt attached.

- ✓ To install the mounting links onto your Gates housing, simply **thread them into the top of the handles** on your Gates housing. Screw them in until fully seated, and tighten them snugly, but do not over tighten.

Light Arms

Attachment

Notice the attachment arms consist of locking, movable links that provide a flexible arm for easy positioning of your light beam. Each link can be separated and re-assembled easily. This allows easy attachment of the arm to your housing.

- ✓ With one hand firmly on the handle of your Gates housing, grasp the light arm at the end that will attach to the housing. The light arm will mate to the link you just installed in the previous step. **Firmly press them together** until they “snap” and lock together. You may need to apply some effort, but they will lock securely.

Removing the Light Arms

- ✓ When you are ready to separate the arms, grasp the handle of your Gates housing and the light in the same way you did to assemble them. **DO NOT PULL the links apart.** Rather, **bend the light arm sideways** until the arm and mounting link separate.

- ✓ You can connect and remove the light arms at your pleasure. They are quite durable and will withstand many cycles of assembly and removal.

Battery Mount

If you purchased the NiteRider battery mount bracket, note there are two parts:

- ✓ A straight 'wing' shaped plate that mounts directly to the bottom of the handle bracket with four 1/4-20 pan head screws; and
- ✓ A 'U' shaped bracket that in turn mounts to the 'wing' shape bracket with two shorter 1/4-20 pan head screws.

Refer to the photo illustration for proper mounting and installation of the battery. Note that the battery may also be carried on a weight belt or BC pocket if so desired.

