UNDERWATER VIEWING SYSTEM

USER MANUAL *VS820*

MarCum Technologies

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INTRODUCTION

Thank you for purchasing the VS820 underwater viewing system from MarCum Technologies Inc., the most technologically advanced underwater viewing system available.

Welcome to the world of underwater viewing. MarCum Technologies has incorporated the latest technology in producing the most compact, technologically advanced and versatile underwater viewing system available. Your new VS820 can be used to hunt for underwater treasures, locate the "spot on the spot", observe fish in their natural habitat or learn how fish react to your lure or bait presentation. The applications are endless.

MarCum's primary objective is to enhance the experience of the outdoor enthusiast. We believe we've created a feature laden viewing system that is not only user friendly but as easy to use in open water as it is on the ice. You will now be able to stop guessing at what is below the surface and start seeing the real mysteries of underwater life. Have fun and good viewing!

FEATURES

- 600v x 800h super-high resolution LCD monitor equipped with a sophisticated, thermostatically controlled heater to enhance your viewing experience in winter conditions.
- Sony CCD Super HAD black and white camera.
- Manta camera design utilizing Darkwater technology lighting system.
- Dual underwater lighting option. Choose between super high intensity blue L.E.D. lights or stealthy infrared lighting.
- 75 feet of high strength, flexible camera cable.
- Removable down-view and trolling fin.
- Front keypad control panel.
- On screen monitor adjustments.
- Video Output jack.
- 90° cable connections to prevent cable wear.
- Padded soft pack encompasses internal molded case that stores battery, camera cable, and Manta camera. Provides for maximum portability and protection.
- 7.2 amp 12v rechargeable battery with 1-amp, 2-stage charger.
- Full 1 Year Warranty

The 600v x 800h super high resolution LCD monitor on the VS820 viewing system provides for an extraordinarily sharp and clear picture under most viewing conditions. The daylight viewable monitor requires no sunshield while viewing outdoors. This makes it more versatile for summer use or while viewing outside on the open ice. It's recommended when viewing outdoors, that the backlight (brightness) be increased to enhance your viewing experience. Although classified as daylight viewable, it is recommended that you turn the monitor away from direct sunlight. As indicated, the screen brightness can be adjusted to improve outside viewing but with direct light and monitor glare it can detract from the picture quality.

The ultra-thin monitor housing is sealed with a rubber gasket and all plug-in connections are potted to protect the internal electronics from the harsh elements. The VS800 series LCD systems are considered water resistant. They're designed to be used in the outside elements under most conditions but they're not recommended to be submerged underwater. While operating in cold temperature's, the VS820 utilizes a sophisticated, thermostatically controlled LCD heating element which allows the monitor to operate at near optimal temperature. You may experience some blurriness or slow down in LCD performance when you first power up the screen in cold

temperatures. It can take up to several minutes before the screen temperature reaches the appropriate operating range.

In order to create an ultra clear - high resolution picture, there needs to be a matching high quality camera. The VS820 uses the best camera module available; the Sony Super HAD ultra low lux CCD. This camera offers a 90° angle of view, giving the user a wide coverage area for maximum visibility.

The Manta camera design matches the high quality Sony Super HAD CCD camera to a choice between adjustable high intensity blue LED's or stealthy infrared lighting. Both lighting options incorporate MarCum's exclusive Darkwater lighting technology. The user can switch between the two lighting options and control the intensity of the LED's by making use of the digital keypad. Darkwater technology greatly reduces particulate reflection and increases viewing distance by positioning the lights above and behind the actual camera lens.

Adjusting the settings on a monitor has never been so easy. The digital keypad activates an onscreen display for making adjustments to the monitor brightness, contrast, color and sharpness. In addition to adjusting the monitor screen settings, the digital keypad also controls underwater lighting options, dimmer for controlling underwater lighting intensity and power ON / OFF.

To clean the monitor screen, use a cleaner recommended for plastic and a soft cloth towel.

Sharing your video is easy. The video output jack located on the rear of the monitor allows for adding an external monitor such as a bigger screen TV or a video recording device.

The camera and power cables have been designed with 90° terminal connections to prevent cable wear. Along with the 90° connections, each cable connector is keyed differently to prevent plugging the cable into the wrong port. The rear cable access panel provides cable strain relief and is screwed to the back of the monitor. The panel securely holds the cables in place and prevents unnecessary wear.

