



Setup, Use and Care Guide

XL2 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

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 XL2 video camera for the underwater imaging professional. Please read through this entire guide to become familiar with the Gates XL2 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 XL2 Camera

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

1. **Remove any lens hood, cap or filters** from the lens.
2. **Display information.** The XL2 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.
3. **Remove the electronic viewfinder (EVF) and microphone boom** completely from the camera.

Remove the handstrap,
microphone and
viewfinder



4. **Install the 20X ND filter gear** if you are using the 20X lens. The filter gear must be installed when the lens is **not** attached to the camera. Align the right side of the teeth on the gear with the right side of the ridges on the lens ND filter operating ring as shown in the photo. Push the gear forward on the lens to completely cover the lens operating ring.



5. **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 oriented with the gear teeth toward the front on the 3x and 16x lenses and toward the rear on the 20x lens (see photos). It may be a snug fit.

Note: different focus gears are used for the 3X, 16X and 20X lenses, so ensure the proper gear is mated to its corresponding lens.

Also note the alignment on the lens as shown in the photos.





6. **Install the Power Ring** as shown in the photo. The slot in the ring will align with the "Off" marker on the camera and the pin is on the outside of the ring.
7. **Install the White Balance Mode adapter** over the white balance knob on the camera and tighten with the allen wrench provided. Orientation is not important.



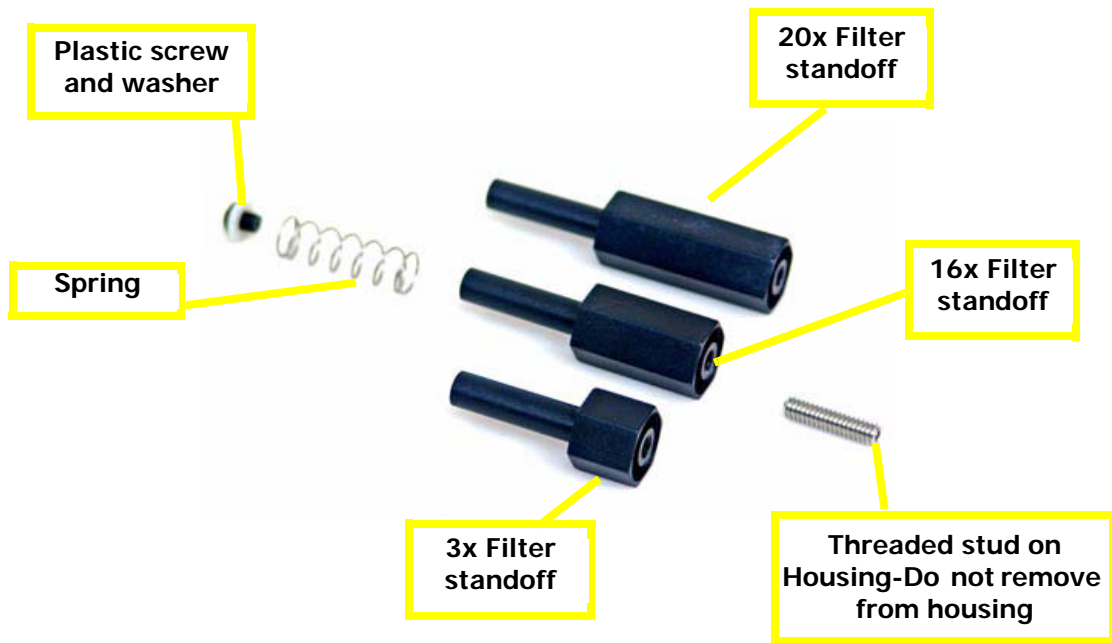
8. **Install a tape** and charged battery.

Preparing the Housing

1. **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.
2. **Open the housing.** Separate the rear half of housing from the front.
3. **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.
4. **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.
5. **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.

