

## FIN & WEIGHT

A Fin has been included with your system for use in open water. When using the system from a boat or in water with current, it is recommended that the Fin be attached to help stabilize and steer the camera in the correct direction. The camera should be used at slow speeds while drifting, or while under propulsion from a trolling motor or outboard motor.

The Fin is designed to be reversible and can be mounted behind the camera housing with the Fin pointing upward for forward viewing or in front of the housing with the Fin pointing downward for viewing backwards. The camera can be attached to a down rigger cable by the use of a down rigger release attached through the holes on the backside of the camera housing. The Fin should be used in front of the camera lens and pointing downward when attached to a down rigger cable.

The Fin can be attached by sliding the rail of the Fin into the slots in the lead ballast weights at either the front or rear of the weights depending on your desired viewing direction. A stainless bolt and nut are provided to attach the Fin firmly to the lead ballast weights. When using the Fin & Weight, be careful to keep the camera out of heavy weeds, brush, or large rocks. If the camera becomes hung up, back up from the direction you were traveling and slowly try to back the camera out of the snag. Do NOT pull upward with force unless all other avenues have been pursued.

## BATTERY CHARGING

Recharging the battery after every use is recommended. As a general rule of thumb, charge the battery for twice the amount of time as it was used. The VS 400 underwater viewing system has a DC charging port located just above the battery door on the right side of the monitor face.

The charger that was supplied with the VS 400 system is a 500 mA DC charger with a male jack. To charge your system, simply plug the male jack of the charger into the plug in port in the face of the monitor and then plug the charger into a 110 volt AC wall outlet. The 7 amp, 12 volt battery that was supplied with the VS 400 system should take about 15 hours to charge from a completely discharged state. The charger incorporates a Charge Alert feature to alert the user to when the battery reaches full capacity. This is accomplished when the green LED light shuts off on the face of the charger. The charger does not shut off automatically but will output a trickle charge indefinitely. It is recommended, however, that the charger be disconnected from the monitor when the Charge Alert green LED is no longer on. It's recommended that you remove the battery door while charging to allow for increased air ventilation through out the battery compartment.

If your viewing image appears cloudy or fuzzy, 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 the same specification. If you need to remove the battery, unplug the two battery terminals from the battery. Unscrew both the screws located in the upper right and left corner of the battery compartment. This will allow you to remove the battery strap from the battery. After removing the strap, lift the battery up slightly with a finger on either side of the battery and slide the battery towards you. This should allow for easy removal of the battery. To replace the battery, lift the battery up and slide into the battery compartment until the front of the battery drops down into the compartment.

## SPECIFICATIONS

<b>BATTERY:</b>	12 volt DC, 7 Amp hr.
<b>CHARGER:</b>	12 volt DC, 500 mA
<b>CAMERA:</b>	
<b>Image Sensor:</b>	1/3" Sony CCD (B/W)
<b>Resolution:</b>	400 HORIZONTAL LINES
<b>Light Sensitivity:</b>	.001 LUX HI-VU LED'S on
<b>Field Of View:</b>	90 Degrees
<b>MONITOR:</b>	
<b>CRT:</b>	5.5" Diag. Flat Screen High Resolution
<b>CURRENT DRAW</b>	
<b>ON (no illumination):</b>	700 mA
<b>IR-Vu (non-visible infrared):</b>	775 mA
<b>HI-Vu (visible multi-color):</b>	750 mA

## WARRANTY

To activate your warranty, you must send the original sales receipt or Xerox copy with the warranty card. The warranty will be void without the accompanying sales receipt. For a period of one year from 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 unauthorized modifications, repairs, or misuse.

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 Authorization Number (RMA) and return shipping address. **DO NOT** return the unit to our PO Box in Monticello. UPS will not deliver to a PO Box. This return procedure 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 Return Authorization Number on the outside of the package and enclose a letter stating the problem with 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 **(763) 512-3987**.



## UNDERWATER VIEWING SYSTEM



## VS 400 Instruction Manual

## **INTRODUCTION**

Thank you for purchasing the VS 400 underwater viewing system from MarCum Technologies.

Welcome to the world of underwater viewing. MarCum Technologies has incorporated the latest technology in producing the most compact and technologically advanced underwater viewing system available. Hunt for underwater treasure or locate the "spot on the spot" for great fishing.