The 75 feet of reinforced camera cable is flexible for ease of handling yet offers high tensile strength.

The Manta camera incorporates internal ballast weights within

the camera housing. The amount of weight is ideal for trolling at low speeds or keeping the camera tracking smooth in current. For added open water stability or to use as a down view camera, the fin (included) snaps into the rear of the Manta camera housing with ease.

Following MarCum's standards, the VS820 is protected with a stylish reinforced padded soft pack case. Under the soft pack is a molded ABS hard case with a built in battery tray and a Velcro strap to securely hold the battery in place. Next to the battery is a storage compartment for the camera and camera cable. The monitor folds down flat and the padded case encompasses the entire system protecting it during transportation. On the left side of the case is a carrying handle for ease of transport.

The sealed 7.2 amp rechargeable lead-acid battery can provide up to 8 hours of continuous use during ideal conditions. Battery run time will vary depending on the condition of the battery, use of underwater LED lighting, level of screen backlight (brightness) and LCD heater system. The 1 amp, two-stage charger will quickly charge the battery back to full capacity. Once charged, a small green LED light will be illuminated to indicate the charger has switched to a trickle charge mode.

The VS820 offers a full one year warranty backed by MarCum's first-rate customer service!

GETTING STARTED

The VS820 has been set-up and tested at the factory before being placed into its retail packaging.

Remove the VS820 from the packaging and place on a level surface with the MarCum Technologies logo facing towards you and right side up. Open the top cover of the soft pack by lifting up on the Velcro closers on each side and front of the soft pack. Once opened, loosen the knobs on the either side of the gimbal bracket (at the base of the monitor) by turning each one counter-clockwise. Make sure to loosen the knobs a considerable distance. Than depress both knobs by pushing inwards and hold in place. This releases the lock on the monitor angle. While depressing the knobs with the base of your palms, use the index fingers of each hand and gently lift the monitor up to the desired viewing position and release tension on the gimbal knobs. Once you have set the monitor to the desired viewing angle,

gently tighten the knobs until they are snug. The battery, camera and cable are now accessible behind the monitor. It's easiest to remove the Velcro straps and unzip the soft pack case. The battery cable connectors can now be connected to the battery by attaching the corresponding wire colors to the correct terminal. The positive (red) wire from the monitor can be connected to the positive (red) terminal on the battery. The negative (black) wire coming from the monitor can be connected to the negative (black) terminal on the battery. After the terminals have been connected, the VS820 is ready for use. *(Note: The battery leads should stay connected at all times other than while charging. This will be covered later in the charging process.)*

To turn ON the VS820, press the power key which is located on the keypad on lower left side on the front of the monitor. After pressing the power key, a small red LED indicator light – located next to the power button - will turn ON. The monitor should now be displaying the image being transmitted from the camera. The camera can now be unwrapped from the cable spool and deployed into the water to the desired depth.

The depth of field (distance the camera can see underwater) depends on the clarity of the water and available light at the depth the camera is used. In clear water, the depth of field can be many feet but in cloudy or muddy water the depth of view can be reduced to only a few inches due to particles suspended in the water.

ADJUSTING THE MONITOR SETTINGS

The VS820 monitor has four different adjustments that can be made by utilizing the on-screen display. These adjustments can be made to enhance the image on the monitor to the user's preference. *(note: The VS820 has been pre-set with factory defaults for normal viewing.)* To access the settings menu, press the menu key on the digital keypad. The settings menu will be displayed on the screen *(note: if you wait too long before selecting an adjustment, the menu screen will time out and disappear).* To change between on-screen adjustment choices (brightness, contrast, color, sharpness), continue to press the menu key. The selected on-screen adjustment will be highlighted on the LCD screen. To change the settings within a selected menu, use the UP and DOWN arrows located on the far right of the digital keypad. You will see the numbers of the selected adjustment increase or decrease depending on the arrow

direction you are depressing. To accept the changes, release the UP / DOWN arrow and settings will be saved. Once the settings are adjusted properly, the on-screen menu will shut off automatically.