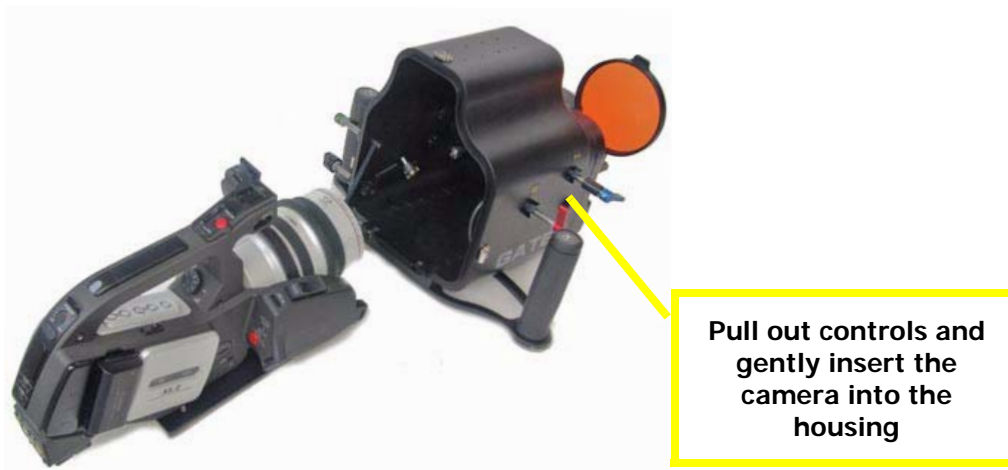


6. **Double Check the Port.** The 3X, 16X and 20x ports must be used with their respective camera lenses. Double check to ensure proper match. The ports are marked on the bayonet as follows;
3X Port: SP45X3
16X Port: SP45X16
20X Port: SP45X20
(Port changing instructions are found on page 14 of this guide.)
7. **Double Check the Filter Standoff.** The 3X, 16X and 20X ports utilize different standoffs at the base of the filter assembly. The 3X is the shortest and 20X the longest, and the proper standoff comes with each port.
To change, 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. Replace the standoff with the appropriate one for the port you will be using.

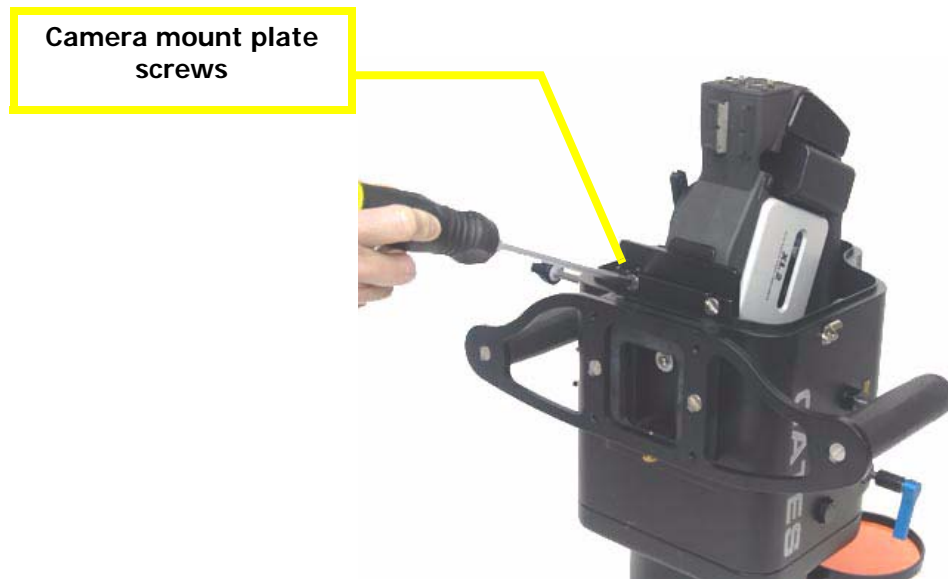


Installing the Canon camera.

1. **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).
2. **Insert the camera.** Carefully slide the camera on its mount plate into the housing. It will stop when fully inserted.



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



4. **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 small switch is located immediately next to the yellow RCA jack on the XL2 camera which needs to be in the down position to output video to the RCA jack.
Note: A subsequent section of this guide details mounting and use of the External Monitor.