There are hundreds of uses for your new VS 400 underwater viewing system. Now you'll actually be able to see what's below the surface of your favorite lake.

## **FEATURES**

The VS 400 viewing system has various modes of illumination that provide enhanced visibility for varying light conditions. The different lighting options can be selected through the keypad located on the face of the monitor. Depending on the amount of natural light available, you can choose between no illumination (ON), Infrared non-visible illumination for stealth viewing (IR-VU), or multi-colored visible illumination (HI-VU). Even in the most dimly lit conditions you can identify fish, structure, or objects with ease.

The VS 400 is available with a choice of either 60 or 100 feet of Kevlar reinforced underwater camera cable. Your VS 400 system comes with a detachable camera that plugs and unplugs at the rear of the monitor. A handy cable reel for convenient cable storage is provided with the system.

The 5.5 inch black and white CRT monitor has excellent resolution allowing viewing with great clarity and detail. Controls for adjusting vertical hold, contrast, and brightness are located at the rear of the monitor behind the rubber plug. Adjustments can be made by removing the plug and rotating the knob either clockwise or counter clockwise to obtain the desired picture. The rubber plug should remain in place in the recessed area at all times to prevent moisture from entering the monitor housing.

The VS 400 has a video-out jack located at the rear of the housing under the rubber plug in the same recessed area as the monitor adjustment controls. The video-out jack can be utilized by purchasing a cable of desired length with male RCA jacks from a local retailer of video or audio equipment. The cable can be plugged into either a larger monitor or T.V. for a larger viewing image or can be used to record onto a VCR or camcorder. To record onto a camcorder you must have a camcorder with a video-in port.

The underwater camera comes with weights installed on the bottom of the camera housing. These weights are required to provide the appropriate ballast for use in the both open water and during ice fishing. Do not use the camera without these weights.

A high quality padded "Soft Pack" carrying case incorporates a built in collapsible viewing shroud to enhance viewing in bright light conditions. The front of the Soft Pack can be opened to allow for viewing when not exposed to harsh light (i.e. when viewing in an enclosed ice house). The versatile "Soft Pack" system provides protection from the elements as well as allows for the easy storage of all camera accessories. A draw string pouch on the back of the "Soft Pack" holds the camera cable while two side pouches accommodate the camera with attached steering Fin and Ice Arm with ratcheted steering clip.

The battery included with the system is a 12 volt, 7amp hour sealed lead acid electrolyte battery that will provide approximately 8.5 hours of viewing time when fully charged. Viewing time will vary dependent on the condition of the battery as well as

the illumination mode used, i.e.: 9.0 hours for ON (no illumination), 8.0 hours for IR-VU (non-visible infrared), and 8.5 hours for HI-VU (visible multi-color). A 500 mA DC wall charger is supplied to recharge the battery to full capacity. Recharging the battery to full capacity after every use is recommended. For further battery charging information, please see the "Battery Charging" section of this manual.

## **GETTING STARTED**

Remove your VS 400 monitor from the Soft Pack by first opening the front of the case. This is accomplished by pulling the flap at the top and sides of the Soft Pack until the Velcro strips separate. Reach into the Soft Pack on top of the monitor and grab the molded inset handle about halfway back. Pull the monitor forward tilting the top towards you until it comes out of the Soft Pack case. Place the monitor on a flat surface and open the battery compartment door located on the front lower section of the monitor case.

This is done by gently applying downward pressure on the grooved finger inset at the top of the battery door and pulling forward. Connect the battery leads to the battery terminals i.e.: red lead to battery positive and black lead to battery negative. Replace battery door and place monitor back into padded Soft Pack case. Close front of case by re-attaching Velcro strips. Turn the Soft Pack to the backside and remove the cable reel from the back pouch.

Reach into the lower left corner of the rear pouch and undo the Velcro door. This allows access to the plug-in port for the camera. Plug the camera cable into the upper plug-in port. Take notice that the plug-in is not round but has a flat side. This is designed to assist in lining up the pins with the sockets in the plug and help eliminate the bending of connector pins. Do not force the plug into the receptacle, you may have it mis-aligned. There will be some resistance when plugging in the camera due to the molded seal rings located on the plug, however, if lined up properly, this should go together quite easily.