Contrast - Contrast is the difference in brightness between lightest and darkest tones in a picture. A picture with too much contrast has highlights (lighter tones) that are too bright and no detail and shadow areas that are too black. A picture with too little contrast looks dull, with no true blacks and more grayish highlights. Different water clarities coupled with the amount of light available will affect the contrast. Adjust the contrast to the desired setting for the best overall picture.

Brightness - Use the brightness adjustment to change the overall brightness of a picture. You can lighten a picture that's too dark, or darken one that's too light. Different lighting conditions and water clarity will affect the brightness of the picture. By adjusting the brightness, the backlight of the monitor will increase making the picture brighter. This can be helpful when viewing the VS820 outdoors during daylight hours Adjusting the brightness can make the monitor easier to see.

Sharpness - Sharpness is the amount of high-frequency detail in the image. Adjust the sharpness according to personal preference. *(note: increasing the contrast can give an impression of increased sharpness, so try this first).*

Color - Increasing the color saturation with a black and white monitor will increase the darkness of the blacks and make the picture look darker overall. Decreasing the color saturation will make the blacks and darker colors look washed out and gray.

LIGHTING

The VS820 gives the user an option to use either super high intensity blue LED lights or the stealthier invisible infrared lights. The VS820 incorporates Darkwater technology which greatly reduces particulate reflection and increases viewing distance by positioning the lights above and behind the actual camera lens.

To turn the lighting system ON, press the key titled LIGHTS, located on the digital keypad on the front of the monitor. By pressing the key one time, a small yellow LED light to the right of the button will

be illuminated. This indicates that the high intensity infrared LED lights are ON. By pressing the LIGHT key a second time, the same LED light next to the LIGHT key will be illuminated green to indicate the super high intensity blue LED lights are ON. To turn the lighting system OFF, press the light button a third time. When the lights are first turned ON, they will be at the lowest level of intensity. To increase the intensity of either lighting option while the lights are ON, press the UP arrow key on the right side of the digital keypad. There are (4) levels of lighting intensity. To decrease the intensity of the lights while the lights are ON, press the down key on the right side of the digital keypad (note: when the LED lights are first turned on, they will always be set at the lowest level of light intensity). The amount of LED light required will depend on the clarity and amount of particulates in the water. Darker, stained water will require more light while clear water will have sufficient light penetration therefore decreasing the need for LED intensity.

ICE FISHING APPLICATION

The VS820 can be used to entertain the kids or as the perfect tool to enhance your ice fishing experience. The VS820 can be used to search for that perfect weed line or locate the crib or rock pile where fish will generally school To use as a search tool, drill a series of holes through the ice in the location you're interested in fishing. The VS820 is small enough to hold in your arms while walking from hole to hole. Drop the camera down each hole in search for the best spot or until you locate fish. Once you've located the spot, drill a hole 3 or 4 feet away from the hole you're actually going to fish in. Set the VS820 on the ice and lower the camera down the second hole. To assist in keeping the camera at the desired depth and direction, it is recommended that a Camera Compass or Ice Arm *(purchased separately)* be used. Once you send a lure or bait down and locate it with the VS820, you're ready to fish. The depth and direction of the VS820 can be changed at any time by lowering or raising the camera and rotating the camera cable between your fingers. The VS820 also includes a down viewing fin that snaps into the back of the Manta camera. Once the fin is attached, the camera cable can be inserted through the cutout at the rear of the fin and locked into place. It is recommended that you leave about six inches of excess cable, forming a loop, before locking the cable into place. The camera can now be lowered into the hole to view what is directly below you. This can be very helpful while fishing in shallow water.

OPEN WATER APPLICATION

To locate fish, look for treasure or find that perfect spot, simply turn the camera power ON and drop the Manta camera into the water. If you're drifting with the wind or using a trolling motor with the VS820, attach the supplied trolling fin to the rear of the Manta Camera for added stability. The internal weight is enough to keep the camera down while the fin assists in keeping the Manta camera tracking straight through the water. If the camera becomes hung up, back up from the direction you were traveling from and slowly try to back the camera out of the snag. **DO NOT** pull directly upward with force unless all other avenues have been pursued.

BATTERY CHARGING

Recharging the battery after every use is recommended. The charger that was supplied with the VS820 is a 1-amp two-stage DC charger. To charge your system, simply connect the positive (red) and negative (black) female connector from the charger to the positive (red) and negative (black) male end at the battery. Once connected, plug the charger into a 110 volt AC wall outlet. The LED indicator light on the charger will be red when the charger is in a charging mode. The LED indicator light on the charger will turn green when the charger switches to a trickle charge. The 7.2 amp hour, 12-volt battery that was supplied with the VS820 system should take about 8 to 10 hours to charge from a completely discharged state.