5. **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 Mode Control knob** will mate with the White Balance Adapter knob attached to the camera.
- ⚡ **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

1. **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.
2. **Position controls for mating.** The White Balance Set control should point straight down for easy mating of the housing. **Place back housing half** onto housing front, using the 'drip lip' to guide the alignment. The housing halves should mate easily with no obstructions. If there are any obstructions, separate the halves and identify the problem before trying again.
3. **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.



- ⚡ **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.***

4. **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.
5. **Check the Port.** It should be seated flush on the front bulkhead and no uneven gaps should exist. If a gap is found, remove the port and re-install per directions in the 'Port' section on page 14 of this guide.
6. **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.

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 on the external monitor. 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.

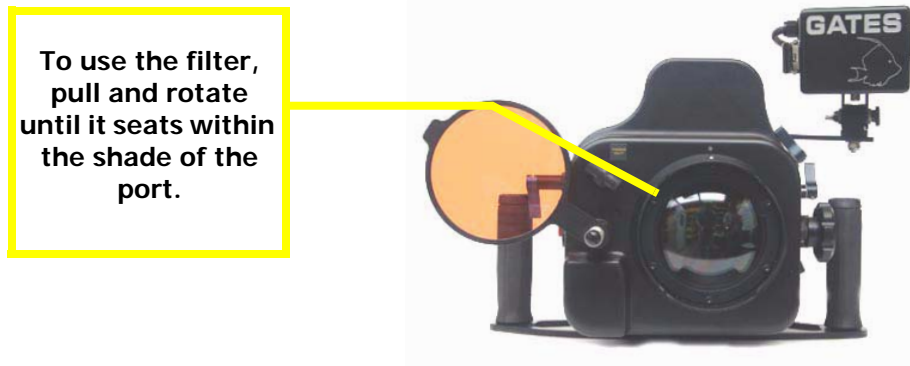
One final note about controls: when operating any control out of water, ***you may need to press the control against the housing, into the position it would naturally find while under water pressure.*** The controls will operate properly in this position.

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 detentes. 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 rotational movement of 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.



- **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.



- **Neutral Density (ND) Filter** The ND Filter Control for the 3X/16X lenses is different than the control for the 20X lens. When using the 20X lens it is important to place the larger (measuring 5/16") of the two spacers on the 3X/16X ND filter control to avoid interference. (The smaller spacer is used on the A/M Focus control with the 20X lens.)



- **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 knob can be used to focus on subjects.

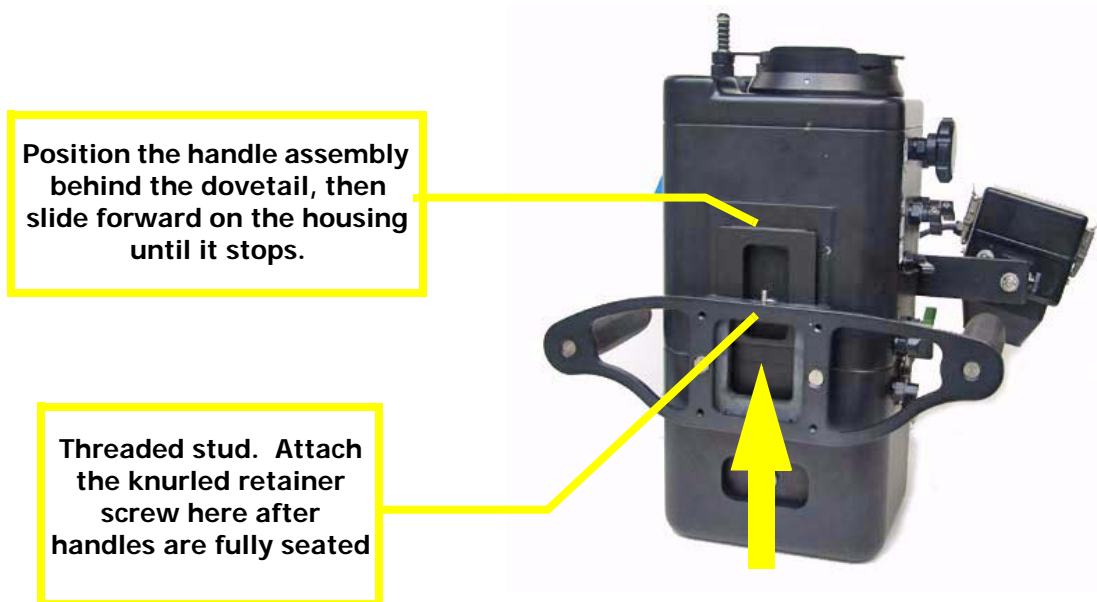
For the 20X lens the A/M Focus control utilizes a small (measuring 5/32") spacer between the trigger and gland. Insert this spacer when using the 20X lens only.