Please take note that the lower plug-in port marked ACC is not relevant to the VS 400. This is a dead port and you should not attempt to plug the camera into this location. Once that camera is plugged into the monitor, you can replace the camera cable into the rear storage pouch and pull the drawstring for a snug fit. Place the camera with the attached weights in the storage pouch on the left side as viewed from the front. Place the Ice Arm into the vertical storage pouch on the right side as viewed from the front. Attach the clip to the cable or store in the pouch on the left with the camera. You are now ready to head to the lake. Once you reach your destination, remove the cable reel from the rear storage pouch and remove the required length of cable. Open the front of the Soft Pack so that the monitor and keypad are fully exposed. Turn the camera power on by depressing the ON button on the keypad. The orange light to the right of the ON button will light up and within seconds the monitor will come on. NOTE: there is no camera illumination in this position.

Lower the camera into the water to the desired depth and secure the cable with the Ice Arm to prevent depth changes. As with all CRT displays, bright light can washout the display making viewing difficult. If this occurs, rotate the system so that the light source is not directly on the monitor screen. In extreme bright light conditions it may be necessary to use the viewing shroud to shield the monitor from the light source. To use the viewing shroud, remove the protective cap from the face of the shroud located on the front of the padded Soft Pack. Grab the face of the view shroud and pull towards you until all three collapsible parts are fully extended. The shroud is not fully extended until you hear the telltale click of each part as it locks into place. This clicking locks the shroud into position so it won't collapse on its own.

To collapse the shroud to its original position, push on the face of the shroud until all three parts collapse inside each other and then the replace the protective cover. The depth of field, the distance the camera can see underwater, depends on the clarity of the water and available light at the depth the camera is used. In extremely clear water the depth of field can be several feet and in cloudy or muddy water the depth of view can be reduced to only a few inches due to particles suspended in the water.

The underwater viewing system utilizes two different lighting options, IR-VU and HI-VU. Infrared (IR-VU) can be selected by depressing the IR-VU button on the keypad. Infrared works well in clear water or in low light conditions (dusk or dawn) or when fish appear to be in a negative or neutral mood and react negatively to the bright HI-VU lights. The HI-VU lights can be activated by depressing the key marked HI-VU and can be used in extreme low light conditions or in water that isn't conducive for an Infrared light source.

## **ICE FISHING APPLICATION**

A folding Ice Arm with a ratcheted steering clip is included with the VS 400 to enhance your viewing through the ice. The Ice Arm and ratcheted steering clip holds the cameras depth and direction of view when positioned over an ice hole. To prepare the Ice Arm for use, hold the Ice Arm (logo pointing upward) in your left hand with the slotted ratcheted area pointing away from you at the 12 o'clock position. Open the Ice Arm by swinging the smaller arm located underneath counter clockwise to a 90-degree angle. Place the camera cable at the back of the slotted ratcheted area in the top arm and close the arm by rotating the smaller arm underneath counter clockwise until the entire arm has been straightened. At this point the ice arm is ready to be placed over the ice hole as shown on the outside of the original package.

You are now ready to set the depth for viewing by attaching the steering clip to the cable above the ice arm. To attach the ratcheted steering clip, apply moderate pressure to the wings and simultaneously slide the cable into the hole in the middle of the clip. Release pressure on the wings and cable will be held firmly in place. The clip must sit in the ratcheted area of the Ice Arm with the camera cable rising straight above the clip for at least 4 inches. If the cable is angled too severely above the clip, the clip won't sit flat in the ratcheted area resulting in poor contact and difficulty in steering.

To determine your viewing direction, position your camera towards your bait so that you can see it in the middle of your viewing screen. Reposition your steering clip so that the front of your clip is facing the same direction as your ice hole that the bait is located in. By doing such, you've set your clip to indicate the direction the camera is pointing. If viewing adjustments are required, lift the steering clip out of the ratcheted area by lifting up on the cable, twist the cable in the required viewing direction and lower the clip back into the ratcheted area.

A suggestion on how best to utilize your viewing system while ice fishing. Drill two holes 3 to 4 feet apart. Lower your bait into one hole while placing the camera in the other hole pointing in the direction of your fishing lure. Set the depth and angle of viewing so that your lure appears in the middle of the viewing screen. Good Fish'n!