When the green LED light is on, disconnect the charger from the battery and wall outlet. If the green LED light does not come on after 10 to 12 hours of charging time or the green LED light comes on relatively soon after the charger is plugged in, this may indicate that the battery will not accept a full charge. If this occurs and your camera run time is greatly diminished, you may want to replace the battery with a battery of equal specification.

If your viewing image appears cloudy, fuzzy or the screen begins to shrink, check your battery charge. One of the major symptoms of a dead or near-dead battery is the degradation of your viewing image. Try charging your battery or if the battery is unable to hold a charge, replace it with a new one of similar specification. If you need to remove the battery, unplug the two battery terminals from the battery. Remove the Velcro strap that is holding the battery in place and lift the battery out. To replace the battery, place a new battery into the battery compartment and secure it with the Velcro strap and re-connect the positive and negative terminals. ***MarCum does not***

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warranty batteries beyond 90 days from date of purchase.
Tip: To preserve battery run time, try to keep the VS820 in a relatively warm environment to minimize the use of the built in LCD heater system. By starting out with a warm monitor, there is less power consumed and less warm up time required.

PRODUCT PERFORMANCE SPECIFICATIONS

Battery...12 volt DC, 7.2 Amp hr.

Charger...12 volt DC, 1 Amp

Camera:

   Image Sensor............................. 1/3" Sony SUPER HAD CCD (B/W)

   Resolution.................................... 400 horizontal lines

   Light Sensitivity........................... 0 lux with lights on

   Field of View............................... 90 degrees

Monitor...8" 4:3 aspect TFT LCD (600v x 800h)

Current Draw:

   System ON (lights off)................. 630mA

   System ON (lights on—full)......... 815mA

One-Year Warranty

To activate your warranty, you must send the original sales receipt or photo copy with the warranty card. The warranty will be VOID without the accompanying sales receipt. For a period of one year from the date of purchase, MarCum Technologies will provide free parts and labor on any defects in materials or workmanship, with exception of the following conditions: damaged or cut cables, lost components, damage due to misuse, unauthorized modifications, or repairs. ***MarCum does not warranty batteries beyond 90 days from date of purchase.***

The manufacturer must perform all warranty work or repairs. If your underwater viewing system requires service, call us at the number listed below to receive a Return Merchandise Authorization (RMA) number or go online to **www.marcumcustomerservice.com**. **DO NOT** return product to our PO Box. This return process has been implemented because we may be able to save you the inconvenience of returning the unit. Some problems may be resolvable by a technician over the phone. If the unit is sent back to MarCum Technologies for repair, mark the RMA number on the outside of the package and enclose a letter indicating the problem. Please include your return address and daytime phone number.

For your convenience, save the original box and packing materials for use if factory return is required. For warranty repair and/or service, call a customer service representative at (763)-323-0456.

Service Information

MarCum Technologies is dedicated to providing you with the best customer service possible. We have designed a web site dedicated to providing you, our customer, with answers to your questions, access to product accessories, repair information, online owner's manuals, etc. These services can be obtained by going on line at **www.marcumcustomerservice.com**. We highly recommend that you take advantage of this service and utilize it as your first line of contact. For those of you that don't have access to a computer, you can call our customer service department at (763)-323-0456, Monday through Friday from 9:00am to 5:00pm CST.

When returning product for repair, please obtain a return merchandise authorization (RMA) number by going online at **www.marcumcustomerservice.com** or by calling (763) 323-0456 This number must be displayed on the outside of the box and will be used as a reference number when checking on the repair status. Always include a note with your return stating the problem, RMA # and return shipping address (No P.O. boxes, you must utilize a UPS shippable address).

Please ship in original factory carton and add adequate internal packing material as required. We make every attempt to complete our repairs within 48-72 hours of receipt. It is our goal to have you back on the water fishing as quickly as possible. Thank you in advance for your patience.

Ship product returns to:
MarCum Technologies Service Center
1034 McKinley St.
Anoka, MN 55303

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One step ahead.