- **Manual Focus Knob** The Manual Focus Knob 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 clockwise motion will actuate the white balance set button on the camera.
- **Iris** The iris, or aperture, is changed by a rocking motion of the lever trigger.

Attaching the Handles

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



Ports

Change

The ports for the XL2 housing are attached with a bayonet-style mount. Port changes are easy and straightforward:

1. **To remove a port:**
 - move the Color Correction Filter out away from the port
 - rotate the port 90 degrees counter-clockwise so that the alignment dots are 90 degrees apart from each other
 - pull the port away from the housing.

- If you have trouble, look inside the front half of the housing and ensure the bayonet tabs of the port are lined up with the cut-outs of the port opening.
- ⚡ **Tip:** If the port has been on the housing for an extended period of time, it may be difficult to turn. You may find that a strap wrench helps to remove it.
2. **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.
 3. **Insert the port** with the bayonets on the port aligned with the cut-outs of the port opening 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 clockwise so the silver dot on the port is aligned with the silver dot on the top of the housing. The port has a built in stop to prevent further rotation.
 4. **Install the proper filter standoff** for the port you will be using. See details and photo in a previous section of this guide.
- ⚡ **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.



Use of Diopters

- The SP45X20, SP45X16 and SP45X3 (for the 20X, 16X and 3X lenses, respectively) allow the use of a single diopter mounted directly on the camera lens.
- The FP45 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 XL2 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.

Cleaning Ports

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

- **Dust or Lint** can be blown with compressed air, preferably use air 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 monitor to the XL2 housing and connection to the Canon camera. Note that the monitor has no controls; it will power up automatically when a video signal is present, it senses a PAL or NTSC signal automatically and displays a proper image regardless of video format.

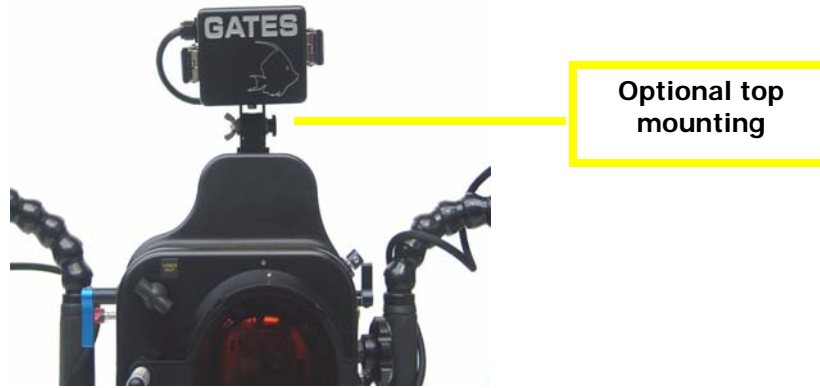
Camera Connection and Setup

1. **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 monitor (see below) and turning on the camera. Note – your Canon camera must be set to display external video, as well as camera information. If you have not already set the external video mode, please refer to the "*Preparing the Camera*" section for directions.

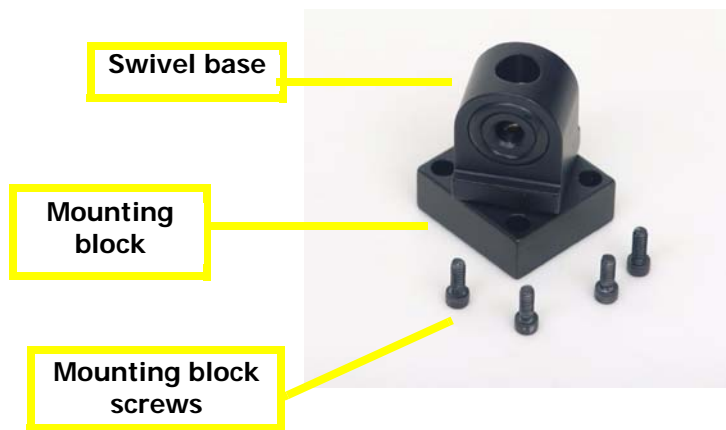


2. **Attach the monitor bracket** to housing. The external monitor is usually mounted to the housing on the left side as seen in most of the photos in this guide. If you prefer, the monitor can be mounted on the top of the housing.



To mount your monitor on the top:

- Separate the monitor from the swivel base
- Remove the 'S' shaped bracket from the housing. There are 4 screws on the top of the housing that secure the bracket.
- Separate the swivel base from the 'S' shaped bracket. You will need a 7/64" hex key tool and 7/16" socket wrench to loosen the nylock nut.
- Use the same bolt and nylock lock nut to attach the swivel base to the square mounting block supplied with your XL2 housing (see photo). Tighten the nylock nut firmly.
- With the swivel base turned slightly, secure the assembly to the top of the housing using the four black 6-32 x 3/8" screws. These are slightly longer than the ones (6-32 X 3/16") that secure the 'S' shaped bracket to the housing.



3. **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.



4. **Plug in the monitor cable** to the XL2 housing bulkhead connector, which is found just above the threaded filter mounting stud. Mate the cable until fully seated into the bulkhead connector.

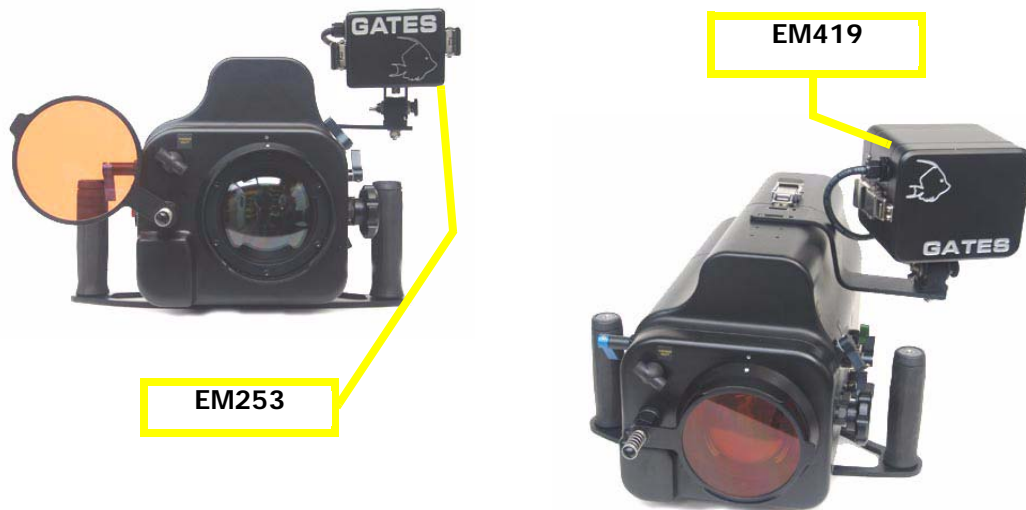


⚡ Caution: If you are not using the EM253 monitor for any reason, do not plug the RCA connector into the camera.

5. **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.

Optional EM419

The EM419 is available offering a 4.1"/104mm color active LCD. As with the EM253, it will power up automatically when a video signal is present. It also senses a PAL or NTSC signal automatically and displays a proper image regardless of video format.



Monitor Setup, Use and Care

The EM253 SU&C Guide is included as a separate document with your XL2 Guide. If you received the optional EM419 monitor, you will find that SU&C guide instead.

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 XL2 has 3 serviceable o-rings. One is located between the mating halves of the housing (the large orange one), and the other two are located on the rear of 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 XL2 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

